FRC
A Safe Fleet Brand

SafeTrack™

Hardware Installation Guide
V 0.03

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1 INTRODUCTION

SafeTrack will help you reduce equipment loss. SafeTrack will notify you prior to departing if an asset is:

- Not on the vehicle
- Not present in the assigned storage location

2 SAFETRACK HARDWARE

The SafeTrack System comprises of the following hardware components.

2.1 SafeTrack Hub

This is a hardware device referred to as the SafeTrack Hub. This device is typically fixed mounted inside the cab area of the vehicle. The Hub is the primary electronic information processor of the SafeTrack system. It is powered by the vehicle. There is typically only one Hub per vehicle

Synonyms for SafeTrack Hub: Hub, Controller, Controller Unit, Notification Controller Unit.

- Mount
  - Screw on
- IP 65
- 12/24 VDC
- Supports
  - Wi-Fi/Bluetooth
  - Cell/LTE and GNS/GPS
  - CAN - J1939 and FRC

2.2 SafeTrack LED

This is an LED indicator, installed in an easily viewable area. The indicator changes color based on the status of assets.

Synonyms for LED Indicator: LED, Status LED, LED Notifier.

- Mount
  - Screw on
- IP 65
- 3V Power

2.3 SafeTrack Relay

This is a hardware device referred to as the SafeTrack Relay. This device is typically fixed mounted inside a Vehicle Storage Location. The Relay monitors the presence/absence of assets in the compartment and relays the information to the Hub. It may be battery power and can also be powered by the vehicle. There is one SafeTrack Relay per storage location on the vehicle.

Synonyms for SafeTrack Relay: Relay, Relay Unit, Reader Relay Unit,

2.4 SafeTrack Tag

This is a small electronic device that is attached to the asset being monitored. The device transmits a signal that is used by the SafeTrack system to detect the asset. The SafeTrack Tag signal is read by a SafeTrack Relay and transmitted to the SafeTrack Hub for processing. There is one Tag per asset to be tracked.
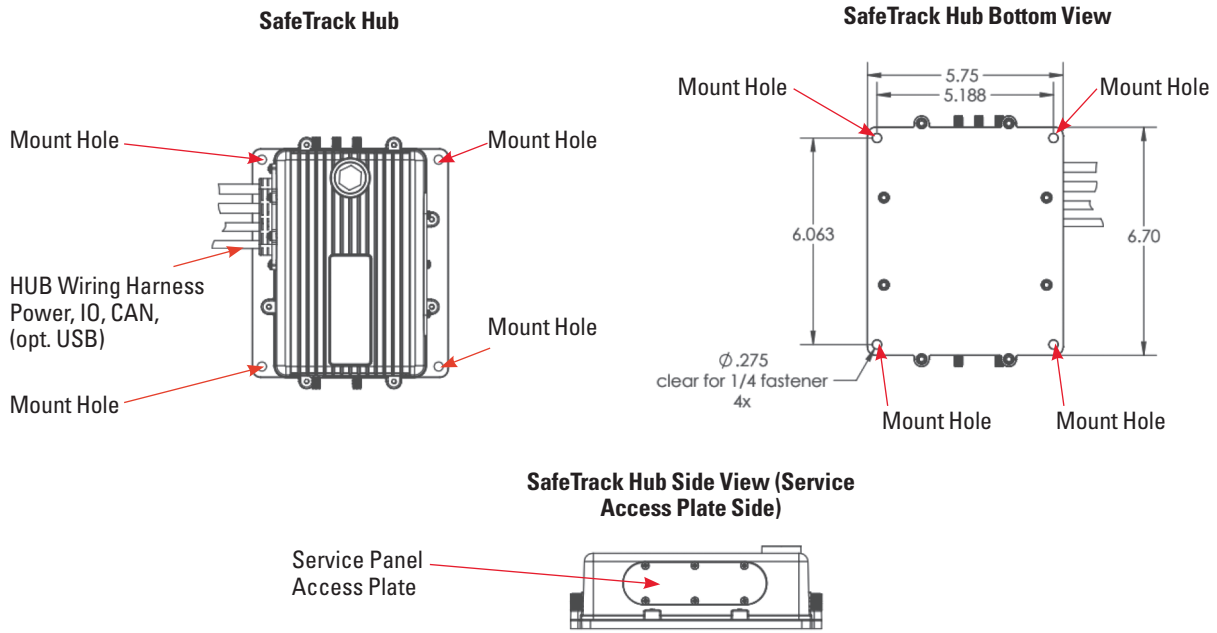
Synonyms for SafeTrack Tag: Tag, Asset Tag, Beacon, Bluetooth Tag.

