AeroScout
Enterprise Visibility Solutions

AeroScout Exciter

Version 1.0

User's Manual

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Introduction

The AeroScout Exciter is a component of the AeroScout suite of enterprise visibility solutions that enables location-based applications. The Exciter extends the AeroScout suite to provide robust and sophisticated RFID detection capabilities, using the same AeroScout tags that can also be accurately located in real time by the AeroScout system.

The Exciter triggers AeroScout's T2 tags as they pass through a choke point, and those transmit a message to AeroScout Location Receiver(s) in range.

This provides instant acknowledgment that a tagged asset passed through a gate, doorway or some other well-defined area. The detection capabilities of the Exciter, combined with the location features of the AeroScout Location System, make the AeroScout suite the most sophisticated enterprise visibility solution for a wide variety of industries.
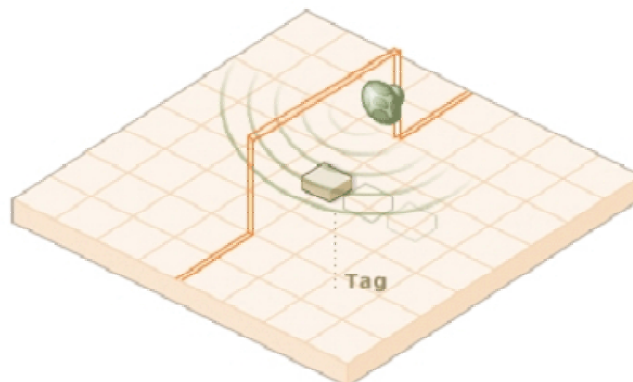
Figure 1: Exciter positioned at choke point triggering a tag

Application and Industry Examples

High value asset tracking

Health care facilities and general enterprises can tag valuable assets that are intended to stay within a certain area. The AeroScout system can track the location of those assets, and if they leave through an exit or enter a restricted area, the Exciter triggers a tag message.

Process control

Manufacturing and supply chain facilities can track the location and presence of equipment and in-process inventory as it moves through the production process. This gives an enterprise a real-time view of which (and how many) assets have passed each step in the process, enabling better supply chain management.

Inventory management

Logistics and manufacturing enterprises can automatically update inventory records as inventory enters and leaves the warehouse, ensuring real-time knowledge of levels without manual checks or physical scanning.

Security applications

Government agencies and enterprises can tag secure assets and people that are restricted to certain areas or require historical location tracking. If those assets leave through an exit or enter a restricted area, Exciter triggers a tag message.

Features

Long range RFID detection of AeroScout T2 tags

Triggering the tags to transmit as they pass through a defined area, Exciters reach up to a 6m (18 ft) range, enough to cover wide gate areas.

Tag behavior modification:

Wireless activation and deactivation of tags. Tag battery life can be extended further by switching the tags off when they leave a defined tracking area through a gate or doorway.

Change of tag transmission rate temporarily or indefinitely to accommodate different usage patterns in various physical spaces.

Message Programming functions

Provide the ability to use the Exciter to store messages on the tag for later transmission. Message transmission can later be triggered by other Exciters, enabling sophisticated process control functions.

Exciters can trigger a tag to:

- Send up to 10 bytes of data
- Transmit one of 10 pre-stored messages
- Send and store up to 10 bytes of data

Rugged IP66 NEMA 4X-rated enclosure

To use in any hostile indoor or outdoor environment and in a wide temperature range.

Ethernet connectivity

Enables centralized programming, monitoring and software updates by the AeroScout Engine.

Exciter Hardware

The AeroScout Exciter includes:

- NEMA 4X rated enclosure

- Single Ethernet interface

- Single power connector

- 110/220VAC power adapter (internal)

- Wall mounting kit.

Figure 2. AeroScout Exciter in NEMA Housing

Connectors Panel

Figure 3 describes the Exciter connectors panel (bottom panel).

Figure 3. AeroScout Exciter Connectors Panel

1. Ethernet LAN Connection – In a configuration that uses physical Ethernet cable connection to the LAN, the network cable is attached here. Permanent connection to a wired network is not mandatory. However you

must have a wired connection for configuring the Exciter. In addition, some of the monitoring functions will not be available if the Exciter is not wired.

The LAN connector is not sealed if the Ethernet RJ-45 cable is just plugged into the connector. In order to seal it, use the *sealing adapter* shown in Figure 4, which is supplied with the Exciter. The CAT5 cable must be threaded through the adapter prior to clamping the RJ-45 connector. After connecting the RJ-45 to the connector on the Exciter, the adapter should be fastened to the LAN connector base (**1**).

