

# RFID TAG SELECTION REPORT



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# Introduction

*The content of this report is based on research conducted by the Rutgers University Research Center. Rutgers University bears sole responsibility for the report content and its accuracy.*

The RFID Tag Selection Report was developed by the Rutgers University RFID Research Center, with support from RFID TagSource. This research and resulting report could not have been completed without the generous sponsorship of Motorola. The purpose of the report is to serve as a reference guide and resource that can help potential users identify the best tag(s) for their prospective RFID application(s). The report includes RFID tag performance testing results, detailed information about a wide range of RFID tags and information about providers of those tags. We have also included helpful articles and charts that can further assist you with RFID tag selection.

We trust that you will find this document a helpful tool in your RFID efforts. Should you have any comments and/or feedback, feel free to direct your email to any one of the following contacts:

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# RFID Tag Testing Methodology



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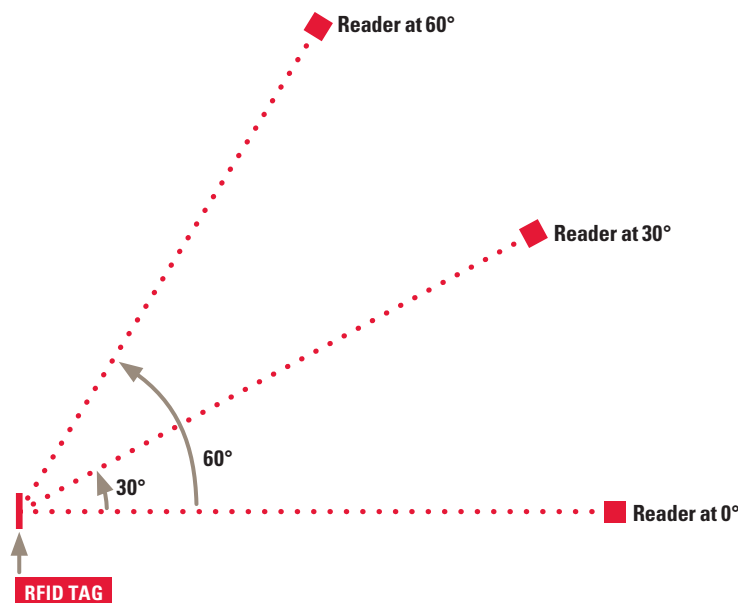
By Francois Berthiaume, Ph.D.

The RFID tag testing for this publication was performed at the Rutgers University RFID Research Center. Formed in 2009 through the collaborative efforts of the Rutgers Center for Innovative Ventures of Emerging Technologies (CIVET) and RFID TagSource, it combines laboratory facilities with real world insight into how RFID is being utilized across the globe to provide real business value.

With the support of RFID TagSource and the sponsorship of Motorola, Rutgers has undertaken one of the largest ever performance evaluations of UHF EPC Gen2 Passive RFID Tags. The RFID readers and antennas used in this testing were provided by Motorola. The tags were provided by RFID TagSource and a variety of tag manufacturers.

All testing was completed in an unbiased academic environment leveraging university resources and was conducted outdoors to eliminate the potential confounding effects of reflective environments to alter test results. All measurements were in free space in a vertical plane. The tags were read face on ( $0^\circ$ ), rotated at  $30^\circ$ , and then rotated at  $60^\circ$  (see schematic below).

When testing using a handheld reader, the reader was rotated on all planes around its axis, as well as positioned up and down between a height of 1.65' (20") above the ground and up to a height of 7' (84") above the ground.



When testing using the fixed reader, the reader/antenna combination was installed on a cart. The tag was mounted in a fixed position and the cart was moved away from the tag in a uniform manner. The cart mounted antenna was rotated, as well as positioned between a height of 1.65' (20") above the ground and up to a height of 7' (84") above the ground.

For metal-mounted RFID tags, tags were affixed to the center of an 18" x 20" aluminum sheet. All other tags were placed on a foam board. The results of each test are respectively indicated in the results as "metal" and "air."

Motorola RFID readers were used in the testing as they could provide two types of fixed RFID readers and two types of handheld RFID readers, which would yield a broader set of test results that might represent different application and operating environment variables. The RFID readers used in the testing include:

- Motorola MC9090-G Industrial-Class RFID Handheld — Rugged handheld RFID reader with linear polarized antenna for warehouse environments and industrial applications.
- Motorola MC3090-Z Business-Class RFID Handheld — Durable handheld RFID reader for indoor and carpeted space environments like retail and healthcare. The MC3090-Z uses a patented omni-directional antenna that provides for the longer read ranges of linear polarized antennas with the broader read pattern of circular polarized antennas.
- Motorola XR450 Industrial-Class Fixed Reader — Rugged fixed reader appropriate for warehouse and back room environments. The Motorola AN480 antenna was used with this reader for testing.
- Motorola FX7400 Business-Class Fixed Reader — Fixed reader appropriate for indoor and carpeted space environments like retail and healthcare. The AN720 and AN480 antennas were used with this reader for testing.

Notice: test results are based on the conditions found at the Rutgers University lab. Results may vary in different conditions.

Additional reader and antenna specifications can be found at the Motorola RFID reader product pages. [www.motorola.com/rfid](http://www.motorola.com/rfid)

This report represents UHF passive RFID tags that were available at the time of research and may not include tags, or successor tags, that may have become available after the research was conducted.

### **About the RFID Research Center**

The RFID Research Center provides the Rutgers University community and industrial sponsors with the necessary tools to support research activities with near term commercial value. Located on Rutgers' Busch Campus in Piscataway, New Jersey, the center is also used to host industry seminars and executive forums, continuing education classes, and independent research projects to support industry and government (including the United States Department of Defense) RFID initiatives. Please contact Francois Berthiaume at [fberthia@rci.rutgers.edu](mailto:fberthia@rci.rutgers.edu) to discuss the Center's capabilities in more detail and how we might support your RFID research initiatives.

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# RFID Tag Selection



Kevin Donahue  
*Managing Director*  
**RFID TagSource**

By Kevin Donahue, Managing Director, RFID TagSource

RFID tag selection is often the most critical part of any RFID implementation; projects will not move forward until an appropriate tag can be found that will support the stated application requirements. The effort required to perform product evaluations across a variety of tags is time consuming, expensive and generally not a core competency for individuals deploying RFID solutions.

This guide has been developed to help organizations quickly identify the tags that meet their requirements and to move efficiently forward toward successful RFID project deployment. The results documented herein serve as a tag performance benchmark, as tag suitability depends on many factors that cannot be completely modeled outside of the application environment.

## **Definitions**

All of the tags evaluated within this report follow the EPC Gen2 UHF Passive RFID Standard. EPC Gen2 RFID tags are made up of an integrated circuit (IC or chip) and a passive tag antenna. These two components together comprise the inlay and most often are integrated into a pressure sensitive adhesive label. The key differentiating features of these tags are the chip manufacturer and antenna design; the same label “packaging” can be used on any standard inlay. Often referred to as “Smart Labels”, these are the tags most associated with supply chain applications such as those promoted by Wal-Mart and the United States Department of Defense.

## **RFID IC/Chips**

The “Brains” of an RFID tag are located in the integrated circuit or “Chip.” Passive RFID tags have no internal power source; when these tags detect an RF signal, the tag antenna is stimulated to a point where the chip is powered up and communicates the information stored in the chip back to the reader.

Standard EPC Gen2 chips can store 96 bits of data. Many of the newer chips can store 512 bits. Some higher memory chips are available that can store in excess of 4 kilobytes (kb) of data.

### RFID Inlays

An RFID inlay is comprised of a chip and an antenna (made of aluminum, copper or silver) bonded to a polyethylene terephthalate (PET) layer. Inlays are generally laminated or “converted” by companies that place them between a paper face sheet and pressure sensitive adhesive. Typically, (but not always), RFID labels can be printed and encoded in an RFID printer.

### On-Metal Tags

Standard RFID inlays are two dimensional and are typically integrated into labels. However, standard RFID labels are not considered durable and will not work when placed directly on metal. It is possible to use a standard RFID inlay with a plastic or foam “stand-off” material that separates the inlay from the metal. However, these tags don't perform as well as those specifically designed for on-metal use.

On-metal tags are three dimensional antenna designs. Historically, on-metal tags have been as thick as .5", but thinner on-metal tags are becoming increasingly available. On-metal tag designs can vary greatly from small asset tags to large cargo tags. On-metal tag performance is suboptimal when not placed directly on metal.

### Tag Packaging and Encapsulation

As application requirements become more demanding, the materials and processes used to manufacture the tags become more complex. Simple RFID inlays can be converted into paper labels, more durable credit card-like materials, or embedded in plastic. Some on-metal tags are significantly more durable than others; high temperature tags require more exotic materials and adhesives, and the more exotic the material, the more expensive the tag.

### Performance

Tag read performance is highly dependent upon several key factors:

- Reader and antenna configuration
- Tag design and materials
- Environmental conditions

The items listed above are by no means all-inclusive — there are several other factors that can impact the cost and availability of durable EPC Gen2 tags for the more demanding applications. The best advice we can offer is as follows:

- Ensure that you have clearly defined your requirements. Important considerations include the materials being tagged (e.g. plastic, metal, etc.), environmental durability (e.g. temperature, chemical resistance, etc.), and performance requirements.
- Regarding tag attachment preferences (e.g. adhesive, rivets, lanyards), note that the tag most appropriate for your application may not support your preferred attachment method off the shelf, and may have to be customized.
- Always test the tags in your application environment. Identify tags that match your requirements and test them in your own environment.

It is always optimal if an off-the-shelf tag is available to support your application needs. In cases where no such tag is available, we can work with your team to review your options. You can be assured that we will do whatever it takes to help assure your project is a success.

**About RFID TagSource**

RFID TagSource, a woman-owned small business, is the leading provider of passive Radio Frequency Identification (RFID) tagging solutions for high value asset management applications. Recognized industry experts, we provide a wide variety of highly durable RFID tags and customization services to support customers around the globe. Our unique products are used for managing IT assets, shipping and logistics equipment, and aerospace and defense parts and equipment. For more information visit <http://www.rfidtagsource.com/>



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# RFID Reader Options for Better RFID Solution Design



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By John Rommel, Sr. Mgr, RFID Channel Development, Motorola

## **Background**

Selecting the proper tag means little if you have not selected the proper reader with which to read it. Whether you are just starting to evaluate RFID technology, or are in the process of planning an RFID implementation, you'll need a solid understanding of the different types of RFID readers that are available today—fixed and handheld. Each type of reader is designed to meet completely different environmental and application requirements. Only through a thorough understanding of each of these devices and what they offer can you develop a plan that maximizes the capabilities, benefits and return on investment for your RFID solutions.

## **Fixed Readers**

Fixed readers are designed for deployment in an environment where the tagged items are in motion and need to be read as they pass by a fixed location. These locations, often referred to as “choke points” or “read zones” include such things as dock doors, conveyor belts, hallways, and other fixed locations. Permanently installed in a defined location, these devices are paired with RFID antennas that are constantly reading, and always “listening” in order to detect any RFID tag that passes within the reader’s active zone.

Fixed readers offer completely automated reading—there is no operator intervention required to read tags. This makes them ideal for situations where items move from location to location. For example, assume a pallet of 100 items is moved from the inbound truck into the receiving area, then moved into quality assurance (QA) for testing, then moved to a holding area before finally being put into storage. With traditional bar code methods, the pallet, or possibly each item on it, would need to be scanned to indicate that it has changed location—this can be very time-consuming. With fixed RFID readers the forklift operator simply performs his or her job as always and the items are automatically read as they are moved from room to room.

### Applications

Fixed readers are designed to streamline processes at the major mandatory read points in your facility—key entry and exit points where the business process requires the bulk capture of inventory and asset movement data. Applications typically include:

- Capturing incoming and outgoing inventory movement at warehouse dock doors
- Work in process (WIP) tracking of all manufacturing process phases/steps
- Tracking the movement of wheelchairs, IV pumps, crash carts, etc. at hospital doorways
- Preventing the unwanted removal of valuable assets at the entrances and exits of facilities.

### Deployment Considerations

Fixed readers can typically support between 2 and 8 antennas. The antennas can be combined to cover one large read zone or can be separated to have each one cover a smaller read zone. This flexibility allows for a reduction in overall costs but also requires advanced planning to determine the optimal locations for each component. In addition, the reader will also need a network connection and power, either through A/C current or via Power Over Ethernet, so users must ensure these are available at the required locations. Care will also be required to ensure the antennas read where you want them to read (i.e., the doorway) and not in any unwanted areas (i.e., the adjacent hallway). Detecting direction of movement and potentially interfacing to motion sensors, light racks, or video systems are also potential considerations.

### Handheld RFID Readers

Handheld RFID readers offer an easy-to-carry compact form factor with an integrated antenna that allows workers to take the reader to the RFID tag—in contrast to fixed readers, where the tag moves past the reader. With a handheld RFID reader, users have complete control over when, where, and how the reader will be used. Typically, handheld readers are used to take inventory and quickly count dozens to tens of thousands of items, a process that would otherwise take a very long time and require large manpower resources. Consider a retail clothing store stocked with thousands of garments, shoes and accessories. The effort required to inventory what is physically on the shelves normally requires a large group of people to work eight to twelve hours during an overnight period—even with bar code scanners. For this reason it is rarely done. However, with a handheld RFID reader, store employees could walk around the store in a matter of minutes, reading and accounting for every item that was on a rack.

Handheld readers are typically fully-functioning portable computers, complete with a keypad and display. Applications can be loaded onto the device and the RFID data can be read and either stored for future use or transmitted via a WiFi network to interface in real time with a host system.

Handheld readers also often feature a bar code scanner to provide multiple input capabilities. In this way, data can be input via keypad, bar code, or RFID—depending on which method makes the most sense for the operation.

