

TOOL TRACKING

BUYER'S GUIDE



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TABLE OF CONTENTS

Introduction	2
About Tool Tracking	3
RFID Tags	4 - 7
Handheld RFID Readers	8 - 9
USB RFID Readers	10 - 11
Fixed RFID Readers	12 - 14
RFID Antennas	15 - 17
RFID Portals	18 - 19
Up Next	20
Contact Us	21
About Us	22

INTRODUCTION

This guide is intended to give a brief description of tool tracking and then recommend RFID tags and hardware that have been validated in existing tool tracking applications.

Not only does this guide help narrow down options for a quicker buying process, but it also helps by recommending quality products that have had proven results.

ABOUT TOOL TRACKING

Tool Tracking, a segment of **Asset Tracking**, has grown rapidly in response to lost or stolen tools in industries like **Healthcare**, Construction, Manufacturing, Aerospace, and even Mining. Tools can be left at jobsites, inside machinery, or, worst case, inside patients. Not only does a lost or stolen tool cost money to replace, but, if that tool causes more damage because of where it was left (e.g. in a patient or inside of an aircraft), a company could face a multi-million dollar lawsuit. The best way to deal with lost or stolen tools (and avoid costing an organization money) is to implement a solution to prevent it from happening.

Tagging tools with RFID tags can be done in several different ways – embedded, heat-sealed, or attached using adhesive, epoxy or screws or rivets. How the tag should be applied to the item depends on a **few factors** like the item's surface material, the RFID's tag's application material (i.e. use of adhesive vs. screws), the item's usage (i.e. indoor vs. outdoor conditions), as well as the item's operating temperature. The tags can then be read by the RFID system, inventoried, and that number can be compared against the exact tools that are supposed to be in the vehicle, crib, or cabinet.

TOOL TRACKING: RFID TAGS

Unlike other RFID applications with only a few RFID tag choices, dozens of **RFID tags** are available for tool tracking. Selecting the right RFID tag will depend on the size, material, and other constraints of the tool being tracked. Most tool tracking applications will involve several different tools, and in turn, several different types of tags to ensure optimum performance. The RFID tags below have been used in tool tracking systems with proven results.

RFID TAGS



XERAFY DOT

MAX READ RANGE:

Up to 1.5 m (5 ft)

SIZE:

0.6 X 2.5 mm
(0.25 x 0.1 in)

APPLICABLE SURFACE MATERIALS:

Metal & Non-Metal Substrates

OPERATING TEMPERATURE:

-40° to +85° C
(-40° to +185° F)

ATTACHMENT METHOD:

Epoxy, Embeddable

PROVEN IN:

Medical Industry



OMNI-ID FIT 400 HIGH TEMP

MAX READ RANGE:

Up to 4 m (13.1 ft)

SIZE:

13.1 x 7.1 x 3.1 mm
(0.52 x 0.28 x 0.12 in)

APPLICABLE SURFACE MATERIALS:

Metal Substrates

OPERATING TEMPERATURE:

-20° to +85° C
(-4° to 185° F)

ATTACHMENT METHOD:

High Temperature Epoxy

PROVEN IN:

Medical Industry



XERAFY PICOX II PLUS

MAX READ RANGE:

Up to 3 m (10 ft)

SIZE:

17.7 x 10.9 x 5 mm
(0.70 x 0.43 x 0.20 in)

APPLICABLE SURFACE MATERIALS:

Metal Substrates

OPERATING TEMPERATURE:

-30° to +85° C
(-22° to +185° F)

ATTACHMENT METHOD:

High Performance Adhesive

PROVEN IN:

Tech Industry

Click on the picture to learn more!

RFID TAGS



OMNI-ID FLEX 600

MAX READ RANGE:

Non-Metal: Up to 3 m (9.8 ft)
Metal: Up to 6 m (19.7 ft)

SIZE:

55.8 x 20 x 2.5 mm
(2.20 x 0.78 x 0.1 in)

**APPLICABLE SURFACE
MATERIALS:**

Metal Substrates

OPERATING TEMPERATURE:

-40° to +85° C
(-40° to +185° F)

ATTACHMENT METHOD:

Film Adhesive

PROVEN IN:

Medical Industry



CONFIDEX IRONSIDE MICRO

MAX READ RANGE:

Up to 4 m (13.1 ft)

SIZE:

7 x 27 x 5.5 mm
(1.06 x 1.06 x 0.22 in)

**APPLICABLE SURFACE
MATERIALS:**

Ideal on Metal Substrates

OPERATING TEMPERATURE:

-35° to +85° C
(-31° to 185° F)

ATTACHMENT METHOD:

Adhesive, Screws, Rivets, Epoxy

PROVEN IN:

Manufacturing Industry



EMBEDDABLE WIRE TAG

MAX READ RANGE:

Up to 2 m (6.6 ft)

SIZE:

Length: 165 mm (6.5 in)
Diameter: 1.5 mm (0.06 in)

**APPLICABLE SURFACE
MATERIALS:**

Metal & Non-Metal Substrates

OPERATING TEMPERATURE:

-50° to +200° C
(-58° to +392° F)

ATTACHMENT METHOD:

Embeddable, Heat-shrinking,
Clips, Adhesives, Bands

PROVEN IN:

Construction Industry

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to learn more!

