



# I.D. SOLUTIONS

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Asset Management

&

Inventory Management

by

RF-ID Tags & Labels



## Introduction

Ever since the first electronic article surveillance device was installed in a retail setting 30 years ago, retail security technology has played an increasingly important role in store operations. With inventory shrinkage costing organizations hundreds of millions of rupees each year, organizations have increasingly turned to technology such as electronic article surveillance (EAS or tagging systems) and video surveillance to control theft and inventory management.

As have grown, so has the technology. The first somewhat large anti-theft tags have evolved over the years into today's wafer-like labels that can be attached or inserted into a variety of items. As EAS technology has become more sophisticated, organizations now have much more flexibility with their systems, with the promise of much more innovation to come.

For manufacturers & retailers, the potential applications and benefits of RFID technology are far-reaching. Systems enable companies to protect and manage their assets more efficiently through identifying and monitoring movement, providing significant enhancements to inventory control and management. Successful integration of such systems into day-2-day working is fast becoming a necessity to manage inventory and reduce overheads.

Organizations also stand to benefit from the efficiencies that RFID have brought to access control systems and to the automation of traditional, more cumbersome time and attendance systems, well-established applications in many other industries. RFID personnel identification can be further extended to restrict and control access to tills, overcoming the loopholes inherent in traditional password-protection and drawer locks.

With tags on products, inventory counting and stocktaking and marking stock down will become faster and more accurate. More detailed and up-to-date product information reduces the risk and costs associated with out-of-stocks and obsolescence. Receiving bays, automated counting results in more efficient checking.

Significant benefits stand to be had in the automation of returns. Ultimately, the concept of automatic self-checkout stands to become a reality, when readers at the till will identify the contents.

## 2. What is a "Smart RF-Id Tag"?

RFID uses radio frequency transmission to identify, categorize, locate and track people, animals and objects. RFID systems are composed of three components - an interrogator or reader, a transponder, commonly called a tag, and a computer or other data processing system. The tag is placed on or in the object you want to identify or track. There is no need for contact or a direct line-of-sight between the reader and the tag. This means that tags can also be embedded in or hidden inside objects that need to be identified.

RFID readers have electronic components that send and receive a signal to and from the tag, a microprocessor that checks and decodes the data it receives, and memory that stores the data for later transmission, if necessary. The reader has an antenna to transmit and receive signals. The antenna is enclosed with the reader electronics.

The main component of the RFID tag is a custom integrated circuit or silicon chip. This chip controls the communication to the reader. The chip has a section of memory that stores the identification code or other data, and the content of the memory is transmitted to the reader when the chip is activated. The tag has an antenna attached to the chip and a tuning capacitor. The amount of data stored in the tag can range from 40bits unique fixed code to 1kbits of addressable memory.



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In this system, the reader emits an electromagnetic field in a zone, the size of which depends on the operating frequency of the system and the size of the antenna. When a tag passes through this zone, the tag detects the signal from the reader and begins to transmit the data stored within the tag back to the reader. The signal generated by the reader provides timing information as well as enough energy to provide power to a tag.

The significant advantage of all types of RFID systems is the non-contact, non-line-of-sight nature of the technology. Tags can be read through a variety of substances and in visually and environmentally challenging conditions, where bar codes or other optically read technologies would be useless.

### 3. What is a “Smart RF-Id Tag”?

Businesses around the world are using RFID technology to give themselves a competitive advantage. Here are some of the benefits you can expect from an RFID system:

#### Improved Efficiency and Productivity

- Hands-off, fully automatic identification, counting, tracking, sorting and routing is possible.
- Improve data collection and identification.
- Helps eliminate errors.
- Improve inventory control.
- Speed up and improve material handling and asset management.
- Can provide automatic access control.

#### Improved Profitability

- Reduce operating cost
- Better Asset Management
- Reduce product cycle times
- Reduce inventory.
- Enhance quality control.

Reduce maintenance costs compared to other automatic identification systems.

### 3. Technical Specifications of the “Smart Rfid Tags”

RF-Id System (Radio Frequency Identification) consists of a transponder and a read/write unit. Both have internal intelligence and an antenna that receives, sends and stores data. The read/write unit sends out a signal causing the transponder to respond and transfer its own signal, containing encoded information.

