The tag beeps twice if you install a fully charged battery. The tag beeps three times if you install a battery with low charge; replace it with a charged battery. When removing and replacing a charged battery, you may need to wait a few seconds after replacing the battery to hear the confirmation beep.

4. Replace the battery cover. Turn the battery cover counterclockwise 1/4 to 1/2 of a turn to properly seat the cover. Turn the battery cover clockwise until it fits flush with the tag case. Be careful not to overtighten.

   Make sure the battery cover is completely closed and that it is not cross-threaded.

5. Dispose of the used battery according to local safety requirements.

Tag Placement

Savi Technology recommends that you mount Savi SensorTag ST-674 by adhering the tag and supplied plastic mounting sleeve with pressure sensitive tape (PST) to the inside or outside of a Class VIII container or plastic, cardboard, or wood container or box. You can also loosely place the tag inside a non-metallic container or box.

PST Reliability and Durability

The only brand of PST that Savi Technology recommends for mounting SaviTags is 3M Corporation's Automotive Acrylic Plus Attachment Tape.

For ease of installation, during manufacturing Savi installs this PST on the back of the mounting sleeve. PST mounting kits are also available for separate purchase.

Once a mounting sleeve is fastened to an asset, you can leave it on the asset even after Savi SensorTag ST-674 is removed so it is available for future use with other compatible SaviTags. Prior to re-use, visually inspect the PST-mounted sleeve to make sure it is attached securely. If necessary, reinstall the sleeve using new PST.

3M Corporation has conducted extensive environmental testing on their Automotive Acrylic Plus Attachment Tape. In addition, Savi has conducted its own independent environmental tests of PST. The U.S. Army (Tobyhanna Army Depot) has also tested PST for use on surfaces treated with Chemical Agent Resistant Coating (CARC). All these tests confirm that PST is an appropriate choice for mounting SaviTags.

- Savi Technology successfully conducted the following tests upon samples of 3M PST:
  - Extreme temperature -40ºC to +158ºF (–40º to +70º Celsius)
  - Step test (200 pounds applied in shear)
  - Shock (140g or 120 lbs.)
  - Vibration (MIL-STD-810E)
  - Salt fog (MIL-STD-810E)
  - Corrosive liquids
  - Peel test (50 pounds of peel force)

  Savi's tests confirm the adhesion integrity and reliability of 3M PST.

- 3M Corporation conducted a longevity test of PST. They found no significant degradation in the performance of PST even after five years of service on a test vehicle. As long as the surface is prepared properly, PST will work reliably for five years or longer.
- 3M Corporation compared the peel strength of a new roll of PST versus a roll that had been aged 21 months. In all cases, the aged roll matched performance of the new roll in tests conducted over a 72-hour period.

