

**ST616**

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## Savi ST-616 Asset Tag Description

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The Savi® ST-616 Asset Tag is an active RFID tag designed to manage assets in both defense and commercial applications. The tag's small, ruggedized form factor is easy to mount on various asset types such as pallets, containers, and rolling stock.

Tag model number

Tag ID number



Pressure sensitive tape (PST) and tie wraps for mounting are included with the ST-616 tag.

### Features

- Low frequency receiver (123 KHz) for communication to the SP-65X Signpost series products and SMR-650 mobile readers
- Fully integrated single chip Ultra High Frequency (UHF) transceiver (433.92 MHz) for two-way communication to SR-650 readers and SMR-650 mobile readers
- On board single non-replaceable full-size AA 3.6 V Li-SOCl<sub>2</sub> battery
- Main processing unit containing firmware logic
- 2 KB of user memory space
- Low battery detection

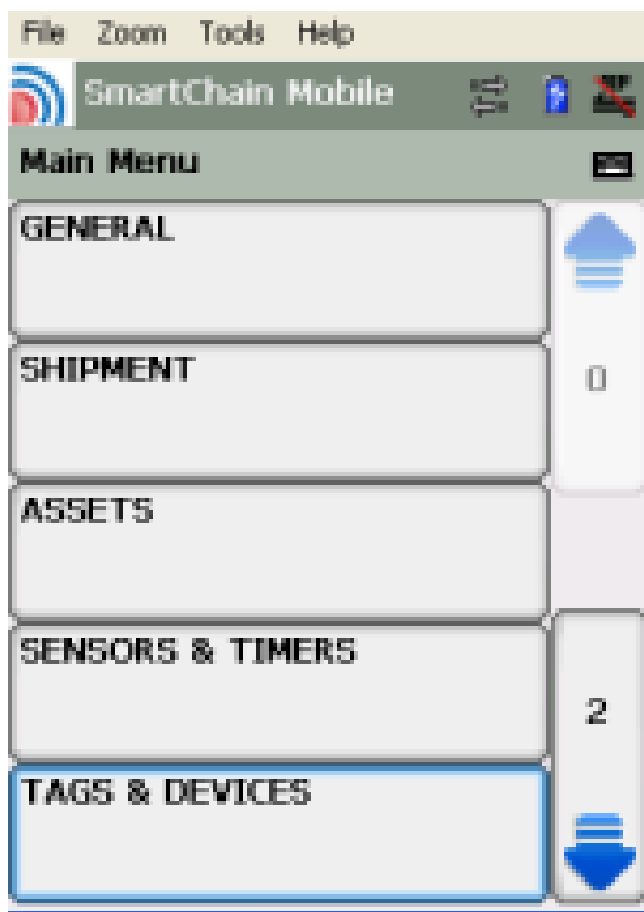
## Activating the Tag

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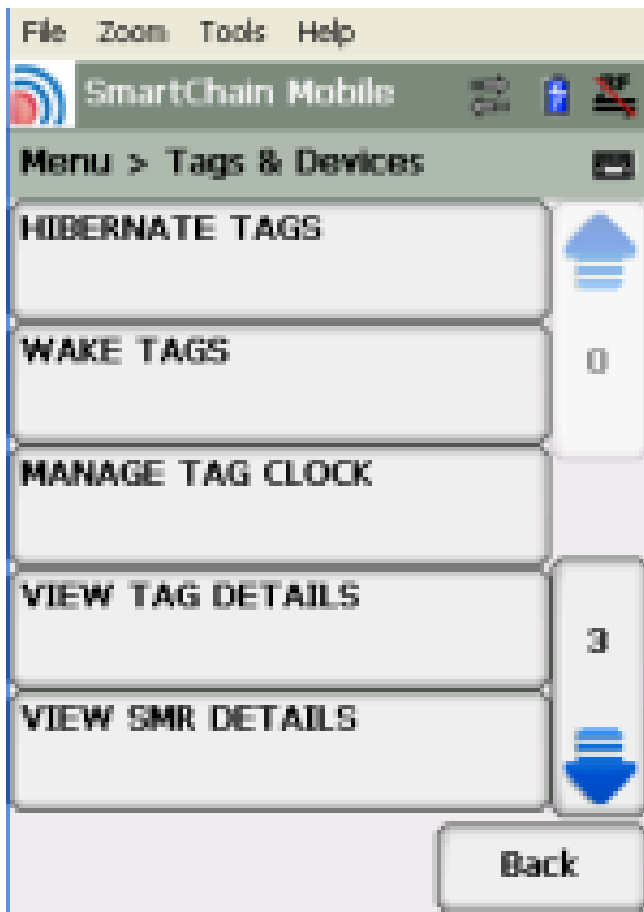
To protect battery life, Savi ships the tag in low-power hibernation mode, which disables the tag's UHF transceiver. You can activate the tag within three feet of the RF device.

