LoRa® Trackers with GPS

Main characteristics

- GPS-based tracking
- LoRaWAN™ Protocol 1.0.3
- Frequency Range: 863 to 928 MHz
- Channels: 8 (configurable)
- Transmit power: Up to +20 dBm
- LoRa® Reception sensitivity: From -120 dBm
- GPS reception sensitivity: From -160 dBm
- Communication distance of a few kilometers, depending on the region where the load or device is located
- Compatibility with the main network servers: Everynet, ChirpStack, TTN and Khomp.
- Waterproof protection
- OTAA or ABP activation

Applications

- Industries
- Agribusiness
- Corporate

Overview

The ITT 100, 101 and 102 endpoints are transmitters from the Khomp IoT Endpoint line of wireless sensing devices, used for tracking and locating liabilities of any kind, operating with LoRa® radio and LoRaWAN™ 1.0.3 protocol.

The localization is done through the latitude and longitude information obtained by the GPS present in all models of the device.

A history of the GPS information is saved in the device memory, with a storage capacity of up to 160 messages (which equals a 40 hour history if the positioning sampling is 15 minutes). By default, the device saves only 50 messages, but this value can be configured via downlink.

The use of this history saving mechanism can be disabled.

Periodically, the connection to the LoRaWAN™ network is checked, and if confirmed, the position history is sent. Otherwise, the data remain saved and the device restarts the network connection process.

Table of models

Model	Description
ITT 100	Endpoint LoRa® transmitter for logistics tracking with GPS, internal antenna, medium cell type C without charging circuit.
ITT 101	Endpoint LoRa® transmitter for logistics tracking with GPS, internal antenna, rechargeable battery, external power supply via integrated fixed cable.
ITT 102	Endpoint LoRa® transmitter for logistics tracking with GPS, internal antenna, rechargeable battery, external power supply via via micro-USB connector.

Technical specifications

ITT 100

Characteristics

- Internal bracket on the board for a 1.5 V type C battery
- An internal LED for operation indication
- An internal button for sending data, factory reset or changing authentication mode
- Internal LoRa® antenna
- Internal passive GPS antenna
- Waterproof protection class
- Interval between transmissions: 15 minutes
- Minimum interval between transmissions: 30 seconds

Physical Characteristics

- Dimensions: 81 x 65 x 36 mm
- Weight: 150g
- Operating temperature range: -20°C to 55°C

Electrical Characteristics

- Input Voltage: 1 C type battery 1.5 V
- Sleep Mode Current: 400 µA
- Transmitting current (maximum): 172 mA
- Receiving current (maximum): 24 mA
- Estimated performance:
  - 1 year (with transmissions every 30 minutes)
  - 8 months (with transmissions every 15 minutes)
- Operating voltage: Between 1.1 V and 3 V
- Average power: 0.15 W

ITT 101

Characteristics

- Internal bracket in the board for a rechargeable lithium polymer battery
- Cable gland for power connection
- An internal LED for operation indication
- An internal button for sending data, factory reset or changing authentication mode
- Internal LoRa® antenna
- Internal passive GPS antenna
- Electrical surge protection circuit
- Battery charging circuit
- Waterproof protection class
- Transmission interval: 1 minute
- Minimum interval between transmissions: 30 seconds

Physical Characteristics

- Dimensions: 104 x 65 x 36 mm
- Weight: 150 g
- Operating temperature range: -20°C to 55°C

Electrical Characteristics

- Input voltage: 1 lithium polymer battery and/or vehicle battery via cable
- Maximum input voltage: 40 V nominal
- Transmitting current (maximum): 172 mA
- Receiving current (maximum): 24 mA
- Battery Life: 36 hours (with send every 1 minute)
- Battery charge time: 1 hour and 30 minutes
- Operating voltage: Between 12 V and 24 V
- Average power: 0.33 W

ITT 102

Characteristics

- Internal bracket on the board for a rechargeable lithium polymer battery
- Micro-USB connector for charging the battery
- An internal LED for operation indication
- An internal button for sending data, factory reset or changing authentication mode
- Internal LoRa® antenna
- Internal passive GPS antenna
- Battery charging circuit
- Waterproof protection class
- Transmission interval: 1 minute
- Minimum interval between transmissions: 30 seconds

