

Installation Guide

Savi ST-675 Container Security Tag



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Documentation for SaviTag ST-675

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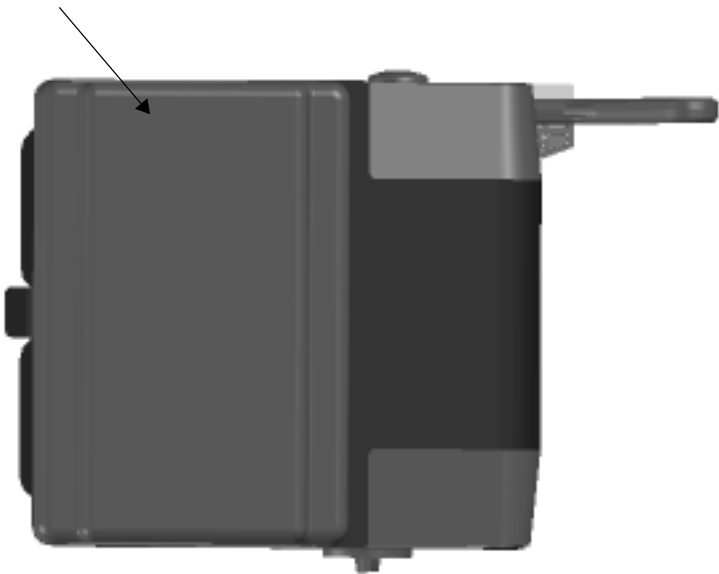
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Savi ST-675 Container Security Tag Description

The Savi ST-675 tag is an active RFID container security tag with intrusion and environmental sensors. The ST-675's sensor arm detects the open/closed state of the shipping container door, and the intrusion light sensor monitors the amount of light entering the container. These intrusion sensors detect potential theft or tampering. The temperature, humidity, and shock sensors monitor environmental conditions to prevent spoilage or damage to goods. In congested RF environments where tags are polled repetitively, the ST-675's over-polling detection and protection algorithm preserves battery life.

Figure 1: Savi ST-675 Container Security Tag (front view)

Antenna



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Figure 2: Top view

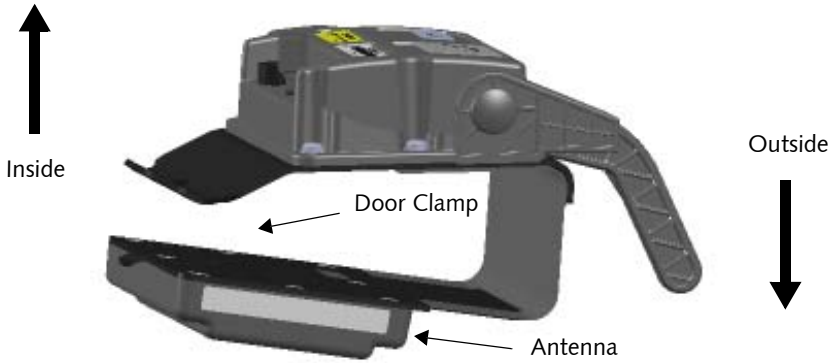
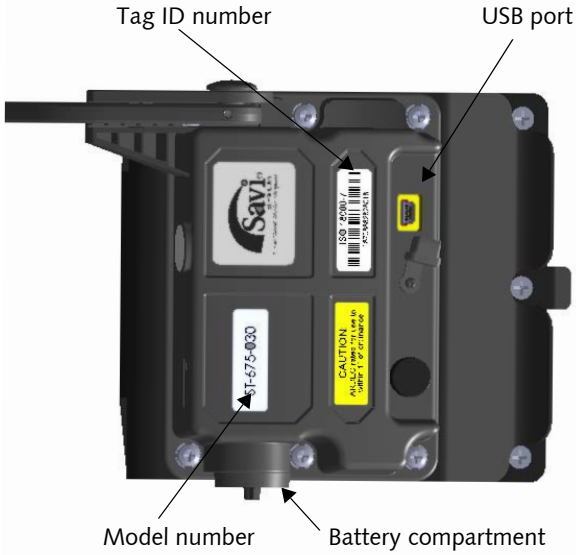


