SmarTag GNSS
User Manual

Part No. G4T_V1R2

Version: 1.4

1. Introduction

This document contains the user manual for SmarTag GNSS.

The SmarTag GNSS is a handheld device that provides GNSS-based (GPS, Galileo, GLONASS) outdoor positioning and BLE-based indoor positioning functions for deployed infrastructure, as well as data communication capabilities over 2G/4G mobile networks (suitable SIM card and data plan required). The SmarTag GNSS unit is able to autonomously manage and bypass network outages caused by poorly covered areas by preventing potential information loss through its built-in offline data storage.

The SmarTag GNSS unit also includes dedicated components to provide remotely controlled audible (speaker), visual (LED), and haptic (vibration motor) feedback functions, as well as a motion sensor to monitor the movement and impact of the person using the device.

As SmarTag GNSS units are active devices, they have a built-in battery that can be charged with a wireless charger. Based on the data from the built-in motion sensor, the battery lifetime is scaled according to the active (moving) time (e.g., leaving it on the table for a longer period of time requires less power to operate).

The SmarTag GNSS devices are designed for industrial environments and ease of use, featuring a durable, aesthetic, and compact casing (100 x 58 x 18 mm), with a total weight of only 83 grams.

2. Operation and Charging

The SmarTag GNSS units do not need to be turned on or off; once taken off the charger, the device immediately becomes active (i.e., collecting data and communicating with the server if possible) and remains in this state until it is returned to the charger or the battery state of charge drops below the level required for operation.

The built-in battery in the unit can be charged using the wireless charging stations provided (Wireless Charging Station for SmarTag GNSS) or most Qi-compatible wireless chargers. With the wireless charging capability, all the activities related to charging are much faster and more robust, as there are no physical connectors on the devices, which can be worn out due to the frequent usage, ensuring long-term usability. Moreover, due to the lack of physical connectors and buttons, the SmarTag GNSS units and the wireless charging areas of the Wireless Charging Stations are easily cleanable with various chemicals.

The Wireless Charging Station, developed for charging SmarTag GNSS units, is a charging station that provides dedicated wireless charging for 12 SmarTag GNSS units simultaneously. It greatly simplifies the tasks related to picking up and returning the SmarTag GNSS units, as charging starts automatically by simply placing them in their dedicated slots.

When charging on Wireless Charging Station, the SmarTag GNSS units pause data collection; however, when using other Qi-compliant wireless chargers, data collection continues during charging (e.g., while charging the unit in a car). Even during charging, SmarTag GNSS units periodically communicate with the server, including reporting the state of charge (voltage) of the built-in battery.

The actual operation status of the SmarTag GNSS units is indicated by a single LED on the front:

Status	LED indicator
Discharged, below the level required for operation	Off
Discharged (battery below 10%), no data collection	1 short red flash
Charging (battery 10-80%)	1 short white* flash
Charging (battery above 80%)	2 short white* flash
Fully charged, still on charger	Solid white*
Active (battery above 10%), no GNSS connection	"Breathing" blue

Active (battery below 10%)	"Breathing" red
Active (battery 10-30%)	"Breathing" orange
Active (battery above 30%)	"Breathing" green

* Due to the nature of the RGB LED, the white indication may appear light blue under certain lighting conditions.

3. Troubleshooting

As SmarTag GNSS units have no connectors or buttons, no moving parts, and switch automatically between different operation states based on the circumstances, the only potential source of error is the charging process.

For wireless charging to be effective, the charger coil and the device-side coil must be closely aligned. Otherwise, charging may be slower or impossible. This potential issue is eliminated by the Wireless Charging Station with slots designed to the exact dimensions of the SmarTag GNSS units. Additionally, both the charger and the device provide visual feedback (LED) when charging begins. Nevertheless, SmarTag GNSS units can be charged with most QI-compatible chargers, in which case extra care must be taken with positioning.

If the battery state of charge drops below the level required for operation, the unit will turn itself off to protect the battery (LED indicator is off). If you correctly position a discharged device on a charger, the charging process should begin within a few seconds. Otherwise, the charger or the SmarTag GNSS unit (possibly both) is probably faulty, and the issue should be reported to the operator. The source of the malfunction can be easily identified using another available charger or SmarTag GNSS unit.

4. Safety Precautions

DANGER

Any modification or alteration not expressly approved by the manufacturer is strictly prohibited, life-threatening, and results in voiding the warranty!

Warning

Check the integrity of the SmarTag GNSS units before each shift! If damaged or flawed, do not charge or use again.

Warning

Any damage to or absence of the strap (indicating the opening of the device) on the SmarTag GNSS unit will void the warranty.

Warning

The battery lifetime of the SmarTag GNSS highly depends on the configuration and the conditions!

- Always check the charge state of the SmarTag GNSS before use! If the LED light indicates a low battery state of charge (below 30%), charge the SafeTag!

- For each shift, use fully charged components.

Warning

To avoid hazardous situations, be aware of the following:

- Do not expose to direct sunlight or excessive heat! The operating temperature range of the SmarTag GNSS unit is 0 – +45°C. At lower temperatures, the battery lifetime drops significantly, and higher temperatures have a negative effect on the lifespan of the built-in battery.

- Do not open, drop, or damage the SmarTag GNSS components. If damaged or flawed, do not charge or use again.

- Do not expose the SmarTag GNSS unit to water, excessive moisture, or humidity!

- Under no circumstances throw the SmarTag GNSS component into fire!

5. Technical Details

Electrical Data

Battery capacity	980mAh @ 3,7V (rated)
Battery lifetime	typ. 16 hours (highly depends on configuration)
Wireless charging	WPC 1.2.4 (Qi) compliant
Ambient temperature	0 … +45°C / 32 … 113°F
Humidity	5% … 95% r.H. (non-condensing)

RF Properties

Technologies	GPS, Galileo, GLONASS (Concurrent GNSS) LTE-FDD/TDD, GSM, GPRS, EDGE (4FF SIM card slot) Bluetooth v5.4 (BLE)
Frequency bands	L1, E1, L1OF – GNSS B1-B5, B7, B8, B12, B13, B18-B20, B25, B26, B28, B66 – LTE-FDD B38, B39, B40, B41 – LTE-TDD 850, 900, 1800, 1900 MHz – GSM/GPRS/EDGE 2,4 GHz ISM - BLE
Transmission power	+33 dBm max. (Cellular) +3 dBm max. (BLE)

Mechanical adatok

IP rating	IP40
Outer dimensions	100mm x 58mm x 18mm / 3,91" x 2,28" x 0,71"
Weight	83g / 2,93oz

Dimensions