

tyco



Store Intelligence. Retail Excellence

Electronic Article Surveillance from security to retail performance

Executive Summary

Historically, shrink worldwide has posed a significant threat to retailers' profits, prompting the invention in the mid-1960's of the first anti-shoplifting systems. The constant growth of retail and increasing sophistication of thieves year over year has compelled retailers of all sizes to adopt "electronic article surveillance" (EAS) technology to make products accessible to shoppers while protecting against theft.

Worldwide, retailers recognize that shrink or inventory loss is only part of their daily challenge affecting profitability. Not only do they need to worry about shrink, but also they must address poor inventory management and inefficient operations, especially during a time when the global economy continues to struggle through one of the most chaotic climates in history.

Thanks to technology advancements over a span of more than four decades, retailers now can invest in solutions that, in addition to reducing shrink, also reduce costs, improve productivity, enhance shopper satisfaction and create new sources of competitive differentiation.

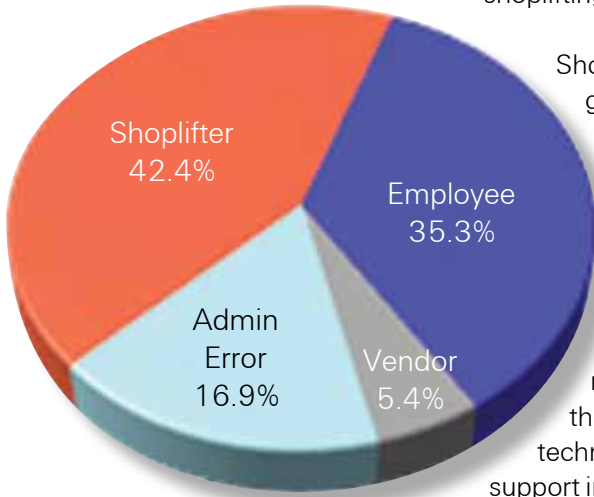
Enhanced EAS solutions provide critical decision support at both the store and enterprise level by capturing, aggregating, interpreting, analyzing, reporting and intelligently responding to real-time operational data from stores, employees, inventory, and shoppers. A new generation of scalable, integrated and interconnected systems focused on merchandise protection and optimization as well as infrastructure reduction is currently being implemented by many retailers worldwide to dramatically enhance their performance.

Enhanced EAS solutions provide critical decision support at both the store and enterprise level...



Retail Shrink – a Worldwide Phenomenon

According to the 2010 Global Retail Theft Barometer, worldwide shrink amounted to more than \$107 billion last year. Shrinkage accounts for any loss of inventory due to shoplifting, employee theft, administrative error or vendor fraud.



Shoplifting has consistently been the most significant challenge for retailers globally. Shoplifting data includes theft committed by Organized Retail Crime (ORC), a rapidly growing threat to retailers over the last few decades. ORC refers to professional shoplifting, cargo theft, retail crime rings and other organized crime occurring in retail environments, usually executed by well trained teams, where some create distractions while others steal. According to the 2010 “Current Crime Trends” survey by the Retail Industry Leaders Association (RILA), ORC is on the rise. Sixty-five percent of a broad array of surveyed retailers reported an increase in organized retail crime, while 74 percent reported an increase in stolen items being sold through online marketplaces. Due to the level of sophistication and the techniques used by the ORC, 60 percent of U.S. retailers’ senior executives support investing in better technology to combat the problem, as reported in a recent National Retail Federation study.

2010 Global Sources of Shrink (Losses of \$107.3 Billion)

The following table highlights the most stolen product categories by vertical market (global data), featuring only the top six verticals.

MOST STOLEN PRODUCT CATEGORIES

Ranking	1	2	3	4	5	6	7
Clothing, apparel, footwear	High-end fashion, all branded	Accessories, jeans, dresses	Shirts, football shirts	Lingerie	Handbags, leather items	Boots, sport shoes	Branded sunglasses & jewelry
Consumer electronics	MP3 players, other games	Digital cameras, cell phones	Mobile computer, iPods, GPS	Med equip., A/C products	Accessories, handphones, data sticks	Plasma screen TV's	Home office consumables
Department stores & large general stores	Perfumes & face creams	Branded clothing	Branded or leather accessories	Watches	E-readers, mobile phones	Handbags	Games & DVD's
Home improvement hardware, DIY	Power tools	Hand tools	Door locks	Building supplies	Home automation devices	Small electronic items	Small packs of screws, washers
Office Products	Printer cartridges, laser toner	Mobile phones cell phones	Laptops	Small electronic devices	Connection devices, adapters, cables	Satnav	Pens, writing products
Supermarkets hypermarkets & food	Razor blades, health & beauty products	whisky, Alcohol, tobacco	Fresh meat/ expensive food stuff	Infant formula, coffee, OTC medication	DVDs, CDs	Shirts & clothing	Garden Products