Electrical Characteristics

- Input voltage: 1 lithium polymer battery with micro-USB connector for charging
- Maximum input voltage: 13 V
- Transmitting current (maximum): 172 mA
- Receiving current (maximum): 24 mA
- Battery Life: 36 hours (with sending every 1 minute)
- Battery Charge Time: 1 hour and 30 minutes
- Operating voltage: Between 4.5 V and 5.5 V
- Average power: 0.33 W

Physical Characteristics

- Dimensions: 81 x 65 x 36 mm
- Weight: 150g
- Operating temperature range: -20°C to 55°C

All models

LoRaWAN™ Specifications

- LoRaWAN™ Protocol 1.0.3
- Frequency Range: 863 to 928 MHz
- Channels: 8 (configurable)
- Transmit power: up to +20 dBm
- Reception sensitivity: from -120 dBm
- Communication distance: a few kilometers, according to the region where the device/cargo is located
- Compatibility with the main network servers: Everynet, LoRa® Server, The Things Network (TTN) and NS ITG 200 Khomp

Standard Device Configuration

- Device Class: A
- Region: LA915
- Authentication Method: ABP
- Data Rate: DR0 (corresponding to SF12)
- Subband: First (915.2 to 916.6 MHz)
- Adaptive Data Rate (ADR): Off
- GPS History Buffer Size: 50 messages (equivalent to 12.5 hours)
- Network connection check period: 60 minutes

GPS Characteristics

- Constellations used: GPS and GLONASS
- Sensitivity: From -160 dBm
- Positioning accuracy: 2.5 meters
- Time to first acquisition (TTFF): Up to 5 minutes
- Data formatting: Degrees, minutes and seconds (DMS)
- Positioning history up to 40 hours, even without LoRaWAN™ network connectivity

Product images

Caption: *ITT 100.*

Caption: *ITT 101*.

Caption: *ITT 102*.

Positioning of the product at the operating site

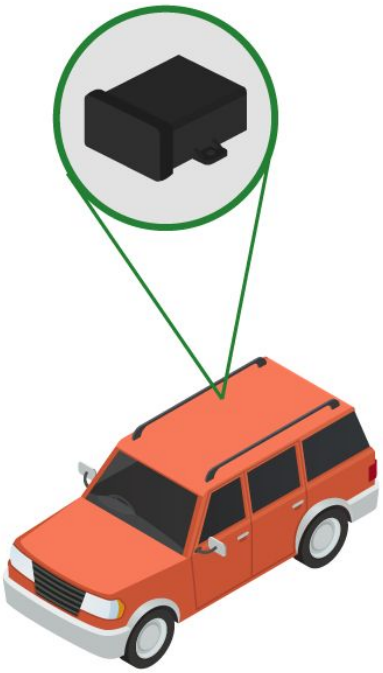
With the device turned on and closed properly, the ITT should be positioned **with the metallic label facing up**. This will ensure a more accurate GPS operation.

ⓘ	**Note**	Due to the operability between LoRa® and GPS, the ITT can have a position error of up to 100 meters when stationary.

Application models

They work with **LoRa®** network

ITT 100



The device acts as a **GPS tracker**.

It has a **non-rechargeable internal battery**.

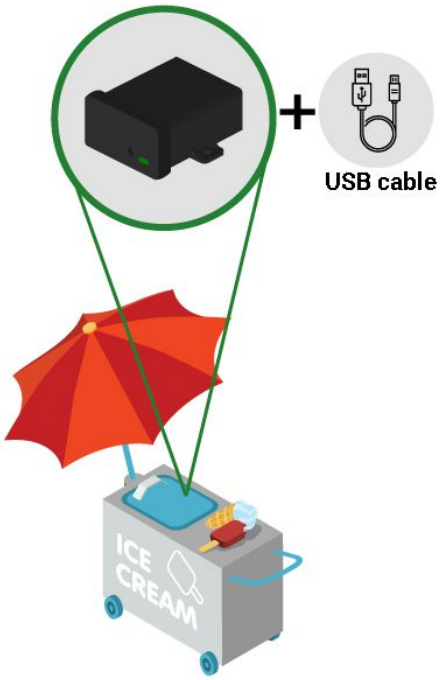
ITT 101*

*Connected to the vehicle battery

The device acts as a **GPS tracker for vehicles**.

It can be powered by an **internal battery** or the **vehicle battery**.

ITT 102



The device acts as a **GPS tracker** for objects.

It can be **removed** after use to **charge your internal battery** via USB.

Everynet interoperability seal

COMPATIBLE WITH LoRaWAN

&thingz Interoperability Lab