SmarTag GNSS EX
User Manual

Part No. G4T_V2R4

Version: 1.52

1. Introduction

This document contains the user manual for SmarTag GNSS EX.

The SmarTag GNSS EX 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 EX 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 visual (LED) feedback functions, as well as a motion sensor to monitor the movement and impact of the person using the device. The SmarTag GNSS EX can be integrated optionally with handheld and portable devices (e.g., smartphones, smartwatches) or other compatible devices using the built-in Bluetooth® Low Energy (BLE) interface.

As SmarTag GNSS EX units are active devices, they have a built-in battery that can be charged using a wireless charger only outside of potentially explosive atmospheres.

2. Explosion-proof design

The product is a portable device intended for use in potentially explosive atmospheres, powered by a non-replaceable battery. It features an intrinsically safe design with "ib" class protection, in accordance with the requirements of EN 60079-11:2012. The product complies with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive 2014/34/EU.

The device may be used in areas classified as zones 1, 2, 21, and 22, where flammable gases, vapors, and dusts are likely to occur.

3. Operation and Charging

The SmarTag GNSS EX 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 EX). 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 SmarTags and the wireless charging areas of the SmarTag Chargers are easily cleanable with various chemicals.

Although there are no connectors or switches on the device housing, with the help of an optionally available device, SmarTag GNSS EX units can be switched off without draining the built-in battery, making it easy to prepare them for safe storage or transport in a matter of seconds while maintaining a charge level ready for use.

The SmarTag Charger, 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 EX units pause data collection, but they still communicate with the server periodically, including reporting the state of charge (voltage) of the built-in battery.

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

Status	LED indicator
Discharged or switched off	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.

DANGER

The Wireless Charging Station for SmarTag GNSS EX and the optional device for switching off SmarTag GNSS EX units are not explosion-proof. Their use is only permitted in nonhazardous areas!

4. Troubleshooting

As SmarTag GNSS EX 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 provided Wireless Charging Station for SmarTag GNSS EX with slots designed to the exact dimensions of the SmarTag GNSS EX units. Additionally, both the charger and the device provide visual feedback (LED) when charging begins. Nevertheless, SmarTag GNSS EX 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 EX 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 EX unit.

5. 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 SafeTag GNSS EX component before each shift! If damaged or flawed, do not charge or use again.

Warning

Opening the housing of the SmarTag GNSS EX unit will void the warranty.

Warning

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

- Always check the charge state of the SafeTag 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 EX unit is -10 - +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 EX unit to strong or high-pressure water jets, and do not immerse it in water!
- Under no circumstances throw the SmarTag GNSS component into fire!

6. Technical Details

Electric Data

Battery capacity	2400 mAh @ 3.7V (nominal), Li-ion, nonreplaceable
Battery lifetime	typ. 24 hours (highly depends on configuration)
Wireless charging method	WPC 1.2.4 (Qi) compliant
Wireless charging duration	typ. 10 hours
Operating temperature	-10 … +45°C / 14 … 113°F
Humidity	5% … 95% r.H. (non-condensing)

RF Properties

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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	+30 dBm max. (Cellular) +3 dBm max. (BLE)

Mechanical Data

IP rating	IP5X (according to EN 60529:2015)
Outer dimensions	134,5 mm x 68 mm x 32 mm / 5,30" x 2,68" x 1,26"
Weight	240 g / 8,46 oz

ATEX Certification

Certificate number	EXON 25 ATEX 0891 X
Zone 1-2	II 2 G Ex ib IIC T6 Gb
Zone 21-22	II 2 D Ex ib IIIC T80 °C Db
Specific conditions of Use	• Only devices with undamaged enclosures may be allowed in potentially explosive atmospheres. If the enclosure is damaged due to vandalism or severe mechanical impact, it must be removed from the hazardous area immediately. • The maximum ambient temperature for the device is 45°C. Do not expose to higher temperatures or prolonged sunlight, as this may cause the surface temperature of the enclosure to significantly exceed the allowed ambient temperature. • The device has a built-in, non-replaceable battery that can only be charged outside of explosive atmospheres using the provided Wireless Charging Station for SmarTag GNSS EX.