Shrink Impacts Retailers' Profits

Shrink can affect retailers directly and indirectly. In addition to generating financial losses, shrink affects them directly by increasing in store out-of-stocks. On average, a retailer needs to sell more than three items to make up the profit dollars for one stolen item. Furthermore, a 2011 study from the IHL Group concludes retailers globally are losing \$773.6 billion in annual sales as a result of out-of-stocks on the products consumers desire to purchase. According to this study, retailers could increase store sales by an average of 9.2 percent if they could manage to keep merchandise in-stock.

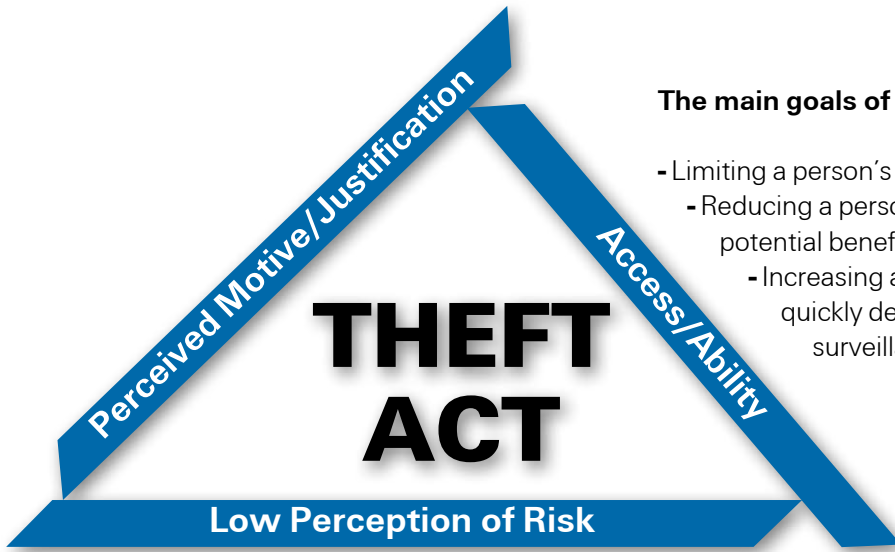
Also, shrink affects retailers indirectly by negatively impacting shopper satisfaction. When considering the direct link between shopper satisfaction and future revenues, it is easy to appreciate the importance of shrink control to minimize its negative effect on the retailer's profit.



The Retailers' Dilemma

Retailers face numerous challenges when combating shrink. One possible dilemma is whether to openly merchandise items to maximize customer convenience and enhance profits, versus locating items behind display cases to protect them from theft while inconveniencing the customer. Another possible challenge could be entrusting employees to be the primary contact with shoppers, yet wondering if they're stealing from you in the process. EAS solutions help retailers solve these problems by stopping shoplifting and by providing a meaningful deterrent.

The great value of using EAS systems as a deterrent can be fully appreciated when taking into account one of the most popular, impulsive shoplifter's decision-making models - the theft decision triangle. Based on this paradigm, retailers can leverage EAS solutions to provide deterrence by shaping the emotions and behavior of would-be offenders.



The main goals of EAS technology implementation are:

- Limiting a person's ability to steal an item - opportunity reduction
- Reducing a person's motive to steal an item by denying them potential benefits from stolen goods - benefit denial
- Increasing a would-be thief's perceived personal risk of being quickly detected and punished for stealing an item - asset surveillance



EAS Technologies

EAS technology has evolved dramatically over the last forty years to meet increasingly sophisticated retail requirements. Specifically:



Introduced: 1960's

Microwave, magnetic, and radio-frequency (RF) EAS

Retailers deploy hardware-based, single-bit event detection technologies tailored for specific retail verticals, to reduce shrinkage and prevent non-productive associate behavior.



Introduced: 1980's

Acousto-Magnetic (AM) technologies

AM quickly gains market share, overcoming all the shortcomings of the previous technologies. Retailers now can migrate to high-integrity tags applied in-store or at manufacturing sources, extending protection across all retail verticals and product categories, including hardgoods, where RF underperforms, improving deterrence, and resisting unauthorized removal or deactivation.



Introduced: 2000's

UHF Gen 2 RFID

The recent development of economical, passive RFID is an evolutionary step beyond existing EAS technologies. The UHF Gen 2 standard is a framework for building RFID systems that operate in the 860 MHz to 960 MHz band. A viable EAS option, this technology also provides retailers with predictive analytics and inventory visibility.

