



# RFID for Product Integrity

Realizing Value Using RFID for Authentication, Brand Management, Channel Diversion, Containment, and Reverse Logistics

As internet transactions continue to foster global trade, consumers and marquee trade manufacturers become increasingly susceptible to issues related to product integrity.

Stemming from a web of unknown origins, the global counterfeit trade is estimated at a staggering annual volume of \$600 Billion dollars<sup>1</sup>.

Brand managers in all vertical markets are subject to counterfeit products, including Apparel, Automotive / Airline Parts, Cosmetics, Drugs, Electronics, Jewelry, Software, as well as Wines & Spirits.

In the United States, counterfeits account for up to \$250 Billion dollars per year in lost business revenue, burdening the public with lost tax contributions, and resulting in the loss of over 750,000 American jobs<sup>1</sup>.

The FAA estimates 520,000 counterfeit parts are installed on airlines each year<sup>1</sup>. Counterfeit automotive brake linings have been found to be made of sawdust and cardboard<sup>1</sup> - irresponsibly posing serious safety implications.

## The Issues

### Counterfeits

- › Result in significant business and public sector tax revenue losses. They contribute to unemployment, and add a tremendous burden to corporate and public enforcement agencies. In instances where inferior products pose health and safety issues, original trade suppliers can be subject to costly litigation in order to prove suspect products are in fact not authentic.

### Brand Equity

- › Brand equity can be significantly diluted by the availability of counterfeit products and the discounted product sales through unintended channels.
- › In addition to brand authentication enforcement, costly litigation, and liability, counterfeits can often tarnish, if not destroy brand equity and consumer loyalty.

### Channel Diversion

- › Violators of authorized distribution channels often take advantage of high supply chain mark-ups and dramatically improve their economics by exaggerating orders and selling to other countries, channels, and retailers outside their appointed channels.

### Return Fraud

- › Return fraud in the United States ratcheted to \$10.8 Billion in 2007<sup>2</sup>. This not only depletes retail revenue, but the end result is higher consumer prices.





## RFID for Product Integrity

Realizing Value Using RFID for Authentication, Brand Management, Channel Diversion, Containment, and Reverse Logistics

### Counter Measures

#### Authentication Options

- › Anti-counterfeiting measures are generally a culmination of various authentication management tools, with a goal of keeping at least one step ahead of perpetrators.
- › Some of the more common measures might include Bar Codes, Holograms, Taggants, Digital Watermarks or Digital Signatures. However, even in combination, these options are often inadequate and often easily duplicated.

#### Authentication Options

Technology	Protected Foundry Identification	Permanent Unique Serial Identification	Product Identification	Access Restricted User Data	Non Line-of-Site Can Be Embedded within Package	Counterfeit Resistance
UHF Gen2 RFID	↑	↑	↑	↑	↑	↑
Bar Codes	↓	↓	↑	↓	↓	↓
Holograms	↓	↔	↔	↓	↓	↔
Taggants	↓	↓	↔	↓	↓	↑
Digital Watermark/Signatures	↓	↓	↔	↓	↓	↓

- › In addition to the more common anti-counterfeiting options listed above, Brand Managers now have a new, robust and cost effective tool within their Product Integrity toolbox.
- › This powerful new tool is Radio Frequency Identification, RFID.

### Radio Frequency Identification

RFID is an enabling technology, providing manufacturers with an array of opportunities for a return on their investment (ROI). Unlike bar codes which is an easily duplicated, write-once technology, requiring a direct line-of-sight to be read, RFID offers a wireless, re-writable memory with open and securable read and write data banks.

### Value to the Manufacturer / Distributor

- › In addition to serving as a vehicle to help with Authenticity, Brand Equity, Channel Diversion, Consumer Safety, Liability, and Return Fraud, manufacturers can also capitalize on increased production and supply chain efficiencies with RFID.
- › In production, manufacturer and product identification information, along with unique serialization can be wirelessly programmed and scanned by local interrogators.
- › Complementing the manufacturer's product and serial number, Alien® Higgs™3 RFID silicon chip offers the addition of a non-duplicable, 64-bit unique factory programmed authentication identifier.
- › The combination of the authentication identifier and the user defined memory serves as a non-refutable anti-counterfeit measure.
- › Often manufacturers commission third party regional contract production entities to fabricate product. Sometimes unscrupulous organizations fabricate more than that ordered by the manufacturer. In such instances, it is very difficult to discern between authorized, and unauthorized product, as both appear authentic.
- › By use of Alien's Higgs3 authentication identifiers, the manufacturer queries, records and distributes sufficient RFID tags to meet the consigned order requirements. Any subsequent product not meeting the schema criteria is deemed counterfeit.
- › The authentication acquisition process is painlessly administered by passing the product in proximity to the RFID reader. And for many products, the contents within their intended packaging is easily read, as RFID acquisitions do not require line-of-sight.
- › In the event it should be required, the technology also provides an effective means to identify, contain, & recall products based upon production origin, safety, supplier, retailer, batch lots, or expiration.
- › The serialization process can be further enhanced by virtue of recording the authorized RFID enabled product in a common server (e.g. a serialization



## RFID for Product Integrity

Realizing Value Using RFID for Authentication, Brand Management, Channel Diversion, Containment, and Reverse Logistics

vault), and forwarding the aggregate contents to downstream partners.

