

AeroScout T2s Tag

User Guide

T2S-UG-080910-01

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Introduction

The AeroScout T2s Tag is a key component of the AeroScout Visibility System. The T2s Tag is a small Wi-Fi and active RFID device that enables the wireless network infrastructure to locate assets not connected to a wireless network. The tag can be attached to people and to a variety of equipment, such as medical devices, containers, manufacturing equipment and vehicles. This enables tagged items to be accurately located in real-time and in any environment – from tight indoor locations such as hospital floors to open outdoor spaces such as parking lots.

There is an option of the T2s Tag with a tamper proof design and there is an option for an embedded Ultrasound receiver.



Figure 1. AeroScout T2s Tag



Figure 2. AeroScout T2s Tag with a strap

T2s Tag Features

Motion Sensing

AeroScout T2s Tags contain on-board motion sensors. The motion sensor can be configured to trigger alerts. It also enables different transmission intervals for tags when they are stationary or in motion – which reduces unnecessary network traffic and conserves battery life.

Telemetry Functionality

The T2s Tags include a serial interface that enables customized connectivity to host units for data retrieval. The tags can be configured to retrieve data from the host periodically and to send the data together with location messages. Applications for this function may include reading mileage and fuel information from cars or reading temperature from shipping containers (such implementations require specific integration and additional hardware).

Call Button Functionality

An optional call button provides the capability to define events according to button pushes – such as for emergency alerting or parts replenishment. The tag can be configured to send different data depending on how the button is pressed: different messages can be associated with a long push of the button and with short, successive pushes.

Ultrasound Receiver

The T2s Tag can be equipped with an ultrasound receiver that picks up the ultrasound transmissions of EX4100 and EX4200 Ultrasound Exciters. The tag transmits the Exciter ID over the Wi-Fi network. The tag is equipped with a proprietary dilution algorithm that extends battery life.

Flexible Mounting and Usage Options

A wide variety of mounting options are available for AeroScout T2s Tags – screw mounts, adhesives, cradle, lanyard, badge clip, belt clip, Velcro and tie-wraps, and wrist straps. An optional cradle allows mounting the tag on a wide array of assets and in various environments.

Long Battery Life

A powerful, replaceable battery provides power for a period of up to 4 years. The Tag periodically provides a report on the battery level so that when the battery level runs low, it can be replaced efficiently with minimum down time. The AeroScout T2s Tag can also be easily deactivated in order to conserve battery power.

Tag Management

The T2s Tag can be programmed via a wireless interface using the AeroScout Tag Activator. Together with the AeroScout Tag Manager software it allows for easy and efficient Tag configuration, activation or deactivation and programming.

Tag Programmability and Storage

The T2s Tag can store up to 15 messages of 15 bytes each. These messages can either be pre-programmed via the Tag Manager or programmed on the fly by an AeroScout Exciter when a tag is in proximity to it. These messages can also be transmitted in addition to the standard location messages (the tags can be either configured to transmit one of the messages or triggered by an AeroScout Exciter to transmit a specific message).

Active RFID Functionality

Using the AeroScout Exciter, the tag sends out specific location reports upon arrival at chokepoints or gateways. The tag behavior can also be automatically modified while passing through a chokepoint such as a doorway or gate. This includes activating/deactivating tags or changing the tags' transmission rate to accommodate different usage patterns.

Compatibility and Non-interference

AeroScout Tags are 802.11b compatible. The tag's clear channel sensing techniques avoid interference with Wi-Fi networks. The use of the unlicensed 2.4GHz frequency band at low power levels ensures no interference with other wireless equipment, making AeroScout tags safe for use with such sensitive equipment as medical devices in a hospital.

Rugged Performance

AeroScout Tags are designed to function in harsh work environments and weather conditions. The tag enclosure is water-resistant, including immersion (IP-67) and designed to withstand significant physical shocks.

Tag Mounting

The AeroScout T2s Tag is enclosed in a compact case and offers a variety of mounting options described in this section.

Wrist Strap

Optional accessory - Can be used to strap the tag around the wrist.



Figure 3. AeroScout T2s Tag with Wrist Strap

Belt Clip

The optional belt clip comes with a cradle designed to attach T2s tags to a belt. Snap the tag into the cradle and attach it to the belt.