To activate the tag using SmartChain Mobile:

1. Remove the mobile device (also known as a handheld interrogator) from the cradle and login to SmartChain Mobile.



2. From the Main menu, tap **Tags & Devices**.

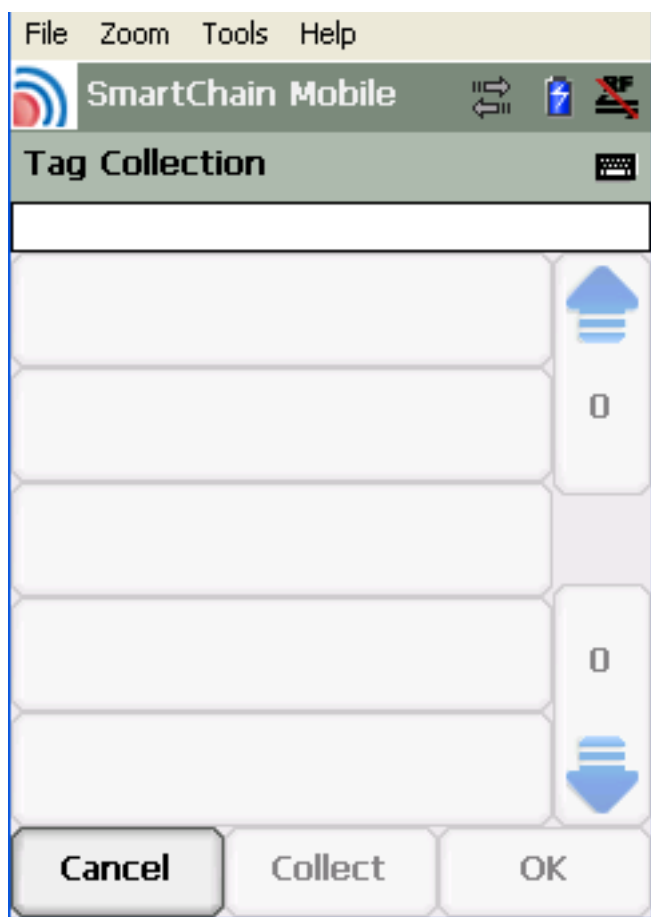


3. Tap **Wake Tags**

4.



Tap  to add tags.



5. Tap **Collect** to begin active tag collection.

6. Select a tag from the list and tap **OK**.

You can select multiple tags.

7.



To add tags to the collection, tap  and repeat steps *List item*. on page 6 and *List item*. on page 6.

8. When you finish adding tags, tap **Wake Tags**.

9. Tap:

- **New Wake Tags** to activate other tags.
- **Return to Main Menu** to go back to the Main menu.

For more information, see the *Savi SmartChain Mobile User Guide* .

## 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.

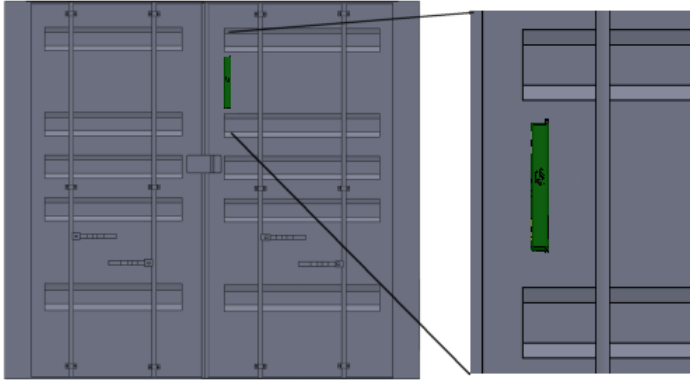
Mount the tag by adhering the tag and supplied plastic mounting sleeve with pressure sensitive tape (PST) to the inside or outside of a Class VIII container or plastic, cardboard, or wood container or box.


