GL530MG User Manual

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

TRACGL530MGUM001

V1.02

Driving Smarter IoT

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Document Title	GL530MG User Manual
Version	1.02
Date	April 11, 2023
Status	Release
Document Control ID	TRACGL530MGUM001

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History

Revision	Date	Author	Description of Change
1.00	June 23, 2021	Super Zhao	Initial.
1.01	March 15, 2023	Super Zhao	Added the SIM card note.
1.02	April 11, 2023	Tammy Tian	Added the description of the method to wake up the device in Chapter 4.3.

1. Introduction

The GL530MG is an IP67-compliant GNSS tracker that features up to 7 years of standby time powered by the internal battery. The device supports multiple bands of LTE CAT-M1 (eMTC) network that are used in both North America and Europe, which is ideal for asset monitoring and Iot management that require tamper detection and temperature monitoring. The full-featured @Track Air Interface Protocol provides complete documentation, so it's easy to learn system integration.

1.1. Specifications

Table 1. GL530MG Specifications

Model No.	Region	Technology	LTE Category	Operating Band
GL530MG	Global	GSM/LTE	eMTC / NB-IoT	GSM850/GSM900/DCS1800/PCS1900 LTE-FDD: Cat M1: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B27/B28/B66/B85 Cat NB2: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85

1.2. Reference

Table 2. GL530MG Protocol Reference

SN	Document Name	Remark
[1]	GL530MG @ Track Air Interface Protocol	The air interface protocol between GL530MG and backend server

1.3. Terms and Abbreviations

Table 3. Terms and Abbreviations

Abbreviation	Description
RXD	Receive Data
TXD	Transmit Data
GND	Ground
USB_DM	USB Data Minus
USB_DP	USB Data Positive
USB_VBUS	Power for USB
UART	Universal Asynchronous Receiver and Transmitter

2. Product Overview

2.1. Appearance

Figure 1. GL530MG Appearance

2.2. Key Description

Table 4. GL530MG Key Description

Functions	To power on: Long press for more than 3 seconds To check the device status: Press the function button once To power off (configuration is required): Long press for more than 3s after power on
Note: 1. To power on the device, the battery switch on the PCB must be in the ON position first; 2. To completely cut off the power supply, the battery switch on the PCB must be in the OFF position.	

2.3. LED Description

Figure 2. GL530MG LEDs

There are two LEDs on the device, which can work separately or together to indicate the status of the device. Please refer to the following table when two LEDs work separately:

Table 5. GL530MG LED Description (work separately)

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
	The SIM card needs a pin code to unlock.	Solid green
	The device isn't registered on the network.	Off
	The power button is pressed to check the device status.	Solid green (indicating the device is working)
GPS LED (Blue)	GNSS is in the process of fixing.	Fast flashing
	GNSS is on and GNSS gets fix.	Slow flashing
	GNSS is off.	Off

Note:

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

Green led would be on after pushing button for 3s when device is power off, push button for 3 - 20s is valid, otherwise green led would be off, and the push event would be ignored.

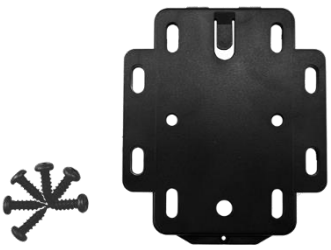
After the device is turned on, the LEDs turn on for 5 minutes and then turn off. Please refer to the following table when two LEDs work in combination:

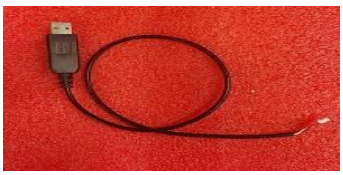
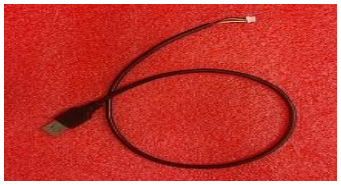
Table 6. GL530MG LED Description (work in combination)

During power-on	Both the LEDs will be on to indicate the device is powered on.
When checking the device status	The Status LED will be on to indicate the device still works.
During power-off	The Status LED will flash simultaneously to indicate the device is powered off.

2.4. Parts List

Table 7. GL530MG Parts List

Name	Picture	Description
GL530MG Locater		EGPRS/LTE Cat-M1/LTE Cat-NB2/GNSS Tracker
GL530MG Back Glue		Used to fix the device to/on sth.
GL530MG Magnetic Case (Optional)		Used to install the device on a metal surface for easy installation and removal
GL530MG Plastic Bracket (Optional)		Used to hold the device on the plastics bracket which is installed on surfaces where screw holes can be drilled

GL530MG UART Data Cable (Optional)		It is used for configuration.
GL530MG USB Data Cable (Optional)		It is used for firmware upgrade.

2.5. Battery Specifications

Capacity	1400mAh
Type	3 CR123A lithium batteries
Standby Time	1 report per day (GNSS on): Up to 5 years 1 report per day (cell ID only): Up to 7 years

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. Interface Definition

The GL530MG has an internal 5-pin connector. It can be used to configure the device or update the firmware (a different cable is required). The definition of the pins is in the following table.

Figure 3. 5-pin Connector of the GL530MG

Table 8. Description of 5-pin Connections

Index	Pin Name	Description
1	USB_5V	USB_VBUS
2	RXD/USB_DM	Device UART RXD/USB_DM
3	TXD/USB_DP	Device UART TXD/USB_DP
4	ID	Used for identifying the USB&UART cable
5	GND	Power and digital ground

4. Getting Started

4.1. Opening and Closing the Case

Loosen or tighten the 4 screws on the back to open/close the case.