### Applications

Handheld readers are designed to expedite any counting or inventory process by quickly detecting multiple items automatically, without the need of line of sight. Their portability and programmability make them ideal for a variety of applications, including:

- Physical inventories of assets, merchandise, supplies, etc.
- Inspections and replenishment of multiple assets located throughout a facility or location.
- Tracking items in a yard or distributed storage environments where items would not pass by a fixed reader.
- Searching for a particular misplaced item that may be out of sight

### Deployment Considerations

Unlike fixed readers, handhelds require no extensive installation or system design. However, there are a variety of factors to consider when evaluating these devices. First and foremost is read performance. Since handhelds are battery powered and possess smaller antennas than fixed readers, their read distance is typically reduced. It is wise to determine how far you will typically need to read and then match the proper reader and tag to meet this requirement (using the charts in this report).

Second in importance is ergonomics. Is the reader heavy? Does it feel comfortable in your hand? Can someone use it throughout an entire shift without fatigue? One more important consideration is durability. Is it rugged? Will it withstand repeated drops? In what temperatures can it operate? Is it resistant to dust, moisture, grease, vibration, etc.? Operational concerns are an important up front consideration when conducting your business process analysis.

### Summary

Fixed and handheld RFID readers all have unique characteristics and functionalities. Through a thorough understanding of the types of devices, enterprises can envision all of the possible areas in the business where RFID can be deployed. Through this vision, enterprises can determine how, where and what type of readers to deploy to achieve maximum efficiency and maximum value from RFID deployments.

### About Motorola

Motorola helps businesses gain increased visibility through automation with an innovative portfolio of RFID readers and antennas for inventory, supply chain and asset management applications. Our comprehensive offering includes a business and industrial line of fixed, handheld and mobile RFID readers that simplifies deployment, lowers costs and maximizes return on investment. A leading provider of mission-critical communication products and services, Motorola extends the value of your RFID solution with a mobility portfolio that includes wireless infrastructure, advanced data capture and mobile computing products. Through leading-edge innovation and communications technology, we are a global leader that enables our customers to be their best in the moments that matter. For more information about our company, our people and our innovations, please visit [www.motorola.com/rfid](http://www.motorola.com/rfid).

# Metal Mount Tags

The chart below lists the most popular RFID tags designed specifically for use on metal objects. To use this chart, first determine the read distance required for your application (see key for definitions), then choose the tag size that works best for your item. When you have found the tags that will meet your requirements, turn to their corresponding pages to get more information.

VENDOR	TAG NAME	PAGE NO	TAG SIZE			READ RANGE			HIGH TEMP
			Small	Medium	Large	Short	Medium	Long	
CONFIDEX	Ironside	38		■			■		■
	Ironside Micro	39	■			■			
	Steelwave Micro Higgs3	40	■				■		
	Survivor	41			■			■	
	Halo	42		■				■	
	Steel Wing	43		■			■		
	Steelwave Micro Monza3	47	■			■			
INTERMEC	IT65 Small Rigid	51		■			■		■
	IT65 Large Rigid	52			■		■		■
METALCRAFT	Universal RFID Asset Tag	54		■				■	
	Universal RFID Hard Tag	55		■				■	
	Sentry M Slim	56	■				■		
	Windshield Tag for Access Control	57		■				■	
	RFID Folded Tab Tag	58			■			■	
OMNI-ID	Prox	61	■			■			
	Flex	62		■			■		
	Max	63		■				■	
	Ultra	64			■			■	
	Max HD	65			■		■		■

Tag names are copyrighted by their respective companies.

Read range data was calculated from independent testing and may differ from printed specifications.

#### TAG SIZE GUIDELINES

**Small Size** = longest edge < 2"

**Medium Size** = longest edge is between 2" and 4"

**Large Size** = longest edge is > 4"

#### READ RANGE GUIDELINES

**Short Range** = < 10'

**Medium Range** = 10' – 20'

**Long Range** = > 20'

#### HIGH TEMPERATURE GUIDELINES

Tag withstands operating temps > 200° F

Refer to the RFID Tag Testing Methodology on page 3 for a description of the RFID readers used for testing.

VENDOR	TAG NAME	PAGE NO	TAG SIZE			READ RANGE			HIGH TEMP
			Small	Medium	Large	Short	Medium	Long	
RCD	Atlas Cargo Tag	67			■			■	
	Sentry M	68	■			■			
	Sentry M Slim	69	■			■			
	Sentry M WW	71	■				■		
SONTEC	Hummingbird I	76		■		■			
	Hummingbird II	77	■			■			
	Hummingbird IV	78	■			■			
	Albatross I	79	■				■		
	Eagle I	80		■			■		
	Peacock I	81		■				■	
	Robin II	82	■				■		
	Pigeon I	83	■			■			
	Jewelry tag	84	■			■			
STARPORT	Adamas	86			■			■	
	Portunus II	87			■		■		
	Terminator	88			■			■	
	Orion	89		■				■	
	Stealth	90			■		■		
TROI	PC-100 Scaffold Tie	93			■	■			
	TMT-2	94	■			■			
	PC-103 Pipe & Cylinder	95			■		■		
	TMT-2 NW (No Wings)	96	■			■			
	MMT-3002 Mini Metal	97			■			■	
	OK-106	100	■			■			■
WILLIAM FRICK & CO.	SM-77B Black Rugged Tag	102			■		■		
	WF-SM-12 — Laser Etched Metal Mount	104			■		■		
	SM-22 Foamed Back	106		■			■		
XERAFY	Pico	111	■			■			
	Nano	112	■			■			
	Micro	113	■					■	

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#### TAG SIZE GUIDELINES

**Small Size** = longest edge < 2"

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**Large Size** = longest edge is > 4"

#### READ RANGE GUIDELINES

**Short Range** = < 10'

**Medium Range** = 10' – 20'

**Long Range** = > 20'

#### HIGH TEMPERATURE GUIDELINES

Tag withstands operating temps > 200° F

Refer to the RFID Tag Testing Methodology on page 3 for a description of the RFID readers used for testing.

# General Purpose Tags

The chart below lists the most popular RFID tags designed for use on a variety of surfaces. To use this chart, first determine the read distance required for your application (see key for definitions), then choose the tag size that works best for your item. When you have found the tags that will meet your requirements, turn to their corresponding pages to get more information.

VENDOR	TAG NAME	PAGE NO	TAG SIZE			READ RANGE			HIGH TEMP
			Small	Medium	Large	Short	Medium	Long	
AVERY DENNISON	AD 908	36			■			■	
CONFIDEX	Survivor	41			■			■	
	Carrier	44		■			■		
	Pino	46		■				■	
FUJITSU	WT A511/A611	49	■			■			
INTERMEC	IT65 Small Rigid	51		■					■
	IT65 Large Rigid	52			■				■
METALCRAFT	Universal RFID Asset Tag	54		■				■	
	Universal RFID Hard Tag	55		■				■	
	Sentry M Slim	56	■				■		
	Windshield Tag for Access Control	57		■				■	
	RFID Folded Tab Tag	58			■			■	
OMNI-ID	Prox	61	■			■			
	Flex	62		■			■		
	Max	63		■				■	
	Ultra	64			■			■	
	Max HD	65			■		■		■

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#### TAG SIZE GUIDELINES

**Small Size** = longest edge < 2"

**Medium Size** = longest edge is between 2" and 4"

**Large Size** = longest edge is > 4"

#### READ RANGE GUIDELINES

**Short Range** = < 10'

**Medium Range** = 10' – 20'

**Long Range** = > 20'

#### HIGH TEMPERATURE GUIDELINES

Tag withstands operating temps > 200° F

Refer to the RFID Tag Testing Methodology on page 3 for a description of the RFID readers used for testing.

VENDOR	TAG NAME	PAGE NO	TAG SIZE			READ RANGE			HIGH TEMP
			Small	Medium	Large	Short	Medium	Long	
SONTEC	Albatross I	79	■				■		
	Eagle I	80		■			■		
	Peacock I	81		■				■	
	Robin II	82	■				■		
	Pigeon I	83	■			■			
	Jewelry tag	84				■			
STARPORT	Adamas	86			■			■	
	Portunus II	87			■		■		
	Terminator	88			■			■	
	Stealth	90			■		■		
TROI	FT-1007 Flex tag	92			■		■		
	ST-74 Security Braid Tag	98			■		■		
	ST-12 Security Braid Tag	99			■		■		
WILLIAM FRICK & CO	SM-77B Black Rugged RFID Tag	102			■			■	
	SM-ID — ID Cards	103			■			■	
	HTL1 High Temperature RFID label	105			■			■	■
	RFID Enabled Pole Markers	107			■			■	
	FLR1 RFID Floor tag	108			■			■	
	WF-SM-IN02	109			■		■		

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#### READ RANGE GUIDELINES

**Short Range** = < 10'

**Medium Range** = 10' – 20'

**Long Range** = > 20'

#### HIGH TEMPERATURE GUIDELINES

Tag withstands operating temps > 200° F

Refer to the RFID Tag Testing Methodology on page 3 for a description of the RFID readers used for testing.

# RFID Inlays

The primary component of any RFID tag is the inlay. The inlays listed below are the primary ones utilized by the leading RFID tag producers, and it is often helpful to understand their read-specific performance capabilities, especially if you require an RFID label. To use this chart first determine the read distance required for your application (see key for definitions), then choose the tag size that works best for your item. When you have found the tags that will meet your requirements, turn to their corresponding pages to get more information.

VENDOR	TAG NAME	PAGE NO	TAG SIZE			READ RANGE			HIGH TEMP
			Small	Medium	Large	Short	Medium	Long	
ALIEN	ALN-9640—"Squiggle"	17		■			■		
	ALN-9662—"Short"	18		■				■	
	ALN-9654 "G" Inlay	19		■				■	
	ALN-9634 2"x 2" Inlay	20		■				■	
	ALN-9629—"Square" Inlay	21	■				■		
AVERY DENNISON	AD-223	23		■				■	
	AD-224	24		■				■	
	AD-230	25		■				■	
	AD-641	26		■				■	
	AD-805	27	■			■			
	AD-814	28	■			■			
	AD-815	29	■			■			
	AD-824	30		■			■		
	AD-826	31		■				■	
	AD-827	32	■				■		
	AD-828	33	■			■			
	AD-833	34		■				■	
	AD-843	35		■				■	
SIRIT	RSI-670	73		■			■		
	RSI-674	74		■				■	

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Tag withstands operating temps > 200° F

Refer to the RFID Tag Testing Methodology on page 3 for a description of the RFID readers used for testing.



# Label Converters

If your tag requirement calls for a peel and stick label, there are many companies that provide these products. All of the firms below provide standard and specialty RFID labels that can be manufactured to various sizes using numerous materials and adhesives. Instead of listing all of the possible combinations here, we have listed the primary manufacturers and their web sites. Check directly with these suppliers for more information.

NAME	WEBSITE
CCL LABEL	www.ccllabel.com
CGP INC.	www.cgplabels.com
CHALLENGE PRINTING CO.	www.challprint.com
CHICAGO TAG & LABEL	www.chicagotag.com
DONNICK LABEL SYSTEMS	www.donnick.com
EAGILE INC.	www.eagile.com
FRONTWEB INC.	www.frontweb.com
GEORGE SCHMITT & CO.	www.georgeschmitt.com
GLOBAL VENTURE	www.globalventurelabels.com
IC-TAG SOLUTIONS, INC.	www.ictagsolutions.com
LOWRY COMPUTER PRODUCTS	www.lowrycomputer.com
MARNLEN	www.marnlen.com
METALCRAFT	www.idplate.com
MEYERS PRINTING CO.	www.meyers.com
MID SOUTH RFID	www.midsouthrfid.com
MINI GRAPHICS INC.	www.minigraphics.net
MPI LABEL SYSTEMS	www.mpilabels.com
NASHUA	www.nashua.com
NATIONAL LABEL COMPANY	www.nationallabel.com
NOSCO	www.nosco.com
PLITEK	www.plitek.com
PRINT-O-TAPE	www.printotape.com
REPACORP	www.repacorp.com
RR DONNELLEY	www.rrdonnelley.com
SATO AMERICA INC.	www.satoamerica.com
STAFFORD PRESS	www.staffordpress.com
STARPORT TECHNOLOGIES LLC	www.starporttech.com
THE KENNEDY GROUP	www.kennedygrp.com
VANGUARD ID SYSTEMS	www.vanguardid.com
WEBER MARKING SYSTEMS	www.webermarking.com
WS PACKAGING GROUP, INC.	www.wspackaging.com

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# Company Profile



**Alien Technology®**  
18220 Butterfield Blvd.  
Morgan Hill, California 95037  
[www.AlienTechnology.com](http://www.AlienTechnology.com)

**CONTACT**  
408.782.3900

## **ALIEN TECHNOLOGY**

Alien Technology provides UHF RFID products and services, including RFID ICs and inlays. Alien is headquartered in Morgan Hill, California, with Alien Technology Asia in South Korea and the RFID Solutions Center located in the Dayton, Ohio region. Alien maintains sales offices in the US, Europe, Australia and Asia.

Alien's Gen-2 products, along with partner solution offerings, reduce costs and improve performance for industries such as retail, apparel, consumer packaged goods, heavy industry, pharmaceuticals, transportation, cargo logistics, government, asset management, and defense.

# Tag Information



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## ALN-9640-F HIGGS-3 "SQUIGGLE" INLAY

General purpose Squiggle inlay performs in multiple applications, including case tagging, pallet placards, apparel and baggage tags.






Powered by the Higgs-3 IC, this inlay boasts a total of 800 bits of memory and includes a 32-bit unalterable TID, a 64-bit unalterable Unique TID (UTID) for counterfeit and authentication purposes, a 96-bit EPC memory bank extensible to 480-bits, a 512-bit User memory bank, Access and Kill passwords, and provisions to hide data from unintended viewers.