Badge Clip Mount

This optional accessory allows mounting T2s Tags using a badge clip



Figure 4. AeroScout badge clip mount

Follow these steps:

1. Snap the badge clip mount to the back of the tag.
2. Strap a badge clip to the flange.



Figure 5. AeroScout T2s Tag with badge clip mount

Magnetic Mount

This optional accessory allows mounting T2s Tags to person's shirt or scrubs, using a magnetic mount.

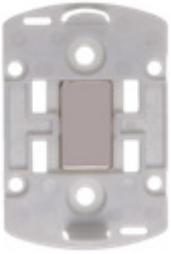


Figure 6. Magnetic Clip

Follow these steps:

1. Snap the tag to the magnetic clip.
2. Use the opposite plate to attach the tag to the scrubs or the shirt.



Figure 7. T2s Tag on a shirt using a magnetic clip

Using the Mounting Cradle

The mounting cradle allows you to fix the tag on surfaces where it cannot be attached using the adhesive material or the strap. Using the cradle, tags can be easily removed and replaced without the need to handle adhesives.

Fixing the Cradle to a Surface Using Screws

Follow these steps:

1. Screw the cradle on the asset, using two screws.

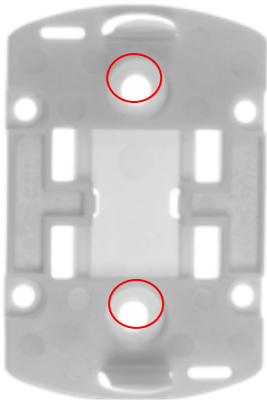


Figure 8.

2. Snap the tag into the cradle.

Securing the Tag to the Cradle

After snapping the tag into the cradle it is possible to secure the tag to the cradle using two straps.

1. Thread the cradle strap through the upper and lower strapping holes and the tag's upper and lower flanges.



Figure 9.

2. Thread the cradle strap through the strapping holes and the tag's back rail.



Figure 10.

3. Tie the strap around the front of the tag.

Attaching the Cradle to a Pole

You can attach the cradle to a pole using two narrow straps. Follow these steps:

1. Thread the cradle strap through the two pairs of strapping holes.

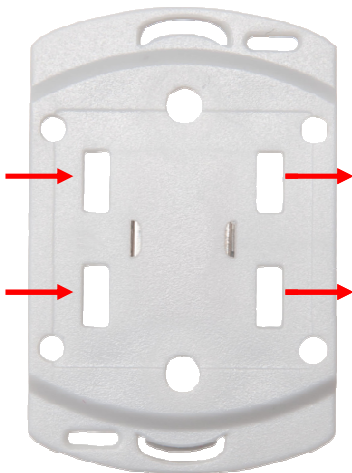


Figure 11.

2. Tie the straps to the pole.
3. Snap the tag into the cradle (or first tie the tag to the cradle and then attach it to the pole).



Figure 12.

Removing Tags

Removing a Tag from a Cradle

The cradle holds the tag tightly. To detach the tag from the cradle, press the two knobs of the cradle from both sides using your fingers.



Figure 13.



Figure 14

Tag Management

The AeroScout T2s Tag can be configured, programmed and activated via a wireless interface. This is done with the help of the AeroScout Tag Manager application and the AeroScout Tag Activator.

In addition, Tag Manager is used to activate and deactivate tags and to program stored messages on the tags.

The Tag Manager functions can also be activated via APIs that enable easy integration with third-party applications.



Note

Use Tag Manager Software version 4.04.04 and above to configure and activate T2s Tags

Please refer to *AeroScout Tag Manager User Guide* and *AeroScout Tag Manager API User Guide*.

Tag Maintenance

Replacing the Internal Battery

The AeroScout Tag uses one 3.6V Lithium Thionyl Chloride (LTC) ½ AA size cell. This internal battery can last up to 4 years depending on the configured tag parameters (e.g. the transmission interval rate).



Figure 15. T2s Tag Battery

To replace a battery:

1. Deactivate the tag with Tag Activator and Tag Manager (recommended).
2. Remove the rear panel by unscrewing the case screws.
3. Disconnect the battery connector from the board
4. Carefully remove the old battery from the battery holder.

**Note**

Do not use a metal object to remove the battery

5. Connect the battery connector to the board.
6. Install a new 3.6V lithium Thionyl Chloride ½ 'AA' size battery in the battery holder.



WARNING: Use only batteries that have been approved by AeroScout. There is a danger of fatal tag damage if the battery is replaced incorrectly or by an incorrect type. Dispose used batteries according to the instructions.