The transponder signal is decoded in the read/write unit and sent to a selected control unit (e.g. Computer, Palmtop). The read distance of common RF-Id Systems (passive systems without battery) is typically 1 foot on a Desktop Reader and 1 meter (between 3 and 4 feet) on Gate Reader.

The necessary components (Integrated Circuits and Antennas) are specially chosen to fit the needs of mass-market applications. 13.56 MHz is a worldwide frequency supported by many organizations for an international RF-Id standard.



## Asset Management & Inventory Management by RF-ID Tags & Labels

Common Applications with our client are

- Process Control
- Item Management and Identification [Asset Tracking]
- Automated Sorting
- Automated Billing
- Product Authentication
- Access Control
- Protection Against Fraud

With Re-usable facility in comparison to barcode, paper tags, stickers etc. the RF-Id technology is far superior.

### THE PROPOSED SOLUTION

The common problem faced inventory management and asset tracking. We propose to automate both through **ONE RF-ID SMART TAG** for ease of working.



All the products are tagged with RF-ID Smart Tags. The storage capacity of the tag will be of 256/384 bytes that are re-usable. The electronic data to be stored in the tag is the product code, product details, issuance details and other required information. As the antenna and the chip is concealed inside the tag not visible the visual area can be printed with the customer logo or any visuals as desired by the customer.



### **System Integrator View of Validation Section**

The tags can further be re-programmed for reuse.

The whole process on automation drastically brings down the time consumed in issue and receipt by cutting down manual processes of verifying the contents. Further it also minimizes the possibility of human error intentional or unintentional and automates the complete asset management process making online availability of data to various departments for better control and MIS generation for the management.

The processes can be fine-tuned to suit the requirement of the customer on system study of his work environment and present problems faced in his working environment for better control and management which will lead to overall efficiency and increase in revenue.



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The specifications “Smart Rfid Tags” are as follows:

- |   |                                     |
|---|-------------------------------------|
| <b>a. Recommend Operating Frequency</b>       | : 13.56 MHz.                        |
| <b>b. Factory programmed Read Only Number</b> | : 32 or 64 bits ID.                 |
| <b>c. Memory [User Programmable]</b>          | :256 or 384 bits. <b>d.</b>         |
| <b>Typical Programming Cycle</b>              | : 1,00,000                          |
| <b>e. Antenna Size</b>                        | : 45 x 45 mm or 45 x 76 mm.         |
| <b>f. Technology</b>                          | : i-Code and Tag-it.                |
| <b>g. Anti-Collision</b>                      | : 30 tags/second or 50 tags/second. |
| <b>h. Operating Distance</b>                  | : 0.6m-1.0m depending specification |
| <b>i. Inlay Base Material</b>                 | : Subs-PET & Antenna- Copper.       |

**B. Advantages of “Smart RF-Id Tag”**

1. The “Smart RF-id Tag” is factory-programmed tags used for product tracking, tamper proof and invisible product marking, automatic data capture, faster data collection, increased data transparency, anti-pilferage.
2. The “Smart RF-Id Tag” can be attached or stuck on the product for any or multiple use of the above-mentioned applications.
3. The contact less reading of “Smart RF-Id Tag” makes it efficient process by reduction in labour and paperwork.
4. No line-of-sight necessary
5. Re-programmable memory
6. Simultaneous identification
7. Designed for cost effectiveness
8. To bring maximum benefits and profitability

**C. Comparison between Rf-id and Barcode**

RFID	BARCODE
RFID does not require direct line of sight with the tag	Barcode requires line of sight to read
RF tags are read faster	Barcode is comparatively slower read than rfid.
RF tags are easier to embed	Barcode tags have to embed in plain area without any wrinkles.
RF tags are virtually maintenance free	Barcode tags have to be well maintained for read.
RFID reading is extremely precise, approaching 100%	In comparison to rfid barcode gives 82% read.
RF tags can be used is harsh environments	Not possible with barcode
RF tags can be read through any non metallic material	Depends on metallic surface
Dust / Dirt	Data loss, no read
Paint	No read
Steam	No read
Mud	No read
Water	No read
RF tags have a virtually unlimited lifetime	One time use only
RF tags duplication is almost impossible	Can be Xeroxed or scanned to duplicate
RF tags can store a large quantity of information	Limited storage as the size of tags length goes up
RF tags can be rewritten	One time write at the creation only