Typical locations include mounting the tag inside the middle of the container or on the outside of the container on a flat surface.

For best performance, make sure the tag is:

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


The figure shows a tag mounted on an ISO container according to the performance guidelines.



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

The tag has 300-foot (100m) read/write range to Savi SR-650 Fixed Readers. For the most consistent communications with the tag, the readers must be mounted:

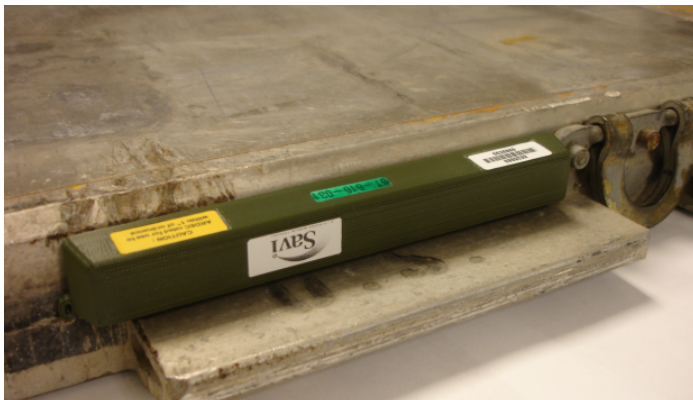
- to have an unobstructed line-of-sight to the tag
- at 20 feet (6m) or higher

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

Follow the instructions in the *Savi SR-650 Fixed Reader Installation Guide* to locate and position the Savi Fixed Reader for best performance.

## Placing the Tag on Aircraft Pallets

Place the tag at least 6 inches (15.24 cm) above ground level, on the long side of the pallet (for example, the 108-inch side of a 108 x 88 inch 463L pallet) to avoid forklift damage. Mount the tag in the middle of the rail of the pallet, directly above one of the tabs (or dog ears) that protrude from the rail.





**Caution:** Do not place tags on the side of the pallet that locks into the aircraft. Place it on the side that faces away from the forklift.

## Mounting the Tag

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Before you install the tag, make sure the following materials, which are included with the tag, are available:

- Pressure sensitive tape (PST)
- Two tie wraps

Whichever mounting method you select, the goal is to prevent accidental loss of the tag by sudden impact or vibration during transport. The best mounting method for your application depends on the material you attach the tag to and your personal preference.

### Mounting with Tape

1. Open the tag mounting kit and remove the roll of PST.
2. Unroll the tape completely. The PST has two sides of adhesive. Immediately apply the entire length of PST to the back of the tag
3. Peel the backing from the PST to expose the adhesive.
4. Position the tag on the asset and press firmly until the tag sticks to the asset.

### Mounting with Tie Wraps

The ST-616 tag has mounting holes at each end of the tag, as shown in the figure below:



Mounting hole for tie wrap

To mount the ST-616 tag using tie wraps, thread a tie wrap through each mounting hole and affix the tag to the asset.



## Mounting with Rivets

1. Determine where the tag is to be attached to the asset.
2. Mark the location of the tag rivet holes on the shipping container or asset.
3. On the asset, drill holes at the locations you marked in step 2.
4. Return to the location where the tag is to be attached to the asset. Align the rivet holes on the tag with the rivet holes you made in step 3.
5. Push the head of the rivets through the tag.
6. Use a handheld rivet gun to clip the nail of the rivet and secure the tag to the asset. Avoid fastening the rivets too tightly to prevent damage to the tag.

## Mounting on a Vehicle

The ST-616 tag can be mounted on a vehicle. The preferred mounting location is on the license plate in the back of the vehicle, as shown in the following figure:



When mounting the tag on a vehicle, ensure the following:

- the tag is mounted with its back to the vehicle (tape on the bottom)
- the tag is mounted horizontally

