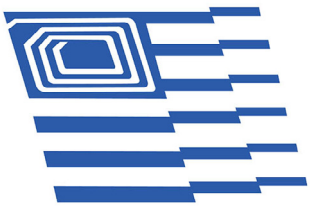
Your Need-To-Know Starter Guide For

RFID SYSTEMS



AB&R®

identify. track. manage.

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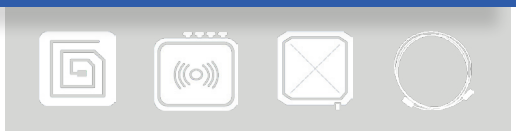


HELLO!

READY TO LEARN?

Welcome to our Need-To-Know Starter Guide for RFID systems. We put this information together to help you understand what RFID technology is, what it can do for your business, and to give you an idea of what each piece of equipment in an RFID system could cost. At the end of this guide, there are resources to take you to the next step (that's where you can call on us – we're the barcode and RFID experts, so you don't have to be). Or if it doesn't seem like the right tech for your needs and resources, you will come out the other side knowing more about a pretty cool technology (we think so, anyway, but are admittedly a little biased). Let's get started with the basics!

WHAT IS RFID?

Radio Frequency Identification (RFID) is a technology that uses radio waves to identify an object within a specified area. That object could be inventory, assets, workers - we'll cover more use cases on the next page. So, how does it work? Digital data is encoded onto RFID tags or smart labels which are captured by a reader via radio waves. This whole process takes place without relying on line of sight, meaning you can read a tag in the vacinity, even if you can't see it for yourself.

Applying RFID tags to items allows users to automatically and uniquely identify, track and manage their assets and inventory. RFID is the epitome of Automatic Identification and Data Capture (AIDC) technology. It has many of the same benefits as barcode technology and even surpasses it in some respects. Allowing tags to be read without line of sight and, depending on the type of RFID, having a read range between a few inches to over 300 feet, RFID is a competitive advantage for companies across the globe.

While RFID got its start during World War II, identifying airplanes as friends or foes, the technology has become much more reliable and diverse in today's applications. Every year the technology improves, and costs for implementing and using an RFID system decrease, resulting in an increasingly efficient and cost-effective solution.

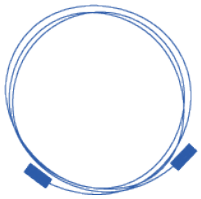
WHAT'S IN AN RFID SYSTEM?

Every RFID system is a science project – there are elements of the environment and use case that will impact the specific components that will work best. That being said, every RFID system contains these four pieces of hardware:

TAG

READER

ANTENNA



CABLE

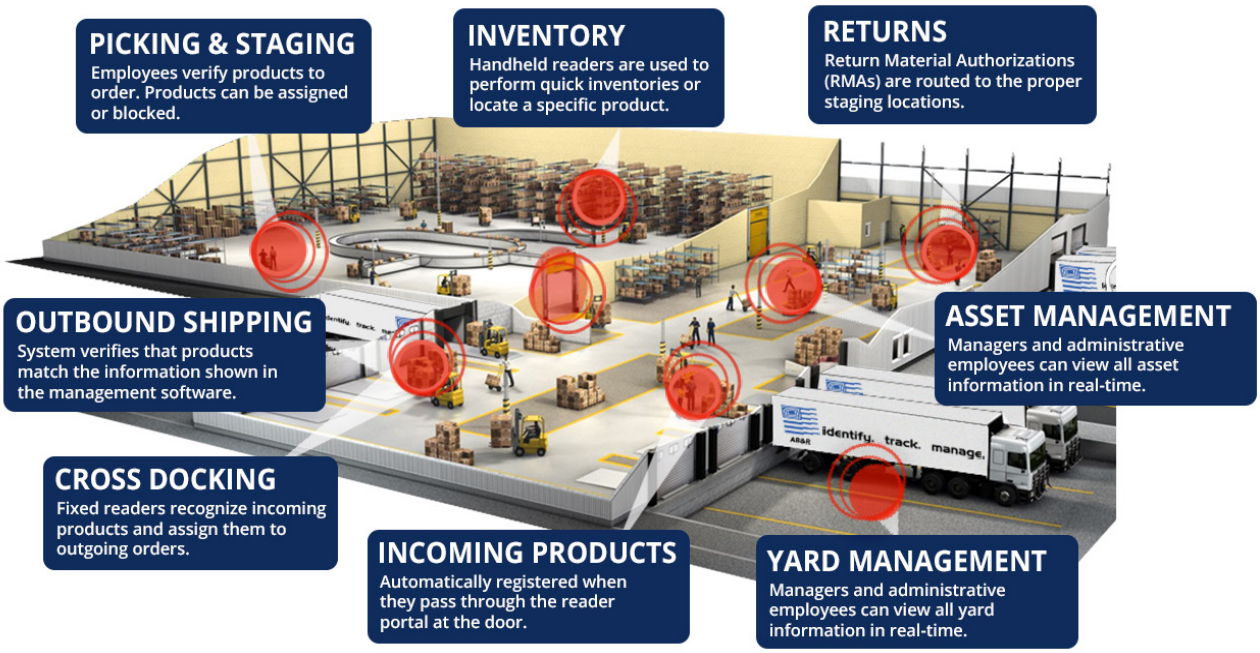
RFID systems range from simpler setups - which can consist of a mobile handheld RFID reader, with an integrated antenna and RFID tags - to much larger and more complex systems - using multi-port readers, multiple antennas and cables, RFID tags, GPIO boxes, additional functionality devices (e.g. stack lights), and a complete software setup.

HOW CAN YOU USE RFID?

There are many ways RFID could be used to improve identification, tracking and visibility. Solutions span from broad applications, like supply chain asset management, to more narrowly focused applications specific to the company or industry, like dock door pallet verification. The unique benefit of RFID applications is that they can quickly and efficiently identify individual items which is often where other traditional systems fall short. Below are a few example applications that successfully use RFID technology.

- Asset Tracking
- Access Control
- Animal Tracking
- Automated Inventory Receipt
- Compliance Management
- Contact Tracing
- Cross Docking
- Cycle Counting
- DVD Kiosks
- Event & Attendee Tracking
- Fleet Management
- File Tracking
- Hospital Infant Tracking
- Identification Cards
- Inventory Tracking
- IT Asset Tracking
- Laundry & Textile Tracking
- Library Materials Tracking
- Logistics Tracking
- Material Management
- Personnel Tracking
- Pharmaceutical Tracking
- Proximity Tracking
- Race Timing
- Real-Time Location Tracking
- Retail Tracking
- Returnable Transit Item (RTI) Tracking
- Shipment Verification
- Sports Tracking
- Supply Chain Management
- Tool Tracking
- Vehicle Tracking
- Work in Progress (WIP)
- Yard Management

RFID's benefits can extend to all corners of your warehouse or building.



RFID WINS - REAL CUSTOMER BENEFITS

This technology can do a lot, and that's great, but it really comes down to what it can do for you. Here are just a couple examples of the real life benefits our customers have seen from investing in an RFID solution.

REAL-TIME LOCATION TRACKING

- Mustering for disaster management ensuring all employees exited a facility
- Limiting entry to secure areas
- Limiting components to pre-assigned areas
- Knowing exactly where crucial equipment is when it is needed

EVENT & ATTENDEE TRACKING

- Understanding the flow of attendees throughout the event
- Badge tracking for monitoring continuing education at association events

ASSET TRACKING

- Knowing the last location of crucial pieces of equipment
- Tracking key tools/components & who they were assigned to
- Identifying calibration requirements when a piece of equipment needs attention

SHIPMENT VERIFICATION

- Automated insurance that the right items go on the right truck
- Sending advanced shipment notifications
- Loading items on the truck in the right order so they can be pulled off as they're needed

