GS1 EPCglobal's RFID-based Electronic Articles Surveillance (EAS)

Strategic Overview

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10 **Document Summary**

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1. Introduction

1.1. Purpose of this Document

- The purpose of this document is to provide the reader with a strategic overview of EPC RFID-based Electronic Article Surveillance (EAS) for disposable and/or reusable tags. An EPC serialized number is critical for the implementations to work.

- The document will clearly illustrate where RFID-based EAS implementation is possible and approaches to enabling the use cases outlined using existing GS1 and EPCglobal standards.

- The reader will understand the benefits, the condition and the different options for the implementation.

1.2. Who Will Use this Document?

- Project Managers with some understanding of what RFID is (including Gen 2) and who want to implement an RFID-based EAS solution in retail operations where this retail operation does not necessarily have an existing RFID or EAS program in place.

- Loss Prevention department leaders

- Store operations

- Internal design teams

- Systems integrators and technical project leaders in retail operations.

- Suppliers providing merchandise to a retailer

1.3. Scope

There are many advantages to using RFID throughout the supply chain, but this document refers directly to the RFID-based in retail environment EAS functionality at:

- Point of Entry/ Exit (PoE)

- Point-of-Sale (PoS)

- Receiving goods

Other use cases may include the following; however, these are not covered in detail in this document:

- Consumer returns

- Additional read points can be seamlessly added to the system, but are out of scope for this document.
  - o Fitting/Dressing rooms
  - o Compactor/ Trash bins

The use of this guide could be extended to other GS1 serialized identifiers to implement RFID-based EAS (e.g. GIAI or GRAI to track individual or returnable assets).

2. Strategic Overview

RFID-based Electronic Article Surveillance (EAS) is a technological method for deterring and detecting theft of consumer goods. RFID-based EAS tags (based on the EPCglobal Gen 2 standard) are fixed to an item's packaging or to the item itself. These tags can be removed and/or disposed by consumers or sales associates after purchase. The goal of RFID-based EAS is to combine the known benefits of RFID such as increased supply chain visibility, improved inventory tracking and process productivity along the supply chain including the retail sales floor with the advantages of an EAS system (item level theft deterrence, detection, and protection).

2.1. Background

GS1 EPCglobal's RFID-based EAS Phase 1 Group developed a set of common retailer requirements for using RFID-based EAS. It is realized that most of these requirements are fulfilled using current standards for disposable and/or reusable tags (see definitions below).

Post Purchase disposable tags can be altered[1] by the retailer. They are generally removed and discarded by the consumer or retailer and include the following:

■ Fabric: pouch with RFID-based EAS device enclosed and sewn on garment.

Figure 2-1 Sewn-on tag[2]

■ Hang tags: RFID-based EAS device integrated into paper hang tag (swing ticket) or pocket flasher.

Figure 2-2 Paper hang tags with integrated RFID tag.

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[1] See GS1 EPCglobal Glossary for a definition of tag alteration at:
(http://www.epcglobalinc.org/home/GS1_EPCglobal_Glossary_V34_KS_May_11_2009.pdf).
[2] Pictures are for illustrative purposes only.

86   ■ RFID-based EAS device integrated into a self adhesive label.

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Figure 2-3 EAS tag integrated in label

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89   ■ Drop-in tags: RFID based EAS device that is dropped into a pocket of a garment which is
90   sometimes then stitched up.

91   ■ Plastic: RFID-based EAS device embedded or encased in plastic; for example, plastic hanger,
92   integrated seal, or disposable hard tag.

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Figure 2-4 Plastic EAS Casing for perfume and razor blades

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Figure 2-5 EAS tags with ink

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99   ✅ **Example:** Single Use Tags – a small, lightweight, hard tag intended for one time use, removed at
100   the Point of Sale and discarded.

101 **Figure 2-6** Single use tag

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103 Reusable tags, generally applied by the retailer, retailer's supply chain or supply chain partners, are
104 removed at Point-of-Sale. They include the following:

105 ■ Hard tags: RFID-based device encased in plastic housing, with a secure method of application.

106 **Figure 2-7** EAS tag's plastic housing

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110 **Figure 2-8** Reusable hard tags attached to electronics

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Figure 2-9 Reusable hard tags attached to apparel

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113 Within phase 2 of this RFID–based EAS group an implementation guide is written to take advantage of the
114 current standards to provide general implementation guidelines for others who may wish to deploy an
115 RFID-based EAS system. The solution does depend on using either a reader with a simple database or
116 access to a network database to determine whether an item has been sold or not. EPCglobal RFID-based
117 EAS Technical Implementation Guide provides guidelines on how to technically implement RFID-based
118 EAS using current GS1 and EPCglobal standards. The retailer needs to realize that with this approach if a
119 reader fails or the database goes down, then RFID-based EAS functionality would be compromised. This
120 loss is not obvious to a customer. Products sold during this time can be captured and later removed from
121 the database.

2.2. Advantages of Common Standard Implementation Guide

123 With legacy EAS systems, the tags performed only the primary purpose of deterring and detecting theft.
124 They were separated, isolated systems with a single function. Previously, retailers could have various tags
125 applied including ones from the manufacturer, ones from the retailer, and the additional EAS tag. Also, due
126 to competing IP protected technologies, EAS tagging could lead to multiple inventories for manufacturers to
127 suit the needs of individual retailers.   As a result of this complexity, less source tagging occurred.

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Figure 2-10 Three tags on single garment. Tags include source tag, RFID tag, and EAS tag.