### SPECIFICATIONS

<b>SIZE:</b> 95 mm x 8.2 mm (antenna) (3.74" x .32")
<b>MEMORY:</b> ~800-bits total. User configurable, allowing user-defined, scalable EPC & User memory partitions (32-bit TID, 64-bit UTID, 16-480 bit EPC, 512-64 bit User, 32-bit Kill, 32-bit Access, Config).
<b>CHIP USED:</b> Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Offered in dry, clear wet, and white wet inlays.
<b>OPERATING TEMP RANGE:</b> -40°F – 158°F



### TEST RESULTS

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	21	—	10	—	42	—	56	—	55	—
30°	18.5	—	10	—	25.5	—	37	—	37	—
60°	11	—	6	—	21	—	21	—	20	—

All distances are in feet

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**ALN-9662-F HIGGS-3 “SHORT” INLAY**

Featuring Higgs-3 IC, this is a general performance inlay for applications with geometric constraints. It’s a great choice for apparel hang tags, cases and pallet placard labels.






Powered by the Higgs-3 IC, this inlay offers a total of 800 bits of memory and includes a 32-bit unalterable TID, a 64-bit unalterable Unique TID (UTID) for counterfeit and authentication purposes, a 96-bit EPC memory bank extensible to 480-bits, a 512-bit User memory bank, Access and Kill passwords, and provisions to hide data from unintended viewers.

**SPECIFICATIONS**

<b>SIZE:</b> 70 mm x 17 mm (antenna) (2.75" x .67")
<b>MEMORY:</b> ~800-bits total. User configurable, allowing user-defined, scalable EPC & User memory partitions (32-bit TID, 64-bit UTID, 16-480 bit EPC, 512-64 bit User, 32-bit Kill, 32-bit Access, Config).
<b>CHIP USED:</b> Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Offered in dry or white wet inlays.
<b>OPERATING TEMP RANGE:</b> -40°F – 158°F



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	18	—	5	—	25	—	17	—	17	—
30°	17	—	5	—	15	—	17	—	15.5	—
60°	9	—	6	—	8.5	—	11	—	8.5	—

All distances are in feet



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**ALN-9654-F HIGGS-3 “G” INLAY**

Designed for demanding applications, this inlay is designed for high dielectric materials such as high density plastic totes and pallets, or windshield glass.






Powered by the Higgs-3 IC, this inlay boasts a total of 800 bits of memory and includes a 32-bit unalterable TID, a 64-bit unalterable Unique TID (UTID) for counterfeit and authentication purposes, a 96-bit EPC memory bank extensible to 480-bits, a 512-bit User memory bank, Access and Kill passwords, and provisions to hide data from unintended viewers.

**SPECIFICATIONS**

<b>SIZE:</b> 93 mm x 19 mm (antenna) (3.66" x .75")
<b>MEMORY:</b> ~800-bits total. User configurable, allowing user-defined, scalable EPC & User memory partitions (32-bit TID, 64-bit UTID, 16-480 bit EPC, 512-64 bit User, 32-bit Kill, 32-bit Access, Config).
<b>CHIP USED:</b> Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Offered in dry or white wet inlays.
<b>OPERATING TEMP RANGE:</b> -40°F – 158°F



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	15	—	7	—	21	—	35.5	—	37	—
30°	9	—	7	—	18	—	36	—	37	—
60°	7.5	—	3	—	8.5	—	20	—	22	—

All distances are in feet



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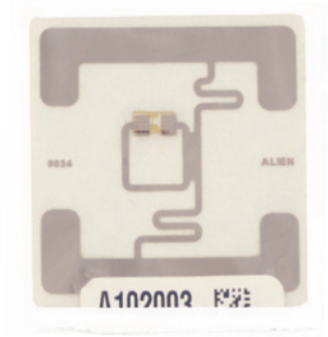
**ALN-9634-F 2"x 2" INLAY**

Featuring the Higgs-3 IC, the ALN-9634-F 2"x 2" Inlay is a general purpose inlay packaged in a small 2"x 2" form factor.






Powered by the Higgs-3 IC, this inlay provides a total of 800 bits of memory and includes a 32-bit unalterable TID, a 64-bit unalterable Unique TID (UTID) for counterfeit and authentication purposes, a 96-bit EPC memory bank extensible to 480-bits, a 512-bit User memory bank, Access and Kill passwords, and provisions to hide data from unintended viewers.

**SPECIFICATIONS**

<b>SIZE:</b> 44 mm x 46 mm (antenna) (1.73" x 1.81")
<b>MEMORY:</b> ~800-bits total. User configurable, allowing user-defined, scalable EPC & User memory partitions (32-bit TID, 64-bit UTID, 16-480 bit EPC, 512-64 bit User, 32-bit Kill, 32-bit Access, Config).
<b>CHIP USED:</b> Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Offered in dry or white wet inlays.
<b>OPERATING TEMP RANGE:</b> -40°F – 158°F



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	16	—	10	—	22	—	26	—	23	—
30°	17	—	10	—	20.5	—	24	—	23	—
60°	16	—	7	—	20	—	25	—	24	—

All distances are in feet



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**ALN-9629-F “SQUARE” INLAY**

Featuring the Higgs-3 IC, the ALN-9629-F “Square” Inlay is an item-level, general purpose inlay packaged in a compact 1" x 1" form factor.

Powered by the Higgs-3 IC, this inlay boasts a total of 800 bits of memory and includes a 32-bit unalterable TID, a 64-bit unalterable Unique TID (UTID) for counterfeit and authentication purposes, a 96-bit EPC memory bank extensible to 480-bits, a 512-bit User memory bank, Access and Kill passwords, and provisions to hide data from unintended viewers.

**SPECIFICATIONS**

<b>SIZE:</b> 22.5 mm x 22.5 mm (antenna) (.89" x .89")
<b>MEMORY:</b> ~800-bits total. User configurable, allowing user-defined, scalable EPC & User memory partitions (32-bit TID, 64-bit UTID, 16-480 bit EPC, 512-64 bit User, 32-bit Kill, 32-bit Access, Config).
<b>CHIP USED:</b> Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Offered in dry or white wet inlays.
<b>OPERATING TEMP RANGE:</b> -40°F – 158°F



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	10	—	3	—	11	—	16	—	17	—
30°	10	—	2	—	13	—	17	—	19	—
60°	6	—	1.5	—	11	—	15	—	17	—

All distances are in feet

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# Company Profile



## **Avery Dennison RFID**

4350 Avery Drive  
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<http://rfid.averydennison.com/>

### **CONTACT**

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### **AVERY DENNISON RFID**

Avery Dennison RFID manufactures UHF, HF and NFC inlays which help enable significant improvements in asset management, product quality and authentication, process improvement and brand experience. Their design experts and applications engineers leverage decades of experience to create real-world RFID solutions in applications such as retail, aviation, supply chain, healthcare and defense. Comprehensive testing of their RFID tags in RFID systems occur in all of their facilities. They partner with an array of industry leaders in tag converting, printer and reader hardware, software and systems integration.



# Tag Information



## Avery Dennison RFID

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## AD-223





The AD-223 is an all-purpose inlay tuned for global supply chain application use.

## SPECIFICATIONS

<b>SIZE:</b> 3.74" x 0.321"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



## TEST RESULTS

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	32	—	10	—	38	—	38	—	45	—
30°	31	—	7	—	28	—	36	—	41	—
60°	17.5	—	2	—	17	—	15	—	18	—

All distances are in feet



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**AD-224**






The AD-224 is an all-purpose inlay with factory-programmed and locked unique ID with 240 bits EPC memory. It is tuned for global use (860–960 MHz). G2XM model has additional 512 bits extra user memory.

**SPECIFICATIONS**

<b>SIZE:</b> 3.74" x .31"
<b>MEMORY:</b> 240 bits EPC (G2XL) or 240 bits EPC + 512 bits user memory (G2XM)
<b>CHIP USED:</b> NXP G2XL or NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	21	—	7	—	19	—	30	—	34.5	—
30°	19.5	—	6	—	17	—	22	—	25.5	—
60°	12	—	1	—	10	—	15	—	18	—

All distances are in feet



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**AD-230**






This general purpose supply chain item-level inlay fits into 3 inch labels and offers strong read range with good stackability performance. It is optimized for 860–928 MHz bands (ETSI & FCC) and tuned for global use (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> 2.76" x .571"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	22.5	—	7	—	38	—	38.5	—	43	—
30°	22	—	5	—	25	—	30	—	31	—
60°	11	—	2	—	16	—	18	—	19.5	—

All distances are in feet



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**AD-641**


The AD-641’s uniform radiation pattern provides strong performance at almost any angle. Its optimized read range supports targeted query in dense read environments. An ideal carton and pallet asset management inlay, it features factory programmed and locked unique ID with 240 bits EPC memory, and global frequency (860–960MHz). G2XM model has additional 512 bits extra user memory.

**SPECIFICATIONS**

<b>SIZE:</b> 2.76" x 2.76"
<b>MEMORY:</b> 240 bits EPC (G2XL) or 240 bits EPC + 512 bits user memory (G2XM)
<b>CHIP USED:</b> NXP G2XL or NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	19	—	8	—	19	—	21	—	26	—
30°	15	—	9	—	15	—	17	—	19	—
60°	6	—	3	—	9	—	12	—	13	—

All distances are in feet



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**AD-805**






The AD-805 exhibits strong read performance in a very small format. Best read range is with the inlay edge facing the reader. Enhanced read range performance when adjacent to metal. Global frequency (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> .63" x .63"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	1.5	—	0.5	—	1.5	—	2	—	2	—
30°	1.5	—	1	—	1.5	—	2	—	2	—
60°	1.5	—	0.5	—	1.5	—	2	—	3	—

All distances are in feet



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**AD-814**






This item-level tagging inlay is designed for best edge-on performance, especially in close range with other tagged items. Ideal for pharmaceutical bottles at FCC frequencies, it is very good with RF-friendly materials like plastic and paper. Maximum performance delivered for item level stacked arrays of goods. Global frequency (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> .866" x .866"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	0.5	—	0.5	—	0.5	—	2	—	1.8	—
30°	1.5	—	0.5	—	1.5	—	2	—	2.3	—
60°	2	—	0.5	—	1.5	—	2	—	2.5	—

All distances are in feet



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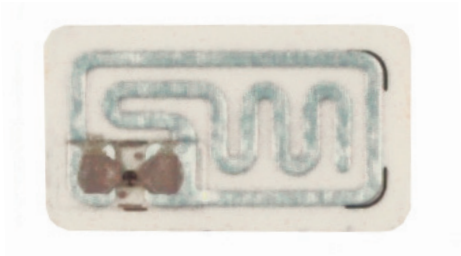
**CONTACT**  
866.903.RFID (7343)

**AD-815**






The smallest form factor in the Avery Dennison UHF portfolio, the AD-815 is an excellent performer in FCC (US) operating frequencies for glass vial and plastics item-level tracking. Ideal for small item retail accessory ticketing, it is optimized for 902–960 MHz bands (FCC) and (MIC) Japan.

**SPECIFICATIONS**

<b>SIZE:</b> .787" x .394"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	0.1	—	1	—	0.1	—	2	—	0.1	—
30°	0.1	—	0.5	—	0.1	—	1	—	0.1	—
60°	0.1	—	0.5	—	0.1	—	1	—	0.1	—

All distances are in feet



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**AD-824**




This stackable inlay enables a higher read rate in item-level applications like document tracking and retail. It features factory programmed and locked unique ID with 240 bits EPC memory. G2XM model has additional 512 bits extra user memory. Global frequency (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> 1.18" x 1.97"
<b>MEMORY:</b> 240 bits EPC (G2XL) or 240 bits EPC + 512 bits user memory (G2XM)
<b>CHIP USED:</b> NXP G2XL or NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	9	—	3	—	15	—	14	—	16.5	—
30°	7.5	—	2	—	11	—	12	—	12.5	—
60°	6	—	1	—	6	—	7	—	6.5	—

All distances are in feet





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**AD-826**






The unique antenna design enables direct stacking of tags up to 10 millimeters of each other and best-in-class read range in this format. Global frequency (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> 1.18" x 1.97"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	12	—	5	—	18	—	19	—	23.5	—
30°	8	—	3	—	13	—	16	—	22	—
60°	3.5	—	2	—	6.5	—	14	—	14	—

All distances are in feet



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**AD-827**


Powerful combination of small form factor and strong read range for case, pallet, ticketing and item level asset management applications. Global frequency (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> .709" x 1.575"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	13	—	1.5	—	13	—	12	—	15	—
30°	8	—	0.5	—	11.5	—	10	—	11.5	—
60°	4.5	—	0.5	—	8	—	6	—	6	—

All distances are in feet



**Avery Dennison RFID**  
4350 Avery Drive  
Flowery Branch, GA 30542  
<http://rfid.averydennison.com/>

**CONTACT**  
866.903.RFID (7343)

**AD-828**






Delivering powerful performance in a small inlay, the AD-828 is ideal for stackable, close proximity item-level tagging. Global frequency (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> .59" x 1.57"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	2	—	1.5	—	3	—	4	—	4	—
30°	1.5	—	0.5	—	2	—	4	—	3	—
60°	1	—	0.5	—	1.5	—	2	—	2	—

All distances are in feet



**Avery Dennison RFID**  
4350 Avery Drive  
Flowery Branch, GA 30542  
<http://rfid.averydennison.com/>

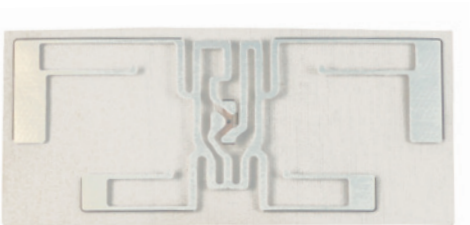
**CONTACT**  
866.903.RFID (7343)

**AD-833**





IATA-certified for baggage handling tags in the airline industry, the AD-833's orientation-insensitive design allows for reading at any angle with no dead spots. Ideal for pallets, cases and returnable totes. Global frequency (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> 1.5" x 3.68"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	27	—	7	—	27	—	26	—	28	—
30°	22	—	5	—	21	—	22	—	22	—
60°	9	—	3	—	14	—	14	—	15	—

All distances are in feet



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Flowery Branch, GA 30542  
<http://rfid.averydennison.com/>

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866.903.RFID (7343)

**AD-843**






The most powerful read range performer in the Avery Dennison portfolio for many application scenarios, the AD-843 offers strong micron spacing metal performance and performance on many difficult absorptive surfaces. Antenna structure can be trimmed down to fit smaller form factors and still perform well. Global frequency (860–960 MHz).