RFID TAGS



XERAFY MICROX II

MAX READ RANGE:

Up to 10 m (33 ft)

SIZE:

35 x 36.3 x 7.5 mm
(2.01 x 1.43 x 0.30 in)

APPLICABLE SURFACE

MATERIALS:

Metal Substrates

OPERATING TEMPERATURE:

-30° to +85° C
(-22° to +185° F)

ATTACHMENT METHOD:

Adhesive, Rivets

PROVEN IN:

Medical Industry



CONFIDEX STEELWAVE MICRO II

MAX READ RANGE:

Metal: Up to 5 m (1 ft)
Non-Metal: Up to 1.5 m (5 ft)

SIZE:

38 x 13 x 4.5 mm
(1.5 x 0.5 x 1.7 in)

APPLICABLE SURFACE

MATERIALS:

Any Substrate

OPERATING TEMPERATURE:

-20° to +70° C
(-4° to +158° F)

ATTACHMENT METHOD:

High Performance
Acrylic Adhesive

PROVEN IN:

Construction

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TOOL TRACKING: HANDHELD RFID READERS

In tool tracking applications, **handheld readers** are used for several different functions within the system, such as inventory counts, locating tags, as well as encoding tags. Handheld readers are mobile RFID readers that include an integrated RFID antenna for ease-of-use. All these readers include a tag finder program with Geiger counter-type functionality to make locating tools much less of a hassle.

RFID HANDHELD READERS



**ALIEN
ALR-H450**

SIZE:

185 x 85 x 105 mm
(7.28 x 3.35 x 4.13 in)

ANTENNA TYPE:

Circular Antenna

OPERATING SYSTEM:

Android 4.4.2 Kit Kat

DATA INTERFACE:

Wireless WLAN 802.11, Bluetooth
4.0, GPS, Micro USB, WWAN

RUGGEDNESS:

IP 64

FOR USE IN:

Office/Retail & Industrial/
Warehouse Environments



**TSL
1128 UHF READER**

SIZE:

60 x 77 x 169 mm
(6.2 x 3.0 x 6.6 in)

ANTENNA TYPE:

Circular Antenna

OPERATING SYSTEM:

Windows Mobile 6.5, IOS,
Windows Phone 8, WinCE,
Windows XP, Windows 7,
Windows 8, Android

DATA INTERFACE:

USB, Bluetooth

RUGGEDNESS:

IP 54

FOR USE IN:

Office/Retail Environments



**ZEBRA
MC-9190-Z**

SIZE:

73 x 119 x 195 mm
(10.75 x 4.7 x 7.7 in)

ANTENNA TYPE:

Linear Antenna

OPERATING SYSTEM:

Windows Mobile 6.5

DATA INTERFACE:

USB, Bluetooth, Wi-Fi

RUGGEDNESS:

IP 64

FOR USE IN:

Industrial/Warehouse
Environments

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TOOL TRACKING: USB RFID READERS

USB RFID readers can be very useful for encoding RFID tags that are to be deployed. A low-cost USB reader can be setup inside a tool area for encoding new tags, used for quick check in/check-out, as well as for reading history and maintenance records on already tagged tools. **USB readers** are small, low-cost, and easily deployed in most environments.

RFID USB READERS



THINGMAGIC USB PRO

SIZE:

7 x 61 x 25 mm
(3.8 x 2.4 x 1.0 in)

ANTENNA PORTS:

1 RP-SMA Female

DATA INTERFACE:

USB

GPIO:

2 I/O Command Controlled LEDs
1 I/O Command Queried Switches

HOST API:

Mercury API SDK

USED FOR:

Desktop Reading/Encoding
System (Must be connected
directly to a host machine)



IDENTIX MINIPAD

SIZE:

116 x 60 x 12 mm
(4.6 x 2.3 x 0.47 in)

ANTENNA PORTS:

2 SMA Female

DATA INTERFACE:

USB

GPIO:

Not Published

HOST API:

N/A

USED FOR:

Desktop Reading/Encoding
System (Cannot be used on a
network)

Click on the picture
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TOOL TRACKING: FIXED RFID READERS

Fixed RFID readers in tool tracking applications can be used for larger scale inventory counts, portal setups, or most any instance where an RFID reader system is needed. **Fixed readers** can be placed on a network, which allows the reader to send information to a database. The data can then be analyzed and the findings reported to multiple users. The fixed readers below are recommended for, and currently being used in, tool tracking applications worldwide.