Mount

- Screw on
- Adhesive
- Secure tie
- IP 67
- Endurance 475 F for 5
- Coin cell battery powered

3 INSTALLING THE SAFETRACK HUB

SafeTrack Hub

SafeTrack Hub Bottom View

Mount Hole

Mount Hole

Mount Hole

Mount Hole

HUB Wiring Harness
Power, IO, CAN,
(opt. USB)

Mount Hole

Mount Hole

Mount Hole

Mount Hole

5.75
5.188

6.063

6.70

∅ .275
clear for 1/4 fastener
4x

Mount Hole

Mount Hole

SafeTrack Hub Side View (Service Access Plate Side)

Service Panel
Access Plate

The Hub has 4 mounting holes on its base plates.

1. Find an interior location that allows for easy access to battery direct power, ignition signal, a clean ground, and running antenna wires to the roof mounted antenna.

2. Where there is sufficient area and height clearance to place the Hub

3. Where holes can be drilled without causing damage to the vehicle or other devices.

3.1 Mount Recommendations

It is recommended that the Hub be mounted

1. The access plate can be easily accessed for removal for service and maintenance (e.g. for adding removing storage card, adding removing SIM cards, access to diagnostics ports)

2. Such that if the Hub attached antenna used, the antenna is vertical (pointing upward). We highly recommend the roof mounted antenna.

3.2 Mechanical Mount

Access Available Behind Mount Wall

1. Drill two holes that adhere to the dimensions of the Hub in terms of location and size of holes.

2. Use bolts to mount the Hub to the wall

3. Secure the bolts with plain or nylon nuts and a lock washer screwed on from the opposite side of the wall.

Access NOT Available Behind Mount Wall

1. Drill and tap four holes, that adhere to the dimensions of the Hub in terms of location and size of holes.

2. Use a size ¼" - 20 tap to drill the hole.

3. Mount the Hub to the wall and secure using screws through the holes
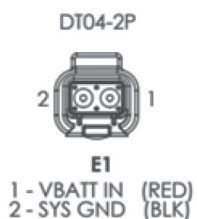
3.3 Electrical Install

3.3.1 Power Supply

The Hub operates on 12 V DC (or 24 V DC where available) Power to Hub is drawn from the Vehicle Battery. The Hub is always powered, it will go into sleep mode drawing ~30mA when the ignition pin is not active
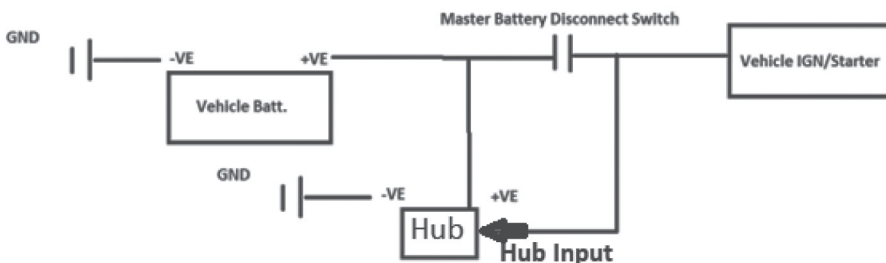
### SafeTrack HUB Harness Power Supply Connector

The Hub wiring harness includes a two pin deutsch connector for power and ground

1. Connect the Hub ground pin to a location on the Vehicle chassis that can serve as a safe ground for the Hub. Away from major device such as a Q-Siren.

2. Connect the Hub power pin to a battery direct terminal in the vehicle.

Yes, battery direct so it is always powered..