**SPECIFICATIONS**

<b>SIZE:</b> 3.75" x 1.5"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	32	—	10	—	36	—	54	—	56	—
30°	21	—	6	—	22.5	—	41	—	42	—
60°	15	—	4	—	13.5	—	23	—	24	—

All distances are in feet



**Avery Dennison RFID**  
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<http://rfid.averydennison.com/>

**CONTACT**  
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**AD-908**






Passive, rugged RFID tag utilizing Avery Dennison AD-223 inlay, the AD-908 is made of an impact-resistant material, allowing the inlay to be used in high durability, outdoor and reusable applications. Excellent performance in demanding applications. Global frequency (860–960 MHz)

**SPECIFICATIONS**

<b>SIZE:</b> 5.06"x 1" x .525"
<b>MEMORY:</b> 96 bits EPC
<b>CHIP USED:</b> Impinj Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 149°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
<b>SCAN ANGLE</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>
0°	—	42	—	17	—	45	—	60	—	63
30°	—	38	—	17	—	44	—	52	—	57
60°	—	20	—	5	—	31	—	40	—	40

All distances are in feet

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# Company Profile

**Confidex, Inc.**

Haarlankatu 1B  
Tampere, Finland 33230

**Confidex Ltd.**

551 Roosevelt Road #160  
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[www.confidex.net](http://www.confidex.net)

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630.258.8646

**CONFIDEX, INC.**

Confidex is a supplier of high-performing RFID tag solutions to make supply chains, transactions and authentication of goods and people more efficient and secure. Today, they are innovating and exploring with our customers how our solutions can help people and companies address their problems and challenges by fusing a strong combination of RFID tag design competence, RF engineering, customization and manufacturing experience.

# Tag Information



## Confidex, Inc.

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## CONFIDEX IRONSIDE™

The Confidex Ironside™ on-metal Gen2 UHF tag is a passive RFID tag whose size and durability (IP68) can meet various customer requirements. The tag can be mounted easily on any metallic surfaces either mechanically with screws or pop rivets or with industrial adhesive. For a superior grip, Confidex also offers a welding bracket for the tags, which can be used when spot welding the tag onto the surface.

As well as being able to survive various challenging environments, from being submerged under water to tropical weather and mechanical impacts, Ironside has passed the rigorous testing requirements for the Aerospace Standard AS5678 specification. The tag is successfully used in tracking assets from steel pallets to train wagons.

## SPECIFICATIONS

<b>SIZE:</b> 51.5 mm x 47.5 mm x 10 mm (2.03" x 1.87" x 0.39")
<b>MEMORY:</b> 240 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Confidex Designed
<b>OPERATING TEMP RANGE:</b> -55°C – 105°C (-67°F – 221°F)



## TEST RESULTS

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	10	—	3	—	13	—	14	—	16
30°	—	10	—	6	—	11	—	12	—	13
60°	—	12	—	6	—	9	—	10	—	12

All distances are in feet



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**CONFIDEX IRONSIDE-MICRO**






Confidex Ironside Micro is a tag solution for returnable transit items and industrial assets that face varying weather conditions and rough handling. Due to its small size, Ironside Micro fits into smaller slots than most tags which are designed to be used in the same applications.

Like the Confidex Ironside, the smaller Ironside Micro is tuned for metal use and brings excessive level of robustness against the demanding requirements of industrial and retail tracking applications. Ironside Micro encapsulation is IP68 level and it requires only approximately 1 square inch area.

**SPECIFICATIONS**

<b>SIZE:</b> 27 mm x 27 mm x 5.5 mm (1.06" x 1.06" x 0.22")
<b>MEMORY:</b> 96 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> Confidex Designed
<b>OPERATING TEMP RANGE:</b> -20°C – 80°C (-4°F – 176°F)

**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	2	—	2.5	—	4	—	4	—	5
30°	—	1.5	—	3.5	—	5	—	5	—	6
60°	—	2	—	1	—	5	—	4	—	8

All distances are in feet

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**CONFIDEX STEELWAVE MICRO HIGGS3**




Confidex Steelwave Micro™ is a miniature UHF on-metal tag. It offers new possibilities for companies to improve their asset management, especially computers and other devices that contain valuable information.

UHF RFID brings clear advantages to all these processes when a small, high performing tag like Steelwave Micro is used. Steelwave Micro's very small footprint and thickness makes it ideal for various applications. The tag can also be used in tools or other assets, which do not typically have space for an on-metal tag. The tag can also be mounted upon non-metal surfaces.

**SPECIFICATIONS**

<b>SIZE:</b> 38 mm x 13 mm x 3 mm (0.5" x 1.5" x 0.13")
<b>MEMORY:</b> 96 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> Confidex Design
<b>OPERATING TEMP RANGE:</b> -20°C – 85°C (-4°F – 185°F)

**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	2	—	3	—	5	—	7.5	—	9
30°	—	2	—	5	—	7	—	4	—	14
60°	—	3	—	2	—	5.5	—	4.5	—	12.5

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**CONFIDEX SURVIVOR™**





The Confidex Survivor™ Class 1 Gen2 UHF hard tag has been especially designed for in the goods transportation industry. The Survivor offers the best performance-to-cost ratio and applicability in the market. Its features form a clever combination for industrial and logistics applications, from local to global operations.

Survivor is an all-purpose tag. Since its launch as Confidex's first tag product, Survivor has been used in various roll cage and other container applications. Confidex Survivor™ is also used to track large valuable items and vehicles, including construction parts and steel pipes, as well as trucks in the petrochemical industry.

**SPECIFICATIONS**

<b>SIZE:</b> 224 mm x 24 mm x 8 mm (8.8" x 0.94" x 0.31")
<b>MEMORY:</b> 240 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Confidex Design
<b>OPERATING TEMP RANGE:</b> -35°C – 85°C (-31°F – 185°F)

**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	7	—	10	—	18	—	33	—	35
30°	—	9	—	8	—	14	—	24	—	26
60°	—	4	—	16	—	6	—	11	—	13

All distances are in feet

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630.258.8646

**CONFIDEX HALO™**



Confidex Halo™ on-metal UHF RFID tag combines light weight, a small footprint and durable encapsulation. The tag has been designed to be easily attached by cable ties through its mounting holes, adhesive or specially-designed magnetic holder, which enables the tag to be moved from place to place when applicable.

It cuts down the time and resources needed for asset inventory tasks. The tag's design makes it also ideal for tracking IT assets.

**SPECIFICATIONS**

<b>SIZE:</b> 60 mm x 12 mm x 14 mm (2.36" x 0.47" x 0.55")
<b>MEMORY:</b> 240 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Confidex Design
<b>OPERATING TEMP RANGE:</b> -35°C – 85°C (-31°F – 185°F)

**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	7	—	4	—	16	—	20	—	21
30°	—	9	—	4	—	18	—	20	—	22
60°	—	6.5	—	3.5	—	10	—	18	—	22

All distances are in feet

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**CONFIDEX STEEL WING**

The Confidex SteelWING has been designed to overcome the challenges of metal asset tagging. The lightweight tag has an adhesive background and can be directly attached to a metal surface—without any extra spacer material.






Instead of avoiding metal contact, contact between the metal and the antenna of the Confidex SteelWING actually improves the operational performance.

SteelWING can also be attached to other materials and operate with only slightly reduced performance.

**SPECIFICATIONS**

<b>SIZE:</b> 76.2 mm x 18 mm (area) 21mm (height) 3 x 0.71" (area) 0.83" (height)
<b>MEMORY:</b> 240 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Confidex Design
<b>OPERATING TEMP RANGE:</b> -35°C – 85°C (-31°F – 185°F)

**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	3	6	6	12	9.5	15	12	21	13.5	22
30°	5	10	13	24	7	13	11	19	13	20
60°	3	5.7	5	11	6	11	9	16	11	17

All distances are in feet



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630.258.8646

**CONFIDEX CARRIER™**

Confidex Carrier™ is a special label with a strong grip for plastic surfaces. It can be easily attached to various containers.

Confidex Carrier™ is targeted especially for plastic container manufacturers and users who want visibility for items they carry, ranging from oranges to automobile engines. In addition to the demanding applications in the supply chain, with its wide-band antenna design, Confidex Carrier™ is a sufficiently compact UHF RFID label to be ideal for various applications.

Carrier is part of the Confidex RPC Tag family with Carrier Pro and Carrier Tough.

**SPECIFICATIONS**

<b>SIZE:</b> 73 mm x 8 mm x 0.2 mm (2.95" x 0.55" x 0.01")
<b>MEMORY:</b> 240 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Confidex Design
<b>OPERATING TEMP RANGE:</b> -35°C – 90°C (-31°F – 194°F)



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	18	—	9	—	18	—	17	—	19	—
30°	16	—	8	—	17.5	—	15	—	18	—
60°	7.5	—	4.5	—	7	—	7	—	7	—

All distances are in feet

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**CONFIDEX CARRIER TOUGH**

Confidex Carrier Tough is an encapsulated, thin tag solution for tracking various plastic containers and plastic returnable transit items. The tag's structure not only protects against impacts, but also covers the barcode or other visual information making the printing tolerant against scratches or other wearing.






In the cases where the plastic container structure does not have a slot that would protect a label type of RFID tag, or when the container will face sharp mechanical impacts during its circulation, Carrier Tough will be the right tag choice.

Carrier Tough is part of the Confidex RPC Tag family with Carrier and Carrier Pro.

**SPECIFICATIONS**

<b>SIZE:</b> 120 mm x 30 mm x 2 mm (4.72" x 1.18" x 0.08")
<b>MEMORY:</b> 240 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Confidex Design
<b>OPERATING TEMP RANGE:</b> -30°C – 70°C (-22°F – 158°F)

**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	7	—	6	—	9.5	—	12	—	13.5	—
30°	7	—	13	—	7	—	11	—	13	—
60°	6	—	5	—	6	—	9	—	11	—

All distances are in feet



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**CONFIDEX PINO™**

Confidex Pino™ is designed to enable cost-efficient and reliable tracking of wooden pallets, one of the main transit item platforms in use globally. This tag is also suitable for identifying similar wooden items from timber to finished structures.






Confidex Pino™ is supplied with the NXP XM chip, which offers additional memory for user-specific information as well as the the up to 240-bit EPC-memory. Typically returnable transit items like wooden pallets require additional data storage to be included with the EPC number. The new chip also provides reliable performance in harsh conditions.

**SPECIFICATIONS**

<b>SIZE:</b> 73 mm x 14 mm x 0.3 mm (2.95" x 0.55" x 0.024")
<b>MEMORY:</b> 240 bit EPC + 512 bit User Memory
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> Confidex Design
<b>OPERATING TEMP RANGE:</b> -35°C – 60°C (-31°F – 140°F)



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	17	—	5	—	23	—	21	—	22.5	—
30°	16	—	3	—	18.5	—	20	—	20	—
60°	8	—	1	—	10	—	9	—	10	—

All distances are in feet



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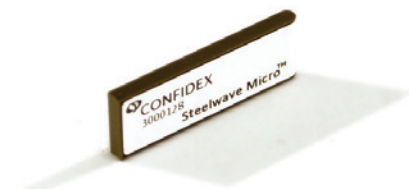
**CONFIDEX STEELWAVE MICRO MONZA3**






Confidex Steelwave Micro™ is a miniature UHF on-metal tag. It offers new possibilities for companies to improve their asset management, especially computers and other devices that contain valuable information.

Due to its size-performance ratio, the tag can also be used in tools or other assets, which do not typically have space for an on-metal tag. The tag can also be mounted upon non-metal surfaces.

**SPECIFICATIONS**

<b>SIZE:</b> 38 mm x 13 mm x 3 mm (0.5" x 1.5" x 0.13")
<b>MEMORY:</b> 96 bit EPC
<b>CHIP USED:</b> Impinj Monza3
<b>INLAY USED (IF APPLICABLE):</b> Confidex Design
<b>OPERATING TEMP RANGE:</b> -20°C – 85°C (-4°F – 185°F)

**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	2	—	2.5	—	4	—	4	—	5
30°	—	1.5	—	3.5	—	5	—	5	—	6
60°	—	2	—	1	—	5	—	4	—	8

All distances are in feet

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# Company Profile



**POSITEK *RFID***

**Fujitsu distributed by  
Positek RFID**

1210 Stanbridge Street  
Norristown, PA 19401  
[www.positekrfid.com](http://www.positekrfid.com)

**CONTACT**

610.275.2905

**FUJITSU DISTRIBUTED BY POSITEK RFID**

Positek RFID provides RFID tags and turnkey solutions to the textile maintenance industry. The Fujitsu WT-A511 UHF Laundry Tag is the basis for the company's UHF industry solutions.

# Tag Information



**POSITEK RFID**

**Fujitsu distributed by**

**Positek RFID**

1210 Stanbridge Street

Norristown, PA 19401

www.positekrfid.com

**CONTACT**

610.275.2905

**WT-A511**

Fujitsu's washable RFID tags are designed specifically for textile applications that require a tag that can survive commercial textile laundering. The flexible tag provides for easy integration into textiles. The extended read range of UHF enables textile maintenance companies the ability to scan bulk quickly, efficiently and accurately.

**SPECIFICATIONS**

<b>SIZE:</b> 2.17" x 3.94" x 6.3"
<b>MEMORY:</b> 96 bit pre-written
<b>CHIP USED:</b> ISO/IEC 18000-6 TypeC (EPC Gen2)
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -20°C – 50°C



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	2.5	—	1	—	5	—	7	—	8	—
30°	2.5	—	0.5	—	3	—	5	—	6	—
60°	1.5	—	0.5	—	2	—	2	—	3	—

All distances are in feet

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# Company Profile



**Intermec Corporation**  
6001 36th Avenue West  
Everett, WA 98203-1264  
[www.intermec.com](http://www.intermec.com)

**CONTACT**  
425.348.2600

## **INTERMEC CORPORATION**

Intermec's passive UHF RFID tags and smart labels are capable of receiving, storing and transmitting digital information in multiple frequencies for global supply chain support.

