

# GL53MG(Plus) User Manual

## EGPRS/LTE Cat-M1/LTE Cat-NB2/GNSS Tracker

TRACGL53MGUM001

V1.04



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## History

Version	Date	Author	Description of Change
1.00	June 30, 2021	Wokky Lin	Initial.
1.01	April 22, 2022	Eden Zhang	Added the description of LED (work in combination).
1.02	April 29, 2022	Eden Zhang	Added the description of LED (function key).
1.03	November 09, 2022	Eden Zhang	Added the description of LED (Bluetooth).
1.04	March 22, 2023	Wokky Lin	Added the description of the method to wake up the device in Chapter 3.3.

## 1. Introduction

The GL53MG(Plus) is a micro waterproof GNSS tracker that supports LTE Cat M1/NB2. The device integrates the latest low-power wide area network standards and covers a broader area, making it more flexible to deploy. Adding a programmable button makes it ideal for applications requiring rapid emergency alert or checking status of the device, such as auto financing, asset monitoring, and car rental and leasing. The built-in BLE allows connectivity to diverse wireless accessories. The full-featured @Track Air Interface Protocol provides the complete documentation, so it's easy to learn system integration.

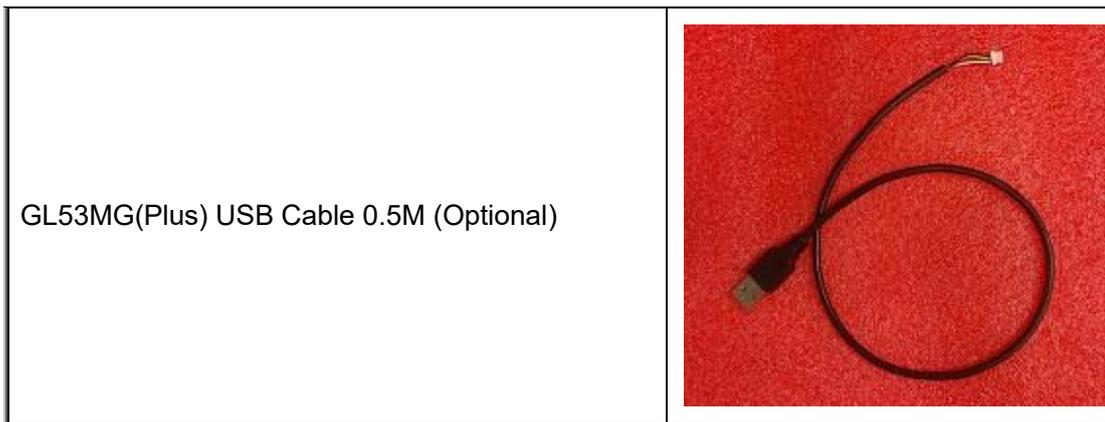
### 1.1. Reference

SN	Document Name	Remark
[1]	GL53MG(Plus) @Track Air Interface Protocol	The air protocol interface between GL53MG(Plus) and backend server.



## 2.2. Parts List

Name	Picture
<p>GL53MG(Plus) Tracker</p>	
<p>Double-sided Adhesive Sheet (for mounting the device)</p>	
<p>GL53MG(Plus) UART Cable 0.5M (Optional)</p>	



### 2.3. Battery Specifications

Capacity	2400mAh
Type	Lithium manganese dioxide battery
Standby Time	BLE Off, G-Sensor Off Standby current: 5µA 1 report per day: Up to 3 years 4 reports per day: Up to 300 days 5 minutes' reporting: Up to 5 days

**Note:**

1. The actual operating life of the battery is affected by conditions such as temperature and cellular signal strength.

a) Temperature

When the temperature is higher than 25°C, the higher the temperature, the greater the rate of self-discharge, which means the hotter the battery is, the quicker it will self-discharge. When the device is below 10° for long-term use, the lower the temperature, the lower the releasable battery capacity; the remaining power won't be released until the temperature rises back to between 10° C and 25° C.

b) Cellular Signal Strength

The following conditions can lead to the high current consumption of the device and thus affect standby life:

- Poor GNSS signal and long positioning time;
- Poor eMTC/EGPRS/NB network signal, long handshake time with the back-end server, and long reporting time.