Safe Hub Harness IO Connector
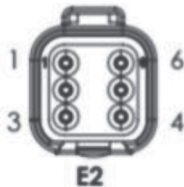
DT04-6P

```
1   6
3   4
```

E2
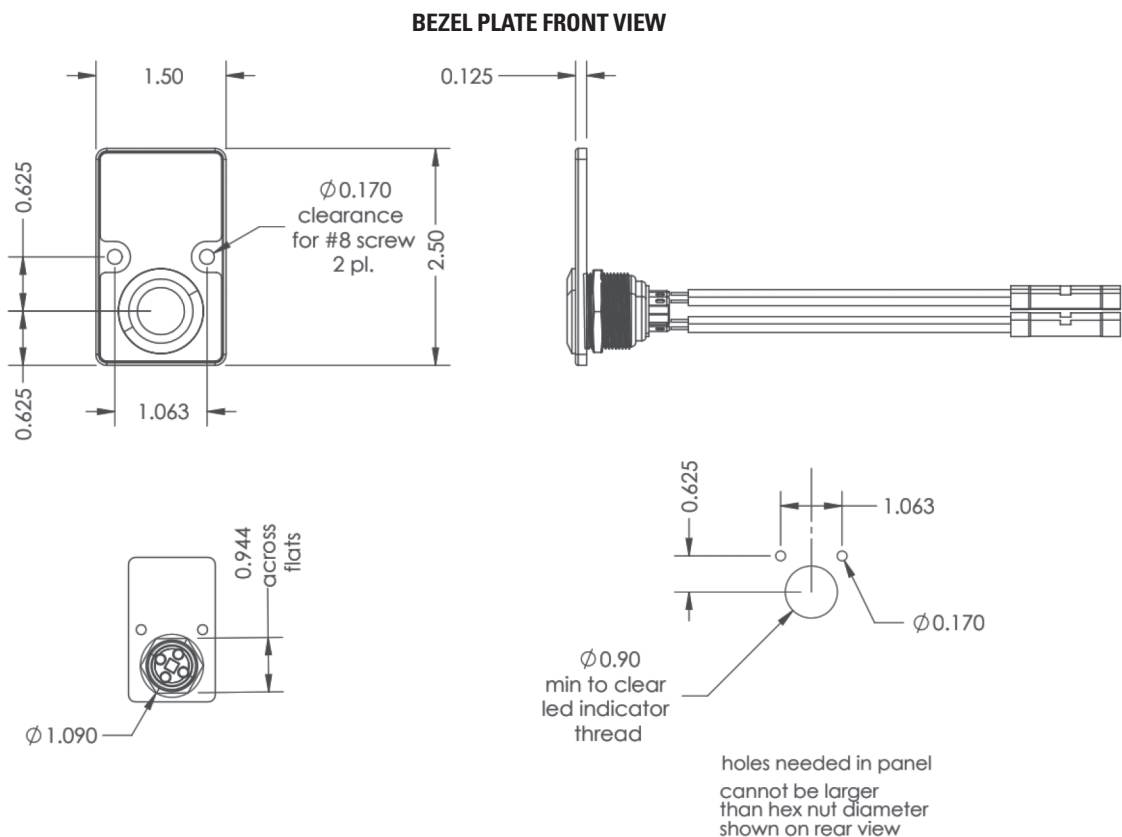
1 - VBATT/IGN   (BLUE)
2 - Addititional input   (BROWN)
3 - LED OUT 1   (RED)
4 - LED OUT 2   (GREEN)
5 - LED OUT 3   (WHITE)
6 - GND   (BLACK)

Wires: 18 AWG rated for -40C to 105C

3.3.2 Battery Signal Input

1. Connect Pin 1 to Ignition, or Master Disconnect. Pin 1 should receive 12/24 volts when the vehicle is being operated.

4 INSTALLING THE SAFETRACK LED

BEZEL PLATE FRONT VIEW

The LED Assembly consists of

- A Bezel Plate
- An LED Indicator Light with hanging wire pigtail with 4 leads

4.1 Mechanical Mount

1. Locate a flat surface on a location that is clearly visible to the driver when seated in the can, that has sufficiently large surface area to house the LED Bezel and where 3 through holes can be drilled.

2. Drill holes as shown in the diagram above

   - 2 for the mounting screws # 8-32 holes
   - 1 for the LED Lens and Body minimum of 7/8th

3. Insert the LED indicator through the Lens hole in the bezel such that the LED lens is facing the same way as the face of the bezel (i.e. same side as the logo on the bezel).

