



GL601 Series User Manual

EGPRS/LTE Cat 1/LTE Cat-M1/LTE Cat-NB2/GNSS Tracker

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0. Revision History

Version	Date	Author	Description of Change
1.00	2024-06-28	Heymi Lin	Initial version

1. Introduction

GL601 Series is an IP67 waterproof and solar-charged GNSS tracker. It's a self-sustaining, zero-maintenance wireless device for container, trailer, rail wagon management.

To deliver constant visibility of intermodal transportation, the device can report more frequently in movement status and less frequently when stationary. The additional energy harvesting by the solar panel ensures and extends the battery life.

Specifically, LTE Cat1 technology eliminates concerns about network coverage for inter-regional transportation and CAT M1/CAT NB2 IoT technology saves data cost to reduce the operation cost in the long run.

Apart from integrating light sensor for tamper alert and temperature sensor for ambient condition monitoring, more use cases can be extended by using BLE connectivity and Wi-Fi.

1.1. GL601 Series Product

Table 1. GL601 Series Product

Model No.	Region	Technology	Operating Band (MHz)
GL601CEU	Global	LTE CAT 1 WCDMA/EGPRS	LTE CAT 1: B1/B3/B7/B8/B20/28A WCDMA: B1/B8 EGPRS: 900/1800MHz
GL601MG		CAT M1/CAT NB2/ EGPRS	CAT M1/LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B 19/B20/B25/B28/B88/B71/B85 CAT NB2/LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B 19/B20/B25/B28/B88/B71/B85 EGPRS:850/900/1800/1900MHz

1.2. Reference

Table 2. GL601 Series Protocol Reference

SN	Document Name	Remark
[1]	GL601 @Track Protocol Pro	The air interface protocol between GL601 Series and backend server

1.3. Terms and Abbreviations

Table 3. GL601 Series Terms and Abbreviations

Abbreviation	Description
RXD	Receive Data
TXD	Transmit Data
VIN	VBUS-5V
GND	Ground