Figure 4. GL530MG Screw Position

4.2. Turning on/off the Device

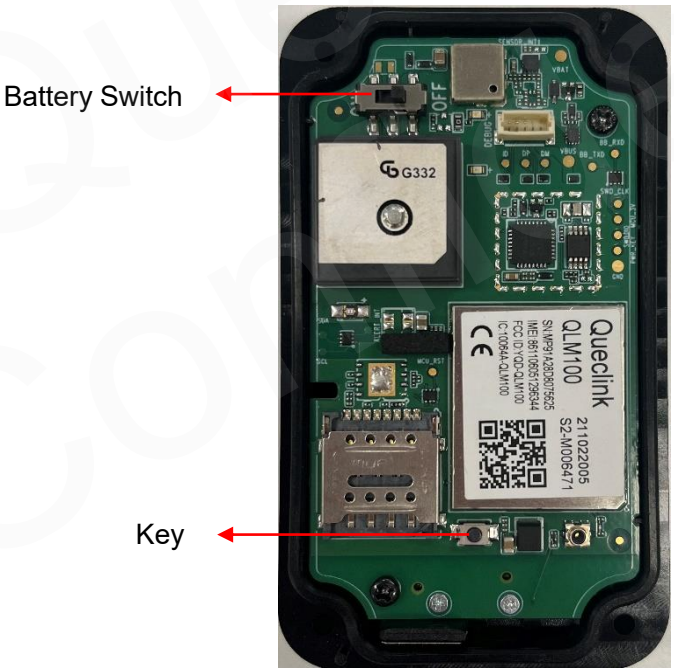


Figure 5. GL530MG Battery Switch and Key

To turn on the device: Toggle the battery switch on the PCB from the OFF to the ON position. Or long press the power button for more than 3 seconds if the battery switch is already in the ON position.

To turn off the device (configuration is required): Long press the power button for more than 3 seconds after power on.

To completely cut off the power supply: The battery switch on the PCB must be in the OFF position.

Note: When leaving the factory, if the SIM card is pre-inserted and the battery switch is in the ON position by default, so you just need to press the power button and make the device work; if the battery switch is in the OFF position, you need to install the SIM card by yourself.

4.3. Waking up the Device

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

Figure 6. Wake up the Device

4.4. Installing a SIM Card

Step 1

Power off the device first.

The battery switch is in the OFF position.

Figure 7. Power off the device

Step 2

Open the flip SIM card holder. Make sure the small notch in the corner of the SIM card matches the one in the SIM card tray so that it fits properly. Install a SIM card on the holder with the words or logo facing up.

Open the flip SIM card holder

Figure 8. Install a SIM card

Step 3

Close the flip SIM card holder. Toggle the battery switch to the ON position to power on the device.

The battery switch is in the ON position.

The SIM card holder is secured.

Figure 9. Power on the device

Note: The SIM card holder **must** be secured at any time when the device is being turned **ON**. Failing to do so may cause incorrect functionality of the device.

5. Installation Precautions

- Firmly fix the device to a reliable surface to prevent falling off.
- Let the side with the GNSS antenna face up to have better signal reception.
- Don't install the device under a metal surface or in enclosed environments, which makes it difficult to get GNSS or network signals.

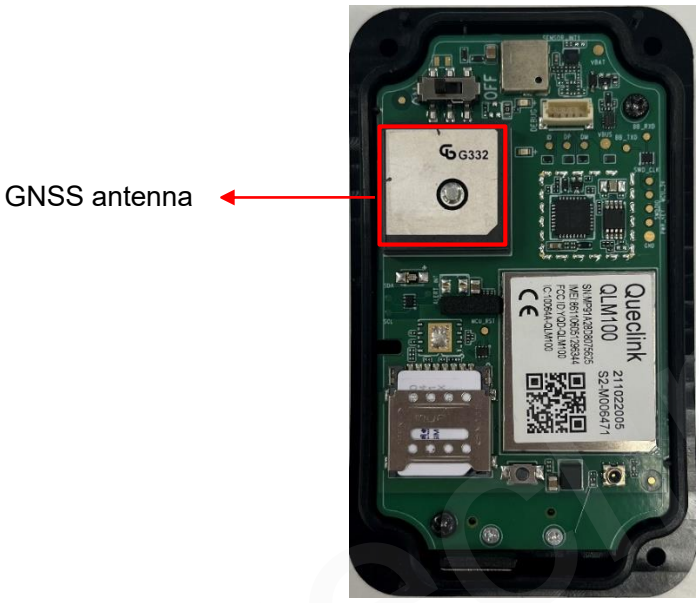


Figure 10. GNSS antenna

Installation: correct	Installation: incorrect

Note: If the magnetic or plastic bracket is used to hold the device, please make sure the force applied to screw the device (as follows) is no more than 0.6±0.2kgf/cm^2. Otherwise, excessive force may cause damage to the device case.

6. Troubleshooting and Safety Info

6.1. Troubleshooting

Table 9. GL530MG Troubleshooting List

Issue	Possible Cause	How to Fix
The Status LED flashes fast when the device is 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.	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 fixed.	The GNSS signal is weak.	Please place the device in an open area; Let the side without LED indicators face up.

6.2. Safety Info

- 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 an airplane or near medical equipment.