4. Pass the wire end of the LED through the hole created for the purpose on the mounting surface.

5. Reach behind the mounting surface and use a hex nut to tighten the LED and the Bezel against the mount surface.

6. Make sure the Bezel is properly oriented and the mounting holes align with the holes drilled for mounting.

7. Fasten the Bezel to the mount surface with screws.

4.2 Electrical

The LED pigtail has 4 wires

- 3 wires that are to be connected to positive outputs on the Hub IO connector

- 1 Wire that is to be connected to the ground Pin on the Hub IO connectors

The Hub IO Connector

- Is a 6 pin Deutsch connector (socket) for IO and ground.

- A pig tail with a 6 Pin Deutsch connector (plug) is supplied with the Hub.

Connect the wires from the Deutsch connector (plug) on the Hub to the wires from the LED as follows. (Refer to diagram below)

- PIN 3 Red LED Output 1

- PIN 4 Green LED Output 2

- PIN 5 White LED Output 3

- PIN 6 Ground

Safe Hub Harness IO Connector
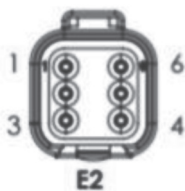
DT04-6P

E2

1 - VBATT/IGN   (BLUE)
2 - Addititional input (BROWN)
3 - LED OUT 1   (RED)
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5 - LED OUT 3   (WHITE)
6 - GND   (BLACK)

Wires: 18 AWG rated for -40C to 105C

5 INSTALLING THE SAFETRACK HUB EXTERNAL ANTENNA
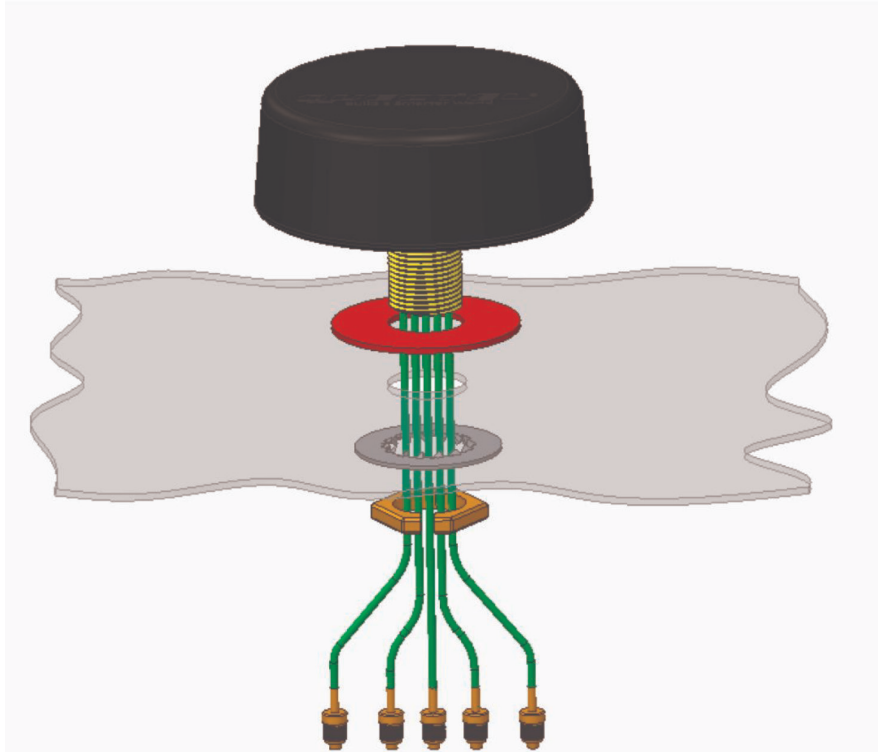
The Hub is supplied with an external vehicle roof mount Antenna for the following communication

- Cellular LTE
- GNSS (GPS)
- Bluetooth
- Wi-Fi

The Antenna comes with four wire cables each 4 meters (157.48 inches) in length.

The Antenna has 4 SMA Male SP connectors one each for the wire corresponding to the following

- 4G-main (for cellular main)
- 4G-div   (for cellular diversity)
- Wi-Fi   (for Wi-Fi and Bluetooth combo)
- GNSS   (for GPS)

NOTE: There may be a 5th optional connector that is not used. All connectors to be used are labelled as above.

Labels should match labels at mating connector points on HUB.

NOTE: There may be a 5th optional connector that is not used for this antenna.