7. Close the rear panel.
8. Activate the tag.
9. Dispose of the old Lithium Thionyl Chloride battery properly.



WARNING: Local regulations vary. Federal regulations allow up to 100 kg./month of Lithium Thionyl chloride batteries to be disposed in common landfill. All leads (the terminals) should be taped to prevent short circuit. The user is responsible for safe disposal.

Tag Battery Life

Table 1 presents battery life estimates for a new T2s tag battery. The parameters that affect battery life include the tag transmission interval and the number of transmission channels configured for the tag.



Note

The calculations in the table below are true for an operating temperature of 20°C. The calculations do not take into consideration additional factors such as Exciter activations of Tag, since these are individual parameters.

Transmission Interval	Estimated Battery Life for: 1 channel, 1 transmission repetition	Estimated Battery Life for: 1 channel, 2 transmission repetitions	Estimated Battery Life for: 3 channels, 1 transmission repetition	Estimated Battery Life for: 3 channels, 2 transmission repetitions
1 second	61 days	47 days	26 days	19 days
5 seconds	266 days	158 days	104 days	59 days
10 seconds	1.3 years	278 days	192 days	107 days
30 seconds	2.4 years	1.67 years	1.26 years	272 days
1 minute	3.1 years	2.42 years	1.96 years	1.27 years
3 minutes	3.9 years	3.47 years	3.13 years	2.41 years
5 minutes	4.1 years	3.81 years	3.55 years	2.95 years
30 minutes	4.39 years	4.33 years	4.27 years	4.1 years
1 hour	4.42 years	4.39 years	4.36 years	4.27 years

Table 1 – T2 Tag Battery Life

Cleaning the Tag

Cleaning the external surface of the Tag's housings can be done using Alcohol or Chloride based wipers only

T2s Tag Models

AeroScout T2 Tag	Comments	Model
AeroScout T2s Tag	Includes 1/2AA Lithium battery and motion sensor	TAG-2300
AeroScout T2s Tag with Call Button	Includes 1/2AA Lithium battery, call button and motion sensor	TAG-2300-C

AeroScout T2 Tag	Comments	Model
AeroScout T2s Tag with Ultrasound Receiver	Includes 1/2AA Lithium battery, motion sensor and ultrasound receiver	TAG-2300-U
AeroScout T2s Tag with Ultrasound Receiver and Call Button	Includes 1/2AA Lithium battery, motion sensor, ultrasound receiver and a Call Button	TAG-2300-CU

Table 2 – Regular T2s Tag Models

Tag Accessory Models

Mounting Accessories	Comments	Model
Tag cradle	For attaching the tag to a pole or similar surface.	TAC-255
T2s Tag Wrist Straps 50-pack	Suitable for T2 Tags attachment to the wrist	TAC-221
Velcro Attachment Kit 50-pack	Velcro Patches	TAC-030
Double-sided Tape Attachment Kit 50-pack	Adhesive Tape patches	TAC-031
Screw Kit		TAC-065
Tie Wraps 2"		TAC-060
T2s Badge Clip 20-pack		TAC-210
T2s Badge Clip Mount 20-pack		TAC-280
T2s Belt Clip 20-pack		TAC-085
Velcro straps	300mm/110mm	TAC-035/036
T2s Tag magnetic mount 20-pack		TAC-290
T2s Tag battery 25-pack		TAC-232
White Neck Straps	Without / With AeroScout logo	TAC-070/071
Tag Management		
Tag Management Suite	Includes Tag Activator, Tag Manager Software and 110/220V to 12V adaptor	

Mounting Accessories	Comments	Model
US Suite	Includes 110/220v to 12v adapter (US)	BWH-1000-02-TA-U
Europe Suite	Includes 110/220v to 12v adapter (Europe)	BWH-1000-02-TA-E
Japan Suite	Includes 110/220v to 12v adapter (Japan)	BWH-1000-02-TA-J
UK Suite	Includes 110/220v to 12v adapter (UK)	BWH-1000-02-TA-UK
Other		
Tag Battery 25-Pack		TAC-230
Tag Battery 50-Pack		TAC-231

Table 3 – Tag Accessory Models

Specifications

Tag Specifications

Performance

- Outdoor range: Up to 200m (600 feet)
- Indoor range: Up to 80m (180 feet)

