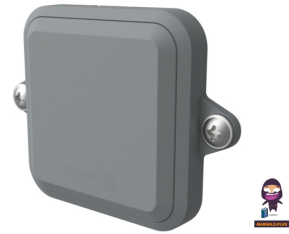**Manuals+** — User Manuals Simplified.

SENSATIVE ☀
**Square Tracker Xtreme
LoRaWAN Sensors**

SENSATIVE Square Tracker Xtreme LoRaWAN Sensors Owner's Manual

Contents

SENSATIVE ☀

SENSATIVE Square Tracker Xtreme LoRaWAN Sensors

Specifications

- **Product Name:** Square Tracker Xtreme
- **Technology:** LoRaWAN Sensors
- **Features:** GNSS (GPS & Beidou), WIFI MAC address scanning, LoRaWAN TDoA, 3D accelerometer
- **Battery:** Integrated 4 Ah battery with over 10 years of life
- **Usage**: Indoor and outdoor asset tracking

Product Usage Instructions

Description
The Square Tracker Xtreme is a cutting-edge precision tracker for indoor and outdoor asset tracking. It utilizes various technologies to provide accurate and power-efficient tracking without the need for frequent battery replacement or charging.

Features

- **GNSS (GPS & Beidou):** For outdoor tracking
- **WIFI MAC address scanning:** For indoor tracking
- **LoRaWAN TDoA**: Reliable positioning in diverse environments
- **3D accelerometer:** Detects motion and tilt position changes

Benefits & Use Cases
The Square Tracker Xtreme is ideal for asset tracking, surveillance, and various applications:

- Asset Management & Logistics
- Vehicle & Fleet Monitoring
- Healthcare Equipment Tracking
- Construction & Agricultural Equipment Tracking

Additional Advantages

The device's combination of technologies, durable build, and energy-efficient design enhances operational efficiency and asset security across various industries.

Square Tracker Xtreme

Description

- Square Tracker Xtreme represents a cutting-edge generation of low-power, precision trackers suitable for both indoor and outdoor environments. This device is engineered to offer advanced asset management capabilities without the necessity for battery replacement or charging.
- It utilizes GNSS (GPS & Beidou), WIFI MAC address scanning, and LoRaWAN TDoA (Time.
- Difference on Arrival) to deliver accurate and power-efficient tracking of assets, both indoors and outdoors.
- The cloud-based location solution significantly reduces scanning time and power consumption compared to conventional trackers.
- A 3D accelerometer further enhances the tracker's responsiveness and battery life. It detects any motion and tilt position change of the sensors. This information can be used to send alarm messages if the object is moved or to control the tracker activity, such as going to the tracker sleep mode during periods of inactivity, thereby conserving energy.
- There are multiple configuration options available, allowing users to fine-tune the balance between device performance and battery longevity.
- The compact tracker is constructed to endure, featuring a sturdy and sealed housing, a conformal coated circuit board, and an integrated 4-Ah battery. This battery is capable of supporting over 10 years of life under standard configuration profiles, making the Square Tracker Xtreme a robust and reliable solution for long-term asset tracking.

Benefits & Use Cases

The Square Tracker Xtreme is a comprehensive tracking solution, ideal for a wide range of applications related to asset tracking and surveillance. Its advanced features, including positioning and 3D accelerometer technologies and a robust design, make it particularly suitable for scenarios where precise tracking is essential.

Enhanced Positioning Technologies:

- **GPS & Beidou:** Provide accurate outdoor tracking across the globe.
- **WIFI:** Effective for indoor location tracking using nearby WIFI networks.
- **LoRaWAN TDoA:** Offers reliable positioning in diverse environments, complementing GPS and WiFi.

Key Applications:

- **Asset Management & Logistics:** Ideal for tracking assets and goods in transit, such as containers and high-value cargo.
- **Vehicle & Fleet Monitoring:** This is Suitable for tracking various vehicles and aiding in security and fleet optimization.
- **Healthcare Equipment Tracking:** Monitors vital hospital equipment, ensuring efficient utilization.