5.1 Mount Recommendations

Antenna should be mounted at a location

1. That has a surface with a Recommended wall thickness size: 3.0 ±1.0 mm

2. The underside (side opposite to where the antenna is mounted) of the wall is accessible for fastening the hex nut used to secure the Antenna

3. Where the Antenna will not hinder the operation of the vehicle or the driver in operating the vehicle.

4. Where the Antenna has sufficient clearance so as not conflict with typical roadway structures and traffic control devices such as over passes, viaduct, suspended traffic lights etc.

5.2 Mechanical Mounting

1. Drill a hole of Recommended hole size: Φ 28.0 ±0.5 mm on the flat surface where the Antenna is to be mounted.

2. Remove lock washer and hex nut from the antenna. Be sure to keep the gasket with the antenna.

3. Run the Antenna cable through the hole into the inside of the Vehicle such that the cable can reach the Antenna connectors on the Hub. Be sure the gasket remains on the outside of the vehicle

4. Pass the mounting bolt on the Antenna through the drilled hole.

5. Pass the lock washer and mounting nut from the 4 connectors to the Antenna mounting bolt on the inside of the drilled hole and use the hex nut to firmly secure the Antenna.

6. Use the hex nut to firmly secure the Antenna

Screw on the 4 SMA Male SP Connectors at the end of the Antenna cables to the corresponding mating connectors on the HUB chassis.

6 INSTALLING THE SAFETRACK RELAY
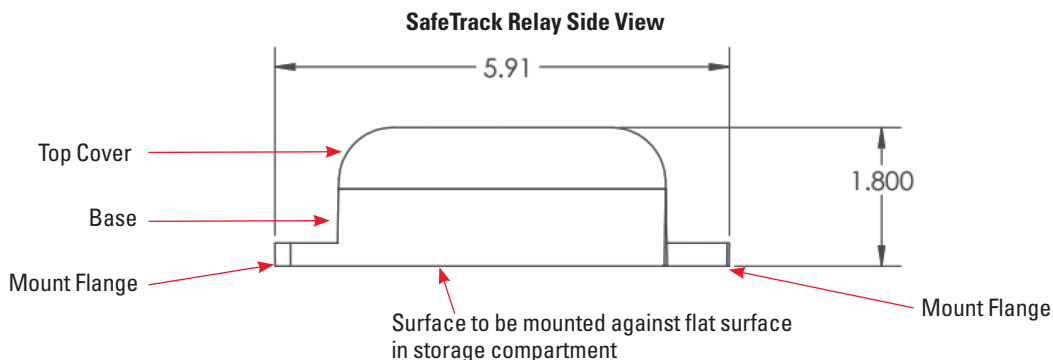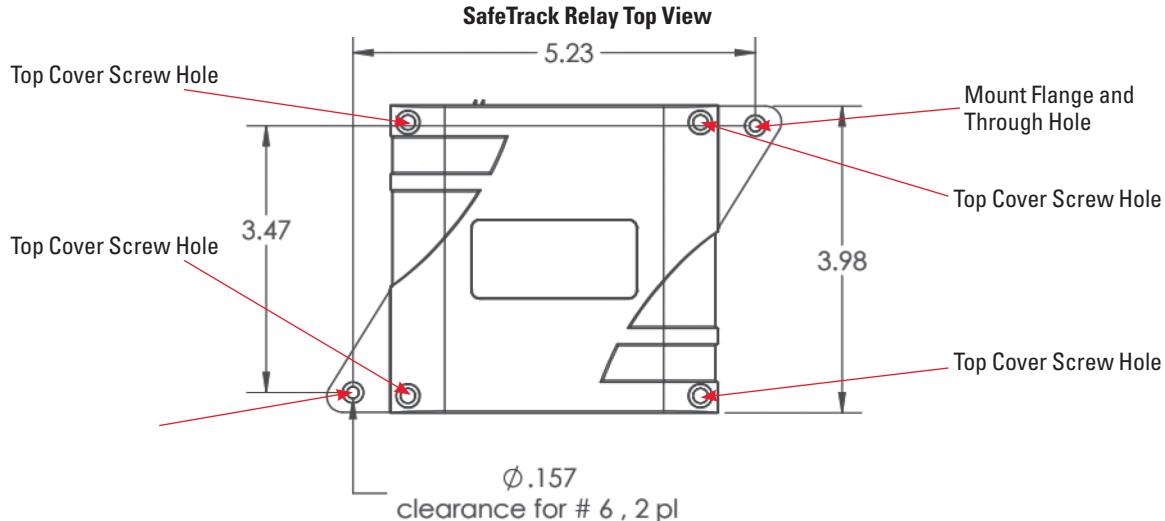
6.1 Mount Recommendations

It is recommended that a RELAY be stationed within a compartment such that

1. It is unlikely to be an obstruction to typical usage of the compartment for storage.

2. It is unlikely to come in contact with other objects in the compartment.

3. It can be positioned such that the orientation indicator label is oriented vertically (perpendicular to the ground).

4. It can be easily accessed for removal and replacement of the cover plate for service and maintenance (e.g. battery replacement if RRU is battery powered)..