# Tag Information



**Intermec Corporation**  
6001 36th Avenue West  
Everett, WA 98203-1264  
www.intermec.com

**CONTACT**  
425.348.2600

## IT-65 SMALL RIGID TAG



Intermec’s Small Rigid Tag (SRT) is a truly passive UHF RFID tag designed for performance on a variety of surfaces. Available in both EPC Global Class 1, Generation 2 (Gen 2) and ISO 18000-6B protocols, the tag combines range with a rugged yet compact design. Additionally, the small rigid tags have a wide band antenna design, which allows for a single tag to be used virtually anywhere in the world and on a variety of surfaces, including metal, plastic and wood.

### SPECIFICATIONS

<b>SIZE:</b> 1.22" x 3.11" (3.10 cm x 7.90 cm)
<b>MEMORY:</b> 96 or 1048
<b>CHIP USED:</b> Monza or NXP
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 250°F (-40°C – 121°C).



### TEST RESULTS

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	10	—	4	—	13	—	5	—	6
30°	—	12	—	5	—	21	—	7	—	8
60°	—	15	—	5	—	17	—	6	—	7

All distances are in feet



**Intermec Corporation**  
6001 36th Avenue West  
Everett, WA 98203-1264  
www.intermec.com

**CONTACT**  
425.348.2600

**IT-65 LARGE RIGID TAG**






Intermec’s Large Rigid tag is a passive UHF radio frequency identification (RFID) transponder that provides performance on a variety of surfaces including plastic, wood and metal. The tag, available in both Gen 2 and ISO 18000-6B versions, combines range with a rugged yet compact package designed for harsh industrial applications and temperatures ranging from -40°F to 250°F (-40°C to 121°C).

**SPECIFICATIONS**

<b>SIZE:</b> 1.26" x 6.1" (3.2 cm x 15.5 cm)
<b>MEMORY:</b> 96 or 1048
<b>CHIP USED:</b> Monza or NXP
<b>INLAY USED (IF APPLICABLE):</b> Not applicable
<b>OPERATING TEMP RANGE:</b> -40°F – 250°F (-40°C – 121°C)



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	25	—	10	—	42	—	14	—	14
30°	—	6	—	4	—	35	—	10	—	11
60°	—	21	—	4	—	21	—	5	—	6

All distances are in feet

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# Company Profile



## **Metalcraft Inc.**

149 4th St. S.W.  
Mason City, IA 50401  
[http://www.idplate.com/  
rfid-tags-and-rfid-labels](http://www.idplate.com/rfid-tags-and-rfid-labels)

## **CONTACT**

800.437.5283

## **FIND A SALES REP:**

[http://www.idplate.com/  
find-a-sales-rep](http://www.idplate.com/find-a-sales-rep)

## **METALCRAFT INC.**

Metalcraft has a 60-year history in metal nameplates and barcodes, and 10 years in the durable RFID tag and label business. They manufacture polymer based thin film RFID tags and labels for hostile applications. Their products are based on UHF and HF inlays from the major world leaders.

Due to the complexities of the technology as well as the environmental factors involved, prototypes are critical for the end user to test in real-life conditions. Metalcraft's Engineers will work with your staff on pilot runs to develop a product that will work for your specific application.

# Tag Information



## Metalcraft Inc.

149 4th St. S.W.  
Mason City, IA 50401  
[http://www.idplate.com/  
rfid-tags-and-rfid-labels](http://www.idplate.com/rfid-tags-and-rfid-labels)

## CONTACT

800.437.5283

## FIND A SALES REP:

[http://www.idplate.com/  
find-a-sales-rep](http://www.idplate.com/find-a-sales-rep)

## UNIVERSAL ASSET TAG — METAL OR NON METAL SURFACES






Long range mount on metal with angular read capability. Inlay is a custom folded non symmetrical patch antenna. This tag is flexible and available with polyester face stock, subsurface graphics, programming, barcode and matching human readable serial numbers are standard.

## SPECIFICATIONS

<b>SIZE:</b> 2.785" x 1.375" x 0.075"
<b>MEMORY:</b> 96-EPC Bits, extensible to 480 Bits; 512 User Bits; 64 Bit Unique TID; 32 Bit Access and 32 Bit Kill Passwords
<b>CHIP USED:</b> Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> Custom
<b>OPERATING TEMP RANGE:</b> -50°C – 85°C



## TEST RESULTS

										
	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	18	24	15	22	30	33	23	24	25	29
30°	16	22	15	20.5	28	30	22	—	22	—
60°	15	20	13	19	25	28	20	—	20	—

All distances are in feet





**Metalcraft Inc.**  
149 4th St. S.W.  
Mason City, IA 50401  
[http://www.idplate.com/  
rfid-tags-and-rfid-labels](http://www.idplate.com/rfid-tags-and-rfid-labels)

**CONTACT**  
800.437.5283

**FIND A SALES REP:**  
[http://www.idplate.com/  
find-a-sales-rep](http://www.idplate.com/find-a-sales-rep)

**UNIVERSAL HARD TAG — METAL OR NON METAL SURFACES**





This Universal Asset tag comes in a clear polycarbonate shell with an ultrasonically welded seam that is water-resistant (submersion to 20') and dust tight. The hard tag is designed to have the barcode read through the clear plastic shell, aiding in deployment into an existing barcode application where RFID readers are not available to all system-wide users at the customer's facilities.

**SPECIFICATIONS**

<b>SIZE:</b> 4.125" x 1.75" x 0.175"
<b>MEMORY:</b> 96-EPC Bits, extensible to 480 Bits; 512 User Bits; 64 Bit Unique TID; 32 Bit Access and 32 bit Kill Passwords
<b>CHIP USED:</b> Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> Custom
<b>OPERATING TEMP RANGE:</b> -50°C – 85°C



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	10	5	9	5	14	20	11	—	12	—
30°	9	5	9	4	12	19	9	—	10	—
60°	8.5	4	8	4	11	18	7	—	9	—

All distances are in feet



**Metalcraft Inc.**  
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rfid-tags-and-rfid-labels](http://www.idplate.com/rfid-tags-and-rfid-labels)

**CONTACT**  
800.437.5283

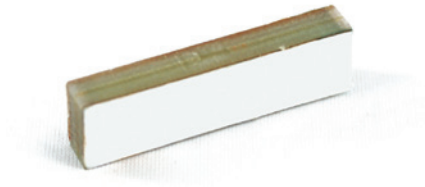
**FIND A SALES REP:**  
[http://www.idplate.com/  
find-a-sales-rep](http://www.idplate.com/find-a-sales-rep)

**SENTRY M SLIM TAG — METAL MOUNT — SMALL PROFILE (FCC TUNING ONLY)**






This small profile mount-on-metal tag is impact resistant (passes 18"/0.5 m drop with 1"/2.5 cm diameter steel ball). The tag comes with a subsurface printed barcode and human readable text. This is ideal when limited space is available for mounting such as IT and fire arms tracking as well as fixed and mobile assets.

**SPECIFICATIONS**

<b>SIZE:</b> 1.375" x .375" x 0.122"
<b>MEMORY:</b> 96-EPC Bits, extensible to 480 Bits; 512 User Bits; 64 Bit Unique TID; 32 Bit Access and 32 bit Kill Passwords
<b>CHIP USED:</b> Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> Custom
<b>OPERATING TEMP RANGE:</b> -50°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	3	7	3	7	7	11	6	9	7	10
30°	3	7	3	6.5	7	10	6	9	7	9
60°	3	6	2.5	3.5	6	9.5	5	8.5	5.7	9

All distances are in feet

**Metalcraft Inc.**

149 4th St. S.W.  
Mason City, IA 50401  
[http://www.idplate.com/  
rfid-tags-and-rfid-labels](http://www.idplate.com/rfid-tags-and-rfid-labels)

**CONTACT**

800.437.5283

**FIND A SALES REP:**

[http://www.idplate.com/  
find-a-sales-rep](http://www.idplate.com/find-a-sales-rep)

**WINDSHIELD TAG FOR ACCESS CONTROL**

This windshield tag is ideal for automation of access control, parking enforcement, and loyalty automation. Adhesive is on the face of the label for mounting inside the vehicle. Tamper-evident slits are available at no additional cost to impair the tag if removal is attempted. This tag has been optimized to work on glass surfaces.

**SPECIFICATIONS**

<b>SIZE:</b> 4.1875" x 1.125" x 0.026"
<b>MEMORY:</b> 96 bit or 800 bit depending chip selection
<b>CHIP USED:</b> Monza4 or Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> KSW, Alien G, or Avery AD 843
<b>OPERATING TEMP RANGE:</b> -40°C – 85°C operational

**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	7	—	8	—	23	—	18	—	22	—
30°	6	—	8	—	22	—	17	—	21	—
60°	4.5	—	7	—	22	—	15	—	19.5	—

All distances are in feet

**Metalcraft Inc.**

149 4th St. S.W.  
Mason City, IA 50401  
[http://www.idplate.com/  
rfid-tags-and-rfid-labels](http://www.idplate.com/rfid-tags-and-rfid-labels)

**CONTACT**

800.437.5283

**FIND A SALES REP:**

[http://www.idplate.com/  
find-a-sales-rep](http://www.idplate.com/find-a-sales-rep)





**FOLDED TAB TAG — XRFIDFT1305**

The folded tab tag is designed for tracking sheet steel, coils and metal assets where a strong adhesive bond is needed. The inlay is completely encapsulated within the tag, protecting it from environmental conditions that could have an adverse effect on the performance and life of the RFID tag. This tag is fabricated with polyester face stock.

**SPECIFICATIONS**

<b>SIZE:</b> 4.5" x 4.5" and folds to 4.5" x 3"
<b>MEMORY:</b> 96 bit
<b>CHIP USED:</b> Monza 3
<b>INLAY USED (IF APPLICABLE):</b> Short Dipole
<b>OPERATING TEMP RANGE:</b> -40°C – 85°C

**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	4.7	—	4.3	—	18.5	—	15	—	18	—
30°	4.5	—	4	—	17	—	13	—	17	—
60°	4	—	4	—	16	—	12	—	15	—

All distances are in feet

Note: This tag was tested in air as it is not a direct-on-metal mounted tag. However, from a practical sense, it can also be attached to metal objects.



**Metalcraft Inc.**  
149 4th St. S.W.  
Mason City, IA 50401  
<http://www.idplate.com/rfid-tags-and-rfid-labels>

**CONTACT**  
800.437.5283

**FIND A SALES REP:**  
<http://www.idplate.com/find-a-sales-rep>

**STANDARD RFID LABEL — POLYPROPYLENE OR POLYESTER LABEL XRFID917ST**






Standard RFID labels are used for all non-metal surfaces, such as wood cabinets, rubber goods, plastic computer cabinets, plastic tote bins, cell phones and radios plus hundreds of other non metal applications.

**SPECIFICATIONS**

<b>SIZE:</b> 4.5" x 1"
<b>MEMORY:</b> This tag is also has the same subsurface graphics, barcode, human readable text and comes preprogrammed ready to install.
<b>CHIP USED:</b> Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> Squiggle
<b>OPERATING TEMP RANGE:</b> -50°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	21	—	10	—	42	—	56	—	55	—
30°	18.5	—	10	—	25.5	—	37	—	37	—
60°	11	—	6	—	21	—	21	—	20	—

All distances are in feet

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# Company Profile



## **Omni-ID**

1100 Ridgeway  
Rochester, NY 14615  
[www.omni-id.com](http://www.omni-id.com)

## **CONTACT**

855.575.6664

## **OMNI-ID**

Omni-ID is a supplier of passive low-profile UHF RFID tags. The company is focused on delivering affordable high-performance tags that work reliably in harsh environments, including on, off, and near metals and liquids.

# Tag Information



## Omni-ID

1100 Ridgeway  
Rochester, NY 14615  
www.omni-id.com

## CONTACT

855.575.6664

## OMNI-ID PROX™






Omni-ID Prox offers a small form factor for a metal environment. The Prox is available as a regionally-tuned tag, or broadband tag providing strong global functionality across all geographic regions. Omni-ID Prox comes standard with a printed label finish. It is also available in a low profile ruggedized rigid case for applications with harsh environmental requirements.

## SPECIFICATIONS

<b>SIZE:</b> 35 mm x 10 mm x 4.8 mm (1.3" x .39" x .18")
<b>MEMORY:</b> 512 Bits
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> 5°C – 40°C



## TEST RESULTS

										
	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	1	2.3	1	3	0.5	2.7	2	6	2	7.5
30°	1	2.2	0.7	3	0.5	3.5	2	11	2	14
60°	0.33	2	0.33	1	0.2	2.8	2	9	2	11

All distances are in feet



**Omni-ID**  
1100 Ridgeway  
Rochester, NY 14615  
www.omni-id.com

**CONTACT**  
855.575.6664

**OMNI-ID FLEX™**






Omni-ID Flex is a medium range RFID tag. The Flex provides performance in metallic or non-metallic environments with a low profile. Omni-ID Flex comes standard with a printed label finish. It is also available in a low-profile ruggedized rigid case for applications with harsh environmental requirements.

**SPECIFICATIONS**

<b>SIZE:</b> 77 mm x 15 mm x 2.8 mm (3.03" x .59" x .11")
<b>MEMORY:</b> 512 Bits
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> 5°C – 40°C



**TEST RESULTS**

										
<b>SCAN ANGLE</b>	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>
0°	—	6	—	4	—	5.5	—	9	18	11
30°	—	11	—	3	—	13	—	11	19	15
60°	—	8	—	2	—	9.5	—	10	16	14

All distances are in feet





**Omni-ID**  
1100 Ridgeway  
Rochester, NY 14615  
www.omni-id.com

**CONTACT**  
855.575.6664

**OMNI-ID MAX™ RIGID CASE V2**


The Max product line features longer-range tags, all with a focus on performance on, off and near metal. The Max tag is a surprisingly small passive UHF RFID tag for indoor or outdoor environments depending on encasement options. Max tags are used in asset tracking and management of supply chain applications in industrial environments. With their mid-range read distance and intermediate size, Max tags are ideal for warehouse racks and storage, stillages, forklifts, reusable conveyance tracking and returnable transport items (RTIs).