- › Once consumed, the particular identity is noted as exhausted – any duplicate reads would signal a return, or potential fraudulent activity.
- › This process strengthens perceived Brand Equity and enhances customer loyalty.

### Value to the Retailer

Return fraud in the United States ratcheted to \$3.7 Billion in the 2007 holiday season<sup>2</sup>. This not only depletes retail revenue, but the result ends in higher consumer prices.



- › Extended user memory may be used to log the specific retailer, the date purchased and for returns, the price paid.
- › For service personnel, the extended user memory may facilitate warranty information, or prior repair history.
- › RFID enabled product also provides a mechanism for a more efficient supply chain, and a means to more quickly assess inventory status.
- › RFID enabled promotional shelving enhances customer service by allowing consumers to provide



product details via a kiosk, which instantly provides availability information for the customer. In addition to enhancing the shopping experience, it reduces sales person intervention, and minimizes upkeep labor.

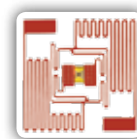
### Value to the Consumer

- › Authenticity Confidence
- › Convenience
- › Customer Service
- › Brand Loyalty
- › Quick Inventory Search
- › Lower fraudulent activities result in lower overhead, and ultimately better customer value.

## Enabling RFID Components

### Tags

- › Leveraging upon the Alien Higgs RFID silicon chip as its foundation, Alien offers an extensive UHF RFID tag portfolio. Most tags are designed for global deployment, with UHF frequency coverage between 840MHz and 960MHz. So even product originating and tagged in Asia and sold in North America or Europe can use the same global tag.
- › Alien tags are available in a variety of geometries, and most are designed to couple to both UHF Near-Field and Far-Field RF signals, thus allowing read ranges to span from a few centimeters to 10's of meters in distance – depending upon the application. At the item level, the Squiggle-SQ is a popular option, with a footprint of less than 1 square inch.
- › Smaller item-level tags are currently under development.
- › By far the most common of all tags is Alien's classic Squiggle™ tag. This high performance, low cost leader is often integrated within product and shipping labels, and widely used at the case and pallet level.



Squiggle-SQ



Squiggle



## RFID for Product Integrity

Realizing Value Using RFID for Authentication, Brand Management, Channel Diversion, Containment, and Reverse Logistics

### Portables

Handhelds from vendors such as Psion Teklogix provide mobility.

### Readers

- Alien's ALR-9900 high performance enterprise reader, comes in a small, unobtrusive package and is well suited for multiple applications. including production lines, packaging lines, pallet stretch-wrap turntable stations, and retail environments. This workhorse accommodates up to four independent read zones.



ALR-9900

- Alien's newest addition to the reader line, the ALR-9650, is a nice solution for more simplistic, or space constrained applications.



ALR-9650

- This self contained product offering is especially attractive with an integrated antenna and reader within the same housing.
- In addition to the compact size and high performance of the ALR-9650, is the added convenience of a single connection. Using the Power-Over-Ethernet (POE) option, a simple LAN cable is all that is required to communicate with the server and provide power to the reader.

## Applicable RFID Components

### Silicon Chip

- Alien's notoriously high performing, state-of-the-art Higgs family of RFID IC's continues to grow, offering continued sensitivity improvements, features and benefits. Newest to the offerings is the non-alterable, unique factory commissioned authentication identifier, suitable for authentication.



Higgs™-IC

- The Higgs family of products are second to none. These silicon chips were designed for global use, accommodating a wide UHF spectral band ranging from 840MHz to 960MHz.
- The Higgs RFID IC's are designed to integrate with UHF Near-Field or Far-Field tag antennas alike.
- Optional user memory is available for added functionality and can not only be write protected, but read access can also be invoked for added security.

## Alien Technology. Your Product Integrity Solution Enabler.

Contact us today at [www.alientechnology.com](http://www.alientechnology.com) for more information.

### Selected References:

<sup>1</sup> The International AntiCounterfeiting Coalition, [www.IACC.org](http://www.IACC.org).

<sup>2</sup> National Retail Federation, 7 November 2007, [www.NRF.com](http://www.NRF.com).