Differences in the EAS technology - critically the frequency of operation and how the tag or label works - provide the major variations in performance and value between the systems available on the market.



EAS SYSTEMS

How EAS Systems Work

An EAS security system has three elements: 1) detectors and controllers that create a surveillance area at exits and checkout aisles; 2) deactivators and detachers – used at the POS to electronically deactivate labels and detach hard tags as items are purchased; 3) and labels and hard tags – sensors that are attached to merchandise.

As shown below, all EAS technologies use radio frequencies, albeit in different frequency ranges.

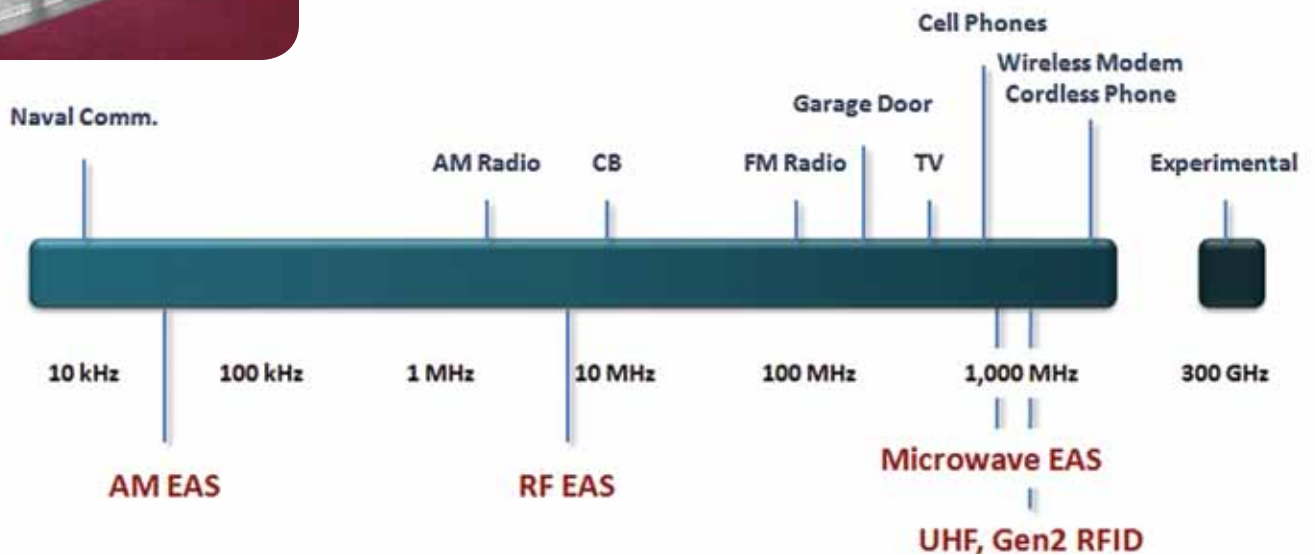


Figure 1; EAS frequency range

Acousto-magnetic (AM) EAS technology uses the 58 KHz frequency that is fairly low in the frequency spectrum and is more difficult to detune, while other technologies such as RF and Microwave operate at much higher frequencies and are therefore easier to detune. Furthermore, while AM has a narrow tolerance of approximately 600 Hz, RF's tolerance is greater than 1 MHz, thus allowing for more noise to be introduced into the system and for more false alarms.

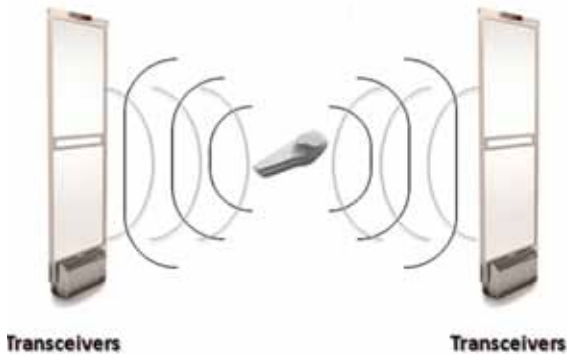
The industry-leading performance of the genuine Sensormatic-branded AM technology is delivered by Tyco Retail Solutions

Acousto-Magnetic (AM) Systems– Developed under the Sensormatic brand, AM was designed to overcome the weaknesses of the previous systems and provides unsurpassed performance at the store exit, significantly reducing losses associated to shoplifting. Some of the greatest benefits of AM are:

- Very wide exit detection combined with small tags and labels
- Consistent performance in all retail environments
- Greater immunity to false alarms
- Superior detection performance against body shielding
- Ability to travel through liquids, offering better merchandise protection
- Ability to work on products and/or packaging containing metal
- Superior performance against electrical noise due to smaller bandwidth