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130 With a collective approach, RFID-based EAS can also be used to help with inventory, returns, detection of
131 counterfeit products and much more. A key advantage with an RFID-based EAS system is that item level
132 visibility could be available at PoE. With legacy EAS systems, no actionable intelligence is provided when
133 the alarm sounds; the only information that is known is that an EAS tag has passed the pedestals. With
134 RFID-based EAS, when an alarm is activated, there is visibility not only that an item has passed the
135 pedestals but additionally which particular item has activated the alarm as well as visibility to the quantity of

136   items passing through the pedestals at that moment. This timely information will help the loss prevention
137   department refine its strategy concerning the deployment of theft deterrent resources.[3]

138   This solution will allow a manufacturer to apply one tag that can be used throughout the supply chain for
139   multiple functions. All costs of readers, tags, hardware installation, application of tags, etc. could be
140   dedicated to the single tag approach[4].

141   Another advantage of a common implementation guide is the ability to leverage existing public policy work
142   within EPCglobal. To encourage consumer acceptance, it is advisable for the retailer to adhere to the
143   EPCglobal Consumer Guidelines available at: http://www.epcglobalinc.org/public/ppsc_guide/.

2.3.   Source Tagging

145   RFID-based EAS tagging will be based on open standards leading to a reduction of multiple inventories for
146   those manufacturers who previously needed to use different tags for various retailers. It will lead to more
147   items being secured by EAS functionality from the source. Utilizing the serialized information available via
148   RFID will improve supply chain visibility and help prevent and detect shrinkage throughout the logistics
149   chain and the retail environment.

150   One of the goals of the Implementation Guide is to increase source tagging by having a common standard.
151   Source tagging is defined as the application of RFID-based EAS security tags at the source, the supplier or
152   manufacturer. For the retailer, source tagging eliminates the labour expense needed to apply the RFID-
153   based EAS tags themselves, and potentially reduces the time between receipt of merchandise and when
154   the merchandise is ready for sale. For the supplier the benefits include the opportunity to use RFID for
155   inventory management and visibility. In addition, it allows the option to preserve the packaging aesthetics
156   by incorporating the tags within the product packaging. Source tagging allows the RFID-based EAS tags to
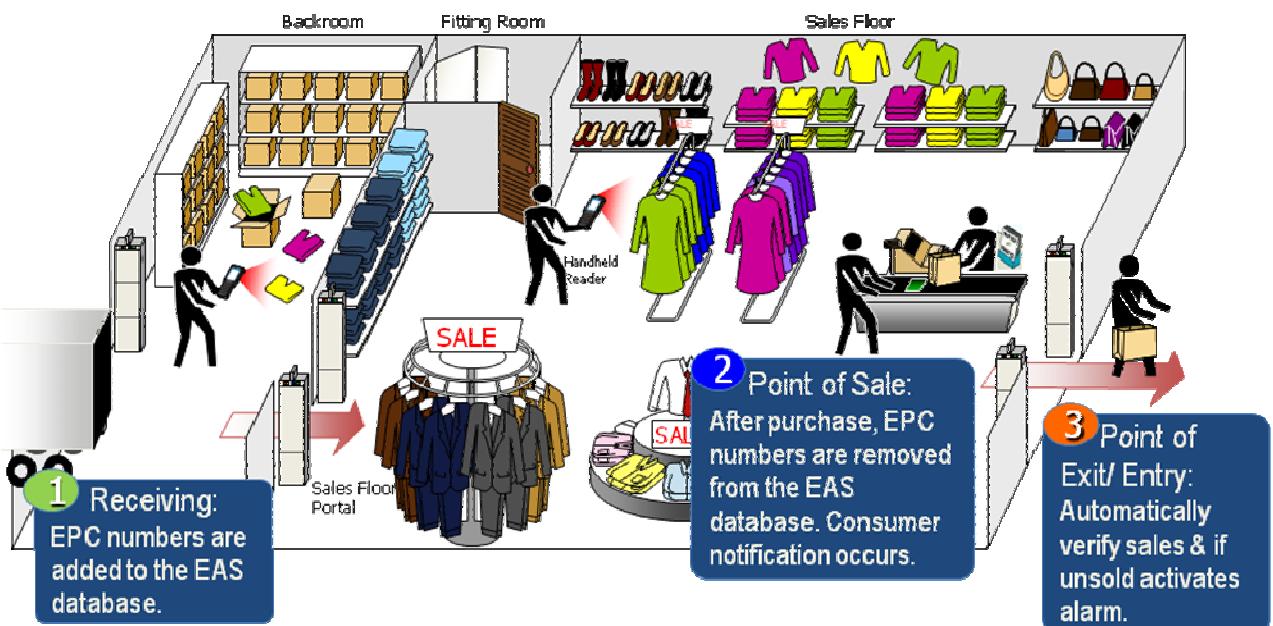157   be concealed and more difficult to remove, if desired.

2.4.   Summary

159   In summary, the implementation guide shows the retailer how to use RFID-based EAS functionality based
160   on current GS1 EPCglobal standards. The implementation guide concentrates on goods receiving, points
161   of entry and exit, and points of sale. These points of entry and exit can be retail store doors, break rooms,
162   rest rooms, etc. Upon receipt of goods an inventory check occurs with all items' serialized EPC numbers
163   are added to a database. Upon an item being sold, the number is removed from the database prior to it
164   leaving the store. At the exits of the store, a detection system sounds an alarm or otherwise alerts the staff
165   when it senses tags that have not been removed from the inventory database.

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[3] To reap this benefit, the EPC must be associated with the item.
[4] Implementation of RFID based EAS requires a replacement or an extension of existing EAS infrastructures in store (security portals and checkout systems).

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166 **Figure 2-11** RFID-based EAS in the retail store environment[5]

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168 ⚠ **Important:** EPC numbers are used for Item Level Identification.

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[5] Source: Checkpoint Systems