WORK IN PROGRESS (WIP)

- Knowing exactly where items are in the course of production
- Material planning based upon available raw materials
- Meeting customer delivery requirements by understanding the stage of production

CROSS DOCKING

- Automatically direct items the second they arrive
- Quick turnaround to meet customer delivery requirements
- Increasing warehouse size without building a larger warehouse by increasing inventory throughput

YARD MANAGEMENT

- Knowing what went out or came in on a specific truck
- Knowing what trucks are out
- Cycling trailers through efficiently
- Knowing where your trailers are in the yard and exactly what is in each of them
- Understanding the order trailers should be directed to the dock doors for incoming freight

AUTOMATED INVENTORY RECEIPT

- Validating against an open PO for quick product receipt
- Directed putaway

SHOULD YOU INVEST IN RFID?

When investing in any new technology there is one overarching question to consider.

WILL YOUR COMPANY SEE A RETURN ON THE INVESTMENT?

Before we set a company up with an RFID solution, these are some of the factors we review for your company's consideration.

HOW PRACTICAL IS RFID IN YOUR ENVIRONMENT?

Like any technology, RFID is not a one-size-fits-all solution. It has limitations. The environment around an RFID system can negatively impact a system's accuracy. Metal and liquids commonly interfere with RFID applications. With the proper equipment, tags and an experienced solution architect, these interferences can be mitigated.

Additionally, the material of the item you're looking to track, read range limitations, and other factors can directly impact the efficacy of an RFID system. Understanding what you need the system to do, along with the environment you will implement technology into, provides the basis for moving forward. Sometimes RFID will not be the best fit for a positive ROI, increased productivity and efficiency.

HOW PRACTICAL IS RFID FOR YOUR BUDGET?

It is also beneficial to evaluate how practical the project is from a cost standpoint. Key considerations include fixed costs, recurring costs, the benefit of and price for a site survey, and the cost of implementation.

Fixed costs are the initial investments that are required to get your system started. These account for the readers, antennas, cables and anything else needed for setup. These will be your initial investment but be aware that they could require upgrades or replacement with use over time.

Recurring costs are the pieces of the application that will routinely be replaced, and therefore are recurring investments. This accounts for RFID tags or labels, ribbons if your system uses printers, or annual software licensing fees – when applicable. Understanding these types of costs builds a better understanding of what the yearly costs of an RFID system will be.

This all happens before you sign up for anything – because sometimes RFID is not the best fit for your use case, company budget, or environment. Sometimes another technology, like barcoding, is the better overall solution or the sensible place to start. You can read more about that here.

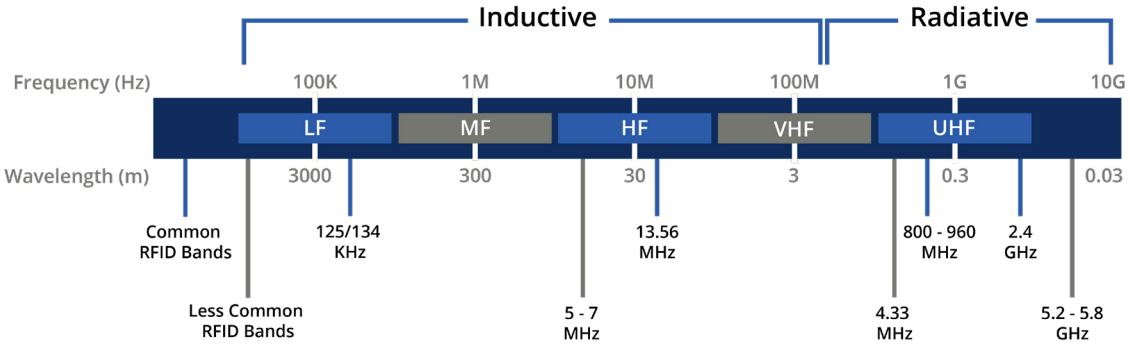
Barcode vs. RFID

RFID

TYPES OF RFID

RFID falls into the radio frequency range of the electromagnetic spectrum.

