



## **RTLS Tag User's Guide**

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## Radio Frequency Compliance Statement

RFind Systems, Inc. is the responsible party for the compliance of the following device:

MODEL: PT100

FCC ID: UL3PT100

CANADA: 6721A-PT100

The user(s) of this product is cautioned to only use accessories and peripherals approved, in advance, by RFind Systems, Inc. The use of accessories and peripherals, other than those approved by RFind Systems, Inc., or unauthorized changes to approved products, may void the compliance of these products and may result in the loss of the user(s) authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## Industry Canada Compliance

This ISM device complies with Canadian ICES-001.

Cet appareil ISM est conforme à la norme NMB-001 du Canada.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme la norme d'Industrie Canada exempts de license RSS (s). Son fonctionnement est soumis aux deux conditions suivantes: (1) cet appareil ne peut pas provoquer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de la appareil.

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# Introduction

RFind Systems, Inc. is an Active RTLS Technology Company specializing in tag to tag communications. With tag to tag communications technology, RFind produces Real Time Locating System (RTLS) solutions for industry clients who have the need to locate and track important assets.

This guide describes how to use the RFind active RFID tag. The RFind RFID tag is primarily used for locating assets in a warehouse, yard, or finished goods area. By attaching the tag to an item of interest known as an asset, when used in conjunction with one or more RFind Gateways and the RFind Expeditor2D™ software package, the asset can be located.

The RFind Tag is the 1st key component of the 3-element Active RFID Technology hardware architecture comprising our Expeditor 2D™ Asset Location System Solution.

Long range and robust communications ability, as well as power saving features afford application flexibility and extended operational lifetime and performance.

## Tag Overview

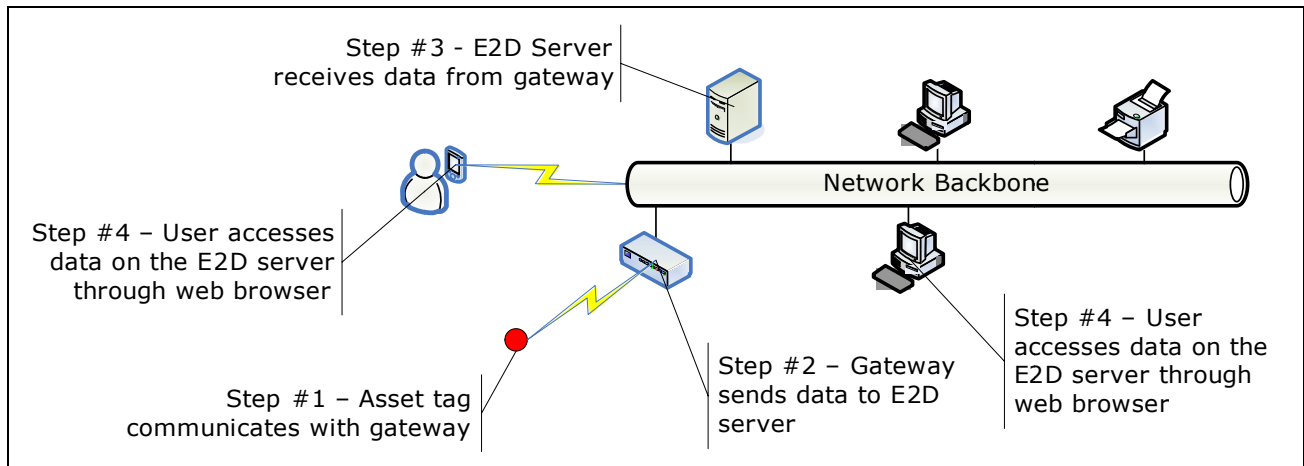
The tag can be utilized in one of two different operational modes: Reference and Asset. Reference tags are placed at known locations in your facility while asset tags are then attached to items which you wish to locate. Using a proprietary algorithm, asset tags will automatically perform a locating sequence so that the system can report on the tags' location.

## System Overview

When attached to an asset, the tag transmits a broadcast message while it is moving. When the asset enters an area and comes to a stop, it initiates a series of communication events with reference location tags. The asset tag then transmits the results of this communication up to the server via the Gateway.

### Network Architecture

RFind uses flexible network architecture for communication pathways culminating in an open systems database residing on a server. Data from this server may be accessed through a collection of user interfaces through a web browser on a workstation or hand held device. Data may also be integrated into other management systems through our application programming interface (E2D-API). Refer to figure 1 for a depiction of the network architecture for the RFind system.



**Figure 1:** Network architecture for RFind system

Once this communication is complete the asset tag goes to a stationary power saving state and begins transmitting its heartbeat if turned on.

Finally, the tag may also operate in an idle state. This user-initiated state forces the tag to stop all transmitting and go into an RF quiet mode until a user sends a command to the tag to exit the idle state. This is desirable for applications requiring assets to travel in RF quiet zones.

