AssetWORKS

QUICK GUIDE

Radio Frequency Identification (RFID)

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Radio Frequency Identification (RFID)

For many companies, RFID tags have become an efficient way to manage assets and inventory. Depending on your needs, there can be a lot to consider in making the move to RFID. From various communicators to different frequencies, companies must look at the variety of options available before deciding whether or not RFID is the right solution for them.

In this Quick Guide, we will explore the fundamentals of Radio Frequency Identification (RFID) with a focus on the different types of frequencies, tags, and applications. Throughout this guide, you will find several tips for helping your organization gain a better understanding of how RFID works. For easy reference, the Quick Guide has been divided into multiple sections as listed below.

SECTION 1 - Overview of RFID

SECTION 2 - Understanding RFID Frequencies

SECTION 3 - Understanding RFID Tags

SECTION 4 - Is RFID right for you?

SECTION 1

RFID: An Overview

RFID: An Overview

What is RFID and how does it work?

The RFID Journal defines Radio Frequency Identification, or RFID, as "**a generic term for technologies that use radio waves to automatically identify people or objects**. There are several methods of identification, the most common is to store a serial number that identifies a person or object, and perhaps other information, on a microchip that is attached to an antenna. That antenna enables the chip to transmit the identification information to the reader. The reader converts the radio waves reflected back from the RFID tag into digital information that can be passed on to computers that can make use of it."

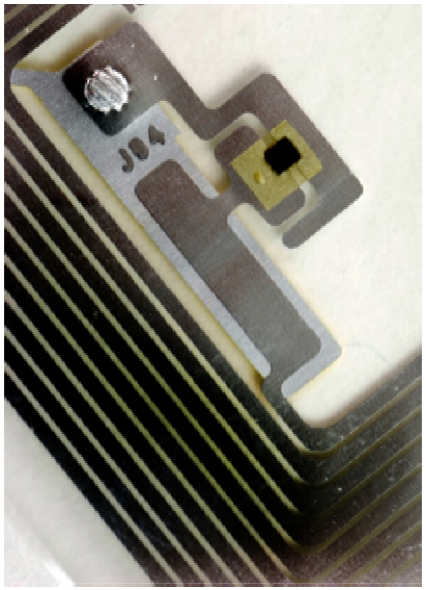
The history of RFID

RFID can be tracked all the way back to World War II, when the Germans and Allies used radar to chart planes. Since then, there have been numerous advancements in the technology. The first RFID patents were issued in the 1970s, but the technology didn't really kick in until the turn of the century when the price went down. At that time, several global companies jumped on board to use RFID as a dependable way to track assets.

RFID: An Overview

Knowing your RFID options

Before investing in an RFID system for your business, it's a wise move to have a grasp on the available technology. Below is a quick breakdown of the options available. We'll get into more details on each in the sections that follow.



RFID Frequencies

Low: Covers frequencies from 30 KHz to 300 KHz
High: Covers frequencies from 3 MHz to 30 MHz
Ultra High: Covers frequencies from 300 MHz to 3 GHz

RFID Tags

Active: Tags have their own transmitter and power source
Passive: Reader and antenna send a signal back to the tag
Semi-Passive: Operates similar to passive, but it has a battery

SECTION 2

Understanding RFID Frequencies

Understanding RFID Frequencies

Low Frequency

- Covers frequencies from 30 KHz to 300 KHz
- Read range of 10 centimeters
- Perform better with liquids & metals
- With different frequency and power levels available around the world, low frequency RFID is not used globally.

Low Frequency uses:
Access control, livestock tracking, key fobs and other uses where a short read range is acceptable.

Understanding RFID Frequencies

High Frequency

- Covers frequencies from 3 MHz to 30 MHz
- Read range of 10 centimeters to 1 meter
- Has a moderate sensitivity to interference

High Frequency uses:
Electronic ticketing, payment and data transfers, credit/debit cards, hotel key cards, healthcare, security systems.

Understanding RFID Frequencies

Ultra-High Frequency

- Covers frequencies from 300 MHz to 3 GHz
- Read range up to 12 meters
- More sensitive to liquids, metals and electromagnetic signals
- Easier and cheaper to maintain than Low and High Frequency
- A faster data transfer rate

Ultra-High Frequency uses:
Retail inventory tracking, pharmaceutical anti-counterfeiting, warehouse management, configuration of wireless devices and other processes requiring a large volume of tags.

Understanding RFID Frequencies

Which is best for Inventory?

Data: Only need to record an asset ID number. No need for a large amount of coded data

Read Range: The longer the read range the better within a reasonable expense

Data Security: Sensitive data is not likely to be stored on an inventory RFID tag so secure communication does not need to be a concern

Ultra High Frequency

SECTION 3

Understanding RFID Tags

Understanding RFID Tags

Active RFID

- Carries its own power source – usually a battery – and transmitter on the tag
- Larger and more expensive than Passive and Semi-Passive systems
- Favors the Ultra-High Frequency
- Used to track large assets like cargo containers, vehicles and machines
- Tags are sometimes equipped with sensors able to measure and transmit temperatures, light and vibration data
- There are two types of Active systems. Transponders turn on when sent a signal, and Beacons send signals at pre-set times.