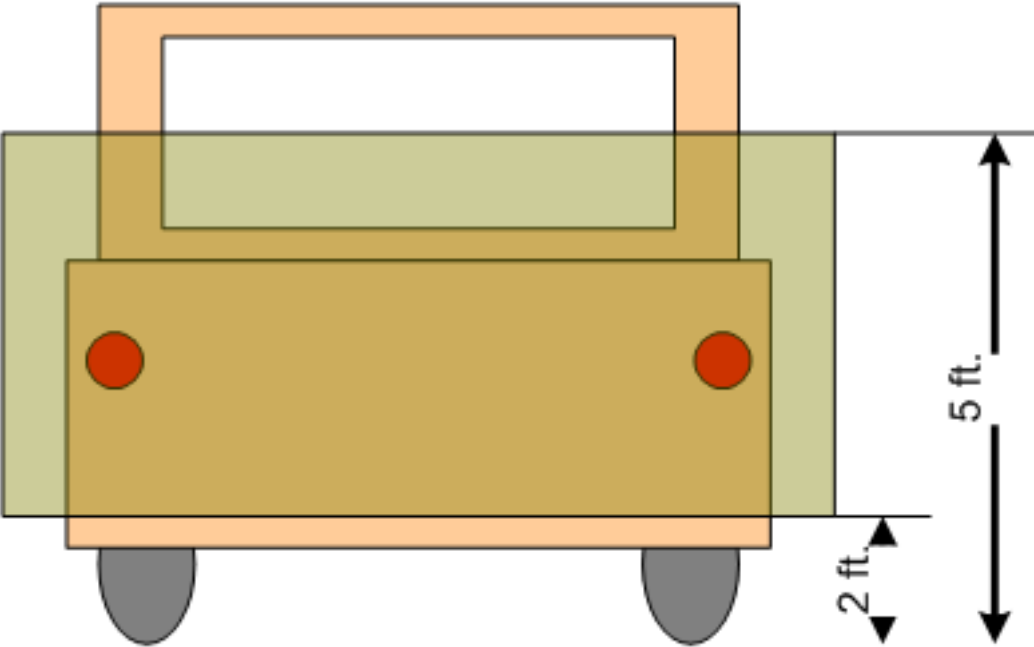
If the tag cannot be mounted horizontally, the tag can be mounted vertically, as shown in the following figures:



or



If no license plate available, tags should be mounted on the vehicle vertically, in the preferred height window of 2 ft. to 5 ft., as shown in the following figure:



If mounting multiple tags, ensure that:

- tags must not be mounted one on top of the other
- tags must not be touching
- tags must be no further than 1 foot apart
- there is a minimum clearance between tags of 1 inch

## Conserving the Battery

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The ST-616 is equipped with a non-replaceable battery that can register up to 60,000 tag events before the battery life is depleted. Overpolling may cause the battery to be depleted prematurely. The tag has several mechanisms that protect against overpolling.

Minimizing a tag's exposure to unintentional reader signals can help extend battery life. The following sections provide suggestions to conserve a tag's battery life.

### Avoid Overpolling

The most common cause of early battery depletion is overpolling. Overpolling, which can occur when the tag is left idle within range of an RF reader, such as in a warehouse, shipping yard, or near a gate where fast UHF polling is used. To avoid overpolling, the ST-616 uses an overpolling suppression feature, which extends battery life in difficult RF environments such as long-term storage facilities.

### Employ Good Business Practices

- Use the Savi tag hibernation mode for tags stored long-term or for future use.
- Maximize use of LF signposts and mobile device operations so the UHF receiver can be left off during normal operation of the tag. You can turn on the UHF receiver using a LF signpost or LF mobile device prior to issuing other commands or collections over the UHF link.

### Protect Stored Tags

You can protect unused tags from unintentional polling by storing them in a fully enclosed metal container, placed away from areas where fixed readers or mobile devices are regularly used. You can also wrap tags in aluminum foil to shield them from nearby UHF signals. To be effective, you must apply multiple, overlapping layers with foil-to-foil contact.

### Isolate Storage Areas

Prevent or minimize the polling of stored tags by isolating the storage area. Storage areas should be more than 600 feet (183m) away from readers mounted within 10 feet (3m) of ground level and 900 feet (274m) away from readers mounted 15 to 20 feet (4.6 to 6m) above ground level.

- 👉 **Note:** Storage areas can also be shielded from reader activity by buildings. Be sure that stored tags are not receiving signals over the top of low buildings, from elsewhere in a storage area, or from within a nearby building.