Physical and Mechanical

- Dimensions: 45mm x 31mm x 18mm (1.7in x 1.2in x 0.7in)
- Weight: 1.4oz (40g)

Radio

- 802.11b radio (2.4GHz)
- Low frequency receiver (125kHz)
- Transmission power: up to +19dBm, ~81mW
- Clear channel sensing avoids interference with wireless networks

Ultrasound Receiver

- Frequency 40KHz

Environmental Specifications

- Temperature: -30°C to +75°C (-22°F to 167°F)
- Humidity: 0 to 100%, condensing
- The housing is water and dust resistant and includes a rubber lining.
- IP-67

Electrical

- 3.6V Lithium ½ AA battery (replaceable)
- Battery life: up to 4 years

Certification

Radio:

- FCC Part 15, sub-part C class B, sub-part B
- EN 300-328, EN 300-330, EN 301-489
- RSS 210 (Canada)
- ARIB STD-T66 (Japan), ARIB STD-33 (Japan)
- MIC (Korea)

Safety:

- CE
- cTUVus (EN60950)

US Patents

- 6,963,289
- 7,295,115
- 7,552,049 B2
- 7,403,108 B2

Safety and Warnings

FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician.

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- a) This device may not cause harmful interference
- b) This device must accept any interference received, including interference that may cause undesired operation.

FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

Limited Warranty

Hardware. AeroScout Inc. ("AeroScout") warrants that commencing from the date of delivery to Customer and continuing for a period of one (1) year thereafter (the "Warranty Period"), the Hardware will be free from defects in material and workmanship under normal use subject to terms hereof. The date of shipment of a Product by AeroScout is set forth on the packaging material in which the Product is shipped. This limited warranty extends only to the original user of the Product. Customer's sole and exclusive remedy and the entire liability of AeroScout and its suppliers under this limited warranty will be, at AeroScout's or its service center's option, shipment of a replacement within the period or a refund of the purchase price if the Hardware is returned to the party supplying it to Customer, if different than AeroScout, freight and insurance prepaid. AeroScout replacement parts used in Hardware repair may be new or equivalent to new. AeroScout's obligations hereunder are conditioned upon the return of affected articles in accordance with AeroScout's then-current Return Material Authorization (RMA) procedures.

Restrictions: This warranty does not apply if the Product (a) has been altered, except by AeroScout, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by AeroScout, (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident; or (d) is provided for beta, evaluation, testing, or demonstration purposes for which AeroScout does not receive a payment of purchase price or license fee.

Exclusions:

This warranty shall have no coverage of the following:

- Batteries (other than DOA -Dead On Arrival)
- Plastics (including defects in appearance, cosmetics, decorative or structural items including framing and non-operative parts).
- Tag Calibration
- Expenses related to removing or reinstalling the Product

Defects or damage that result from the use of Non-AeroScout certified Products, Accessories, Software or other peripheral equipment are excluded from coverage.

Defects or damages resulting from service, testing, adjustment, installation, maintenance, alteration, or modification in any way by someone other than AeroScout, or its partners, are excluded from coverage.

Extended Warranty:

AeroScout offers an extended warranty. The initial year of the extended warranty must be purchased at the time of the product purchase or before the original warranty expires. The extended warranty may be renewed again for a maximum of two additional years (on top of the initial warranty period). Warranty extensions must be purchased prior to the existing warranty expiration and will not be available after the original/extended warranty expires.

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This disclaimer and exclusion shall apply even if the express warranty set forth above fails of its essential purpose. Under no circumstances shall AeroScout's liability under this limited warranty exceed the actual cash value of the Product at the time Consumer returns the Product for repair, determined by the price paid by Consumer for the Product less a reasonable amount for usage.

Please use the following link to submit your tickets using AeroScout's support portal:

<http://support.aeroscout.com>

About AeroScout

AeroScout is the market leader in Unified Asset Visibility solutions. Clients improve operational efficiency and quality using AeroScout products that leverage standard Wi-Fi networks to track and manage the location, condition and status of mobile assets and people. AeroScout's global customer base consists of leading hospital, manufacturing and logistics organizations, including many of the Fortune 500. The company originally invented the first Wi-Fi-based Active RFID tag, and today is widely recognized as leading the market in number of deployments and tags shipped. Headquartered in Redwood City, Calif., AeroScout has offices in Europe, Asia, the Middle East, Latin America and Australia. For more information, please visit www.aeroscout.com.

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