2. Product Overview

2.1. Product Appearance

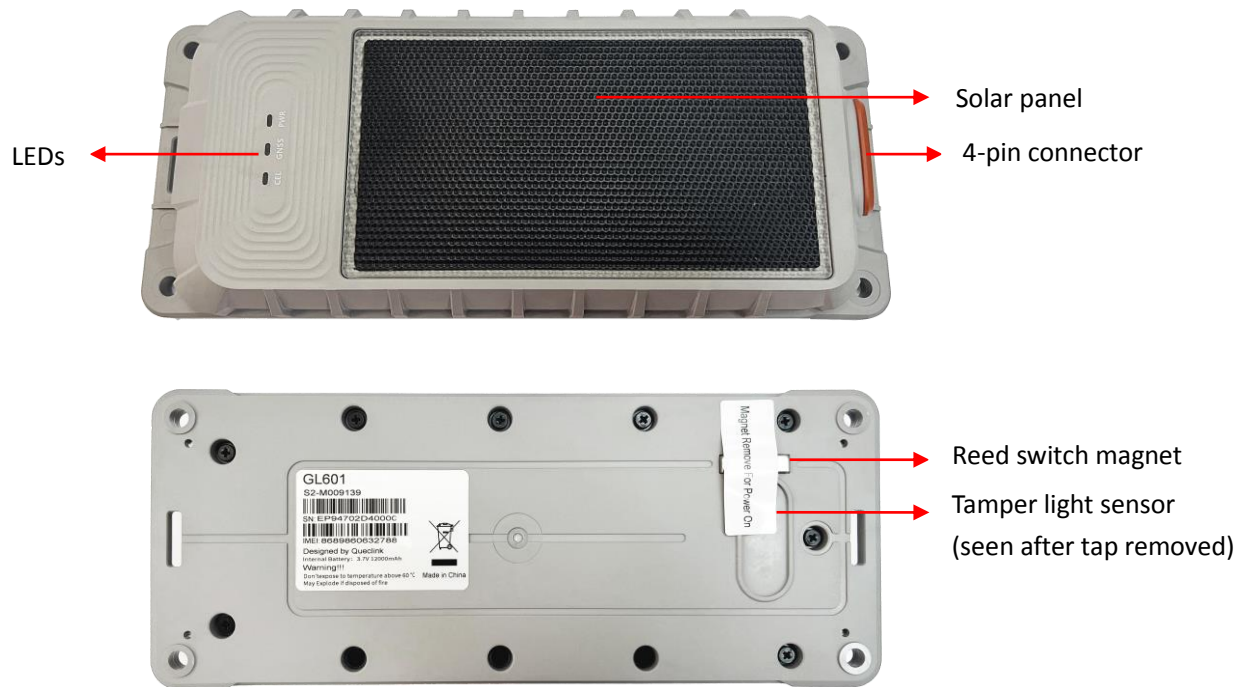


Figure 1. GL601 Series Product View

2.2. LED Description

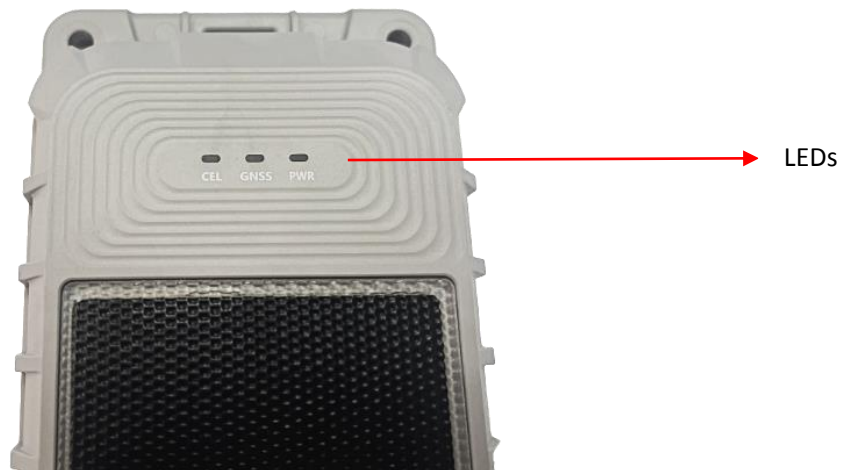


Figure 2. GL601 Series LEDs

There are three LEDs on GL601 Series. For details, please see the table below:

Table 4. GL601 Series LED Description





LED	Event	State
CELL LED (Green)	Searching network	Fast flashing
	The device has been registered to network	Slow flashing
	SIM is locked by PIN or abnormal	Solid on
	Modem off	Solid off
GNSS LED (Blue)	GPS is in the process of fixing	Fast flashing
	GPS chipset is abnormal	Slow flashing
	GPS is on and GPS gets fix	Solid on
	GPS off	Solid off
POWER LED (Red)	Battery power is low	Fast flashing
	Charging	Slow flashing
	Charge complete	Solid on
	No charging	Solid off

Fast flashing: 100ms on/200ms off

Slow flashing: 200ms on/1800ms off

2.3. Parts List

Table 5. GL601 Series Parts List

Name	Picture	Description
GL601 Series Locator		LTE CAT 1 WCDMA/EGPRS or CAT M1/CAT NB2/ EGPRS GNSS Tracker
Magnetic Buckle Kit (Optional)		Used to attach GL601 Series on steel (iron) surface
Steel Cable & Steel Plates (Optional)		Used to provide extra protection from falling in case the magnetic buckle loosens
GL601 Series Data Cable (Optional)		USB data cable which can be used for firmware upgrade, configuration and charging

3. Interface Definition

GL601 Series has a 4-pin connector which is shown in the following figure:

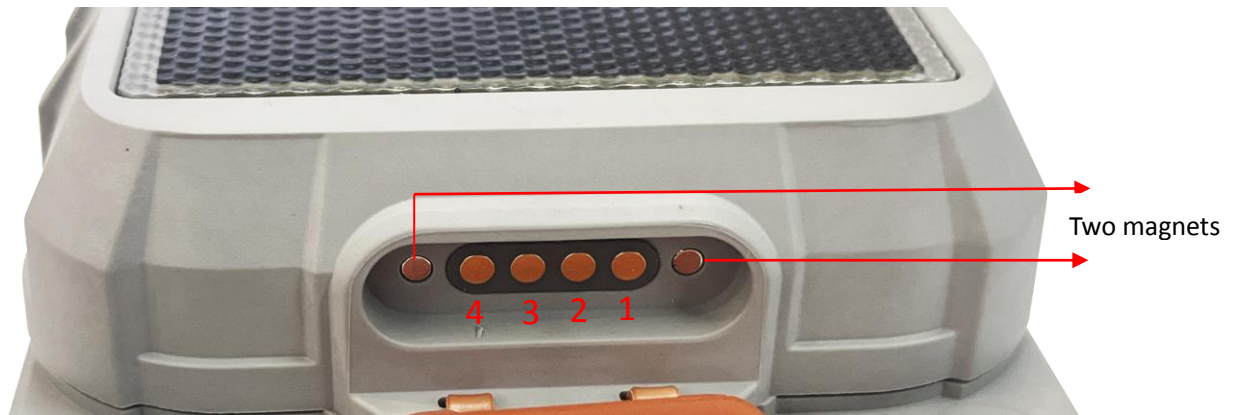


Figure 3. 4-pin Interface of GL601 Series

Table 6. Description of 4-pin Connector

Pin No.	Pin Name	Function Description
1	VBUS	USB PWR
2	GND	GND
3	UART_RXD	Debug Receive Data
4	UART_TXD	Debug Transmit Data

Note: When using the GL601 Series Data Cable to connect to the device, please pay special attention to the polarities of the magnets. The force of mutual exclusion or attraction can be felt clearly when the cable socket is placed above the connector area. The cable is correctly inserted when the magnets between the cable and device are attracting to each other.

4. Getting Started

4.1. Opening and Closing the Case



Figure 4. GL601 Series Screw Position

To open/close the case: Unfasten or tighten the 11 screws at the back side.

Note: Remove the screws of the device using the screw driver ($7.0 \pm 0.5 \text{ kgf.cm}^2$) and close the casing with 7 kgf.cm^2 . And as following, the screws must be tightened in diagonal direction so that the casing can be tightened evenly to keep waterproof capability and at the same time the screw head does not get damaged.

4.2. Turning on/off the Device

If the device is pre-assembled with the SIM card inserted inside, the battery switch is at ON position by default and everything is ready, simply remove the magnet at the back side, the device will power on and function. Once the device is powered on, to power it off, the casing needs to be opened to put the battery switch at OFF position.

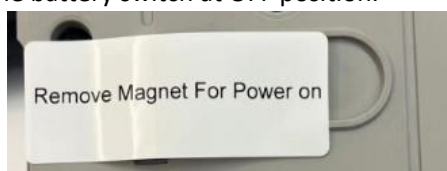


Figure 5. Using Magnet to Power on/off the GL601 Series

Note: if the device is installed with the magnet buckle, power on the device first and then install the magnet buckle so it will not interfere triggering power-on of the device.

If the SIM card needs to be inserted by the user, please following Chapter 4.1 to open the device first (the device can be delivered without tightening the casing if required). And then, as following screenshot, in the same viewing direction, toggle the battery switch to the left side to ON position and use the magnet to swipe over the reed switch to trigger the device to power on.