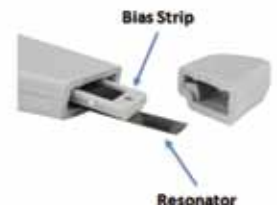
AM systems use a transmitter to create a surveillance area where tags and labels are detected. The transmitter sends a radio frequency signal (of about 58 kHz) in pulses,

which energizes a tag in the surveillance zone. When the pulse ends, the tag responds, emitting a single frequency signal like a tuning fork. While the transmitter is off between pulses, the tag signal is detected by a receiver. The system verifies the unique AM signature and if all the criteria are met, the alarm occurs.



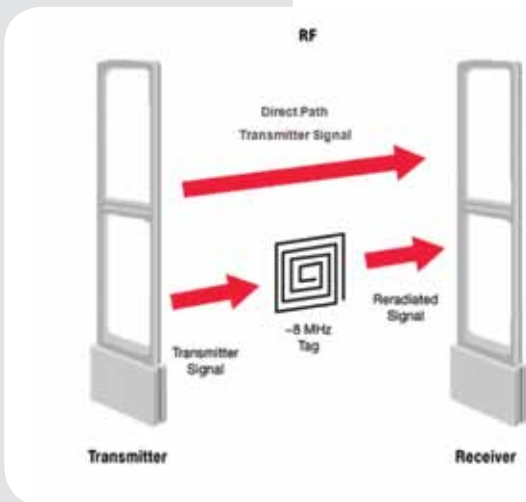
The ability of the system to detect smaller labels and to use a very narrow bandwidth comes from the design of the tag and label. Both contain a resonator and a bias. The tag has a plastic case, may be reusable, and is removed at the POS during a

purchase. The label is deactivated at the POS so it will not cause an alarm at the exit. The bias-resonator is protected by patents in many countries by the Sensormatic brand, providing retailers with unmatched anti-theft performance.



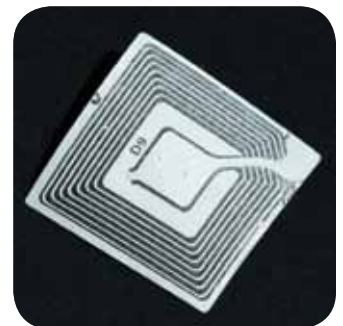
Radio Frequency (RF) Systems – These systems transmit with a center frequency of 8.2 MHz. When the label or tag is attached to a product, it responds to the aforementioned frequency emitted by a transmitter antenna. The

response from the label is subsequently detected by an adjacent receiver antenna, processing the label response signal and triggering an alarm when it matches specific criteria.



The size of the label is important for performance reasons. The standard size of the label is 4 x 4 cm (1.6 x 1.6 inches); label sizes smaller than this have reduced performance characteristics.

Electrical noise, vertical power cables, neon lights, etc., all can affect significantly the performance



of RF technology. Passive noise sources are also a major issue. RF systems cannot be installed near metal doors or even the metal edging around door mats. Typically, you will see RF systems installed more than 24" away from the exit to avoid interference, therefore forcing retailers to give up precious real estate that could otherwise be used to display merchandise.

Radio Frequency Identification (RFID) Systems – RFID is a technology that uses radio waves to transfer data from an electronic tag, called an RFID tag or label, attached to an object, to a reader for the purpose of identifying and tracking the object. RFID technology allows automatic object identification without line of sight, unlike barcode scanning. In addition, RFID tags can transmit and receive data, allowing them to be updated with new information as they move through the retail enterprise.

The heart of RFID technology is a tag consisting of a tiny silicon chip with an antenna. The chip contains information about the item that it is either attached to or embedded in.

RFID technology provides retailers with an accurate account of the inventory on-hand, in real-time. Through enhanced inventory visibility, retailers can improve existing operations, reduce out-of-stocks, and enhance the shopping experience.

RFID can be used as an EAS system at the exit, not only triggering the alarm when a theft has occurred, but also identifying the exact item stolen. This knowledge enables the stolen item to be quickly identified and facilitates real-time shelf replenishment of merchandise, resulting in increased sales.

When AM and RFID technologies are paired together, retailers are powered with both world class shoplifting prevention and inventory intelligence.

