T1000-E User Guide

Content

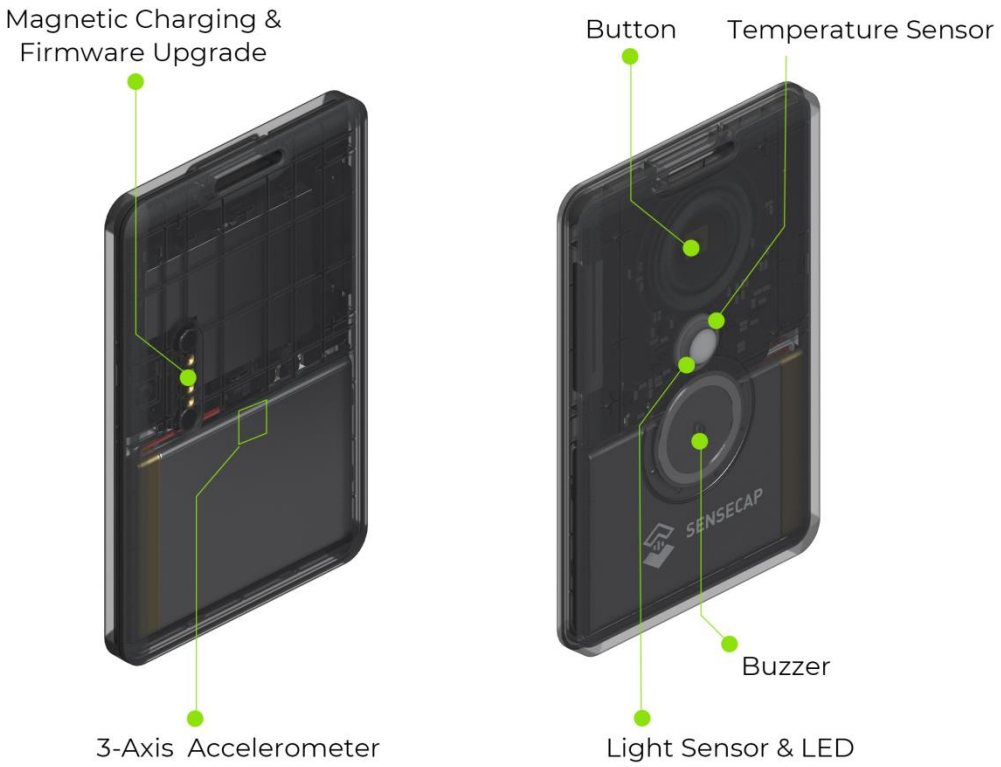
1. Introduction

SenseCAP Card Tracker T1000-E for Meshtastic is a high-performance tracker designed for Meshtastic, as small as a credit card, effortlessly fitting in your pocket or attaching to your assets. It embeds Semtech's LR1110, Nordic's nRF52840, and Mediatek's AG3335 GPS module, providing Meshtastic users with a high-precision, low-power positioning and communication solution.

2. Features

- **Multi-Protocol Support**: Featuring nRF52840 and LR1110, it supports Bluetooth 5.0, Thread, Zigbee, and LoRa, ensuring compatibility with a wide range of devices and networks.
- **Powerful Positioning Capabilities**: Integrated with the Mediatek‘s AG3335 GPS chip, it provides high-precision positioning services.
- **Expandable Interfaces**: Designed with four pogo pins, it supports USB interface for DFU (Device Firmware Upgrade), serial logging, and API interface, simplifying device management and debugging.
- **Open Source Support**: Compatible with the Meshtastic open-source mesh networking protocol, suitable for long-range and low-power communication needs.

3. Specification



General

Network protocol	LoRa, Bluetooth v5.1
Temperature	Range: -20 to 60℃; Accuracy: ± 1℃ (min ±0.5℃, max ±1℃) Resolution: 0.1℃
Light	0 to 100% (0% is dark, 100% is brightest)

3-Axis Accelerometer	3-Axis Accelerometer to detect movement
LED and Buzzer	1*LED and 1* buzzer to indicate status
Button	1* Button to operate
Antenna	Internal (GNSS/LoRa/Wi-Fi/BLE)
Communication Distance	2 to 5km (depending on antenna, installation, and environments)
Dimensions	85 * 55 * 6.5 mm
Device Weight	32g
Operating Temperature	-20℃ to +60℃
Operating Humidity	5% - 95% (No condensation)
Certification	CE /FCC

Battery

Battery Capacity	Rechargeable lithium battery, 700mAh
Battery Life Monitoring	Periodic uplink battery level
Charge Cable **(Adapter not included)**	USB magnetic charging cable, 1 meter
Power Input Voltage	4.7 to 5.5V DC
Charging Temperature Limit	0 to +45℃