### 3. Getting Started

#### 3.1. Install a SIM Card

**Step 1:** Loosen the 4 screws on the back to open the top cover.



**Step 2:** Install the SIM card on the flip SIM card holder with the words or logo facing up. Then close the flip SIM card holder.



**Step 3:** Place the top cover on the bottom cover. Make sure that there is a tight fit between the covers and the seal ring.



**Step 4:** Tighten the screws.



### 3.2. Turn on/ off the Device

There are two methods to turn on the device:

**Method One:** Turn on the battery switch.



**Method Two:** The battery switch on the PCB must be in the ON position first and then long press the key button for more than 3 seconds.



To turn off the device (<Function Key Mode> in the **AT+GTCFG** command is required to be set to 1), long press the key button for more than 3 seconds.

**Note:** Press button down for 3 to 20 seconds as a valid operation.

### 3.3. Wake up the Device

If the device goes into sleep mode, pressing the button three times within 2 seconds will wake up the device.



### 3.4. UART Interface

The device has an UART interface that is used for configuration by using the UART Cable 0.5M.



### 3.5. USB Interface

The device has a USB interface that is used for firmware download and MCU firmware download. The physical interface used by it is the same as that used by as the UART interface.



### 3.6. LED Description



Definition of Device Status and LED Status

LED	Device Status	LED Status
Status LED (Green)	The device is searching for network.	Fast flashing
	The device has been registered on the network.	Slow flashing
	SIM is locked by PIN.	Solid green
	The device isn't registered on the network.	Off
	The key button is pressed to check the device status.	Solid green (indicating the device's MCU is working)
	Bluetooth pairing	Fast flashing
	Bluetooth paired successfully	Slow flashing for 10 times
GPS LED (Blue)	Bluetooth pairing fails	At fixed intervals: Off At non-fixed intervals: Fast flashing for 4 minutes
	GPS is in the process of position fixing.	Fast flashing
	GPS is on and GPS gets fix information.	Slow flashing
	GPS is off.	Off
	The key button is pressed to check the device status.	Solid blue (indicating the device's firmware is working)

**Note:**

1. Fast flashing is about 60ms when the LED indicator is on and 780ms when it is off.
2. Slow flashing is about 60ms when the LED indicator is on and 1940ms when it is off.

- When the **AT+GTSVR** function works, the LED indicates Bluetooth pairing status instead of network status. This time, fast flashing is about 100ms when the LED indicator is on and 100ms when it is off; slow flashing is about 2s when the LED indicator is on and 2s when it is off.

After the device is turned on, the LEDs will turn on for about 5 minutes and then turn off. Please refer to the following table when two LEDs work in combination:

**GL53MG(Plus) LED Description (Work in Combination)**

When checking the device status	Both the LEDs will be on to indicate the device still works in wakeup status.
	The Status LED will be on to indicate the device still works in sleep status.
When the key button is triggered	The Status LED will be on for about 3 seconds, then flashing.

### 3.7. Installation Recommendation

Because of the location of the built-in GNSS antenna, let the side with the button face the sky when installing it.



## 4. Troubleshooting and Safety Information

### 4.1. Troubleshooting

Trouble	Possible Reason	Solution
The Status LED flashes fast when the device is turned on.	1. The cellular signal strength is weak; 2. The device isn't registered on the network.	Please place the device in an area with good network coverage.
Messages can't be reported to the backend server over the network.	APN is not right.	Ask the network operator for the right APN.
	The IP address or port of the backend server is wrong.	Please check and make sure the IP address for the backend server is identified by the Internet.
There is no response from the UART port when the device is configured by using UART.	The UART port is not ready or the device is not powered on.	Please check and make sure the UART port and the device are working properly.
The device can't get GNSS fix.	The GNSS signal is weak.	Please place the device in the open sky; Or
		Let the side with antenna face up.

### 4.2. Safety Information

- Don't disassemble the device by yourself.
- Don't place the device in an environment with high temperature and high humidity. Avoid exposure to direct sunlight. The high temperature will damage the device and even cause a battery explosion.
- Don't use the device on the airplane or near the medical equipment.