Technology Comparison

Performance	AM (58kHz Bias-Resonator Tech)	RF (8.2MHz)	UHF - Gen 2 RFID (915Mhz or 868MHz)
Body Shielding	No Impact	Moderate Impact	High Impact
In / Near or On Metal	Low Impact	Moderate Impact	High Impact
On Liquids	Low Impact	Moderate Impact	High Impact
False Alarm Immunity	Medium-High	Low	High (with data)
Proximity Deactivation	Medium	High	High
Exit Width	Wide	Medium	Wide
Item Level Label Size (2m exit detection)	Small	Large	Small
Noise Immunity	Moderate-High	Low	High
Sensor Pick Rate (Cooperative)	High	Med-High	High
Deactivation Integrity	High	Low	High
Unlimited Activation / Deactivation of Labels	Yes	No	Yes (with data)
Ease of Source Tagging	High	Low	Medium
Item data Storage	No	No	Yes
Mobile Proximity Deactivation (10-13cm)	No	No	Yes
POS Scanner Integration Capable	Medium	High	High



AM EAS System Components

The most important components of AM systems include the following:

Detection Systems – Use one or more pedestals or a concealed system configured to create a surveillance zone at exits or checkout lanes. Pedestals, which come in a wide range of attractive designs, can provide visible deterrence while concealed systems offer more discreet protection for upscale retail environments.

The U.S.-based Loss Prevention Research Council (LPRC) conducted a retailer-sanctioned study across 320 stores, and demonstrated that in same-store settings, the AM technology detection rates were more than 1.5 times those of RF technology.



Deactivation – Renowned qualities in AM deactivators include a large deactivation zone and up to 100% deactivation with no false alarms at the store's exit. Quite common are flat deactivator pads used for distance deactivation of tagged merchandise.

Sensormatic deactivators fall into two different categories:

Integrated deactivators provide seamless scanning and deactivation compatible with the leading bi-optic scanning systems. These units, which can be also integrated into a variety of self-checkout devices:



- Provide reliable deactivation performance due to the height of the deactivation zone
- Maintain high throughput during the checkout process in large store formats

Counter-ready deactivators provide reliable deactivation and are ideal for boutique and/or low throughput environments.



Labels – labels are one-quarter the footprint of standard RF labels and can be applied manually or at high speed. Unlike RF technology, AM labels can:

- Protect items in smaller packages like batteries, given their smaller footprint
- Be placed more effectively on the product – without masking consumer brand, dosing or other important product information
- Go through unlimited activation/deactivation cycles
- Perform when liquids and/or metal are present (superior anti-theft performance)



AM Label Size: 1.78" L x 0.42" W
RF Label Size: 1.5" L x 1.5" W

Detailed technology comparison regarding labels

	AM	RF
Low Cost	✓	✓
Smallest Footprint	✓	
Highest Pick Rate	✓	
Works on Most Liquids	✓	
Works on Metalized Packaging Foils	✓	
Detected in Metal Shopping Carts	✓	
Protects Wide Exits with Fewer Pedestals	✓	
Virtually no False Alarms	✓	
Repeatable Deactivation/Reactivation	✓	



Source tagging is a great alternative to in-store label application, helping increase product sales and profitability by enabling retailers to maximize merchandising techniques and product assortments. Depending on the applications, AM labels can be applied at speeds of up to 600 labels per minute, which is much faster than RF labels, typically running at less than 400 labels per minute.

In addition to typical label requirements, AM solutions offer specialty label products for markets such as food & drug, health & beauty, and others.

Detachers – Designed to allow for simple detaching of hard tags, AM Sensomatic detachers belong to either the clamp or the magnetic detaching family. All AM detachers:

- Maximize counter space thanks to their compact design
- Can be secured directly to or flush mounted into the counter-top
- Provide quick and efficient removal of security tags from merchandise at the POS



Clamp Detacher



Magnetic Detacher

Dress created from genuine
Sensomatic hard tags.
Designed by Jose Castro

TAGS

Hard Tags – Retailers need to protect a wide variety of merchandise. Sensormatic offers one of the industry’s most comprehensive assortments of EAS hard tags providing theft deterrence with exceptional performance, strength, and versatility.

Provided in two locking categories, clamp and magnetic, hard tags are ideal for apparel, accessories, and general merchandise. They offer exceptional durability, high security, ease of application, and ease of removal.

Sensormatic hard tags using AM bias/resonator technology:

- Perform better within foil lined bags or metal shopping carts
- Cannot be de-tuned when placed next to a metal object such as a coin, keys, etc.
- Are durable, with a high impact ABS molded housing reinforced internally and throughout
- Do not contain any electrical components that could possibly be damaged when held too close to an antenna
- Are highly defeat resistant

Within the broad assortment of Sensormatic hard tags, Ink Tags and Alarming Tags represent two specialty tags that stand out for their unique characteristics and applications.