- **Construction & Agricultural Equipment:** Tracks machinery and tools, preventing loss and unauthorized use.

Excellently suited for scenarios where the location updates should be based on the activity, such as assets that move infrequently. Ideal for situations requiring up to one position update per hour or only upon request from the service. This feature makes it perfect for monitoring assets that do not require constant location updates.

Additional Advantages:

- **Indoor and Outdoor Capability:** Seamlessly transitions between indoor and outdoor tracking modes.
- **Durable and Weather-Proof:** It withstands challenging conditions, thanks to its IP68 and IK06 ratings.
- **Extended Battery Life:** The 4 Ah battery ensures long-term operation with minimal maintenance.
- **Flexible Installation:** It offers multiple mounting options for easy deployment.
- **Motion and Temperature Sensors:** Includes a 3D accelerometer for movement-based alarms &tracking and a temperature sensor for environmental monitoring.

The Square Tracker Xtreme, with its blend of multiple positioning technologies, durable build, and energy-efficient design, is an invaluable tool for various industries, enhancing operational effi and asset security, particularly in applications with specific tracking frequency requirements.

Mechanics

The Square Tracker Xtreme is engineered to be both weather-proof and ultra-rugged, meeting the robust standards of IP68 for water and dust resistance and IK06 for impact resistance.

To accommodate different installation requirements, the tracker offers three mounting options:

- **Adhesive (Included):** This option allows for quick and easy mounting on various surfaces without the need for tools.
- **Mounting Frame (Included) and Screws (Not Included):** For a more secure and permanentinstallation, the tracker can be mounted using the included frame along with screws (whichneed to be procured separately).
- **Cable Ties:** The tracker can be attached using cable ties, either one in the central slot for a straightforward setup or two utilizing the space outside the central slot for additional stability.

These mounting alternatives provide the flexibility needed to deploy the tracker across a wide array of environments and applications, ensuring optimal placement for effective tracking.
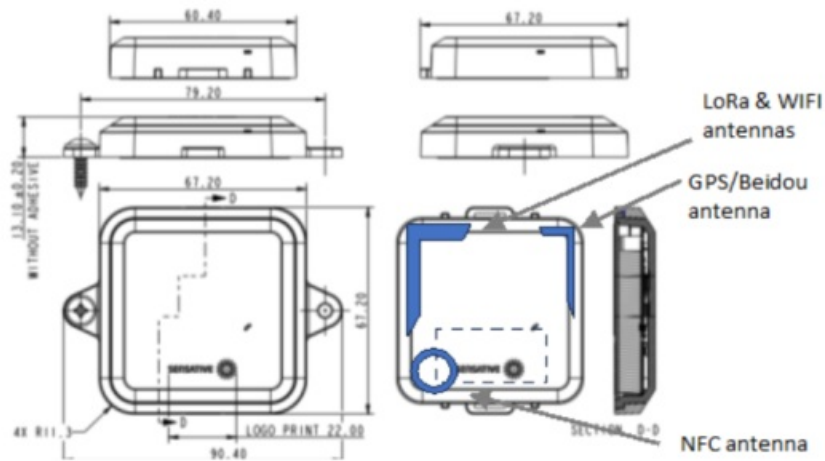
Figure 1: Mechanical outline (mm) with & without mounting frame

Software

- The Square Tracker Xtreme from Sensative is equipped with a sophisticated software architecture that includes a Virtual Sensing Machine (VSM) embedded in its firmware. This VSM executes specialized sensor applications designed for the device's sensing capabilities and specific use cases. The device is initially configured with a versatile, general-purpose tracking application, adaptable for a broad spectrum of tracking situations.
- For more specialized requirements, Sensative provides tailored application development through its expert engineering services. This customization enables the Square Tracker Xtreme to be precisely adapted to meet unique needs, thereby significantly enhancing its performance in a variety of specialized settings.