PIN

Power to Sensor	P0.4	GPIO
Temperature	P0.31	NTC (analog)
Light	P0.29	LUX(analog)
3-Axis Accelerometer **(Not currently used in the Meshtastic firmware)**	SDA: P0.26 SCL: P0.27	Via IIC
Power to Accelerometer	P1.7	GPIO
LED	P0.24	GPIO
Buzzer	P0.25	GPIO
Enable Buzzer	P1.05	GPIO
Button	P0.6	GPIO

Power to Sensor	P0.4	GPIO
Power to sensor	P1.6	GPIO
LR1110	P1.08: SPI MISO P1.09: SPI MOSI P0.11: SPI Clock P0.12: SPI NSS P1.10: LoRa Reset P1.01: LoRa DIO1 P0.07: LoRa DIO2 LR11X0_DIO3_TCXO_VOLTAGE 1.6V	SPI
GPS	RX: P0.14 TX: P0.13	Serial1 BAUDRATE:115200

4. Button

Actions	Description
Press once	Power on
Press button and hold for 5 seconds	Power off
Press twice continuously	Upload node info and location info
Press 3 times continuously	Switch GPS on or off

5. Get Started

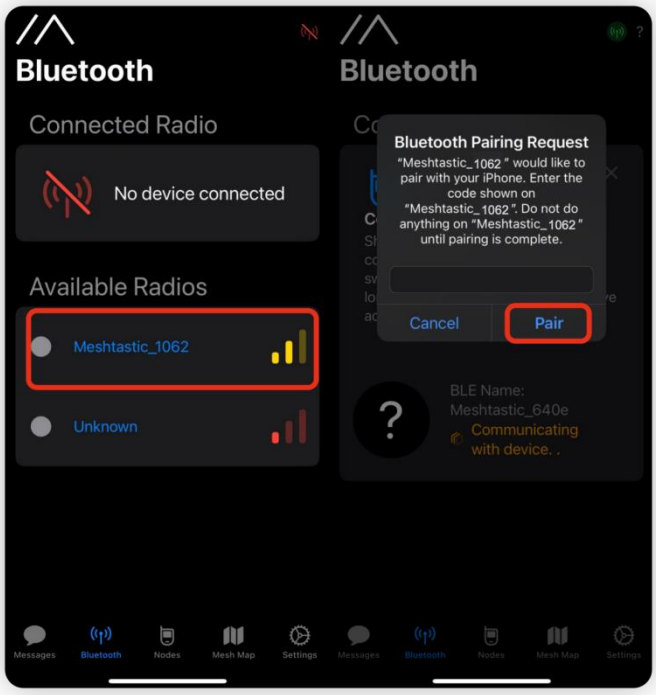
5.1 Configure via Meshtastic App

5.1.1 Connect the device

1) Download Meshtastic App.

- **IOS App**
- **Android App**

2) Power on the T1000-E tracker, the Bluetooth pairing will be activated automatically.
3) On the Bluetooth page, select the target device, enter the code(default code is '123456') and then click 'Pair' to connect the device.



5.1.2 Configure the parameters

In order to start communicating over the mesh, you must set your region. This setting controls which frequency range your device uses and should be set according to your regional location.

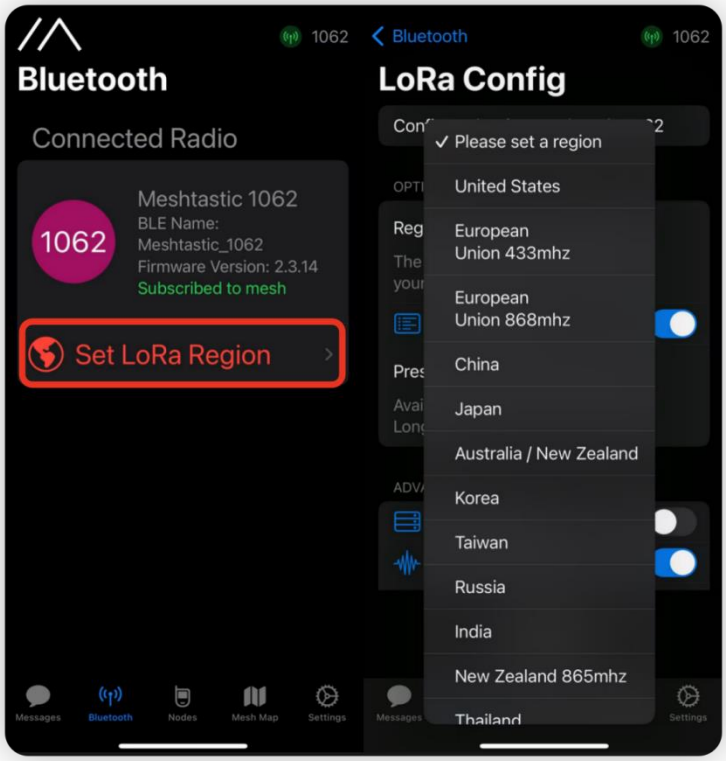
Region List

Refer to [LoRa Region by Country | Meshtastic] for a more comprehensive list.