There are three primary frequency ranges used for RFID transmissions within the radio frequency portion of the electromagnetic spectrum – Low Frequency (LF), High Frequency (HF), and Ultra-High Frequency (UHF).



LOW FREQUENCY

FREQUENCY RANGE

GENERAL	PRIMARY
30 - 300 KHz	125 - 134 KHz

READ RANGE

Contact - 4 inches

PROS

- Works well near liquids and metals
- Global standards

CONS

- Very short read range
- Limited quantity of memory
- Low data transmission rate
- High production cost

APPLICATIONS

- Work in progress manufacturing automation
- Applications with high volumes of liquids and metals
- Access control
- Car key-fob
- Animal tracking

AVERAGE COST PER TAG

$0.75 - $5.00

HIGH FREQUENCY

FREQUENCY RANGE

PRIMARY

13.56 MHz

READ RANGE

Near contact - 12 inches

PROS

- NFC global protocols
- Larger memory options
- Global standards

CONS

- Short read range
- Low data transmission rate

APPLICATIONS

- MIFARE cards
- NCF applications
- Personal ID cards
- Library books
- Poker & gaming chips
- DVD kiosks

AVERAGE COST PER TAG

$0.20 - $10.00

ULTRA HIGH FREQUENCY

FREQUENCY RANGE

GENERAL	PRIMARY
300 - 3000 MHz	433MHz, 860 - 960 MHz, 2.4GHz

Within Ultra High Frequency, there are two types of RFID that are commonly used in business applications. Active RFID and Passive RFID.

AT-A-GLANCE COMPARISON

ACTIVE RFID PASSIVE RFID

PRIMARY FREQUENCY RANGE

ACTIVE RFID	PASSIVE RFID
433 MHz, 2.4 GHz for BLE Applications	860 MHz - 960 MHz

READ RANGE

ACTIVE RFID	PASSIVE RFID
~100 - 300+ ft	Near Contact - 80 ft

AVERAGE COST PER TAG

ACTIVE RFID	PASSIVE RFID
$15.00 - $40.00	$0.09 - $20.00

PRIMARY APPLICATIONS

ACTIVE RFID	PASSIVE RFID
• Vehicle Tracking • Auto Manufacturing • Asset Tracking • Personnel Tracking	• Supply Chain Tracking • Asset Tracking • Inventory Tracking • Shipment Verification

PROS

ACTIVE RFID	PASSIVE RFID
• Longer Read Range • Lower Infrastructure Cost (*Compared To Passive RFID)* • Large Memory Capacity • High Data Transmission Rates	• Lower Cost Per Tag • Wide Variety Of Tag Sizes/Shapes • Small And Lightweight • Global Standards • High Data Transmission Rates

CONS

ACTIVE RFID	PASSIVE RFID
• Higher Per Tag Cost • Shipping Restrictions (*Batteries)* • Replacing Tags/Batteries If They Die • Complex Software May Be Required • Interference *(Metal & Liquids)* • Few Global Standards	• Moderate Read Range • High Equipment Costs • Moderate Memory Capacity • Interference (*Metal & Liquids*)

PRIMARY INDUSTRIES FOR BOTH TYPES

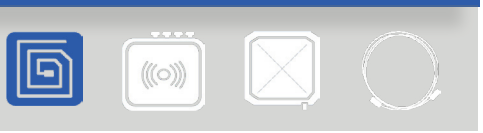
Using active or passive RFID will be highly dependent on which application best meets your company's needs. We've seen successful UHF RFID applications in:

- Manufacturing
- Distribution Centers
- Logistics
- Oil and Gas
- Construction
- Utilities
- Healthcare
- Retail
- Mining

When Should I Use Active RFID?

When Should I Use Passive RFID?

RFID TAGS



WHAT IS AN RFID TAG?