Getting Started

Initial Setup & Activation (OTAA)

Pre-Activation Steps:

- Before activating the device, ensure it is registered on the designated LoRaWAN server.
- Utilize the Dev EUI and Network Key provided with your digital delivery information for registration.

Activation:
Following registration, briefly bring any NFC reader close to the device to initiate activation. Most mobile phones are equipped to serve as NFC readers. Just ensure that NFC is enabled in your phone settings.

- The activation process might take up to two minutes. Successful join activity will be indicated on the LoRaWAN Network Server.
- The device will continuously attempt the activation process until it successfully connects to the registered LoRaWAN network. Joining the network might take up to 24 hours once the LoRaWAN network becomes available.

Configuration:

- Tailor the device settings to fit your specific use case.
- Multiple configuration options are available.

- Confi guration support: **https://sensative.com/resource-center/**

Installation

General Guidelines:

- The Square Tracker Xtreme antenna positions are indicated in Figure 1. To ensure effective GNSS(Global Navigation Satellite System) performance, it is important to install the device in a manner
That allows the antenna an unobstructed view of the sky. It is recommended that the unit is installed such that either the front, top, or right side is directed toward the sky.
- It's important to note that any obstruction between the sensor and the sky can adversely affect GPS functionality. This includes any objects that might shelter or cover the sensor, impeding its direct line of sight to the sky.
- For installation, the device offers versatile mounting options. It can be securely attached using theadhesive provided in the package, fi xed in place with cable ties for a more fl exible setup, ormounted with screws when using the included mounting frame. These options allow for a wider range of installation possibilities, accommodating various surfaces and orientations to suit different operational requirements and ensure optimal GPS performance.

Figure 2: Cleaner sachet

- Adhesive: Clean both the device's back side and the surface where the device should be mounted with a 50:50 mixture of isopropyl alcohol (IPA) and water or a surface cleaner sachet, as shown in Figure 2.

Figure 3: Apply adhesive

- Apply the adhesive on the back of the Tracker.

Figure 4: Install with cable ties

- Cable Ties: Use plastic cable ties to mount the Tracker when applicable. It may be combined with the usage of the adhesive for extra durability.

Figure 5: Install with screws

- Screws: Use the provided frame to mount using M4 screws where applicable.
- For removal of a device mounted with adhesive, dental floss can be an effective tool. Simply slide the floss behind the sensor and use a sawing motion to gently cut through the adhesive, detaching the device without causing damage.

Operations

- Your device can be confi gured to best fi t your use case while maintaining a long battery life. Pre-defi ned confi guration profi les are available.
- Square Tracker Xtreme utilizes a cloud service, decreasing the GPS/Beidou scanning time from 30 seconds down to 3-4 seconds and off-loads the geo-location calculation to the cloud server, resulting in an expected 10-year battery life with up to 1 scan per hour.
- It is recommended to use the built-in 3D accelerometer to control the geo-position scanning such that geo-positioning is turned off if the tracker has not been moved since the last scan.
- WIFI tracking is more power-efficient than GPS & Beidou and is suitable for indoor and urban outdoor positioning.
- GPS & Beidou do not work indoors or under a sheltering roof.
- In many applications, it may be better to use WIFI as the main geolocation service and only use GNSS if no accurate WIFI position is found.
- "Position on Demand" is a feature of the Square Tracker, allowing you to configure the sensor to transmit its location data during its subsequent interaction with the LoRaWAN network when requested. This functionality

enhances the tracker's flexibility and responsiveness in various tracking scenarios.

