Installation Guide

Savi ST-673 Sensor Tag with Metallic Container Mount

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Documentation for SaviTag ST-673

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Savi ST-673 Sensor Tag Description

The Savi ST-673 tag is an active RFID tag that enables real-time tracking and environmental monitoring of sensitive, perishable items such as medical supplies, food stuff, and ammunition. The ST-673 features sensors that monitor and log the temperature and humidity of assets and their contents during transportation and while in storage. The external mounting bracket allows an externally-mounted ST-673 to monitor the contents of a sealed container.

Figure 1: Front view

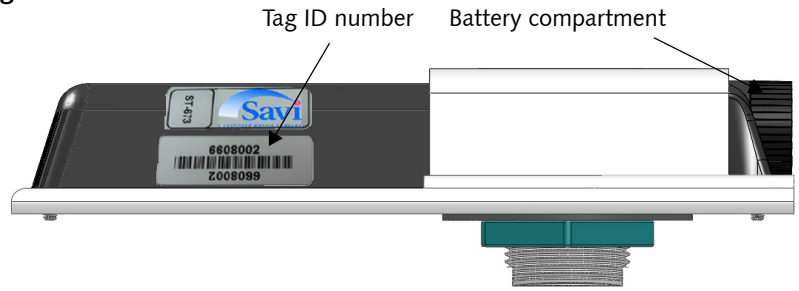


Figure 2: Rear view

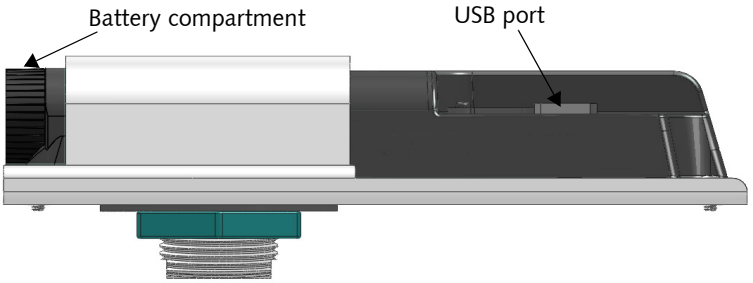


Figure 3: Features

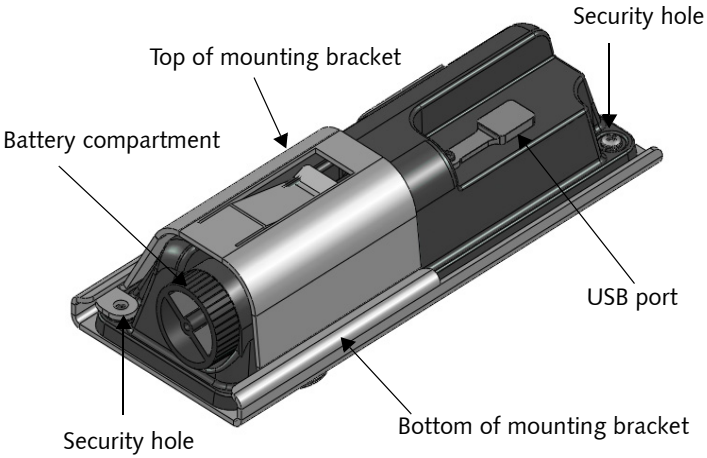
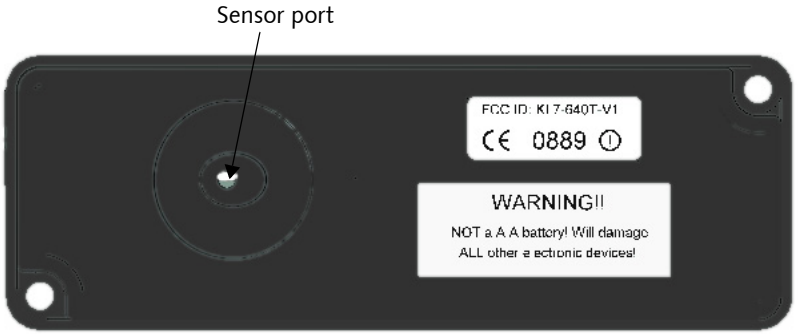