An RFID tag is the piece of an RFID system that is item specific. It is associated with a unique item for identification, tracking, and management purposes. The simplest tags are made of three parts; an antenna - that transmits and receives signals - an RFID chip - that stores the tag's information – and a substrate – which can be thought of as the glue that holds the pieces together. Attach encoded RFID tags to items, then they can be tracked using an RFID reader and antenna.

RFID tags transmit item data through radio waves to the RFID reader/antenna. UHF Passive RFID tags do not have a battery. These tags are activated to send out their data when they receive energy from the radio waves generated by the reader. The tag receives the transmission from the reader/antenna and the energy courses through the tag's internal antenna to the chip. The energy activates the chip and modifies the energy with the requested information. Then the tag transmits a signal back toward the antenna and reader.

Passive RFID tag performance strongly depends on the antenna's size and the tag's orientation or angle compared to the reader. The larger the antenna, the more energy it can collect and then send back out. Tags with larger antennas, therefore, tend to have higher read ranges (although not as high as you'll see from active tags). The tag's orientation impacts the performance similarly because the angle of the tag compared to the reader changes the amount of the tag antenna the reader's signal can reach. The orientation essentially changes the antenna surface area the energy can enter through. Internal antenna shape is also important for tag performance. For example, they can be shaped like tiny coils when magnetic in nature or created in a V shape when electrical in nature.

Active RFID tags are usually larger than passive tags and always contain their own power source. They send out information regardless of whether or not a reader is looking for it. When an active RFID tag transmits its signal within the read range of

a reader, the information will be read and stored in the system. Active tags are commonly used for real-time tracking scenarios for that reason.

Active tags have two features that differentiate them from passive tags: an onboard power supply and onboard electronics.

The onboard power supply is usually a battery, although it can also be solar. This power source is part of what allows active tags to be read from distances of 100 feet or more, whereas passive tags can only be read up to around 80 feet.

Onboard electronics could include sensors, microprocessors, and input/output ports, all of which are powered by the tag's onboard power source. The electronics allow active RFID tags to be used in a wider range of applications than passive tags.

For example, perishable food products tagged with sensors that collect data can be used to determine expiration dates and warn the end user if an item may be spoiled. Even though many products have expiration dates printed on them, these dates are valid only if the product is stored under its optimal conditions (temperature, humidity, exposure to light, etc.). Under poor conditions, the product may expire before the printed date. An RFID tag equipped with a temperature sensor could predict the actual expiration date of a carton of milk in a broken refrigeration truck, for example, which may be very different from the printed date.

No matter the application, there are many tag shapes, sizes, features that are designed to fit specific environments and applications.

ENCODING TAGS

To effectively identify and track using RFID, the RFID tags need to be encoded. Encoding tags is the process by which you store information into a tag. This process allows users to assign uniquely identifiable information to a tag, which is then associated with an asset, inventory, or entity for identification and tracking purposes.

Depending on its design, the chip may be read-only (RO), write-once read-many (WORM), or read-write (RW). Typically, RFID chips carry 96 bits of memory but can range from 2-1000 bits. If companies follow GS1 Standards during the encoding process, then their labels and tags can be read by other companies with the right equipment.

What "Encoding a Tag" Means

TYPES OF RFID TAGS

To fit the wide variety of RFID applications, there are a corresponding wide variety of RFID tags. We can narrow them down by looking at their form factor and features. One common division is inlays vs. hard tags.

FORM FACTOR
Inlay, Label, Card, Badge, Hard Tag

FREQUENCY TYPE
LF, NFC, HF, UHF Passive (902 – 928 MHz, 865 – 868 MHz, or 865 – 960 MHz), BAP, Active

ENVIRONMENTAL FACTORS
Water Resistant, Rugged, Temperature Resistant, Chemical Resistant

CUSTOMIZABLE
Shape, Size, Text, Encoding

SPECIFIC FEATURES/APPLICATION
Laundry Tags, Sensor Tags, Embeddable Tags, Vehicle Tags, High Memory Tags

SPECIFIC SURFACE MATERIALS
Metal Mount Tags, Glass Mount Tags, Tags For Liquid-Filled Items

TAG PRICING

When considering tag pricing, it is important to consider the individual tag price, based on the type of tag, and the overall quantity necessary for your RFID solution. Tag pricing can fluctuate depending on the quantity that are being ordered.