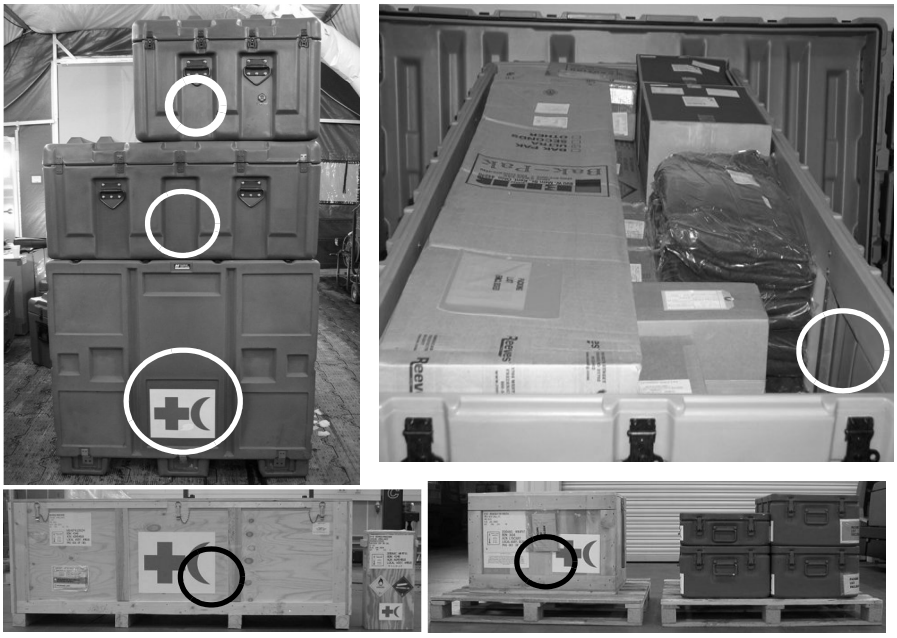
Achieving Maximum Communication

Savi SensorTag ST-674 achieves a 300-foot (91.44 meters) read range from SR-410 and SR-650 fixed readers. To achieve 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 (6 meters) or higher
- With the reader dome pointed downward

The following photos show specific Savi SensorTag ST-674 mounting locations on Class VIII containers. Typical locations include mounting the tag inside the middle of the container or on the outside of the container on a flat surface.

Figure 2-1 Mounting locations are inside the Class VIII containers



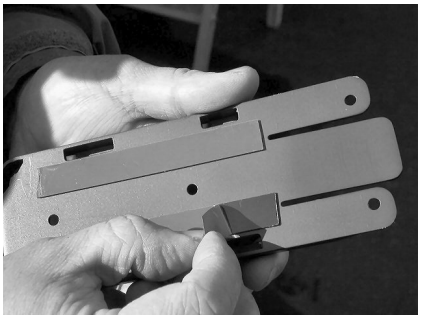
Mounting Savi SensorTag ST-674

The mounting method for Savi SensorTag ST-674 includes using pressure sensitive tape, nylon tie-wrap, and a plastic mounting sleeve. This method prevents accidental loss of the tag by sudden impact, vibration, or shock during transport.

Savi SensorTag ST-674 includes these mounting fasteners:

- PST
- Nylon tie-wrap
- Plastic mounting sleeve

1. Clean the location on the container where the mounting sleeve is to be attached.
2. Obtain a mounting sleeve with PST installed and carefully remove the red protective film covering. Avoid touching the PST adhesive.



3. Position the sleeve horizontally or vertically, making sure there is at least 4 inches (10 cm) of clearance at the opening of the sleeve to allow the Savi SensorTag ST-674 to be inserted. Be sure that the surface to which you will apply the tape is flat, and that the sleeve can move freely to compress the tape in the next step.
4. When the sleeve is level, press it into place. Apply pressure to the tape strips by pushing firmly against the inside surface of the sleeve. To assure a good bond, apply as much finger pressure as possible and work fingers on the area over the tape strips.

5. Insert the tag into the sleeve and insert a wire loop or nylon tie-wrap through the two retaining ears. No tape curing time is required prior to installing the tag.

The mounting sleeve is equipped with a tie-wrap groove to ensure that Savi SensorTag ST-674 is securely fastened.

Tie-wrap groove

6. To prevent the tag from dislodging from the tag mounting sleeve as a result of sudden impact or extreme shocks, insert the supplied tie-wrap through the sleeve.

Savi SensorTag ST-674 Specifications

Specification	Description
Physical characteristics	**Length:** 6 .25 inches (16 cm) **Width:** 2.13 inches (5.4 cm) **Height:** 1.13 inches (2.9 cm) **Weight:** 3.8 oz. (108 g)
Environment	**Temperature:** -40ºF to +158ºF (-40ºC to +70ºC) operating; -40ºF to +185ºF (-40ºC to +85ºC) storage; Tested per MIL-STD-810F **Humidity:** 100% non-condensing **Altitude:** Maximum altitude = 40,000 feet (12,192m); Tested per MIL-STD-810F
RF receiver/transmitter	**Ultra High Frequency transceiver:** **Frequency:** 433.92 MHz **Modulation:** FSK, deviation +/- 50KHz **Data rate:** 27.8Kbps **Data coding:** Manchester **Communication range (unobstructed):** Typical range is up to 300 feet (91.44 meters) line-of-sight when mounted onto a container and communicating with a Savi Fixed Reader SR-650-101 or SaviReader 410R. Typical range is 200 feet (61 meters) line-of-sight when communicating with a Savi MobileReader SMR-650 **Maximum transmit power:** 0.6mW **Air protocol:** BCS Commands, EBCS Commands (20-bit and 22-bit tag identification supported); Savi EchoPoint Air Protocol 2.1 (32-bit tag identification supported)