Figure 3: Rear view



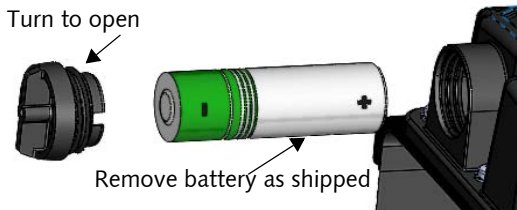
Features

- ISO 18000-7 compliant active RFID tag with environmental sensor capability
- Sensors monitor security status and environmental conditions inside shipping container
- Unique C-clamp, door-mounted design
- Supports low frequency technology for more precise locating capabilities
- FCC, HERO, ETSI, RoHS (Directive 2002/95/EC) certified

Activating the Tag

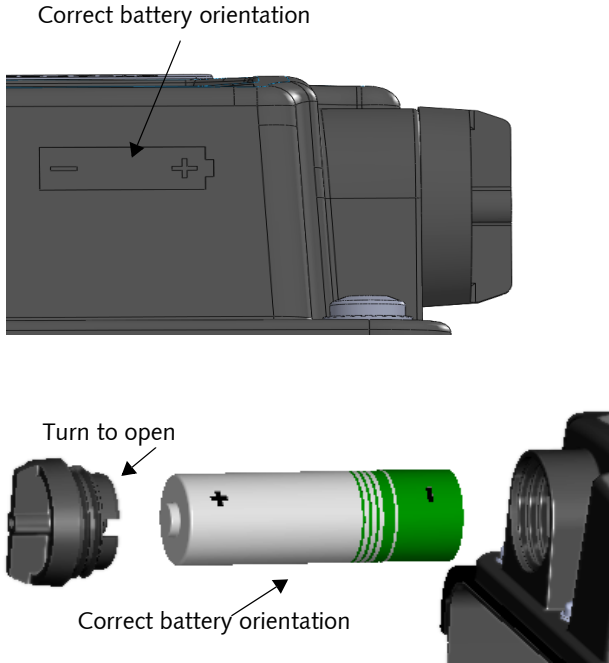
The tag is shipped in sleep mode. You must remove and re-insert the battery to wake up the tag. After you re-insert the battery, you can initialize the tag.

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).

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

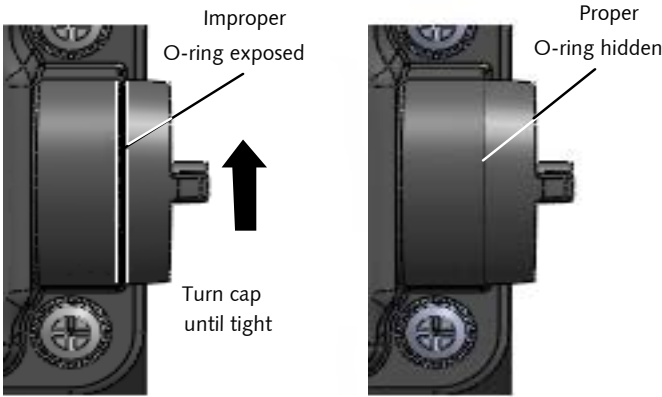
Then, if the tag emits a long (1/2 second beep), that means it has an internal sensor failure.

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.**

Initializing the Tag



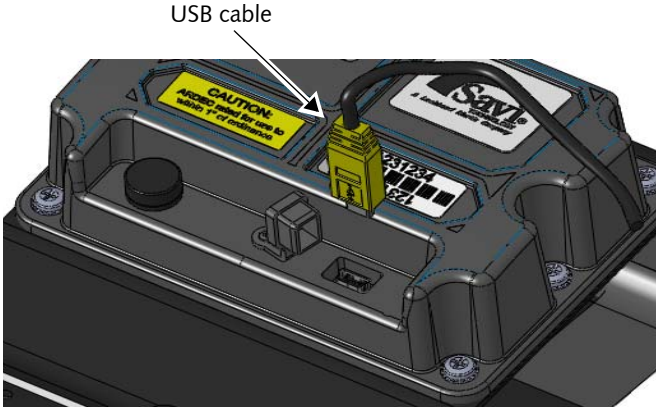
If the O-ring is not properly compressed by the cap, water leakage and damage may occur.

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 the Tag for Best Performance

Savi Technology recommends that you mount the tag on a flat surface, with the tag aligned vertically. For best performance, place the tag as high as possible, safe from impact (for example, between the ribs of an ISO-type shipping container), and away from obstructions on the asset.