**SPECIFICATIONS**

<b>SIZE:</b> 104 mm x 33 mm x 8.4 mm (4.09" x 1.20" x .33")
<b>MEMORY:</b> 512 Bits
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -20°C – 55°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	8	—	9	—	19	—	27	42	29
30°	—	14	—	10	—	29	—	46	28	50
60°	—	13	—	7	—	22	—	39	17	40

All distances are in feet



**Omni-ID**  
1100 Ridgeway  
Rochester, NY 14615  
www.omni-id.com

**CONTACT**  
855.575.6664

**OMNI-ID ULTRA™**






The Ultra is a global frequency tag that can be used anywhere in the world. With its long read distance, the Ultra passive UHF RFID tag provides a more affordable solution for applications which previously required active tags, such as automotive tracking and security, military asset tracking, cargo and container tracking, transportation & logistics, airline ULDs, and construction and heavy machinery.

**SPECIFICATIONS**

<b>SIZE:</b> 210 mm x 110 mm x 21 mm (8.27" x 4.33" x .83")
<b>MEMORY:</b> 512 Bits
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -40°C – 65°C



**TEST RESULTS**

										
<b>SCAN ANGLE</b>	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>	<b>AIR</b>	<b>METAL</b>
0°	—	83	—	34	—	81	—	81	99	83
30°	—	80	—	33	—	88	—	79	68	77
60°	—	44	—	16	—	54	—	60	44	56

All distances are in feet



Omni-ID

1100 Ridgeway  
Rochester, NY 14615  
www.omni-id.com

CONTACT

855.575.6664

OMNI-ID MAX HD






This tag is ideal for the most challenging asset tracking and management applications. The Max HD can be deployed across all geographic regions with its broadband global performance. It offers a choice of ABS or rugged polycarbonate encasement for all-weather exposure, balanced performance on and off metal and a larger footprint for attachment and labeling on large assets, which makes it effective for challenging asset management and logistics applications. Applications include cargo and container tracking, military equipment, automotive RTIs, heavy machinery and airline ULDs.

SPECIFICATIONS

SIZE: 140 mm x 66 mm x 14 mm (5.51" x 2.6" x .55")
MEMORY: 512 Bits
CHIP USED: Alien Higgs 3
INLAY USED (IF APPLICABLE): N/A
OPERATING TEMP RANGE: ABS: -40°C – 55°C; PC: -40°C – 100°C



TEST RESULTS

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	17	—	20	—	19	—	18	—	19
30°	—	21.5	—	22	—	41	—	38	—	40.5
60°	—	26.5	—	15	—	40	—	37.5	—	40

All distances are in feet

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# Company Profile



## **RCD Technology, Inc.**

101 E Mill St.  
Suite P-16  
Quakertown, PA 18951  
[www.rcdtechnology.com](http://www.rcdtechnology.com)

## **CONTACT**

215.529.9440

## **RCD TECHNOLOGY, INC.**

RCD Technology designs and manufactures RFID tags for custom applications. They use state of the art development tools, patented fabrication processes and proprietary assembly methods that provide quick turn, high value solutions. RCD is able to engineer and produce a wide range of high-quality RFID tags designed and built in Quakertown, Pennsylvania.

# Tag Information



## RCD Technology, Inc.

101 E Mill St.  
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Quakertown, PA 18951  
www.rcdtechnology.com

## CONTACT

215.529.9440

## ATLAS CARGO TAG






For long range vehicle, rail or trailer locating applications, the Atlas Cargo tag and RFID asset tag provide readability in a durable, weather-resistant package. Engineered for use on metal surfaces, the Atlas is designed with industrial environments in mind and will withstand repeated exposure to vibration, weather elements, salt sprays and more. The 5"x 8", ABS-protected tag is an alternative in applications previously requiring costlier active UHF tags.

## SPECIFICATIONS

<b>SIZE:</b> 5" x 8" x 0.525"
<b>MEMORY:</b> 96 bit EPC and 512 bit user memory
<b>CHIP USED:</b> Alien Technology, Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> RCD Technology Proprietary Inlay
<b>OPERATING TEMP RANGE:</b> 50°C – 85°C (-58°F – 185°F)



## TEST RESULTS

										
	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	40	—	35	—	65	—	102	—	106
30°	—	26	—	31	—	57	—	71	—	74
60°	—	5	—	15	—	7	—	24	—	18

All distances are in feet



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**SENTRY (METAL AND MULTI-SURFACE TAG)**






RCD's Sentry family of UHF asset tracking tags have been designed to identify IT assets. The Sentry tag (multi-surface capabilities) is an excellent all-surface RFID tag for environments with a mixture of surfaces. The patent-pending tag conforms to the FSTC performance guidelines for Data Center Asset Tracking. The Sentry tag is highly vibration and shock resistant. In addition to metal assets, the Sentry tag will work on surfaces such as painted computer housings, plastic-coated components and electronic component cabinets.

**SPECIFICATIONS**

<b>SIZE:</b> 36.3 mm x 10.9 mm x 5.6 mm (1.43" x.43" x .22")
<b>MEMORY:</b> 96 bit EPC and 512 bit user memory
<b>CHIP USED:</b> Alien Technology, Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> RCD Technology Proprietary Inlay
<b>OPERATING TEMP RANGE:</b> 50°C – 85°C (-58°F – 185°F)



**TEST RESULTS**

SCAN ANGLE										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	6	—	4	—	7	—	3	—	3.5
30°	—	7.6	—	4	—	8.6	—	4	—	4
60°	—	6.6	—	4	—	6	—	4	—	4.5

All distances are in feet



**RCD Technology, Inc.**  
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**CONTACT**  
215.529.9440

**SENTRY-M SLIM (MOUNT ON METAL)**






RCD’s Sentry family of UHF asset tracking tags have been designed to track and identify IT assets. The Sentry-M Slim is a tag intended for attachment directly to metal assets, such as blade servers and racks. This tag provides a very thin form factor without sacrificing durability or significant performance. In addition to data centers, other applications include tools, metal pallets/racks, electronic component cabinets and any other applicable metal surface. The patent-pending tag conforms to the FSTC performance guidelines for Data Center Asset Tracking. The Sentry-M Slim tag is highly vibration and shock resistant.

**SPECIFICATIONS**

<b>SIZE:</b> 36.3 mm x 10.9 mm x 2.8 mm (1.43" x .43" x .11")
<b>MEMORY:</b> 96 bit EPC and 512 bit user memory
<b>CHIP USED:</b> Alien Technology, Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> RCD Technology Proprietary Inlay
<b>OPERATING TEMP RANGE:</b> 50°C – 85°C (-58°F – 185°F)



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
	0°	— 3	— 3	— 7	— 3	— 3				
	30°	— 4	— 2	— 8	— 4	— 4				
	60°	— 4	— 1.5	— 8	— 3	— 3				

All distances are in feet



**RCD Technology, Inc.**  
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Quakertown, PA 18951  
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**CONTACT**  
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**SENTRY-M (MOUNT ON METAL)**






RCD’s Sentry family of UHF asset tracking tags have been designed to track and identify IT assets. The Sentry-M is a tag intended for attachment directly to metal assets, such as blade servers and racks. This tag provides a small, but standard form factor without sacrificing durability or any read performance. In addition to data centers, other applications include tools, metal pallets/racks, electronic component cabinets and any other applicable metal surface. The patent-pending tag conforms to the FSTC performance guidelines for Data Center Asset Tracking. The Sentry-M tag is highly vibration and shock resistant with excellent operating characteristics.

**SPECIFICATIONS**

<b>SIZE:</b> 36.3 mm x 10.9 mm x 5.6 mm (1.43" x .43" x .22")
<b>MEMORY:</b> 96 bit EPC and 512 bit user memory
<b>CHIP USED:</b> Alien Technology, Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> RCD Technology Proprietary Inlay
<b>OPERATING TEMP RANGE:</b> 50°C – 85°C (-58°F – 185°F)



**TEST RESULTS**

SCAN ANGLE										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	3	—	3	—	8	—	4	—	4
30°	—	5	—	3	—	8	—	5	—	5.4
60°	—	4	—	5	—	7.5	—	6	—	6.5

All distances are in feet





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**SENTRY-M WW (MOUNT ON METAL)**






RCD’s Sentry family of UHF asset tracking tags have been designed to track and identify IT assets. The Sentry-M WW is a tag intended for attachment directly to metal assets for a worldwide environment. It conforms to the FSTC performance guidelines in the North American, European and Japanese frequency bands making it ideal for source tagging of IT equipment by the OEM. This tag provides a small, but standard form factor without sacrificing durability. In addition to data centers, other applications include tools, metal pallets/racks, electronic component cabinets and any other applicable metal surface. The Sentry-M WW tag is highly vibration and shock resistant.

**SPECIFICATIONS**

<b>SIZE:</b> 36.3 mm x 10.9 mm x 5.6 mm (1.43" x .43" x .22")
<b>MEMORY:</b> 96 bit EPC
<b>CHIP USED:</b> Alien Technology, Higgs 2
<b>INLAY USED (IF APPLICABLE):</b> RCD Technology Proprietary Inlay
<b>OPERATING TEMP RANGE:</b> 50°C – 85°C (-58°F – 185°F)



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
	0°	— 4	— 2	— 7	— 2	— 2	— 2	— 2	— 2	
	30°	— 5	— 1.5	— 8.75	— 2	— 2	— 2	— 2		
60°	— 5	— 3.5	— 7.6	— 2.5	— 3					

All distances are in feet

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# Company Profile



## **Sirit**

901 Lane Avenue  
Chula Vista, CA 91914  
[www.sirit.com](http://www.sirit.com)

## **CONTACT**

619.656.2515

## **SIRIT**

Sirit is a leading designer, developer and manufacturer of Radio Frequency Identification (RFID) tags for applications such as Tolling, Electronic Vehicle Registration, Parking and Access Control, Asset Management, Cashless Payments and Supply Chain Systems.

Sirit Inc. is a unit of Federal Signal Corporation (NYSE: FSS), in its Federal Signal Technologies Group (FSTech).



**Sirit**  
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www.sirit.com

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619.656.2515

**RSI-670**

Sirit's RSI-670 is an omni-directional, surface-independent antenna designed for use in applications which require orientation insensitivity and longer read ranges. Optimized for use on a broad variety of surfaces, the RSI-670 is meant for challenging applications.

**SPECIFICATIONS**

<b>SIZE:</b> Wet Inlay, 76.2 mm x 76.2 mm (3" x 3")
<b>MEMORY:</b> 96 bit
<b>CHIP USED:</b> Impinj Monza3
<b>INLAY USED (IF APPLICABLE):</b>
<b>OPERATING TEMP RANGE:</b> -40°C – 85°C (-40°F – 185°F)



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	12	—	9	—	15	—	12	—	16	—
30°	11.5	—	8.5	—	14.5	—	12	—	17	—
60°	11	—	8.5	—	14	—	10	—	16	—

All distances are in feet



**Sirit**  
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Chula Vista, CA 91914  
www.sirit.com

**CONTACT**  
619.656.2515

**RSI-674**

Sirit's RSI-674 is an all purpose antenna. Designed for use with Monza 3 ICs and optimized for use in supply chain, warehouse and logistics applications, the RSI-674 design gives excellent performance for a wide variety of applications.

**SPECIFICATIONS**

<b>SIZE:</b> Wet Inlay, 98.425 mm x 12.7 mm (3.875" x 0.5")
<b>MEMORY:</b> 96 bit
<b>CHIP USED:</b> Impinj Monza3
<b>INLAY USED (IF APPLICABLE):</b>
<b>OPERATING TEMP RANGE:</b> -40°C – 85°C (-40°F – 185°F)



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	15	—	9	—	12	—	20	—	24	—
30°	8.5	—	6	—	14	—	19	—	22	—
60°	4.5	—	3	—	4	—	9	—	6	—

All distances are in feet

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# Company Profile



## **Sontec Co. Ltd.**

Suite 1201  
GEMS Building  
No. 487 Tianlin Road  
Xuhui District  
Shanghai 200233 China  
[www.sontec.com](http://www.sontec.com)

## **CONTACT**

+86.21.61150999

## **SONTEC CO. LTD.**

Founded in 2006, Sontec's UHF metal and specialized tags, aka Sontec series products, have been intensively tested in various harsh environments. Its solutions have been successfully deployed in many critical management applications, such as Supply Chain Management and Asset Tracking/Management, and in industries such as Smart Grid, Manufacturing, Logistics, Financial and Banking, and IT.

# Tag Information



## Sontec Co. Ltd.

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## CONTACT

+86.21.61150999

## HUMMINGBIRD I (C04020-30IMC)






Industrial and manufacturing, warehousing and logistics, asset management.

## SPECIFICATIONS

<b>SIZE:</b> 56 mm x 25 mm x 5.5 mm (2.21" x 0.99" x 0.22")
<b>MEMORY:</b> N/A
<b>CHIP USED:</b> Impinj MONZA2
<b>INLAY USED (IF APPLICABLE):</b>
<b>OPERATING TEMP RANGE:</b> -30°C – 85°C



## TEST RESULTS

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	4	—	2	—	4	—	3	—	4
30°	—	4	—	2.25	—	4	—	3	—	4
60°	—	4.5	—	0.5	—	4.5	—	3	—	4

All distances are in feet



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+86.21.61150999

**HUMMINGBIRD II (C02509-30AMC)**


Asset management.