Figure 4. Ethernet LAN connection sealing adapter

The *protective cap* supplied with the Exciter (see Figure 5) is also fastened to the cover base (**1**). When working in standalone mode (without a permanent wired LAN connection), this cap should be used to seal the LAN connection.
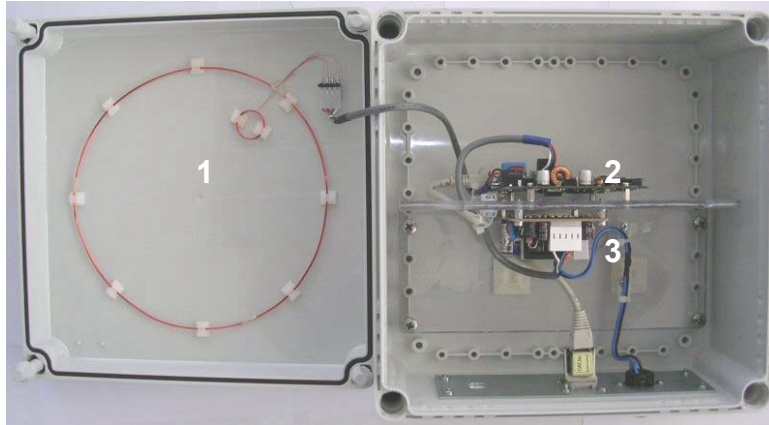

Figure 5. Ethernet LAN connection protective cap

2. Power jack – 110/220VAC. The power adapter plug (see Figure 6) supplied with the Exciter, should be assembled to a power cord and connected to the power jack.

Figure 6. Power adapter plug

Exciter Components

1. 2 LF (Low Frequency) antennas
2. Exciter boards
3. AC/DC converter

Installing the Exciter

This section explains how to install an Exciter unit.

Preparing the Cables and Connectors

Network:
Connect the LAN cable to the LAN connection on the Exciter.

Power:
Connect the power cable to the power jack.

Configuring the Exciter

Exciters are configured using the AeroScout System Manager. The configuration settings consist of device installation and network definitions. The configuration procedure involves the following steps:

1. Connect all Exciters with a wired Ethernet connection to a dedicated segment.

2. Add the Exciters to the system and define their IP settings (IP, subnet, gateway, ports) in the System Manager.

3. Verify that the Exciters' status is OK.

4. Position the Exciter in the site according to site survey recommendations, and mount it.

5. Align the Exciters' positions according to the required area coverage.

6. Configure the Exciter's settings. The following are the Exciter's configurable parameters:

   - Name

   - ID

   - IP address

   - Port

   - Coordinates of its location

   - Transmission range: up to 6m

   - Transmission Interval: the interval between two consecutive messages transmitted by the Exciter (10msec – 1000msec).

   - Exciter events define the required tag response after they are triggered by the Exciter:

     - Send Exciter ID
     - Send Exciter ID and change tag transmission mode
     - Send Exciter ID and send a data message
     - Send Exciter ID, store a data message and send it.
     - Send Exciter ID and send one of the data messages stored on the tag.
     - Activate tag
     - Deactivate tag

Note

The configuration process is explained in detail in the *AeroScout Engine User's Manual (version 2.4 and above)*.

Mounting the Exciter

Mounting the Exciter on a Wall

The Exciter can be mounted on a wall using the wall mounting kit (provided with the Exciter). The wall mounting kit includes four fastening ear lugs that can be connected to the four corners of the Exciter housing as shown in Figure 7.
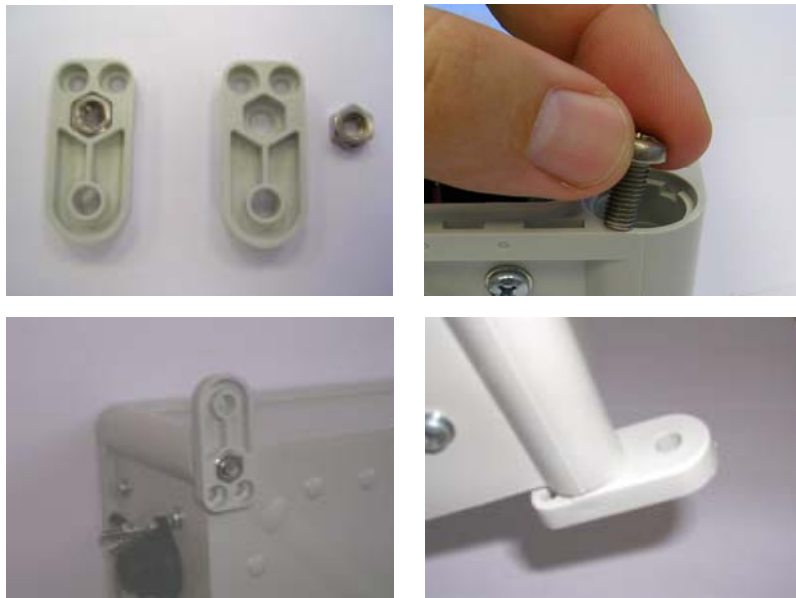
Figure 7. Exciter Wall Mounting Kit