FIXED RFID READERS



IMPINJ SPEEDWAY R420

SIZE:

190.5 x 175.3 x 30.5 mm
(7.5 x 6.9 x 1.2 in)

ANTENNA PORTS:

4 RP-TNC Female ports,
Monostatic

DATA INTERFACE:

RS-232, Ethernet

GPIO:

4 GPI Optically Isolated 3-30V
4 GPO Optically Isolated 0-30V

HOST API:

Java, .Net



THINGMAGIC IZAR

SIZE:

194 x 139 x 33.6 mm
(7.6 x 5.5 x 1.3 in)

ANTENNA PORTS:

4 RP-TNC Female ports,
Monostatic

DATA INTERFACE:

Ethernet, 2 USB, Micro HDMI,
Micro-SD

GPIO:

4 Opto-Isolated Inputs
4 Opto-Isolated Outputs

HOST API:

C, Java C, C#, .NET

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FIXED RFID READERS



ALIEN F800

SIZE:

190.5 x 200.6 x 27.9 mm
(7.5 x 7.9 x 1.1 in)

ANTENNA PORTS:

4 RP-TNC Female ports,
Monostatic

DATA INTERFACE:

LAN, RS-232, USB Host, USB
Console

GPIO

4 Inputs, 8 Outputs

HOST API:

.NET, Java, Ruby APIs



ZEBRA FX9600 8-PORT READER

SIZE:

273.1 x 184.1 x 50.8 mm
(10.7 x 7.2 x 2 in)

ANTENNA PORTS:

8 RP-TNC Female ports,
Monostatic

DATA INTERFACE:

Ethernet, USB, Serial

GPIO:

4 Inputs, 4 Outputs

HOST API:

.Net, C, Java EMDK

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TOOL TRACKING: RFID ANTENNAS

The performance of tool tracking applications using a fixed RFID reader depend upon selecting **RFID antennas** ideal for the application use case. Because various hardware setups exist, it is important to understand what the functionality of the antenna will be within the system. The three basic types of RFID antennas that can be used in tool tracking are shelf antennas, portal antennas, and panel antennas.

RFID ANTENNAS



**KEONN
ADVANTENNA
CP-11**

SIZE:

180 x 180 x 17.5 mm
(7 x 7 x 0.7 in)

POLARIZATION:

Circularly Polarized

GAIN:

0.2 dBi

BEAMWIDTH:

Elevation: 120°
Azimuth: 120°

ANTENNA TYPE:

Shelf Antenna

RUGGEDNESS:

Indoor

BEST FOR:

Smart Shelving Applications



**TIMES-7
A7030C**

SIZE:

300 x 300 x 8.5 mm
(11.8 x 11.8 x 0.3 in)

POLARIZATION:

Circularly Polarized

GAIN:

6 dBic (FCC)
5 dBic (ETSI)

BEAMWIDTH:

Elevation: 65°
Azimuth: 65°

ANTENNA TYPE:

Shelf Antenna

RUGGEDNESS:

Indoor

BEST FOR:

Smart Shelving Applications



**LAIRD
S9025PR**

SIZE:

132 x 132 x 18 mm
(5.2 x 5.2 x 0.71 in)

POLARIZATION:

Circularly Polarized

GAIN:

5.5 dBi

BEAMWIDTH:

Elevation: 100°
Azimuth: 100°

ANTENNA TYPE:

Panel Antenna

RUGGEDNESS:

Outdoor

BEST FOR:

Portal and/or Fixed Reader

Click on the picture
to learn more!

RFID ANTENNAS



**MTI
MT-262006**

SIZE:
305 x 305 x 25 mm
(12 x 12 x 0.98 in)

POLARIZATION:
Circularly Polarized

GAIN:
9 dBic

BEAMWIDTH:
Elevation: 63°
Azimuth: 63°

ANTENNA TYPE:
Panel Antenna

RUGGEDNESS:
Indoor

BEST FOR:
Portal and/or Fixed Reader
Applications



**TIMES-7
A6034**

SIZE:
747 x 314 x 12 mm
(29.4 x 12.4 x 0.5 in)

POLARIZATION:
Circularly Polarized

GAIN:
9 dBic

BEAMWIDTH:
Elevation: 25°
Azimuth: 81°

ANTENNA TYPE:
Portal Antenna

RUGGEDNESS:
Indoor/Outdoor

BEST FOR:
Portal Applications where
Maximum Coverage is Important



**TIMES-7
A6590C**

SIZE:
915 x 305 x 8 mm
(36 x 12 x 0.31 in)

POLARIZATION:
Circularly Polarized

GAIN:
9 dBic

BEAMWIDTH:
Elevation: 20°
Azimuth: 80°

ANTENNA TYPE:
Portal Antenna

RUGGEDNESS:
Indoor/Outdoor

BEST FOR:
Portal and/or Fixed Reader
Applications

Click on the picture
to learn more!