Specification	Description
LF receiver (downlink)	**Low Frequency Receiver (downlink)** **Frequency:** 123 KHz **Modulation:** ASK on-off keying **Data rate:** Average 1.6 Kbps, 50% duty cycle **Data coding:** Pulse width modulation **Communication range:** Up to 3.5 feet (1 meter) from Savi Mobile Reader SMR-650. Up to 12 feet (3.66 meters) from Savi Signpost SP-651 and SP-652-211 **Air protocol:** BCS Commands, EBCS Commands (22-bit tag identification supported); Savi EchoPoint Air Protocol 2.1 (32-bit tag identification supported) and Savi EchoPoint Air Protocol 1.1
Network	**Wireless:** RF read/write capable
Memory	On board non-volatile 128K user memory for all tags and 32K sensor memory
Hardware compatibility	✦ Savi Mobile Reader SMR-650P (model SMR-650P-110 and SMR-650P-111) ✦ Savi Mobile Reader SMR-650 (models SMR-650-21x) ✦ Savi Fixed Reader SR-650-101 ✦ Savi Signpost SP 651 and SP-652 ✦ Savi Docking Station model SDS-2002 ✦ Savi ST-654 Docking Station Adapter SDSA-654-01 ✦ Savi Tag Write Cable STA-1030 ✦ Savi Tag Write Cable Adapter STA-1031
Antenna	**Internal UHF:** Omni loop antenna **Internal LF:** Two integrated ferrite core antennas (orthogonally mounted)
Shock and vibration	**Shock:** Tested per MIL-STD-810F, 4 feet (1.22 meters) **Vibration:** Tested per MIL-STD-810F
Protection type	Sealed to IP 54 ISO 1496 weatherproofing requirements

Specification	Description
Power	**Battery type:** 3.6 volt primary lithium (Li-SOCI2), A size, user replaceable **Battery life:** Approximately 4 years depending on usage **Power management:** UHF sleep mode prevents unwanted collections, enabled/disabled by LF link **Diagnostics:** Reports low tag battery status
Regulatory approvals	**Radiated emission (intentional):** U.S. emission standards as contained in FCC Part 15 and European Community emission standards as contained in EN 300 220 (433 MHz) **Electromagnetic immunity:** ESD compliance exposed to 8 kV air discharge or 4 kV contact discharge in accordance with EN 301 489-1 **Radiated emission (unintentional):** U.S. emissions standards as contained in FCC Part 15 and European Community emission standards as contained in EN 301 489-1 **Safety approval:** U.S UL 1950; European EN 60950 **Ordnance Safety:** HERO certification **Markings:** Savi logo, product model and serial number, EMC compliance (FCC/EN), and Ordnance/HERO
Sensors and indicators	**Temperature sensor:** Integrated sensor takes temperature readings based on configurable time (in minutes). Default is set to 5 minutes **Humidity sensor:** Integrated humidity sensor takes readings based on configurable time (in minutes). Default is set to 5 minutes **Beeper:** Audible beeper for tag location.
Mounting	Plastic mounting sleeve with nylon tie-wrap and PST for SensorTag ST-674
Software	Savi SmartChain for Mobile Devices, Savi SmartChain Transportation Security System (TSS), Savi SmartChain Site Manager 5.7, Savi SmartChain Client Tools 4.x, Savi SmartChain Mobile Manager 6.x, Savi Retriever 2.1
Accessories	Spare A size batteries; part number BAT-1125