**SPECIFICATIONS**

<b>SIZE:</b> 25 mm x 9 mm x 3 mm (0.99" x 0.35" x 0.12")
<b>MEMORY:</b> 512 Bits
<b>CHIP USED:</b> ALIEN higgs-3
<b>INLAY USED (IF APPLICABLE):</b>
<b>OPERATING TEMP RANGE:</b> -30°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	3	—	2	—	3	—	3	—	3
30°	—	3.6	—	2	—	3	—	3	—	3.6
60°	—	3.5	—	1	—	3.5	—	3	—	3.8

All distances are in feet



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+86.21.61150999

**HUMMINGBIRD IV (C016-15IMC)**






Asset management.

**SPECIFICATIONS**

<b>SIZE:</b> $\phi$ 21 mm x 5 mm ( $\phi$ 0.83" x 0.2")
<b>MEMORY:</b> N/A
<b>CHIP USED:</b> Impinj MONZA2
<b>INLAY USED (IF APPLICABLE):</b>
<b>OPERATING TEMP RANGE:</b> -30°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	1.6	—	2	—	2.5	—	2	—	2.6
30°	—	2.8	—	0.5	—	2.2	—	2	—	2.2
60°	—	3	—	0.5	—	3.2	—	2	—	2.1

All distances are in feet





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**ALBATROSS I (P13022-37IMC)**

Industrial and manufacturing, warehousing and logistics, asset management.

**SPECIFICATIONS**

<b>SIZE:</b> 130 mm x 22 mm x 3.7 mm (5.12" x 0.87" x 0.15")
<b>MEMORY:</b> N/A
<b>CHIP USED:</b> Impinj MONZA2
<b>INLAY USED (IF APPLICABLE):</b>
<b>OPERATING TEMP RANGE:</b> -30°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	11	—	4	—	15	—	17	—	19.7
30°	—	13	—	3	—	16	—	17	—	19.7
60°	—	9	—	1	—	10	—	15	—	16

All distances are in feet



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**EAGLE I (P09525-37AMC)**






Industrial and manufacturing, warehousing and logistics, asset management.

**SPECIFICATIONS**

<b>SIZE:</b> 95 mm x 25 mm x 3.7 mm (3.74" x 0.99" x 0.15")
<b>MEMORY:</b> 512 Bits
<b>CHIP USED:</b> ALIEN higgs-3
<b>INLAY USED (IF APPLICABLE):</b>
<b>OPERATING TEMP RANGE:</b> -30°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	14	—	2	—	16.2	—	15	—	16.5
30°	—	17	—	6	—	17	—	16	—	18.5
60°	—	15	—	1.5	—	14.7	—	14	—	16

All distances are in feet



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**PEACOCK I (F08025-00NLC)**

Fashionable consumables.

**SPECIFICATIONS**

<b>SIZE:</b> 80 mm x 25 mm x 0.1 mm (3.15" x 0.99" x 0.004")
<b>MEMORY:</b> 512 Bits
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -30°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	24	—	20	—	30	—	35	—	37	39
30°	17	—	15	—	27	—	30	—	35	32
60°	15	—	12	—	11	—	21	—	28	22

All distances are in feet



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**ROBIN II (C02525-27IMC)**

Government and public safety, asset management; special ceramic substrate for stable performance; high performance on metals; highly anti-corrosive; high-intensity bonding applicable to poor working conditions.

**SPECIFICATIONS**

<b>SIZE:</b> 28.5 mm x 28.5 mm x 4.2 mm (1.12" x 1.12" x 0.16")
<b>MEMORY:</b> N/A
<b>CHIP USED:</b> Impinj MONZA2
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -30°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	7	—	1	—	12	—	12	—	13.5
30°	—	8	—	3	—	11	—	11	—	12.5
60°	—	5.5	—	1	—	10	—	10.5	—	10.5

All distances are in feet



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**PIGEON I (C01309-30NMC)**






Asset management.

**SPECIFICATIONS**

<b>SIZE:</b> 16 mm x 12 mm x 4 mm (0.63" x 0.47" x 0.16")
<b>MEMORY:</b> 512 Bits
<b>CHIP USED:</b> NXP G2XM
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -30°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	3	—	1.5	—	3.5	—	4	—	4.75
30°	—	4	—	2	—	4.5	—	5	—	6.33
60°	—	4	—	0.5	—	4.25	—	3	—	4.75

All distances are in feet



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**JEWELRY TAG (C016-15IJC)**






Jewelry management, valuables logo (not currently available).

**SPECIFICATIONS**

SIZE: N/A
MEMORY: N/A
CHIP USED: Impinj MONZA2
INLAY USED (IF APPLICABLE): N/A
OPERATING TEMP RANGE: -30°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	2	—	0.5	—	4.5	—	5	—	5
30°	—	2	—	0.5	—	3.25	—	4	—	4.6
60°	—	0.3	—	0.5	—	3.5	—	4	—	4.5

All distances are in feet

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# Company Profile



## **Starport Technologies, LLC**

10601 NW Ambassador Drive  
Suite H  
Kansas City, MO 64153  
[www.starporttech.com](http://www.starporttech.com)

### **CONTACT**

816.985.9286

### **STARPORT TECHNOLOGIES, LLC**

Starport Technologies is a manufacturer of passive UHF RFID metal mount tags and labels for asset, supply chain management and work-in-process tracking solutions. Starport Technologies metal mount tags deliver a thin form factor with extended read distances in rugged environments.

# Tag Information



**Starport Technologies, LLC**  
10601 NW Ambassador Drive  
Suite H  
Kansas City, MO 64153  
www.starporttech.com

## CONTACT

816.985.9286

## ADAMAS






The Adamas is a long-range passive UHF RFID tag. Its thin form factor is designed for flat surfaces and won't be easily removed or damaged. It is meant for applications such as racking and binds, IT equipment, conveyances, logistics, warehousing, and distribution. The Adamas was designed to work on many different materials, metals, plastics, wood and cardboard. This tag uses patented technology to produce a low-cost passive Class I Gen 2 tag for the logistics, manufacturing and distribution businesses.

## SPECIFICATIONS

<b>SIZE:</b> 5.5" x 2.5" x 0.072"
<b>MEMORY:</b> 240 bit
<b>CHIP USED:</b> Impinj Monza 2
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -20°F – 200°F



## TEST RESULTS

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	15	—	9	—	21.5	—	6.5	—	28
30°	—	11	—	6	—	21	—	10	—	16
60°	—	5	—	4	—	12	—	9	—	12

All distances are in feet





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**PORTUNUS II**






Our Portunus tag is a long-range passive UHF RFID tag. Its rugged construction is well suited for multiple applications, including conveyances, high-value assets, racking and vehicle tracking and vehicle protection. The Portunus tag was designed specifically to work on metal and other hard-to-read surfaces.

**SPECIFICATIONS**

<b>SIZE:</b> 4" x 2" x 0.072"
<b>MEMORY:</b> 512 bit
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -20°F – 200°F



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	3	—	4.5	—	17.5	—	7.5	—	16
30°	—	3	—	7	—	16.8	—	7	—	17
60°	—	2	—	4.5	—	11	—	4	—	7

All distances are in feet



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**TERMINATOR**



A high-performing on-metal tag specifically developed for large distribution and warehousing applications.

**SPECIFICATIONS**

<b>SIZE:</b> 4.5" x 1.75" x 0.138"
<b>MEMORY:</b> 512 bit
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -20°F – 200°F



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	30	—	23	—	50	—	33	—	55
30°	—	21	—	16	—	53	—	25	—	34
60°	—	10	—	6	—	25	—	16	—	19

All distances are in feet



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**ORION**






Our Orion tag is a long-range passive UHF RFID tag. This Gen 2 tag is well suited for many applications, including IT equipment, parts, binds, small equipment, and any medium to high value items. This technology does not require a ground plane or rigid substrate layer for spacing from metal as some other asset tags do. Instead it uses the metal object it is attached to as a ground.

**SPECIFICATIONS**

<b>SIZE:</b> 3.8" x 1.6" x 0.15"
<b>MEMORY:</b> 240 bit
<b>CHIP USED:</b> Alien Higgs 2
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -10°F – 150°F



**TEST RESULTS**

SCAN ANGLE										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	6	—	4	—	21.5	—	11	—	44
30°	—	7	—	4	—	11.5	—	5	—	44
60°	—	4	—	1.6	—	6	—	3	—	25

All distances are in feet


**Starport Technologies, LLC**

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**CONTACT**

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**STEALTH**

The Stealth is created specifically for discretely tracking high value IT equipment and security applications.

**SPECIFICATIONS**

<b>SIZE:</b> 3.4" x 2.1"
<b>MEMORY:</b> 512 bit
<b>CHIP USED:</b> Alien Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -20°F – 200°F


**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	10	—	8	—	21.25	—	17	—	18
30°	—	11	—	9	—	20.25	—	18	—	12
60°	—	3.5	—	3	—	11	—	9	—	8

All distances are in feet

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# Company Profile



## **TROI Technologies**

4 Wingfoot Ct.  
Simpsonville, SC 29680  
[www.troirfid.com](http://www.troirfid.com)

## **CONTACT**

864.373.1842

## **TROI TECHNOLOGIES**

Troi targets markets demanding the ultimate environmental performance. Construction, pipes, oil, laundry (Gen 2 UHF), concrete represent their target markets. TROI is one of only two or three companies featuring solder bonded tags. A second differentiating feature for TROI is that the majority of TROI tags are flexible and even narrow or low profile. TROI also provides UHF Gen 2 RFID tags for the extreme high temperatures found in metal fabrication and electro-paint operations.

# Tag Information



**TROi Technologies**  
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**CONTACT**  
864.373.1842

## FT-1007— FLEX TAG 11 INCH TIE WRAP

Flexible wire based tag, employing rugged MSOP (chip) on FR4 board electronics design in a flexible plastic package. Read/write performance on any non-metal surface.

### SPECIFICATIONS

<b>SIZE:</b> 140 mm x 4 mm x 2 mm (5.51" x .16" x .08")
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -55°C – 85°C



### TEST RESULTS

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	10	—	6	—	10	—	7	—	11	—
30°	8.7	—	4	—	11	—	10	—	12	—
60°	8.5	—	4	—	9.5	—	8	—	11	—

All distances are in feet



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**CONTACT**  
864.373.1842

**PC-100 SCAFFOLD TIE**






Employs a rugged chip on board electronics design in a vulcanized rubber package. Read/write performance on any surface. Attached by adhesive, double sided tape , strap, velcro strap.

**SPECIFICATIONS**

<b>SIZE:</b> 135 mm x 12 mm x 12 mm (5.31" x .47" x .47")
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -55°C – 85°C



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	2	4	2	1	1.5	1.5	2	3	3	3.5
30°	3	3	3	1	3	1.8	3	5	3	3.5
60°	5	2	3	0.5	5	1.5	4	6	2	2

All distances are in feet



**TROi Technologies**  
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**CONTACT**  
864.373.1842

**TMT-2**





Read/write performance on any metal surface or embedded below the surface (backfilled with epoxy). Plastic cover and adhesive backed for rapid attachment.

**SPECIFICATIONS**

<b>SIZE:</b> 35 mm x 20 mm x 5 mm (1.38" x .79" x .2")
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -55°C – 85°C



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	1	—	1	—	4	—	3	—	3
30°	—	1	—	0.5	—	3	—	3	—	3
60°	—	0.5	—	0.5	—	1.7	—	2	—	2

All distances are in feet





**TROi Technologies**  
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**CONTACT**  
864.373.1842

**PC-103-I — PIPE & CYLINDER TAG**






Metal mount tag, employing rugged chip on board electronics design in a vulcanized package. Read/write performance on any surface. O-Ring dimension: 10"–26".

**SPECIFICATIONS**

<b>SIZE:</b> 160 mm x 10 mm x 10 mm (6.3" x .39" x .39")
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -55°C – 85°C



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	14	9	9	5	14	10.5	15	14	16	15
30°	12.5	9	7	3	10	13	12	11	13	13
60°	8	5	5	2	5	5.8	6	5	7	7

All distances are in feet



**TROi Technologies**  
4 Wingfoot Ct.  
Simpsonville, SC 29680  
www.troirfid.com

**CONTACT**  
864.373.1842

**TMT-2-NW (NO WINGS)—TINY METAL MOUNT**

Read/write performance on any metal surface or embedded below the surface (backfilled with epoxy). Plastic cover and adhesive backed for rapid attachment.

**SPECIFICATIONS**

<b>SIZE:</b> 35 mm x 20 mm x 5 mm (1.38" x .79" x .20")
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -55°C – 85°C



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	3	—	1	—	3	—	2	—	3
30°	—	3.4	—	1	—	3	—	3	—	4
60°	—	3.5	—	1	—	4	—	3	—	5

All distances are in feet



**TROi Technologies**  
4 Wingfoot Ct.  
Simpsonville, SC 29680  
www.troirfid.com

**CONTACT**  
864.373.1842

**MMT-3002 — MINI METAL SILICONE TAG**






Metal mount tag, employing rugged MSOP (chip) on-board electronics design in a rugged, sealed and impact-resistant silicone-molded package. Read/write performance on any metal or non-metal surface.

**SPECIFICATIONS**

<b>SIZE:</b> 152 mm x 7 mm x 9 mm (5.98" x .28" x .35")
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -78°C – 85°C



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	19	17	15	13	18	22	21	24	24	26
30°	16	10	9	7.5	16	17	13	12	18	14
60°	8	3	6	3	8	3	7	4	10	4

All distances are in feet



**TROi Technologies**  
4 Wingfoot Ct.  
Simpsonville, SC 29680  
www.troirfid.com

**CONTACT**  
864.373.1842

**ST-74 SECURITY BRAID TAG**






Flexible braided wire-based tag. NOT AN INLAY but instead a rugged MSOP (packaged chip) on FR4 board electronics. Tie to any part. Robust Polyolefin HIX casement on base antenna. Security tag ties to part and when cut kills read distance. Lock-out tag out for security or anti-theft applications.