6.2 Mechanical Mounting

The RELAY has 2 mounting holes on flanges extending from its base.

Find a location on an inside wall, floor or ceiling of a compartment, where there is sufficient area and height clearance to place the RELAY and where holes can be drilled.

SafeTrack Relay Top View

Top Cover Screw Hole
5.23
Mount Flange and Through Hole
Top Cover Screw Hole
Top Cover Screw Hole
3.47
3.98
Top Cover Screw Hole
$\emptyset$.157
clearance for # 6 , 2 pl

SafeTrack Relay Side View

Top Cover
5.91
Base
1.800
Mount Flange
Mount Flange
Surface to be mounted against flat surface in storage compartment

6.2.1 Mechanical Install Procedure

Access Available Behind Mount Wall

1. Drill two holes that adhere to the dimensions of the RELAY in terms of location and size of holes.

2. Use bolts to mount the RELAY to the wall.

3. Secure the bolts with plain or nylon nuts and a lock washer screwed on from the opposite side of the wall.

Access NOTE Available Behind Mount Wall

1. Drill and tap two holes, that adhere to the dimensions of the RELAY in terms of location and size of holes.

2. Use a size # 6-32 tap to drill the hole.

3. Mount the RELAY to the wall and secure using screws through the holes.

6.3 Electrical Install

The SafeTrack Relay comes into version

- Battery Power (2 X Type D battery)

- Power from Vehicle Over Harness.

The following applies to the second version.

The Relay wiring harness includes a two pin Deutsch connector for power and ground

1. Connect the Relay power pin to power rail on the Vehicle that supplies 12 VDC.

2. Connect the ground pin to vehicle chassis ground.

Important: Be careful not to connect the ground pin to a location where there may be large inductive devices, such as a ladder rack motor.

7 INSTALLING THE SAFELINK TAG

Tags are mounted onto equipment that need to be tracked. Tags may be mounted using one of the following options, depending the on the equipment/asset being tagged

1. Drill and Tag Hole
2. Secure Tie
3. Adhesive
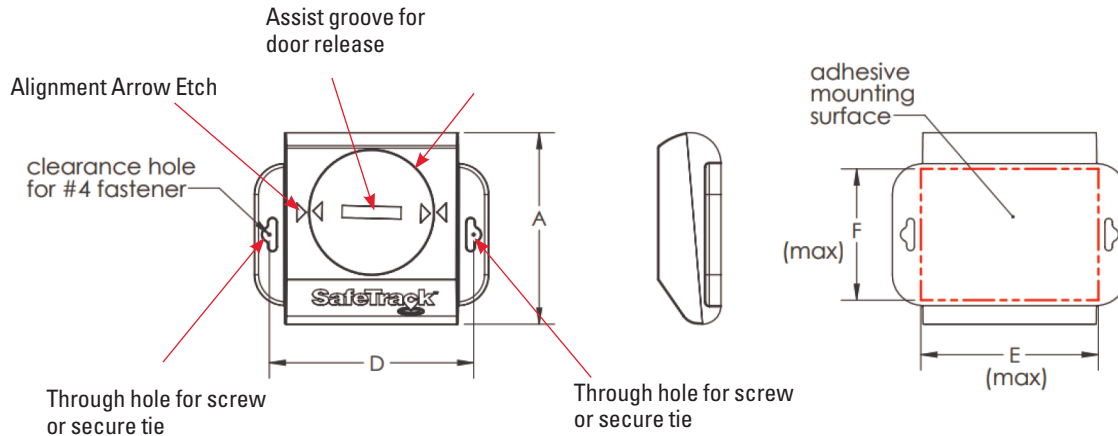
dimension	decimal	fractional	mm
A	1.55	1 17/32" - 1 9/16"	39.4
B	1.90	1 29/32"	48.3
C	.51	1/2"	12.7
D	1.65	1 21/32"	42
E	1.438	1 7/16"	36.5
F	1.062	1 1/16"	27

Prior to Mounting

Make sure that

1. The battery isolator has been removed from the underside of the CR2032 coin cell battery that powers the Tag.

2. The battery is properly installed with the positive side facing the back cover or battery door of the Tag.

3. The orange gasket around the battery holder hole should not be visible after the battery door has been placed back.

4. The battery compartment closed by rotating the door such that the etched arrows on the battery door line up with the two arrows etched on the Tag body.