Region Code	Description	Frequency Range (MHz)	Duty Cycle (%)	Power Limit (dBm)
UNSET	Unset	N/A	N/A	N/A
US	United States	902.0 - 928.0	100	30
EU_868	European Union 868MHz	869.4 - 869.65	10	27

Note: EU_868 have to adhere to an hourly duty cycle limitation of 10%, calculated every minute on a rolling 1-hour basis. Your device will stop transmitting if you reach it, until it is allowed again.

After the device is connected, click 'Set LoRa Region' and set the parameters for your region.



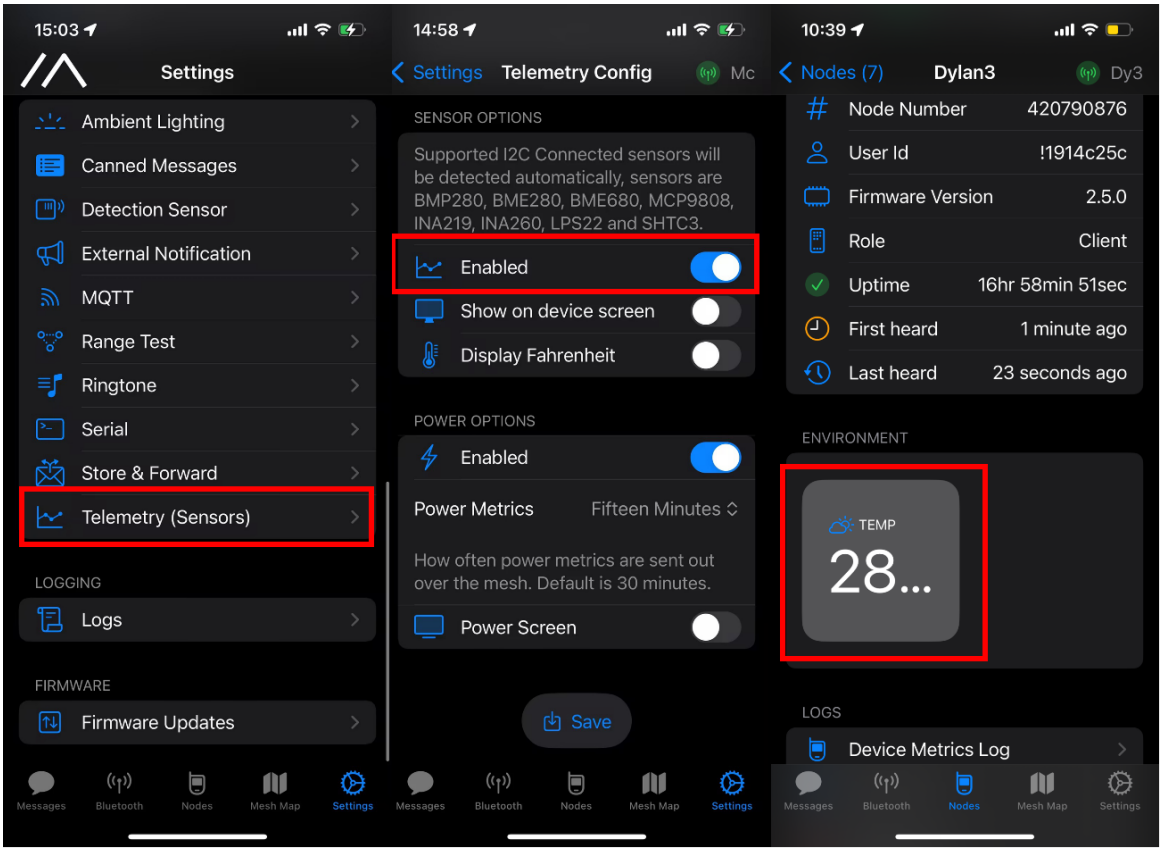
More configurations please check [Meshtastic doc].