Figure 4: Bottom view



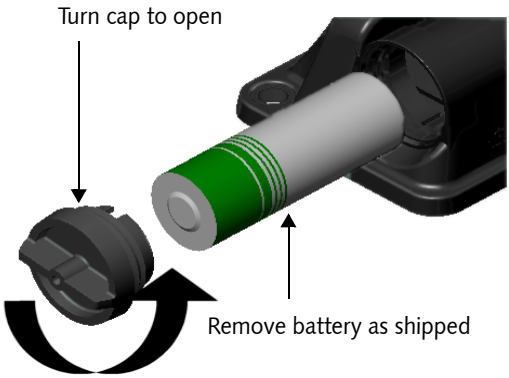
Features

- ISO 18000-7 compliant active RFID tag with environmental sensor capability
- Ideal for tracking sensitive items such as medical supplies, food, and ammunition
- Mounting bracket for attaching tag to metallic assets
- Supports low-frequency technology for more precise locating capabilities
- Supports USB for reading and writing
- FCC, HERO, ETSI, RoHS (Directive 2002/95/EC) certified

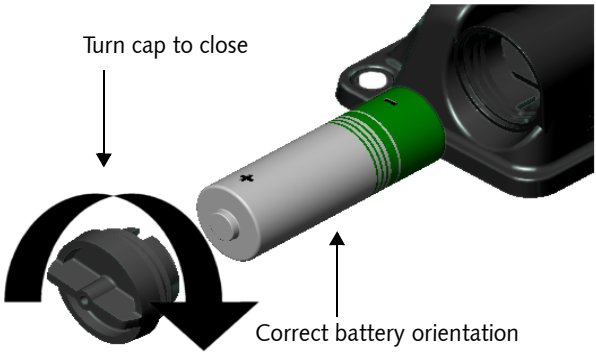
Activating the Tag

The tag is shipped in sleep mode. You must remove and re-insert the battery to wake up the tag. After you re-insert the battery, you can initialize the tag.

1. Remove the battery cap.



2. Remove the battery. Wait a few seconds and then reinsert the battery, matching the negative (–) and positive (+) terminals to the symbols shown on the tag housing. The tag will not work if you install the battery in the wrong direction (reversed).



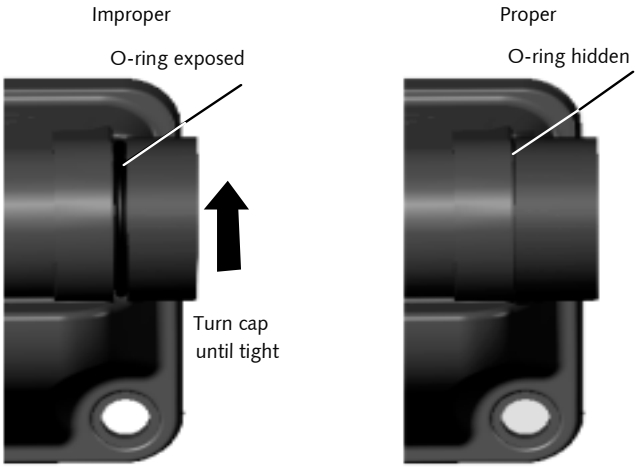
Whenever a battery is inserted into a tag, the tag will emit 5 beeps.

Then, if the tag emits a long (1/2 second beep), that means it has an internal sensor failure.

Then, the tag will emit 2 short beeps to indicate adequate battery voltage or 3 short beeps if a fresh battery is required.

Whenever a battery is inserted into a tag, the tag assumes that it is a fresh battery. Inserting a used battery into a tag may result in what appears to be a premature battery failure.

3. Replace the battery cap on the tag. **Continue tightening the cap until it is secure**.



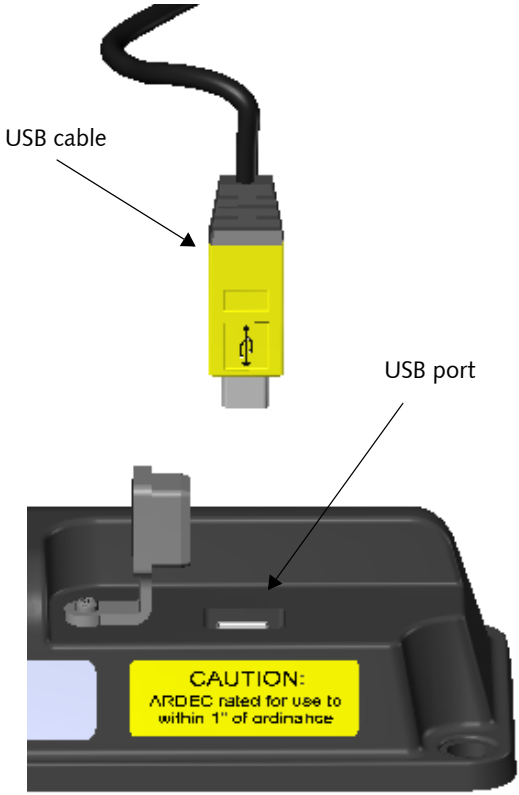
If the O-ring is not properly compressed by the cap, water leakage and damage may occur.