Ink Tags – An attractive solution for apparel protection, ink tags incorporate the Sensormatic brand’s patented breaker plate and dispersion pad to dispense an un-freezable, non-toxic, aggressive permanent ink. Permanently damaging a garment, the ink renders stolen merchandise useless or unsellable if the tag is removed through unauthorized force, thereby denying the benefit of shoplifting.



Alarming Tags – These top-of-the-line tags represent an electronic approach to merchandise tagging. Designed to protect high-value, high-risk merchandise such as electronics, handbags, leather, and luxury goods - all prime targets for thieves – the tag emits an audible alarm that alerts store associates of any unauthorized attempts to remove or defeat the tag. Also it alarms the detection system when tagged merchandise enters the detection field.

Safers and Wraps – The Sensormatic line of safers and wraps provides retailers with the perfect solution for open merchandising and high security, allowing shoppers to select and purchase items without having to engage store employees to access products protected in locked cabinets or behind the POS.



Safers – Protected with proprietary non-deactivatable AM label, Sensormatic safers are made with the highest grade polycarbonate plastic, the same material used in bullet proof glass, which resists scratching, yellowing and does not become cloudy, thus ensuring attractive product presentations.



Wraps - Wrap tags provide protection to popular, high-valued product categories while keeping them accessible to customers.

Offered in two and three alarm versions, Sensormatic wrap tags emit a loud, audible alarm - 97 Decibels...louder than standard motorcycle engines! - if an attempt is made to defeat them.

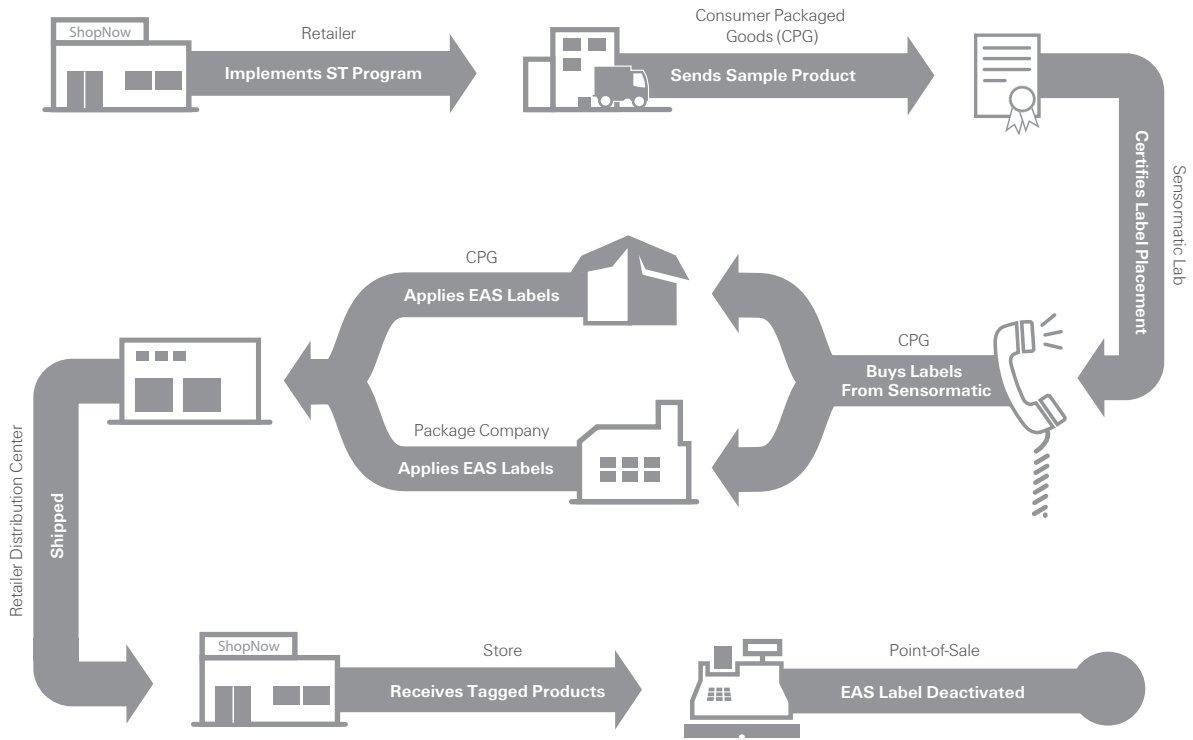
Source Tagging



Driven by the demands of the retail community, source tagging is the application of EAS tags and labels by a manufacturer during the manufacturing process. Through 2011, Tyco Retail Solutions has protected more than 40 billion products worldwide with Sensormatic branded labels.