5.1.3 Sensor Configuration

Sensor	Description
Temperature	✓
Light	Not supported by the App currently
Accelerometer	To be continued

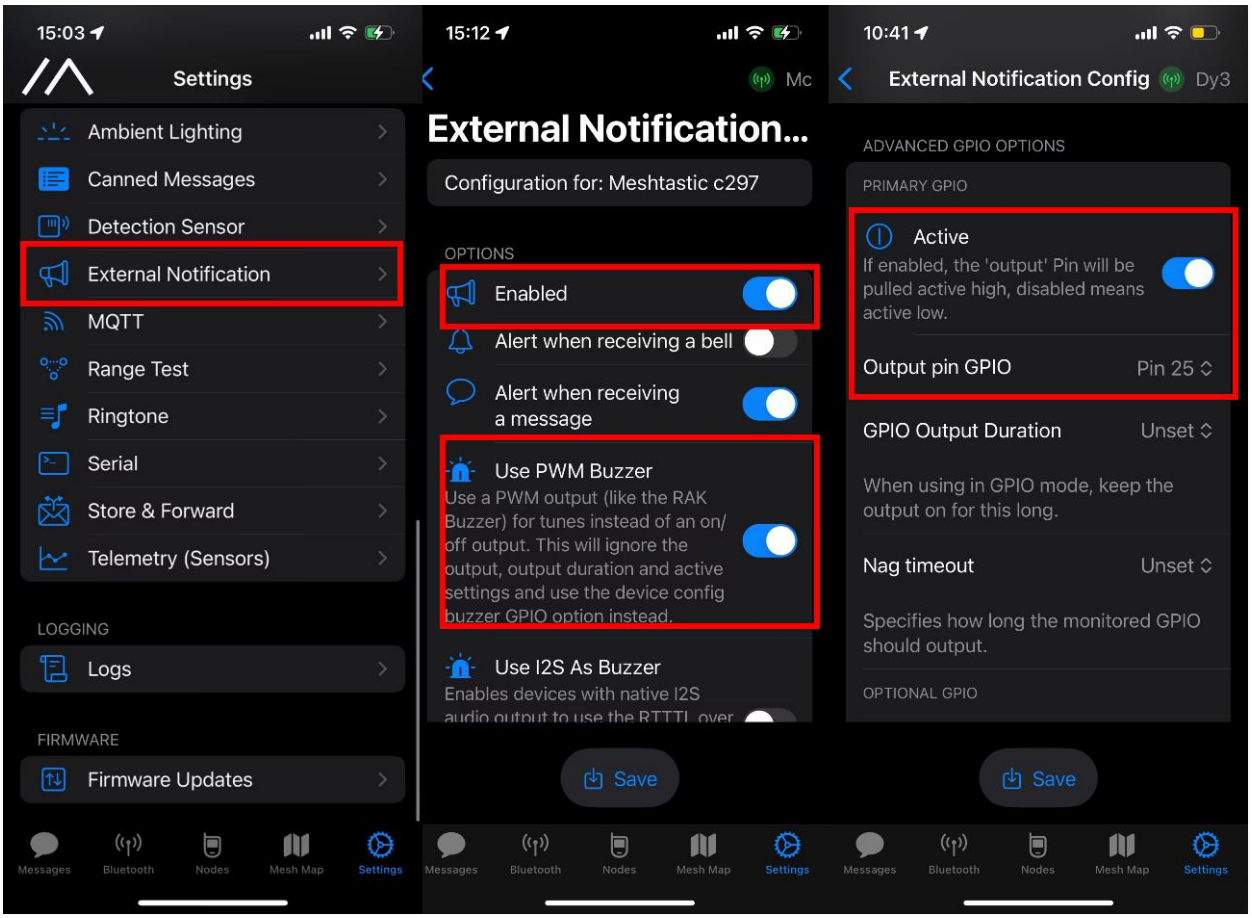
Temperature Sensor Config

Navigate to **Settings** -> **Telemetry**(**Sensors**) -> Enable **sensors**.



Buzzer and LED Config

Navigate to **Settings** -> **External Notification** -> Enable **GPIO** -> Set **Output Pin GPIO**.



6. FCC

FCC regulatory conformance:

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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to 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 in accordance with 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

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user’s authority to operate the equipment.

RF Exposure

The SAR limit adopted by FCC is 1.6 W/kg averaged over one gram of tissue. The highest SAR value reported to the FCC for this device type when using in portable exposure conditions is 1.19W/kg..

7. CE

Declaration of Conformity

Hereby, Seeed Technology Co., Ltd. declares that the radio equipment type T1000-E is in compliance with Directive 2014/53/EU and this product is allowed to be used in all EU member states. The full text of the EU declaration of conformity is available at the following internet address: www.seeedstudio.com

Manufacturer information:

Company name: Seeed Technology Co., Ltd.

Address：9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen 518055, China

Operation frequency (Max power)

Bluetooth: 2402-2480 (9.1dBm)

Lora: 863MHz-870MHz (13.9dBm)

RF exposure statement

For the countries that adopt the SAR limit of 2.0 W/kg over 10 grams of tissue. The device complies with RF specifications when used at a distance of 0.0 cm from your body. The highest reported SAR value: body SAR: 0.321W/kg

8. Document Version

Version	Date	Description	Editor
V1.0	7/22/2024	First edition	Jessie
V1.1	9/12/2024	Modify some description.	Jessie