Inlay tags typically cost around $0.09 - $1.75 depending on the tag's features. Hard tags tend to be more expensive, often ranging anywhere from $1.00 - $20.00. The extra cost isn't for nothing, though - while more expensive, hard tags also tend to have more rugged and weather resistant features. Tags that are specialized or require a higher level of customization will be more expensive when compared to off-the-shelf tags.

READY TO SELECT RFID TAGS?

HERE'S SOME QUESTIONS TO CONSIDER

- What type of material are you affixing the tag to (plastic, wood, metal, etc.)?
- For containers, does the container hold liquid or metal?
- How far from the reader will the items you hope to track be?
- Are there size limitations for the surface that the tag will be attached to (i.e. the tag must fit within an area x by y by z inches)?
- Are there environmental conditions that could harm or damage the tag (excessive heat, cold, moisture, impact, etc.)?
- Is there a specific way the tags need to be attached? (adhesive, epoxy, rivets/ screws, cable ties, etc.)?

With so many options available, the key to choosing a tag is to test a variety of them in your unique environment on the items you wish to track and identify in the final system. Our team at AB&R can help with this part of the process, it is built into our proven Solution Process as part of the Site Survey and System Requirements Design Study (SRDS). During this phase, we identify recommended equipment and tags that are ideal for your application and environment.

RFID READERS

WHAT IS AN RFID READER?

RFID readers, sometimes referred to as interrogators, are a critical part of any RFID system. They could be thought of as the brain of the system. They are devices that send and receive radio waves in communication with RFID tags. There are two distinct categories of RFID readers, mobile readers and fixed readers.

Mobile readers can be moved around an area to read tags. They offer a more flexible RFID reading solution. The two main types of mobile RFID readers are mobile computing devices - readers with an onboard computer - and sleds - readers that use a Bluetooth or Auxiliary connection to a smart device or tablet). Both types accommodate reading RFID tags on the move, while still being able to communicate with a host computer or smart device.

Fixed readers are stationary and enable the most automated RFID reading system. Typically, they are mounted on a wall, the ceiling, a desk, into a portal, or other fixed location. The primary subtype of fixed reader is an integrated reader. These readers have a built-in antenna and typically include one additional antenna port for the connection of an optional external antenna. They are designed for indoor applications that do not have a high traffic of tagged items and tend to be more aesthetically pleasing.

In certain cases, it can be beneficial to have multiple antennas attached to one reader. The number of antennas connected to one reader depends on the area of coverage and or directionality monitoring required for the RFID application. When looking to track which asset entered or exited a section of a warehouse, for example, a transition reader could be hung above the doorway. Depending on which antenna picked up the tag's signal first, and which picked it up last, you could tell if it entered or exited the area. In these cases, fixed RFID Readers with multiple antennas could be the best fit. Other applications only need a small coverage area, like checking files in and out, so one antenna does the job.

When To Use Mobile Readers

When To Use Fixed Readers

TYPES OF RFID READERS

The most prevalent way to categorize readers is to classify them as either fixed or mobile. They can also be differentiated by connectivity, features, available utilities, processing capabilities, antenna ports, power options, etc.

FREQUENCY RANGE
902 – 928 MHz US, 865 – 868 MHz EU, etc.