5. Note the ID number of the TAG as it may be needed at a later point for registering the Tag (logically linking it to the asset in software)

7.1 Drill Tap Hole

1. Drill and tap two holes on to a flat surface of the asset, that adhere to the dimensions of the TAG in terms of location and size of holes.

2. Use a size # 4-40 screw tap to drill the hole.

3. Mount the TAG to a flat surface of the asset secure using screws through the holes.

Precautions

When mounting the asset with drill and tap method, be sure that

1. The holes to be drilled are at locations that will NOT cause damage to or hinder the proper operation and use of the asset.

2. The holes should be drilled on a flat surface area of the asset.

7.2 Secure Tie

The slot for secure tie is meant for a 3/16" (.1875) width zip tie. Standard widths for ties are .170 - .180,

1. Slide a secure tie through the holes on the flanges on the tag.

2. Secure the two ends of the secure tie through any "loop" shaped area on the exterior of the Asset that can be used as an anchor for the secure tie.

Precautions

When mounting the asset with secure tie, be sure that

1. The secure tie is anchored to the asset at a location where it will not get detached during regular operation and use of the asset.

2. Ideally the secure tie should be tightened to the point such that the Tag does not impede the use of the asset (such as a "rattling" or "hanging" tag.

7.3 Adhesive

1. Locate a flat surface on the asset with sufficient area for the Tag's adhesive application (see diagram) area to be placed flush against the surface of the asset.

2. Use 99% Isopropyl Alcohol to clean the adhesive application area section of the tag as well as the area of the asset where the Tag is to be mounted.

3. Wait for Alcohol to dry.

4. Use a VHB Double Sided tap (such as a 3M Branch VHB double sided) such that one side of the tap adheres to the Tag adhesive application area and the other side to the cleaned surface section of the Asset where the tag is to be mounted.

5. Press the Tag with sufficient suppression onto the asset such that the VHB tape makes contact with both the Tag and the asset and creates a firm attachment.

Precautions

Make sure that

1. Selected location where the Tag is to be mounted on the asset is such that

2. The surface area is flat

3. The mounted tag will not hinder the typical operation and use of the asset and that

4. The Tag will not come in contact with force that can damage or dislodge it.

5. The surface areas on the Asset and the Tag where the contact will be made for mounting are cleaned with 99% isopropyl alcohol.

6. Sufficient time is allowed for the alcohol to dry.

8 PARTS LIST

No.	Part Number	Description
1	XE-ATS130NCU-D0A	SafeLink Hub with regular (no USB) Harness
2	XE-ATS130NCU-D1A	SafeLink Hub with USB enabled Harness
3	XE-YB00221A	Roof Mount 4 in 1 External Antenna – Wi-Fi, BT, LTE, GNSS
4	XE-ANT000	Bluetooth 2.4 Ghz Antenna for mounting on to Hub enclosure with SMA connector
5	XE-ATS130IND-A0A	LED Indicator Assembly
6	XE-ATS130IND-C0A	Mating Pig Tail for SafeLink Hub Harness I/O connector
7	XE-ATS130PWR-C0A	Mating Pig Tail for SafeLink Hub Harness Power connector
8	XE-ATS130INDEXT-C10A	Extension cable between LED Assembly and SafeLink Hub
9	ZE-DT06-3S-CAP	Sealing Caps for SafeTrack Hub CAN connectors
10	XE-ATS120RRU-D0A	SafeLink Relay with Power Harness
11	XE-ATS120RRU-D1A	SafeLink Relay Battery Powered
12	XE-ATS120PWR-C0A	Mating Pig Tail for SafeLink Relay Power Harness
13	XE-ATS110TAG-A1A	SafeLink Tag

NOTES

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