TOOL TRACKING: RFID PORTALS

Some tool tracking applications may have a portal system in place at the entrance and exit to tool rooms. Purchasing an out-of-the-box portal is not a necessity, but these portals help to consolidate and hide the RFID system within for ease of installation and to protect the equipment inside.

Depending on the portal type and manufacturer, **RFID Portals** may include various components, such as a reader, antennas, brackets, power supplies, and **GPIO devices** like motion detectors and light stacks. It is important to thoroughly understand what is included with each portal to ensure no important components are left out.

RFID PORTALS



IMPINJ SPEEDWAY XPORTAL

SIZE:

774.7 x 222.2 x 50.8 mm
(30.5 x 8.7 x 2 in)

WHAT IS INCLUDED:

- 1 Impinj Speedway R420 Reader
- 2 Dual Phase Linear Antennas

MOUNTING OPTIONS:

Keyhole slots, Clearance holes, & Integrated Threaded Fasteners

DATA INTERFACE:

RS-232, Ethernet

HOST API:

Java, .NET



SLS RFID SMARTPORTAL

SIZE:

2580 x 380 x 120 mm
(101.5 x 15 x 4.5 in)

WHAT IS INCLUDED:

- 2 SmartPortal Stands
- Integrated RFID Reader
- Wave Antennas
- Mounting Hardware
- 2 Cables

MOUNTING OPTIONS:

Anchored to Floor

DATA INTERFACE:

RS-232, Ethernet

HOST API:

Java, .NET

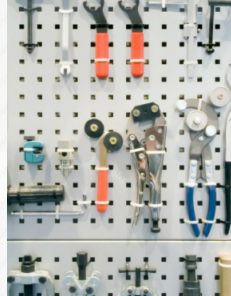
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UP NEXT...

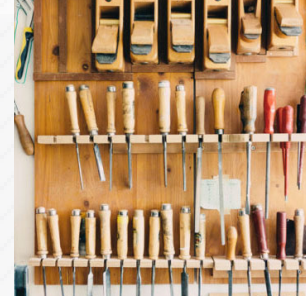
LEARN MORE ABOUT TOOL TRACKING



5 Examples of RFID Tool Tracking



Protecting Your Tools with RFID

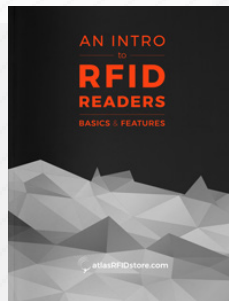


Manage Preventative Tool Maintenance with RFID

LEARN MORE ABOUT RFID



A Guide to UHF RFID Tags

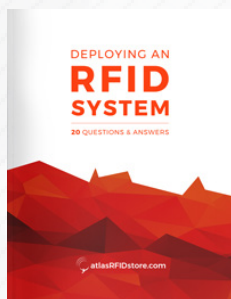


An Intro to RFID Readers



Tactics for Choosing an RFID Antenna

LEARN ABOUT HOW TO DEPLOY AN RFID SYSTEM



Deploying an RFID System:
20 Questions & Answers

CONTACT

THE

If you have any additional questions about if RFID is right for your application, or about Tool Tracking with RFID, don't hesitate to [contact us](#).

RFID

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EXPERTS

ABOUT US

Founded in 2008, [atlasRFIDstore](#) is a trusted source in the RFID hardware industry. We are a global retailer providing customers a secure, one-stop location where you can buy RFID components for your own systems and applications.

atlasRFIDstore sells name-brand products in virtually every RFID hardware category, so you can build cost-effective RFID solutions across a variety of verticals.

The atlasRFIDstore team focuses on creating the absolute best customer service experience and works with you to select the right RFID equipment for your systems.

Our sales engineers are highly trained in the field of RFID and are ready to answer your questions, big and small. While we may not immediately have an answer, we'll diligently work for you to find a solution.

Our offices are located on Morris Avenue, in downtown Birmingham, Alabama. We have customers all around the globe and ship products worldwide.