MOBILITY
Fixed, Integrated, or Mobile Readers

CONNECTIVITY OPTIONS
Wi-Fi, Bluetooth, LAN, Serial, USB, Auxiliary Port

AVAILABLE UTILITIES
HDMI, GPS, USB, Camera, GPS, GPIO, 1D/2D Barcode, Cellular Capabilities

PROCESSING CAPABILITIES
OnBoard Processing, No OnBoard Processing

POWER OPTIONS
Power Adapter, PoE, Battery, In-Vehicle, USB

AVAILABLE ANTENNA PORTS
No External Ports, 1-Port, 2-Port, 4-Port, 8-Port, 16-Port

READER PRICING

The RFID reader will often be the most expensive component in an RFID system. Their price can range from approximately $400 up to $3,000+ depending on the system's required features and capabilities. USB readers, a less-expensive class of readers, average around $400. These readers usually are used in desktop applications that operate well with their short read ranges.

READY TO SELECT AN RFID READER?

HERE'S SOME QUESTIONS TO CONSIDER

- How far of a read range does your application require?
- Are there environmental conditions that could damage or interfere with the reader (excessive heat, cold, moisture, impact, etc.)?
- Will you be adding the reader to a network?
- Where will the reader be installed?
- Does the reader need the flexibility of a mobile solution?
- How many read points/read zones will you need?
- How many tags will the reader need to read at the same time?
- How quickly will the tags move through the read point/read zone (i.e. a slow-moving conveyor belt vs a vehicle or forklift moving through the warehouse)?

RFID ANTENNAS

WHAT IS AN RFID ANTENNA?

Onto the third key component of an RFID system! An RFID antenna is the piece of the system that facilitates communication between the RFID reader and the RFID tag. Antennas convert the reader's signal into RF waves that can be picked up by tags. Without an antenna, either integrated or standalone, the reader will not be able to send and receive signals to tags, which would disrupt the system's functionality.

RFID antennas receive power directly from the reader; they do not function on their own. The reader transmits energy to the antenna, which generates an RF field and transmits to the tags in the vicinity. The antenna's gain refers to how well the antenna creates and directs waves in a specific direction. At a high level, the higher the gain, the more powerful and further-reaching RF field an antenna will have.

An antenna's polarity can significantly impact the RFID system's read range. Its polarity is designated by whether it gives off RFID waves along a horizontal or a vertical plane. Read range can be maximized by ensuring the antenna's polarity properly aligns with the RFID tag's polarity. Attempting to use a vertical linearly-polarized antenna with a horizontal linearly-polarized tag would drastically diminish the read range. Simply put, you want the antenna polarity to match the tags polarity for optimal read range.

Circularly-polarized antennas transmit waves that oscillate between horizontal and vertical planes. These afford applications with enhanced flexibility because they allow for RFID tags to be read in multiple orientations. Keep in mind, though, with the energy divided between two planes, these antenna's read range will be shorter than a linear antenna with similar gain.

TYPES OF RFID ANTENNAS

Finding the best RFID antenna for your RFID solution is easier when you narrow down the options by their factors. The most common types of RFID antennas are distinguished by polarity and ruggedness.

FREQUENCY RANGE
902 – 928 MHz, 865 – 868 MHz, 860 – 960 MHz

POLARITY
Circular, Linear

RUGGEDNESS
Indoor IP Rated, Outdoor IP Rated

READ RANGE
Proximity (Near-Field), Far-Field

MOUNTING TYPE
Shelf Antenna, Ground Antenna, Panel Antenna, Portal Antenna

ANTENNA PRICING

RFID antennas typically cost between $75 and $300 apiece. Some antennas with application-specific factors, like ground or mat antennas, are on the higher end or even above this price range. These specialized antennas are built to withstand and perform in rugged applications, like ones designed to function even as a forklift drives over them. Or like the antennas needed for highly specific environments, like a lab or manufacturing line, that require a highly precise read area. While specialized antennas can significantly increase an RFID system's cost, they could be the difference between a functioning and non-functioning system, depending on the application.

READY TO SELECT AN RFID ANTENNA?