Source Tagging for Packaged Goods and Food – Hardgoods and food retailers work in concert with the manufacturers of highly pilfered goods to ensure products are tagged, shelf ready and openly displayed for consumers to conveniently purchase. For the retailer, source tagging helps to increase profitability due to product availability and labor savings at the store level with 100 percent tag compliance. Consequently, tag compliance is directly related to shrink reduction. For the manufacturer, the benefit of source tagging is brand protection because the product stays on the shelf.

Through its Sensormatic brand, Tyco Retail Solutions offers some of the industry's most advanced, versatile, and reliable solutions, including labels that can be embedded into the products or product packaging, ideal for CPG and food items.



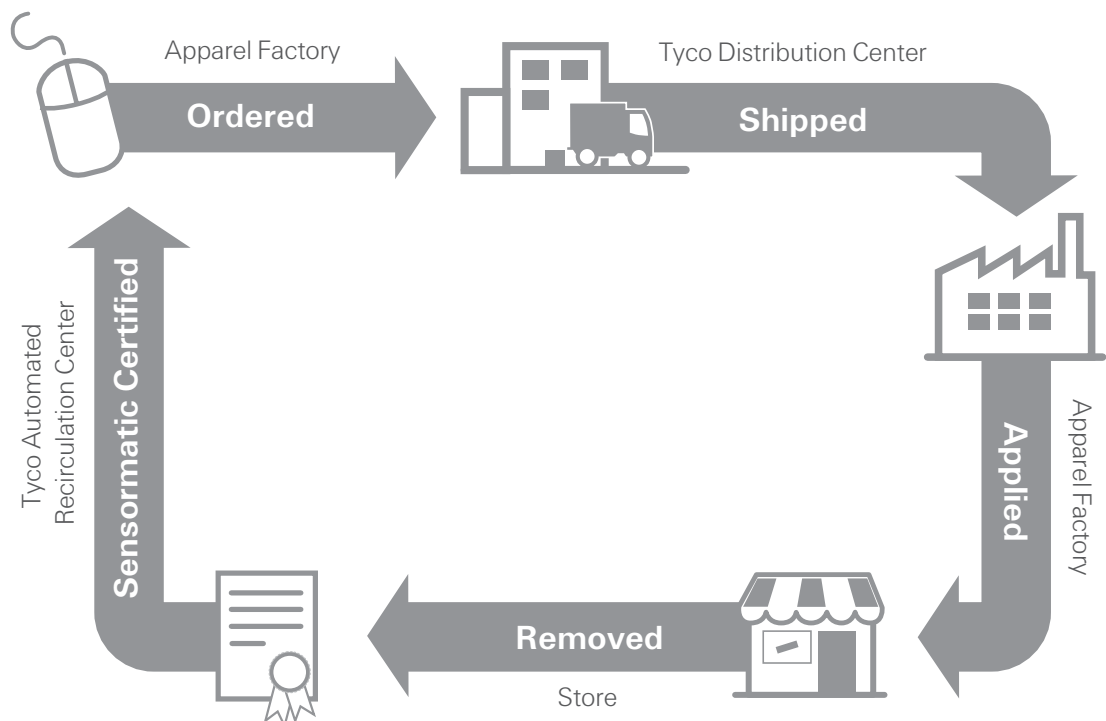
Packaged Goods Source Tagging program—certification, label, and information flows

Source Tagging for Apparel—Through its Source Tagging Recirculation program, Tyco Retail Solutions helps retailers improve supply chain and selling floor efficiencies by delivering a more effective and streamlined tagging strategy. When source tagging is implemented, retailers realize lower tag defeat rates, reduced labor costs of in-store tagging, and increased associates’ availability to service shoppers. Ideal for apparel retailers, the Source Tagging Recirculation program begins to put the infrastructure in place to deliver cost-effective protection today, and unlock the full capabilities of EAS and RFID for robust protection and end-to-end inventory visibility tomorrow.

Some of the program’s key benefits are:

- **Labor savings** – fewer payroll hours at the store to apply tags, and a higher percentage of time spent on selling time and customer service.
- **Less shortage** – more tags on more items throughout the store, with 100 percent compliance and 100 percent consistency, and no merchandise left untagged in back rooms.
- **Increased sales** – better speed to floor, fewer stock-outs on popular items, and store associate time spent selling, not tagging.
- **Consistency** – application in manufacturing environment, for fewer damages and a better appearance.
- **Lowest tag cost** – overall tagging cost is reduced by selling the tag back to Tyco, compared to utilizing the tag one time.
- **Environmental sustainability** – the initiative embraces green retailing principles by recirculating tags to save valuable time, money, and resources.

Recirculation shouldn’t be confused with recycling. Tyco Retail Solutions repurposes tags, supporting a complete recirculation solution. Using an established reverse logistics process, tags can be reapplied multiple times at the garment manufacturing location.