Note: When the tag is not in use, disable the tag by removing, reversing, and re-inserting the battery. Store the battery at room temperature (50-80 °F or 10-27 °C).

Initializing the Tag

Once you activate the tag, you can initialize it for immediate use.

1. Unplug the USB port cover.
2. Insert the USB cable into the USB port on the tag and connect the other end to the USB port on the computer.



3. Refer to the *Savi SmartChain Mobile User Guide* or the *Savi SmartChain WorkStation User Guide* for instructions on the initialization process.

Placing Tags on Jet Engine Shipping Containers

The Savi ST-673 Sensor Tag in the supplied metal mounting sleeve attaches through the ports on the jet engine container to monitor humidity inside the shipping container.

There are a variety of jet engine shipping container configurations. Some have the mounting hole for the tag on the bottom of the container; others have a hole for the tag higher up on a side.

In many cases the top of the container may end up on a different bottom platform, in which case the tag should be on the bottom section.

The tag will have a 100-foot (30m) read/write range to Savi SR-650 Fixed Readers when mounted a foot or less above the ground, up to a range of 300-feet (100m) when mounted 3 or more feet (1m or more) above ground level. For the most consistent communications with the tag, the Fixed Readers must be mounted:

- to have an unobstructed line-of-sight to the tag
- at 20 feet (6m) or higher

  caution: Tags mounted close to the ground may have less range.

Mounting the Tag

Mounting the tag requires screws and a metal mounting sleeve. The tag, in the supplied metal mounting sleeve, attaches through the ports on the jet engine container to monitor humidity inside the shipping container.

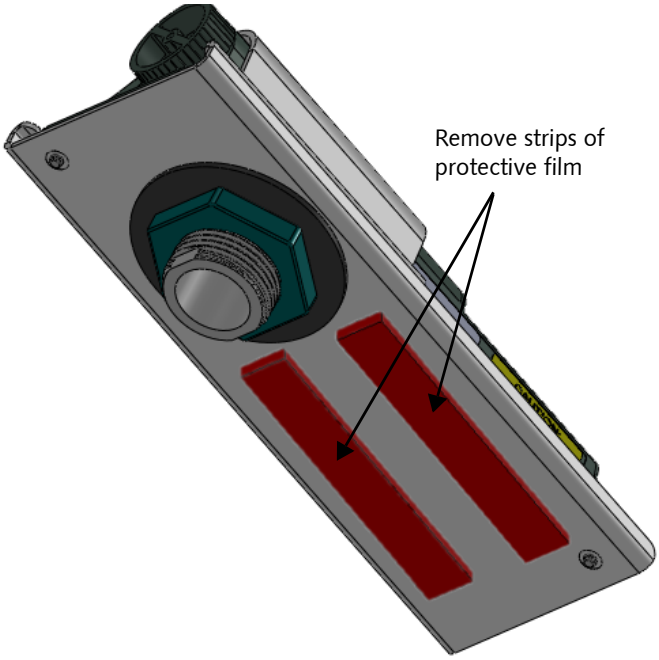
The ST-673 includes these required mounting fasteners:

- Stainless steel screws and washers
- Metal mounting sleeve

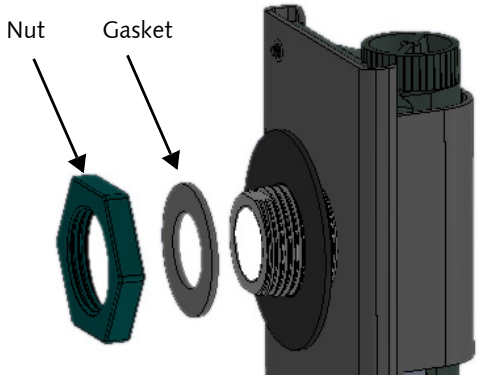
Mounting the Tag on a Jet Engine Container

You receive the tag and metal mounting bracket fully assembled. Follow the instructions to mount the unit onto a jet engine container.