Dimensions
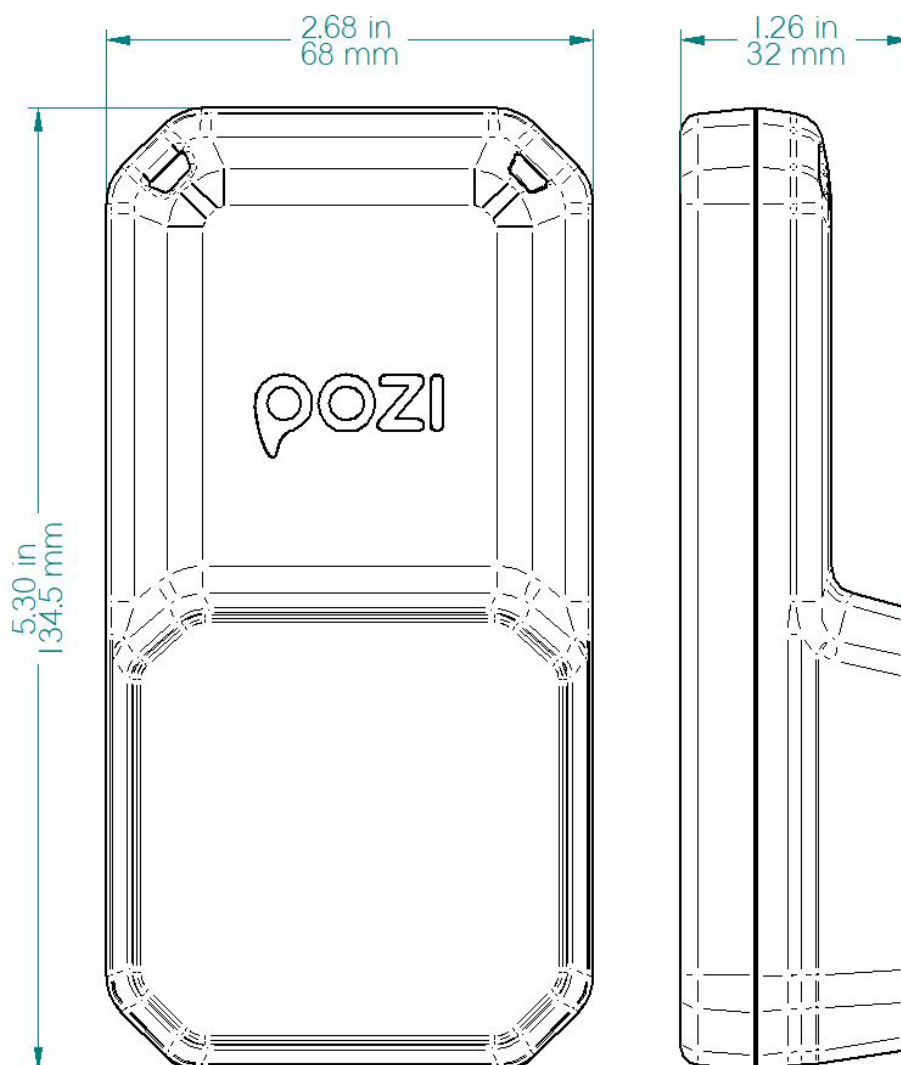
7. Storage

If SmarTag GNSS EX units are not in use for several days (up to 2 weeks), they can be kept fully charged and ready for use at the wireless charging stations provided. In case of downtime longer than 4 weeks, it is advisable to switch off the units using the optional device mentioned above. That way the units can be transported or stored for a longer period of time while remaining fully charged and ready for use.

Without charging or proper shutdown, the SmarTag GNSS EX unit will discharge beyond its operating time, and the status indicator LED will turn off. Safe transportation and storage are given in this state as well; however, after placing the units back on the charger, it will require a longer time to reach a fully charged, ready-to-use state.

8. Warranty Terms and Conditions

Pozi Development Kft. provides a 12-month warranty on SmarTag GNSS ATEX units from the date of delivery. The warranty does not cover defects resulting from misuse or circumstances beyond the manufacturer's control.

The warranty is explicitly void if the malfunction results from improper operating conditions, external physical impact, an improper power supply (including overvoltage), normal wear and tear, failure to follow usage instructions, damage during transport or storage, fire, or natural disasters (e.g., floods or lightning).

The warranty shall become void if the product is opened or modified without written permission from the manufacturer, or if repairs are carried out using non-approved parts or not in accordance with the maintenance instructions. The manufacturer may charge for repairs not covered by the warranty. The warranty does not cover direct or indirect damage or loss of profit.

9. Declaration of Conformity

EU DECLARATION OF CONFORMITY

1. Producrt: **SmarTag GNSS EX** intrinsically safe portable, positioning and tracking device (type G4T_V2R4)

2. Manufacturer: **Pozi Development Kft.**, Frankel Leó út 45, Budapest 1023, Hungary

3. Manufacturer declares, under its sole responsibility, that the product complies with the requirements of the directives:

> 2014/34/EU – ATEX Product Certification Directive
> 2014/30/EU – Electromagnetic Compatibility Directive

4. Manufacturer declares, under its sole responsibility, that the product has been designed and tested in accordance with the standards:

> EN 61000-6-3:2020 – Radiated RF emission limits
> EN 61000-6-2:2019 – Radiated RF disturbance immunity (industrial)
> EN 61000-6-2:2019 – ESD immunity (industrial)
> EN 60079-11:2012 – Explosive atmospheres, Part 11: Equipment protection by intrinsic safety "i"
> EN IEC 60079-0:2018 – Explosive atmospheres, Part 0: Equipment, General requirements

5. The product has been certified for use in potentially explosive atmospheres by **EX-ON Mérnökiroda Kft.** (NB2786), Address: Örs utca 3, Budapest 1183, Hungary.

> Notification number: EXON 25 ATEX 2361 Q
> EU-type examination certificate number: EXON 25 ATEX 0891 X

Budapest, 2025.09.09

Dr. Buchwald Milán, CEO
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