HERE'S SOME QUESTIONS TO CONSIDER

- How long do you need the read range to be?
- For your application, are you able to control the orientation of the RFID tag in relation to the antenna's position?
- Are there environmental conditions that could damage or interfere with the antenna (excessive heat, cold, moisture, impact, etc.)?
- Will the antenna need to be installed indoors or outdoors?
- Are there antenna size limitations? (i.e. the antenna can be no larger than x by y by z inches)?

RFID CABLES +

WHAT ELSE DO WE NEED?

RFID antenna cables assist in communications between the RFID reader and RFID antenna. If you remove the cable, the reader cannot power and send signals to the tags via the antenna. Cables might seem like they are a simple piece of the puzzle, a simple choice, but there are three key factors to keep in mind during selection. Cable length, thickness/insulation rating, and connector types should all be considered to create a functional RFID solution.

Optimal cable length and thickness will depend on your specific solution. These two factors together are also referred to as the cable's insulation rating. Typically cable length is determined by the distance between the RFID reader and antenna. One important piece to keep in mind, however, is that the longer the cable, the more power will be diminished during transit. This loss can be compensated for by using a cable with a higher insulation rating. It is worth noting that as the insulation rating increases, so does the thickness and rigidity of the cable. This can make it more difficult to bend and work with the cable when turning corners or running it through a conduit.

It's also important to consider the connectors for both ends of the cable. Check the connectors on the RFID reader and the antenna to determine what cable connections are needed. For example, if the reader has an RP-TNC Female connector, the cable will need an RP-TNC Male connector on one end.

MAKING USE OF YOUR DATA

The best way to start using RFID technology is often with a Development Kit. These are created by the reader manufacturer paving the simplest way to start with RFID. An RFID Development Kit contains essential components to start reading and writing RFID tags, which helps people start with the technology and test out the application. There are a handful of kits to choose from, that can combine the readers with a recommended antenna and sample RFID tags to test.

A sample program for reading and writing RFID tags, and access to the manufacturer's Software Development Kit, or SDK, are usually included in the Development Kit. Having access to the SDK is beneficial because it contains API access and code samples, as well as information and documentation on the reader, so that a software developer can begin writing software for the application.

The components we've covered can create a functioning data collecting system, but there is often one more big piece of the system - the software. The data needs to be in a format and system that works for you and your company, that's where software and integration come into play. Application specific software acts as the middleman between the RFID setup and your existing back-end business systems so your team can take full advantage of the information being collected. When budgeting for an RFID system be aware that, depending on the size of your solution, the software and integration can cost as much, if not more, than all the hardware components for your RFID system.

OTHER EQUIPMENT & ACCESSORIES

There are other equipment and accessories that may improve your system's functionality or efficiency, depending on the application. Examples include RFID printers, RFID portals, GPIO adapters, sensors, antenna mounting brackets, and RF power mappers.

WHERE TO FROM HERE?

Now you have a ton of information about RFID. So, what's next? Where do you go from here? Learning about RFID can be overwhelming and complicated. We get it, there is a lot of nuance in this four-letter technology. Grasping the concepts in this guide is just the start. But don't worry, we have more resources for you to develop a better understanding of RFID and how it can improve your business.

WEBSITE RESOURCES

www.abr.com/resources-support/

You can find a variety of documents and videos on our website that can assist in developing a deeper understanding of RFID. Whether you are ready for a full solution installation or just need some ideas for how RFID could benefit your business, we will continue to create a variety of content that will best suit your business needs.

YOUTUBE

www.youtube.com/user/TeamRFID/

Discover demonstrations, educational videos, tips for product maintenance, success stories, and much more about available services and solutions on our channel.

AB&R BLOG

www.abr.com/blog/

Keep up to date with recent developments in RFID and more. Whether you know a great deal or very little about the RFID world, we create content that caters to a variety of industries, and a variety of roles within a company. It all comes back to our belief in making you better, so you can get back to doing what you do best.

WE HAVE YOUR BACK

Think RFID could benefit your business? Have questions or concerns? Feel free to contact us - we can probably help you! Afterall, we're the barcode and RFID experts, so you don't have to be.