



GL501MG User Manual

EGPRS/LTE Cat-M1/LTE Cat-NB1/GNSS Tracker

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0. Revision History

Revision	Date	Author	Description of Change
1.00	2019-11-28	Heymi Lin	Initial

1. Introduction

GL501MG is an IP67 waterproof GNSS tracker that features up to 900 days standby time powered by internal batteries and supports wireless charging. The device is ideal for lot management and other tracking applications that require real-time monitoring on temperature and light. GL501MG supports LTE Cat M1/NB1 network on multiple bands for operation in America, Europe, and Oceania with a fallback to GPRS.

1.1. GL501MG Product

Table 1. GL501MG Product

Model No.	Region	Technology	Operating Band (MHz)
GL501MG	Worldwide	eMTC/NB-IoT	GSM:GSM850/GSM900/ DCS1800/PCS1900 LTE-TDD: B39 (for Cat.M1 only) LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/ B19/B20/B25/B28

1.2. Reference

Table 2. GL501MG Protocol Reference

SN	Document Name	Remark
[1]	GL501MG @Track Air Interface Protocol	The air interface protocol between GL501MG and backend server

1.3. Terms and Abbreviations

Table 3. GL501MG Terms and Abbreviations

Abbreviation	Description
RXD	Receive Data
TXD	Transmit Data
GND	Ground

2. Product Overview

2.1. Product Appearance



Figure 1. GL501MG Product View

2.2. Key Description

Table 4. GL501MG Key Description

Key Functions	To power on: Long press for more than 3 seconds ¹ To check the device status: Press the key for one time To power off (needs to be configured): Long press for more than 3s after power on ²
Note: 1, To power on the device, set the battery switch on the PCB to ON position first; 2, To completely cut the power, set the battery switch on the PCB to OFF position.	

2.3. LED Description



Figure 2. GL501MG LEDs

There are two LEDs on GL501MG. They can work separately and in combination to indicate the status of the device. For the details when they work separately, please see the table below:

Table 5. GL501MG LED Description (work separately)

LED	Event	State
Status LED (Green)	Searching network	Fast flash
	The device has been registered on network	Slow flash
	SIM is locked by PIN	Solid on
	Network modem off	Solid off
GPS LED (Blue)	GPS is in the process of fixing	Fast flash
	GPS is on and GPS gets fix	Slow flash
	GPS off	Solid off

Fast flash: 100ms on/200ms off

Slow flash: 200ms on/1000ms off

Note: The LEDs will be on about 5 minutes after power on. After that, they will always be off.

When they work in combination, the details are described as below:

Table 6. GL501MG LED Description (work in combination)

During power on	Both the LEDs will be on to indicate the device is being powered on.
When checking the device status	Both the LEDs will be on to indicate the device still works.
During power off	Both the LEDs will flash simultaneously to indicate the device is being powered off.
During charging	Both the LEDs will flash simultaneously to indicate the device is being charged.
When fully-charged	Both the LEDs will be on to indicate the device is fully charged.

2.4. Parts List

Table 7. GL501MG Parts List

Name	Picture	Description
GL501MG Locater		EGPRS/LTE Cat-M1/LTE Cat-NB1/GNSS Tracker
GL501MG Back Glue		Used to install GL501MG
GL501MG Magnetic Case (Optional)		Used to install GL501MG on metal surface with convenient taking off
GL501MG Data Cable (Optional)		USB data cable which can be used for firmware upgrade and configuration
GL501MG Wireless Charger Accessory Kit		For battery charging Note: Remove the magnetic case when charging the device with the wireless charger kit.

3. Interface Definition

GL501MG has an internal 4-pin connector. It can be used to configure the device. The definition of the pins is in the following table.



Figure 3. 4-pin Connector of the GL501MG

Table 8. Description of 4-pin Connections

Index	Pin Name	Description
1	USB_5V	Not used
2	RXD	MCU UART RXD
3	TXD	MCU UART TXD
4	GND	Power and digital ground

4. Getting Started

4.1. Opening and Closing the Case



Figure 4. GL501MG Screw Position

To open/close the case: Unfasten or tighten the 4 screws at backside.

4.2. Turning on/off the Device



Figure 5. GL501MG Battery Switch and Key

To turn on: Long press the key for more than 3 seconds.

To turn off (needs to be configured): Long press for more than 3s after power on.

Note: When leaving factory, the internal battery switch is at “ON” position by default if SIM card is pre-inserted so the user only needs to press the key to make the device working and at “OFF” position if the SIM card will be installed by the users themselves.

4.3. Installing a SIM Card

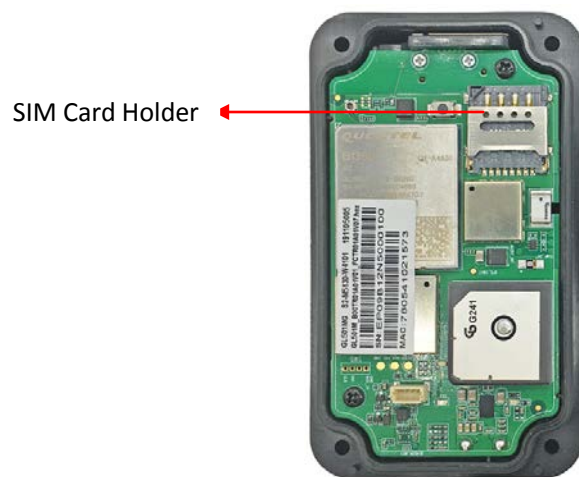


Figure 6. GL501MG SIM Card Holder

Power off the device first and then install the SIM card.

5. Installation Precautions

- ◆ Firmly install the device to a reliable surface to prevent falling off.
- ◆ Make the side with antenna face sky to have better signal reception.
- ◆ Do not install the device under metal surface or in enclosed environments having difficulty in getting GPS and network signal.

6. Troubleshooting and Safety Info

6.1. Troubleshooting

Table 9. GL501MG Troubleshooting List

Trouble	Possible Reason	Solution
After the device is turned on, the Status LED always flashes quickly.	The signal is too weak. The device isn't registered to the network.	Please move the device to a place with good network coverage.
Messages can't be reported to the backend server by GPRS.	APN is not right.	Ask the network operator for the right APN.
	The IP address or port of the backend server is wrong.	Make sure the IP address for the backend server is an identified address in the internet.
There is no response from UART when the device is configured by using UART.	The port is not ready or the device is not powered on.	Please check the port and the device to ensure they are working properly.
The device can't get GPS fix.	The GPS signal is weak.	Move the device to a place under open sky.
		It is better to make the side with antenna face the sky.

6.2. Safety Info

- Do not disassemble the device by yourself.
- Do not put the device in the overheated or too humid place, and avoid exposure to direct sunlight. Too high temperature will damage the device or even cause battery explosion.
- Do not use the device on the airplane or near medical equipment.

7. Appendix: Supported Accessories

- GL501MG Wireless Charger Accessory Kit