**SPECIFICATIONS**

<b>SIZE:</b> 140 mm x 4 mm (board area only) x 2 mm (5.51" x .16" x .08")
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -55°C – 85°C



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	10	—	4	—	9.5	—	11.5	—	12.5	—
30°	5	—	1.5	—	6	—	11	—	10	—
60°	2	—	1	—	4	—	6	—	5	—

All distances are in feet



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**CONTACT**  
864.373.1842

**ST-12 SECURITY BRAID TAG**

Flexible braided wire-based tag. NOT AN INLAY but instead a rugged MSOP (packaged chip) on FR4 board electronics. Tie to any part. Robust Polyolefin HIX casement on base antenna. Security tag ties to part and when cut kills read distance. Lock-out tag out for security or anti-theft applications.

**SPECIFICATIONS**

<b>SIZE:</b> 140 mm x 4 mm (board area only) x 2 mm (5.51" x .16" x .08")
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -55°C – 85°C



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	7	—	4	—	9	—	11	—	12	—
30°	8	—	1.5	—	7	—	11	—	11	—
60°	3	—	1	—	3	—	7	—	4	—

All distances are in feet



**TROi Technologies**  
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**CONTACT**  
864.373.1842

**OK-106 — EMBEDDED TAG**






Read/write performance on any metal surface or embedded below the surface (backfilled with epoxy).

**SPECIFICATIONS**

<b>SIZE:</b> 24 mm x 10 mm x 4 mm (.94" x .39" x .16")
<b>MEMORY:</b> 96 bits
<b>CHIP USED:</b> Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -55°C – 85°C



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	2	—	6	—	2.5	—	3	—	3
30°	—	1.8	—	3	—	3	—	3	—	3.5
60°	—	2.5	—	2	—	3.5	—	2	—	3.5

All distances are in feet

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# Company Profile



## **William Frick & Company**

2600 Commerce Drive  
Libertyville, IL 60048  
[www.fricknet.com](http://www.fricknet.com)

### **CONTACT**

866.669.7590

### **WILLIAM FRICK & COMPANY**

William Frick and Company is a veteran owned manufacturer of specialty labeling and marking products. In addition to the labels, decals, nameplates and signs upon which the company was founded, its product line has grown to include SmartMark RFID products.

# Tag Information



**William Frick & Company**  
 2600 Commerce Drive  
 Libertyville, IL 60048  
 www.fricknet.com

**CONTACT**  
 866.669.7590

## SM-77B BLACK RUGGED RFID TAG — WHITE THICK TRANSPARENT






These tags are perfect for marking carts, tagging high-value items with glass, plastics or metal, and for authentication applications. This is the black polycarbonate alternative to the WF-SM-77, which features a clear outer casing. The black polycarbonate case protects the RFID inlay from environmental conditions. The inlay is especially well-suited for high dielectric materials such as glass, reusable plastic pallets or containers. This is a cost-effective metal-mount, harsh-environment RFID tag.

### SPECIFICATIONS

<b>SIZE:</b> 5.2" x 1.5" x 0.52"
<b>MEMORY:</b> 96 bit + 512 bit
<b>CHIP USED:</b> Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Various
<b>OPERATING TEMP RANGE:</b> -40°F – 158°F (-40°C – 70°C)



### TEST RESULTS

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	3.5	—	7	—	7	—	11	56	12
30°	—	5	—	8	—	5	—	10	43	10
60°	—	4	—	2	—	3.5	—	3	21	3

All distances are in feet





**William Frick & Company**  
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**CONTACT**  
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**WF-SM-ID — ID CARDS**






Radio Frequency Identification (RFID) tag technology can be used not only to identify and track objects but people as well. The SM-ID PVC identification badge works with standard UHF Gen 2 systems. Proximity cards can be used to identify employees, contractors, vendors and others in government buildings, military bases, hospitals, banks, credit card companies, insurance companies. Proximity cards may also be a suitable choice when selecting ID cards for students and school employees.

**SPECIFICATIONS**

<b>SIZE:</b> 3.4" L x 2.1" W x 0.041" H
<b>MEMORY:</b> 96 bit
<b>CHIP USED:</b> Monza 3
<b>INLAY USED (IF APPLICABLE):</b>
<b>OPERATING TEMP RANGE:</b> 14°F – 122°F (-10°C – 50°C)



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	20	—	14	—	20	—	27	—	30	—
30°	22	—	14	—	19	—	23	—	24	—
60°	14	—	10	—	13	—	13	—	14	—

All distances are in feet



**William Frick & Company**  
2600 Commerce Drive  
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**CONTACT**  
866.669.7590

**WF-SM-12—LASER ETCHED METAL MOUNT**






This RFID label consists of a printed layer of white polyester with a durable clear polyester overlamine. Dual magnets on opposite ends of the label enable the label to be temporarily secured and easily relocated. Permanent installation capable. Abrasion, UV, water, oil, and solvent resistant. Multiple inlays available.

**SPECIFICATIONS**

<b>SIZE:</b> 5" L x 3" W x 0.375" H
<b>MEMORY:</b> 96 bit + 512 bit
<b>CHIP USED:</b> Higgs 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -40°F – 392°F (-68°C – 200°C)



**TEST RESULTS**

SCAN ANGLE	 MOTOROLA MC9090-G RFID		 MOTOROLA MC3090-Z		 MOTOROLA XR450/AN480		 MOTOROLA FX7400/AN720		 MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	2	—	2	—	3.15	—	2	—	2
30°	—	0	—	0.5	—	1.8	—	1	—	1
60°	—	2	—	0.5	—	1.8	—	1	—	1

All distances are in feet



**William Frick & Company**  
2600 Commerce Drive  
Libertyville, IL 60048  
www.fricknet.com

**CONTACT**  
866.669.7590

**WF-SM-HTL1 — HIGH TEMPERATURE RFID LABEL**






A solution for high temperature applications, the HTL1 uses a proprietary design to survive heat. The HTL1 high temperature RFID label will survive temperatures up to 300°F for 30 minutes or more. These high-temperature RFID labels have been used for process tracking and paint line asset tracking. A variety of sizes and inlays are available. The HTL1 comes pre-printed (alphanumeric or barcode information) or as thermal transfer blanks for on-demand printing and encoding.

**SPECIFICATIONS**

<b>SIZE:</b> 4" x 2" custom sizes available
<b>MEMORY:</b> 96 bits
<b>CHIP USED:</b> UPM Raflatac
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F (-40°C – 85°C)



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	26	—	7	—	26	—	32	—	34	—
30°	19	—	4	—	19	—	22	—	25	—
60°	15	—	1	—	14	—	16	—	15	—

All distances are in feet



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**WF-SM-22 — FOAM BACKED METAL MOUNT TAG**



This foam-backed, metal mount RFID tag can be used for many different purposes such as identifying rack locations in a warehouse, metallic assets like fleet trucks, forklifts and tractors, as well as IT assets. There are a variety of ways to attach these tags, from permanent adhesive to magnet backed for quick removal and re-use. The SM-22 RFID tag can be directly attached via adhesive or magnets to metallic surfaces.

**SPECIFICATIONS**

<b>SIZE:</b> 4" x 1.375" x 0.141"
<b>MEMORY:</b> 96 bits
<b>CHIP USED:</b> Monza 3
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F (-40°C – 85°C)



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	27	—	7	—	22	—	30	—	30	—
30°	19	—	3	—	19	—	26	—	23	—
60°	13	—	1	—	14	—	14	—	15	—

All distances are in feet



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**WFS-ES-0035— RFID-ENABLED POLE MARKERS**

These RFID-enabled pole markers offer quick and easy identification of utility poles, posts, cabinets, pedestals, enclosures, switch gear, transformers, pipelines and underground assets. The data can be displayed in human-readable format, barcode and UHF Gen 2 RFID. Pole tags can be attached using screws to wood or metal. They are available in different sizes and either horizontal or vertical orientation.

**SPECIFICATIONS**

<b>SIZE:</b> 12" H x 1.5" W, or custom
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Impinj or NXP
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -40°F – 185°F



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	18	—	13	—	16	—	19	—	20	—
30°	16	—	11	—	14	—	17	—	16	—
60°	10	—	11	—	7	—	10	—	9	—

All distances are in feet



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WF-SM-FLR1 — RFID FLOOR TAG






This thin layered yet durable RFID tag is made for floors, walls, and other flat objects. These tags are used to mark the floor location in a warehouse or distribution facility to aid in automatic data collection and inventory control.

SPECIFICATIONS

SIZE: 4" x 6"
MEMORY: 96 bits
CHIP USED: UPM Raflatac
INLAY USED (IF APPLICABLE): N/A
OPERATING TEMP RANGE: -40°F – 185°F (-40°C – 85°C)



TEST RESULTS

										
	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	29	—	7	—	28	—	40	—	43.5	—
30°	29	—	5	—	34	—	34	—	41	—
60°	14	—	1	—	17	—	30	—	27	—

All distances are in feet



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**WF-SM-IN02**

These patent-pending embeddable RFID tags can be used in a wide variety of form factors. The durable wire tags can be embedded in pallets, concrete, or plastics. Because of their unique design, they can provide a 360° read profile to reduce orientation sensitivity.




These wire-based tags combine strength with flexibility. A variety of encapsulations are available: high temperature Teflon or silicone, durable vulcanized rubber, and integrated cable ties. The tags can be attached with a broad range of mechanical methods.

**SPECIFICATIONS**

<b>SIZE:</b> 6" x 0.125"
<b>MEMORY:</b> 96 bits or 512 bits
<b>CHIP USED:</b> Higgs 3, NXP, or UPM
<b>INLAY USED (IF APPLICABLE):</b> N/A
<b>OPERATING TEMP RANGE:</b> -40°F – 400°F



**TEST RESULTS**

SCAN ANGLE	 <b>MOTOROLA MC9090-G RFID</b>		 <b>MOTOROLA MC3090-Z</b>		 <b>MOTOROLA XR450/AN480</b>		 <b>MOTOROLA FX7400/AN720</b>		 <b>MOTOROLA FX7400/AN480</b>	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	16	—	11	—	25	—	24	—	26	—
30°	13	—	9	—	22	—	23	—	24.5	—
60°	17	—	8	—	23	—	25	—	26	—

All distances are in feet

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# Company Profile



## **Xerafy Ltd.**

Lippo Centre Tower II  
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## **XERAFY LTD.**

XERAFY is a global provider of small and durable passive UHF RFID Read-On-Metal (ROM) tags. Their products endure extreme conditions over the lifetime of the asset.



# Tag Information



## Xerafy Ltd.

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## PICO






The Pico is a small, durable, metal-mount tag that is designed for harsh environments. It survives application temperature ranges from -40° F to 302° F (-40° C to 150° C). Ideal for small asset tracking and tool identification (FME, FOD) in aerospace, oil & gas production, utilities, and manufacturing. Metal-embeddable "iN" version available. Higher performance Pico X-II now available.

## SPECIFICATIONS

<b>SIZE:</b> 0.62" x 0.35" x 0.15" (15.7 mm x 8.8 mm x 3.9 mm)
<b>MEMORY:</b> 512 Bit User Memory, 96-EPC Bits (Ext. to 480 Bits) 64 Bit Unique TID
<b>CHIP USED:</b> Alien Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Xerafy design
<b>OPERATING TEMP RANGE:</b> -22°F – 185°F (-30°C – 85°C)



## TEST RESULTS

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	2	—	3	—	3	—	3	—	3
30°	—	2	—	3	—	2.5	—	2.5	—	3
60°	—	2.5	—	2.5	—	2.5	—	2	—	2.5

All distances are in feet



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**NANO**

The Nano is a small, ruggedized metal-mount tag intended for physically challenging environments. Application temperature range is -40° F to 302° F (-40° C to 150° C). Ideal for IT asset identification (FSTC-compliant), tool identification, and instrumentation tracking (medical, test, process) in multiple industries. Metal-embeddable “iN” version available. Higher performance Nano X-II now available.

**SPECIFICATIONS**

<b>SIZE:</b> 1.17" x 0.43" x 0.15" (27.9 mm x 10.8 mm x 3.9 mm)
<b>MEMORY:</b> 512 Bit User Memory, 96-EPC Bits (Ext. to 480 Bits) 64 Bit Unique TID
<b>CHIP USED:</b> Alien Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Xerafy design
<b>OPERATING TEMP RANGE:</b> -22°F – 185°F (-30°C – 85°C)



**TEST RESULTS**

										
	<b>MOTOROLA MC9090-G RFID</b>		<b>MOTOROLA MC3090-Z</b>		<b>MOTOROLA XR450/AN480</b>		<b>MOTOROLA FX7400/AN720</b>		<b>MOTOROLA FX7400/AN480</b>	
SCAN ANGLE	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	4.5	—	4	—	8	—	5.5	—	9
30°	—	4.5	—	4	—	7	—	3.5	—	8.5
60°	—	4	—	3	—	5	—	3	—	7

All distances are in feet



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**MICRO**






The Micro is a ruggedized metal-mount tag intended for harsh environment (IP68-rated) and high temperature applications to 482° F (250° C). It is intended for larger asset identification in aerospace, oil & gas production, manufacturing, construction, and transportation. Metal-embeddable “iN” version available. Higher performance Micro X-II now available.

**SPECIFICATIONS**

<b>SIZE:</b> 1.65" x 1.26" x 0.22" (42 mm x 32 mm x 9.5 mm)
<b>MEMORY:</b> 512 Bit User Memory, 96-EPC Bits (Ext. to 480 Bits) 64 Bit Unique TID
<b>CHIP USED:</b> Alien Higgs-3
<b>INLAY USED (IF APPLICABLE):</b> Xerafy design
<b>OPERATING TEMP RANGE:</b> -22°F – 185°F (-30°C – 85°C)



**TEST RESULTS**

										
SCAN ANGLE	MOTOROLA MC9090-G RFID		MOTOROLA MC3090-Z		MOTOROLA XR450/AN480		MOTOROLA FX7400/AN720		MOTOROLA FX7400/AN480	
	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL	AIR	METAL
0°	—	20	—	18	—	20	—	14	—	16
30°	—	18	—	15	—	19	—	13	—	15
60°	—	16	—	13	—	16	—	11	—	12

All distances are in feet



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