Apparel Source Tagging Recirculation program—merchandise, tag, and information flows

Tyco's information-based systems enable actionable intelligence to help retailers become more profitable.

Benefits of AM Solutions – A Holistic Approach

As shoplifters grow increasingly sophisticated and organized, Tyco Retail Solutions leverages the industry-leading performance of its genuine Sensormatic AM technology to offer an expanding portfolio of mission-critical solutions and services. Tyco Retail Solutions is leading the evolution of retail performance and security solutions by providing a scalable, integrated platform of interconnected systems centered on inventory protection and optimization. These information-based systems enable actionable intelligence to help retailers become more profitable.

Re-inventing EAS

The evolution of EAS technologies and the continuous efforts by companies like Tyco Retail Solutions to provide customers with increasingly sophisticated and effective solutions led to the introduction of enhanced EAS systems featuring key elements like:

STORE OPS.

- **Tags-too-close** – Reduces unintended alarms, allowing retailers the flexibility to display merchandise closer to the exits.
- **People counting and directionality** – A simple and valued tool to help increase customer service, improve productivity and optimize staffing.

ORGANIZED RETAIL CRIME

- **Metal Foil Detection** – Sensormatic metal-foil “booster” detection technology helps identify “booster” bags lined with aluminum foil.
- **Jamming** – EAS systems can be rendered inoperative by jamming. Sensormatic jammer detection software addresses the threat of these devices, allowing retailers to more effectively fight ORC.

Moreover today, by leveraging the additional benefits of the recent AM EAS systems, retail enterprises are able to combine solutions to integrate in-store surveillance technologies and consolidate information across stores, to improve protection and analyze events and trends. From merely reactive, EAS becomes predictive.

The ability to gather predictive and actionable intelligence is optimized when retailers invest in the existing infrastructure at the POS to integrate action-oriented EAS solutions with information based RFID technology.

Environmental Impact

Tyco Retail Solutions considers protection of the environment a top priority and is taking the lead in developing disciplined, metrics-driven technologies and processes that minimize environmental impacts. By adopting a systems approach, Tyco Retail Solutions delivers solutions that work up and down the value chain from manufacturers to customers— not just for their own products in isolation, but including the systems that supply or depend on them, and throughout their lifecycle.

At the heart of the Tyco Retail Solutions’ environmental sustainability program is the company-wide goal to reduce greenhouse gas emissions, water use and waste generation by 25 percent over the next five years, supporting the vision of a greener future for everyone, everywhere.



Global strength. Local expertise. At your service.

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Conclusions

Tyco Retail Solutions is the only company able to deliver a complete solutions approach to retail customers worldwide based on the superior performance of Sensormatic AM technology. From enhanced detection systems at the exit to detachers and deactivators at POS; from a broad assortment of hard tags and labels to a world-class source tag recirculation program; Tyco Retail Solutions provides retailers from all vertical markets with a one-stop-shop solution to all of their shrink reduction needs.

Because of advancements in EAS technologies and the intrinsic nature of certain product categories and their packaging, Tyco Retail Solutions strongly believes that AM EAS, as a solution, will be an integral part of retailers' operations. Also they foresee different needs-based scenarios where some retailers can benefit from a dual technology solution of AM-RFID functionality, whereas others may require a sequential approach in slowly migrating from one technology to the other.

Aside from the significant challenges provided by shoplifters, retailers deal every day with issues related to inventory accuracy, out-of-stocks, item location, price management, promotions execution, internal shrink and vendor fraud that also negatively impact their profitability. In today's changing retail environment, retailers need to incorporate more intelligent and integrated technologies into their existing investment to enhance the customer shopping experience and improve product availability while limiting shrink and lowering costs. Traditionally focused on loss prevention, Tyco Retail Solutions now offers a broad family of item-level RFID solutions. The integration of Tyco Retail Solutions' RFID infrastructure into Sensormatic's portfolio of loss prevention systems enables retailers to deploy RFID at the store level to gain better control, security and visibility into their inventories and increase operational efficiencies.

Leverage our strength and experience

Tyco Retail Solutions, a unit of Tyco International, is a leading global provider of integrated retail performance and security solutions, deployed today at more than 80 percent of the world's top 200 retailers. Customers range from single-store boutiques to global retail enterprises. Operating in more than 70 countries worldwide, Tyco Retail Solutions provides retailers with real-time visibility to their inventory and assets to improve operations, optimize profitability and create memorable shopper experiences.

The Tyco Retail Solutions portfolio for retailers is sold through ADT and authorized business partners around the world. For more information, please visit www.tycoretailsolutions.com.

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