Understanding RFID Tags

Passive RFID

- Smaller, more cost effective and more flexible than Active RFID, so it can be attached to a wider variety of items
- Requires only a tag chip and antenna, so a power source or a transmitter is unnecessary
- Read ranges are much shorter, and use is limited by the strength of the radio signal
- The reader and its antenna send a signal to power on the Passive RFID tag, which reflects back to the reader
- Can be used with Low, High and Ultra-High frequencies
- Possessing plenty of packaging options, Passive RFIDs are used commonly for tracking goods in a supply chain, asset inventory or authentication

Understanding RFID Tags

Semi-Passive RFID

- Works much like Passive RFID, but with a power source (usually a battery)
- Semi-Passive works well with large jobs because it can track assets over a greater distance
- Semi-Passive tags don't have their own transmitters, but the power source allows them the ability to reflect a signal back to a reader
- Also referred to as Battery-Assisted Passive

Understanding RFID Tags

Which is best for Inventory?

Battery: Tag only needs to emit frequency when prompted by a reader

Size: Though human readable capability is required, the smaller the better

Data Storage: Asset ID ties all current asset details to a master profile in your database or software solution making storage a non-issue

Read/Write: Tags are used for asset identification making write capabilities not strictly necessary.

Passive RFID Tags

SECTION 4

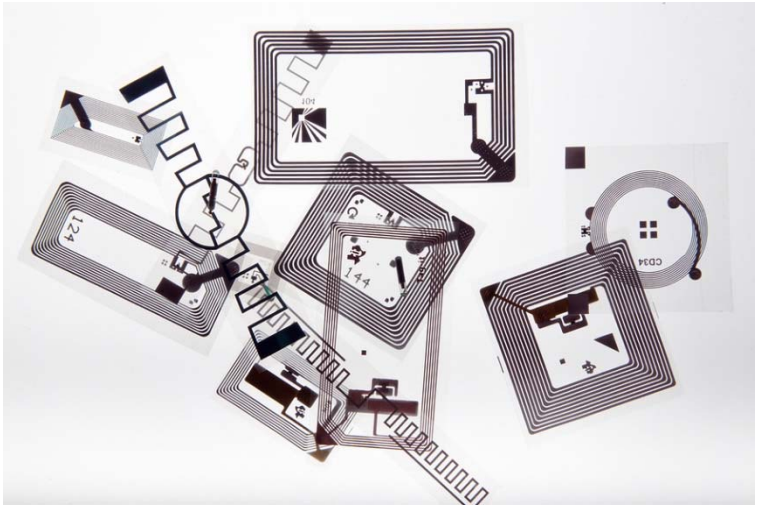
IS RFID right for you?

Is RFID right for you?

Some advantages of RFID

According to RFID Insider, Radio Frequency Identification offers a number of advantages over strictly barcode tagging assets. For example:

- RFID does not need a line of sight
- RFID can reduce the need for physical asset contact
- RFID tags are read/write
- RFID tags are durable and reusable
- RFID data can be encrypted
- RFID tags can store additional data
- RFID tags can be printed with a barcode
- Several RFID tags can be read at one time



Is RFID right for you?

Some disadvantages of RFID

While there are advantages to an RFID system over the use of barcodes, the technology also has its limitations. If you're considering a switch to RFID, understanding the challenges is important. For example:

- RFID tags can be more costly than barcodes
- RFID tags don't always play nice with liquids and metals
- RFID technology can be difficult to understand
- RFID technology comes with more moving parts
- RFID implementation may mean additional staff training
- RFID tags come with some security concerns depending on type
- Several RFID tags may be read at one time when not desired

In general, RFID does not eliminate the need for physical asset verification, the search for assets in the field, or dedicated inventory resources.

Is RFID right for you?

Use Barcode Tags and RFID Together for Exceptional Results

When to use RFID:

Difficult to reach assets
Difficult to reach asset tags (hidden, high)
Assets that should not be handled
Critical assets that are highly mobile

When to use Barcode Tags:

All other equipment

Benefits to Using Technology in the Inventory Process

- Save Time and $$
- Increase Accuracy
- Increase Accountability
- Simplify Reconciliation

AssetWorks Can Help

Introducing technology like RFID and Barcode Tags into your inventory process can be extremely beneficial if supported by the right internal policies and procedures. For decades, AssetWorks has been helping entities of all sizes maintain accurate, up-to-date, fixed asset inventories. With high quality fixed asset inventory services and robust software solutions for asset and inventory management, we can help your organization comply with reporting requirements from GASB, GAAP, and OMB to your State or own accounting standards.

To learn more about how barcode tags or RFID can improve your inventory process, contact AssetWorks today at 1-877-809-0600 or info@assetworks.com.

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