Mounting the Exciter on a Pole

The Exciter can be mounted on a pole using the pole mounting kit, as shown in Figure 8.

The Pole Mounting Kit is an optional accessory that can be acquired separately. It is available in 2 sizes:

- Pole Mounting Kit 50-70mm: For 50-70mm-diameter pole

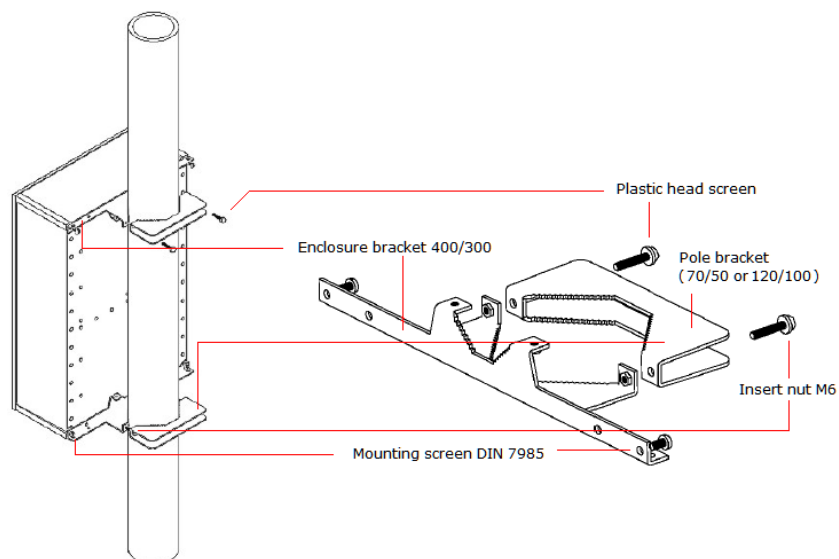- Pole Mounting Kit 100-120mm: For 100-120mm-diameter pole

Figure 8. Exciter Pole Mounting Kit

Exciter and Accessories Model Numbers

Exciter	Comments	Model Number
AeroScout Exciter	Includes NEMA 4X rated enclosure, single Ethernet interface, 110/220VAC power, wall mounting kit	EX-1000
Mounting Accessories		
Wall mounting kit		NAC-100
Pole mounting kit 50-70mm		NAC-110
Pole mounting kit 100-120mm		NAC-111

Exciter Specifications

Range

- Adjustable range up to 6 m (18 feet)
- Supports AeroScout T2 Tags

Physical and Mechanical

- Dimensions (mm): 280 x 280 x 130
- Dimensions (inches): 11 x 11 x 5.1
- Weight (kg): 1.5
- Housing: IP66, NEMA 4X-rated enclosure

Network Interface

- Ethernet (RJ-45)

Power

- Input voltage: 110/220VAC 50/60Hz
- Maximum Power Dissipation: 4.5W

Management

- All settings configured remotely using AeroScout Engine's System Manager.

Environmental Specifications

- Operating temperature: -20°C to +60°C (-4°F to 140°F)

- Humidity: 0 to 95%, non-condensing

LF Channel

- 125kHz

- Field intensity limits: 28.4dBμA/m at 10m (ETSI)

- Propagation limits: 11μV/m at 300m (FCC)

- Modulation: ASK

Certification

- FCC Part 15, sub-part C class B, sub-part B

- EN 300-330, EN 301-489

- Safety: CE

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.

Warranty

Hardware. AeroScout Inc. ("AeroScout"), warrants that commencing from the date of delivery to Customer, and continuing for a period of one year the Hardware will be free from defects in material and workmanship under normal use. 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 returned 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 sold for beta, evaluation, testing, or demonstration purposes for which AeroScout does not receive a payment of purchase price or license fee.

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