## Low Battery Warning

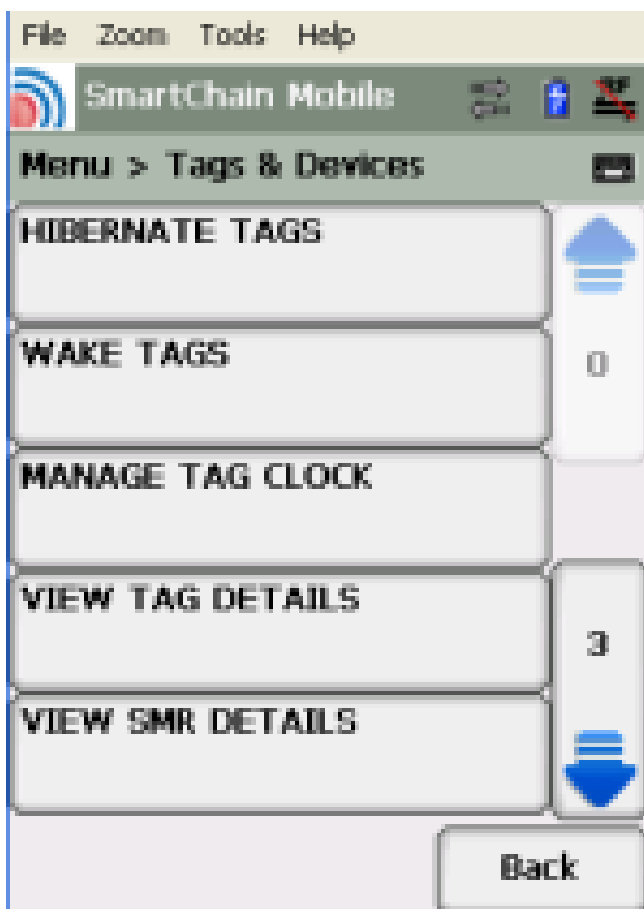
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When the ST-616 detects that its battery power is low, the tag sends a low-battery message to the Savi software in response to a collect request. At that time, the ST-616 battery is depleted and the tag must be replaced.

## Deactivating the Tag

To place the tag in hibernation mode.

1. Make sure the mobile device is disconnected from the external power supply.



2. From the Main menu, tap **Tags & Devices > Hibernate Tags**.
3. Tap **Add**.
4. Tap **Collect** to begin active tag collection.
5. Select a tag from the list and tap **OK**.  
You can select multiple tags.
6. To add tags to the collection, tap **Add** and repeat steps 4 and 5.
7. When you finish adding tags, tap **Hibernate**.
8. Tap:
  - **New Hibernate Tags** to disable UHF reception for other tags.
  - **Return to Main Menu** to go back to the Main menu.

For more information, see the *Savi SmartChain Mobile User Guide* .

## Removing Pressure Sensitive Tape-Mounted Tags

Savi recommends that you leave the tag attached to the asset for reuse, but if it is necessary to remove the tag:

1. Lift one end of the RFID tag with a putty knife or chisel and separate the tape.
2. Remove the tape on the tag or mounting surface by rubbing with dry thumbs.
3. Use a scouring pad with a mild soap and water solution to remove remaining adhesive.

## Store Tags in an Ambient Location

The tag battery is affected by temperature. Store tags below room temperature of 25°C (77°F) whenever possible.

## Contacting Savi Support

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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](mailto: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

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Model Number	ST-616-001: Asset tag with non-replaceable battery
Physical Characteristics	Dimensions: 7.8" (19.8 cm) x 0.1" (2.5 cm) x 0.7" (1.7 cm) Weight: Less than 3 ounces (85g) Color: Green
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: 433.92 MHz at 0.6 mW peak EIRP, FSK modulated Range: 300 ft. (100m) operating read/write range (outdoors, non-obstructed) from Savi SR-650 Fixed Reader Protocol: EchoPoint, ANSI INCITS 256
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
Power	Battery type: Non-replaceable lithium battery Battery life: Estimated life 3.2 years based on an average of 2 UHF collections per day. Overpolling protection algorithm to extend battery life
Digital	Database memory: 2 KB on-board non-volatile memory
Approvals	Radio Type Approval: FCC Part 15, ETSI, EN 300 220 (433.92 MHz) EMC and immunity: ETSI, EN 301 489 Ordnance: HERO Certified, ARDEC rating of 1 in. (2.5 cm)