1. Carefully remove the red protective film covering from the pressure sensitive tape (PST) on the bottom of the bracket. Avoid touching the PST adhesive.



2. Open the jet engine container and locate the container port. This is the opening for the tag mounting bracket.
3. Unscrew the nut on the mounting bracket.



4. Remove the small rubber gasket washer from the mounting bracket.
5. To mount the tag, insert the mounting bracket and tag into the port opening.
6. Apply pressure to the tape strips by pushing firmly against the tag. Press as hard as possible on the top of the bracket and tag.
7. On the inside of the container, replace the small rubber gasket washer and screw the nut onto the hollow screw stem to secure the tag. Close the jet engine container.
8. If the port opening on the container is too large for the tag to be mounted securely, insert a metal shoulder washer before replacing the rubber washer and nut. Ensure that the lip on the metal shoulder washer is inserted through the orifice and is facing the outside of the container. The metal shoulder washer must be ordered separately.

Replacing the Battery

The tag is equipped with non-volatile memory, which means stored data is not lost when you replace the battery.

1. Remove the battery cap.
2. Remove the discharged battery from its compartment.

   For more information, see “Activating the Tag” on page 7.The lithium battery can be harmful to the environment. Follow current procedures for safely disposing of lithium batteries. The battery cannot be reused or recharged.
3. Install a 3.6V lithium "A" battery, matching the negative (–) and positive (+) terminals to the symbols shown on the tag housing. The tag will not work if you install the battery in the wrong direction (reversed).
4. Replace the battery cap on the tag.

   Whenever a battery is inserted into a tag, the tag will emit 5 short beeps, one second apart.

   Then, if the tag emits a long (1/2 second beep), that means it has an internal sensor failure. Remove the battery and insert it again. If the tag emits the same long (1/2 second) beep, do not use the tag.

   Then, the tag will emit 2 short beeps to indicate adequate battery voltage or 3 beeps to indicate inadequate battery voltage. 3 short beeps means the tag needs a fresh battery.

   Whenever a battery is inserted into a tag, the tag assumes that it is a fresh battery. Inserting a used battery into a tag may result in what appears to be a premature battery failure.

   After the beep, continue tightening the cap until it is secure.

Contacting Savi Support

If you cannot find the information you need, contact Savi Support Services.

- Check http://supportcenter.savi.com for contact information.
- Send an email to help@savi.com.
- Call 1-888-994-SAVI (North America only) or 1-650-316-4760 between 5 a.m. and 5 p.m. Pacific time.

When you contact Savi Support Services by telephone or email, have the following information available:

- Contact information (company name, your name, email, and phone number)
- Problem description
- Software version
- Product type
- Serial number or license information

Specifications

Model Numbers	ST-673-030: Sensor tag with metallic container mount
Physical Characteristics	Dimensions: 6.2 in. (16 cm) x 2.5 in. (6.4 cm) x 1.1 in. (2.8 cm) Weight: 12.6 ounces (357g) Color: Black
Environmental	Temperature: -32°C to +70°C operating; -40°C to +85°C storage Humidity: 95% non-condensing Vibration and shock: MIL-STD-810F Weatherproofing: IP64 Manufacturing: RoHS Directive 2002/95/EC
Wireless (UHF Transceiver)	Frequency: 433 MHz Communication range (unobstructed): 400 ft. (122m) operating read/write range (outdoors, non-obstructed) from Savi SR-650 reader Protocols: ISO 18000-7, EchoPoint
Wireless (LF Receiver)	Frequency: 123 kHz Range: Greater than 20 ft. (6m) from SP-651-211 Signpost or SP-652-211 Signpost Reader Protocol: EchoPoint
Power	Battery type: 3.6 volt lithium-ion, replaceable by user without tools Battery life: Approximately 4 years at 2 collections per day. Over-polling protection algorithm to extend battery life

Digital	Sensor memory: 32 Kbytes on-board non-volatile memory Database memory: 128 Kbytes on-board non-volatile memory Wired interface: USB 1.1, USB 2.0
Accessories	Mounting bracket for attaching tag to metallic assets (included)
Approvals	Radio Type Approval: FCC Part 15, EN 300 220 (433 MHz) EMC and Immunity: EN 301 489 Ordnance: HERO Certified, ARDEC rating of 1 in. (2.5 cm)
Environmental Sensors	Temperature: Senses and samples temperature with adjustable sample period and adjustable alarm thresholds Humidity: Senses and samples humidity with adjustable sample period and adjustable alarm thresholds