## RFind Software

The RFind software system is referred to as Expedito 2D ('E2D'). There are several components in this system:

- Locating engine and database
- API
- E2D Core
- E2D Mapping

In order for the RTLS to function, it is necessary to install the locating engine and database on a server. All data that comes from the tags, gateways, and gateposts will be filtered through the locating engine and then reside in the database. All the data in the database is fully accessible through our comprehensive application programmer's interface (API). This means all functions, configuration settings, location data etc. held in the database is accessible through the API. All of the RFind applications are designed and built as web interfaces.

The E2D Core is an application that contains all the functionality used in performing configuration, commissioning, and administrative tasks. This core set of functions are typically one-time functions that are used during installation of the RTLS or reconfiguration of the RTLS. When the RFind system is integrated into other systems, this core set of functionality is most often accessed through the provided E2D Core.

The E2D Mapping application is an add-on application that provides additional user functionality through a web interface for locating and viewing assets on a map of the user's facility. The key functions are:

- Locating an asset
- Locating a group of assets by the asset type
- Viewing the asset on a map
- Zooming in on the location of the asset
- Sending a command to a specific asset tag to illuminate the LED (blink)
- Identify when an asset is in motion
- Identify when an asset has stopped

This application is perfect as a first step in deploying a RTLS management system. This application can be run and used by users to identify where assets are located while getting used to using an RTLS or while the integration to other applications is fine tuned. If the limit of functionality desired is locating where an asset is located then E2D Mapping can continue being used as a standalone system.

## Installation

The tag's back surface is suitable for applying adhesives, magnets, hook and loop fasteners, or double-sided tape to facilitate other methods of mounting the Tags to Assets. For additional mounting information, please refer to RFind's Installation Guidebook.

## Deployment

Before tags can be used by the RFind Expedito2D™ system, they must be commissioned as either an Asset or a Reference tag. Depending on what tag type is selected, the system will automatically send messages to the tags to configure them as the appropriate type.

There are several configuration options which can be established for the tag. These are:

- *Transmit Power*: Configurable from -30dBm to +10dBm.
- *Stationary Heartbeat*: Configurable from 0 to 4 minutes.
- *In-Motion Heartbeat*: Configurable from 0 to 18 hours.
- *Blink Duration*: Configurable from 0 to 255 seconds.

Presented here are some tips for different deployment types which can be used as a guide when preparing for a deployment at your site.

### I want to:

***Know roughly where an asset is in my facility. Then you should place your Reference tags:***

- Up high to get as much coverage as possible

- In a rectangular pattern where the Asset tag can reasonably be expected to be inside the boundary of a group of Reference tags
- Out of the way of objects which could interfere with transmissions from the Asset tags to the Reference tags. Objects such as metal shelving units or metal sheeting can have unexpected effects on radio transmissions.

*You should configure your Reference tags to use a relatively high transmit power.*

**I want to:**

***Know exactly what area (or station) my assets are in. You should place your Reference tags:***

- As close to the center of your stations as possible
- As far apart from one another as possible

*You should configure your Reference tags to use a relatively low transmit power.*

## Battery Replacement

The tag housing is designed to enable the user to replace batteries as required. The specific battery size and type will vary depending on the tag housing and version. Please consult the specific instructions provided with your asset tags for battery replacement, or use the support link at the end of this document to contact us.

The following steps will guide you through battery replacement in the standard reference tag format.

**Step 1:** Twist off the top cover of the tag by rotating counter clockwise





**Step 2:** Flip over the cover to remove and replace batteries.



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**Warning:** Lithium batteries can be harmful to the environment. Follow current procedures for safely disposing of used lithium batteries.

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Do not damage holders while removing. If the batteries are too tight to remove by hand, use a non-metallic tool to aid in gently lifting the battery out of its holder.

Ensure correct polarity during replacement, both batteries will have the same polarity as instructed on battery holder. Ensure that batteries are 3.6V A lithium batteries.

**Note:** New working batteries will cause the tag's LED to blink once long followed by two quick blinks. This device's memory is non-volatile, therefore no reconfiguration is required.

**Step 3:** Align the tops of the case cover and base and tighten by rotating clockwise approximately 360 degrees. Before tightening the tab with the hole and the smaller label slot should be aligned.



**Warning:** This product contains a lithium battery. To avoid possible explosion, do not recharge, crush, disassemble, heat above 212°F (100°C), incinerate or expose contents to water. Exchange only with approved part.

# Support

For support on any RFind Systems hardware, please contact us at:

RFind Systems, Inc.

[www.rfind.com](http://www.rfind.com)

email: [support@rfind.com](mailto:support@rfind.com)

Telephone: (250) 862-3412