More information

- The default Square Tracker Xtreme application documentation includes configuration options.WWW….
- Library of documentation for all available Square Tracker Xtreme applications. WWW *Support
- **https://shop.sensative.com/support**
- Support resource center www
- Android app www
- Sensor initiated roaming www

Technical information

Specification	Description
Features	Cloud-supported GNSS (GPS/Beidou) geo-positioning for outdoor usage.
	Cloud-supported WIFI MAC address scanning and geo-positioning for indoor and outdoor usage.
	Motion and tilt detection using 3D accelerometer technology
	supporting alarms and motion-controlled positioning. Temperature sensor (Typical accuracy: +/- 2 °C between 0-30 ° C) LoRaWAN connectivity
	NFC (Near field communication) connectivity with your smart ph

Specification	Description
LoRaWAN specifications	Regions: * EU (863-870 MHz) * US915 (902-928 MHz) * AS923-1 (920-923 MHz) * AS923-2 (923-925 MHz) * KR (923-925 MHz) * AU (915-928 MHz) * IN (865-867 MHz) Up to +14 dBm output power Up to 10 km range LoRaWAN v1.0.4 OTAA (Over-The-Air Activation & Configuration) A-OTA (Application Upgrade Over-The-Air) Multiple LoRaWAN network keys for sensor-initiated roaming
Geo-positioning specifications	The device supports the following geo-positioning services: – GNSS (GPS & Beidou) @1575.42 MHz – 2.4 GHz WIFI (b/g/n) MAC address scanning – LoRa TDoA (Time Difference on Arrival) A geo-solving cloud service is required for geo-positioning.
Dimensions	60.4 * 67.2 * 15 mm Weight: 61 g incl battery
Operating conditions	-30 to + 65° C Weather protected: IP67 Sealed housing Circuit boards are moisture protected by Conformal Coating
Recommended storage c onditions	+10 to + 30° C
Power supply	Built-in 4.0 Ah LiMnO2 battery. 3.0 V
Battery life	Estimated 10 years battery life using any provided configuration profiles and max 2 geo-position scans per hour and good LoRa network coverage (SF7-SF 9).

Specification	Description
NFC	13.56 MHz Range: approx.. 2 cm. Position your NFC-enabled phone on the front side of the Tracker such that the phone NFC antenna is positioned above the tracker NFC antenna. See drawing above. Optional Android app for local configuration and data monitoring (password protected)
Other	* Supports battery reporting. * Data memory for offline storage of time-stamped data

Safety & Compliance

- Square Tracker Xtreme contains a built-in primary LiMnO2 battery. The device should be disposed of as a battery for recycling.
- LiMnO2 batteries are, in general, a safe battery technology but should still be handled with care. Do not short circuit, puncture, or expose to temperature above +80° C.

Note:
This equipment has been tested and found to comply with the limits for a Class B digital device, under part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

FCC NOTICE (for USA):

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Federal Communication Commission (FCC) Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. To avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antennashall not be less than 20cm (8 inches) during normal operation. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. No changes shall be made to the equipment without the Company's permission, as this may void the user's authority to operate the equipment.

INDUSTRY CANADA STATEMENTS:
This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device. This equipment complies with the safety requirements for RF exposure by RSS-102 §2.5.2. This equipment must be installed and operated according to the provided instructions, and a minimum 20 cm spacing must be provided between the antenna and any person's body during wireless modes of operation.

INDUSTRY CANADA NOTICE
"This device complies with ISED's licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device."

FAQS

- **Q: How long does the battery last?**

  A: The integrated 4 Ah battery can support over 10 years of life under standard configuration profiles.
- **Q: What are the key applications of the Square Tracker Xtreme?**

  A: Key applications include asset management & logistics, vehicle & fleet monitoring, healthcare equipment tracking, and construction & agricultural equipment tracking.

Documents / Resources

SENSATIVE Square Tracker Xtreme LoRaWAN Sensors [pdf] Owner's Manual
005, 2AHIR-005, 2AHIR005, Square Tracker Xtreme LoRaWAN Sensors, Square Tracker Xtreme, LoRaWAN Sensors, Sensors

References

- 🌐 **Resource Center - Sensative**
- ❋ **Support | Sensative Shop**
- **User Manual**