For best performance, make sure the tag is:

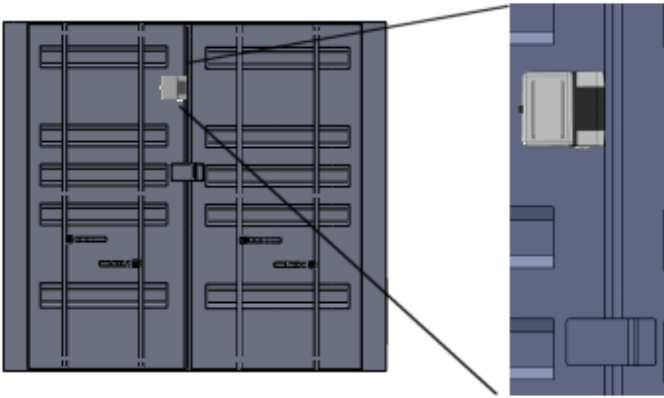
- Mounted on a metal surface.
- Mounted at no less than a 6 foot (1.8m) elevation.
- Mounted vertically.
- Not mounted behind or between metal objects

Placing the Tag for Best Performance

- Mounted on the container door higher than the closing and locking mechanism.

The next figure shows an example of a security tag mounted on an ISO container door.

Figure 4: Security tag mounted on an ISO container door



Note: Make sure you clean the surface of the container or other asset before attaching the tag.

The tag will have 400-foot (122m) read/write range to Savi SR-650 Fixed Readers. For the most consistent communications with the tag, the Fixed Readers must be mounted:

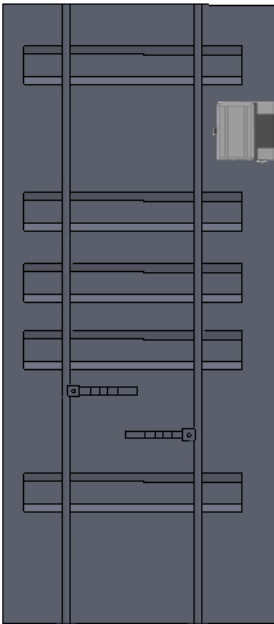
- to have an unobstructed line-of-sight to the tag
- at 20 feet (6m) or higher

Follow the instructions in the Savi Fixed Reader documentation to locate and position the Savi Fixed Reader for best performance.

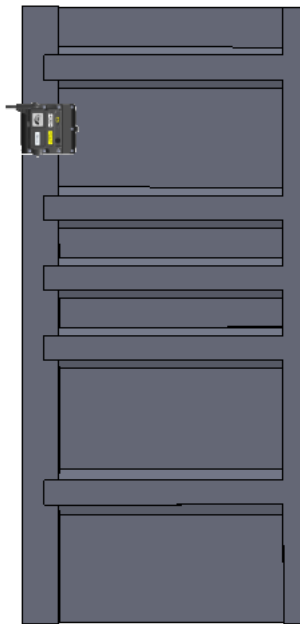
Mounting the Tag

1. Open the right door of the container.
2. Using both hands, push the C-clamp on the tag onto the edge of the *left* door until it is on as far as it can go.

Left door outside view



Left door inside view



3. Flip the door sensor arm to the *right* position so it can contact the inside of the right door when it closes.
4. Close the right door. The door sensor arm is now armed and in position to trigger if the container is opened.

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

Specifications

Model Numbers	ST-675-030: Container security tag ST-675-030-NSN: Container security tag with label
Physical Characteristics	Rear case: 4.7 in. (12 cm) x 4.5 in. (11.4 cm) x 1.5 in. (3.8 cm) Front case: 4.6 in. (11.6 cm) x 3.2 in. (8.1 cm) x 0.5 in. (1.2 cm) C-clamp: 4.7 in. (12 cm) x 5.2 in. (13.3 cm) x 2 in. (5 cm) Container: ISO 668: 1995(E) Series 1 Freight Containers 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 Range: 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 Savi SP-651-211 Signpost or Savi SP-652-211 Signpost Reader Protocol: EchoPoint Protocol
Power	Battery type: 3.6 volt lithium, replaceable by user without tools Battery life: Approximately 4 years at 2 collections per day. Over-polling protection algorithm to extend battery life

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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
Mounting	C-clamp: Clamps easily onto shipping container left door edge (frame) - C-clamp to left door, sensor arm under right side for monitoring door closure status. Tag can be mounted anywhere on the edge of the left-hand container rectangular doorframe measuring 2 in. (50 mm) x 4 in. (100 mm).
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
Tamper Sensors	Door Sensor: Senses whether door is opened or closed Light Sensor: Senses light entering the shipping container above an adjustable threshold