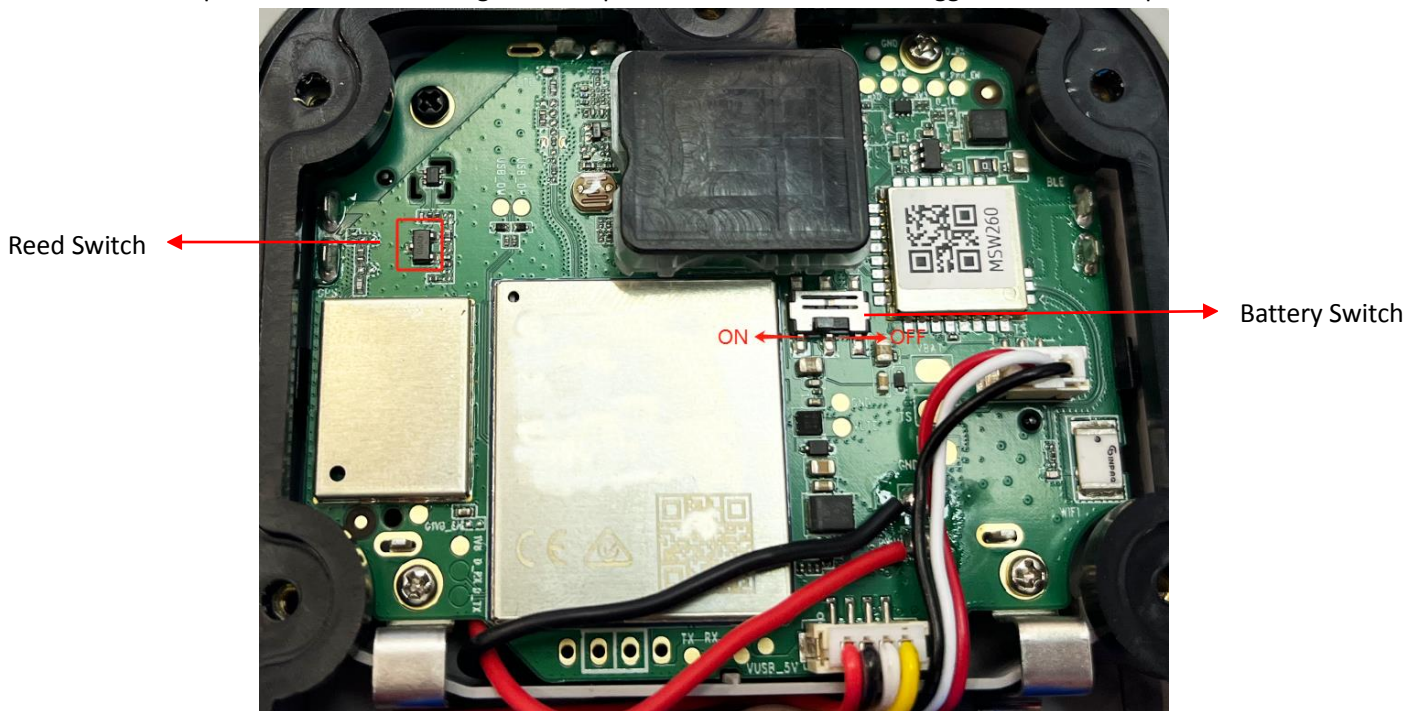


Figure 6. GL601 Series Battery Switch and Magnetic Reed Switch

4.3. Installing a SIM Card

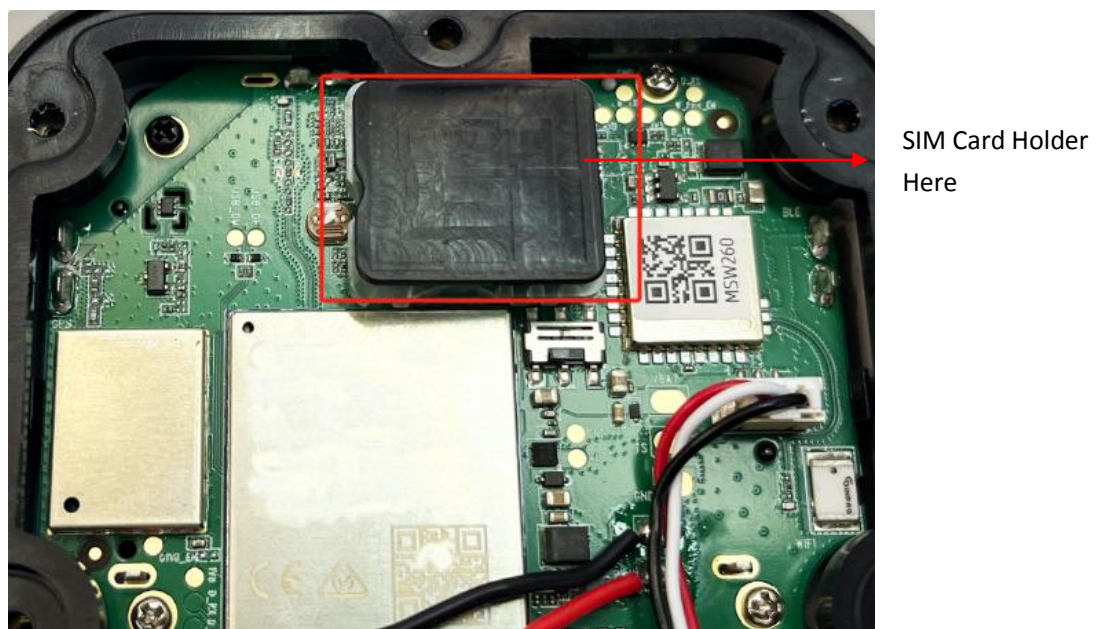


Figure 7. GL601 Series SIM Card Holder

Power off the device first and then install the SIM card (Nano SIM, 4FF).

5. Installation Precautions

- ◆ Firmly install the device to a reliable surface to prevent falling off.
- ◆ Make the side with solar panel face sky to have better energy harvesting as well as better signal reception for the antenna is also at this side.
- ◆ 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 7. GL601 Series Troubleshooting List

Problem	Possible Reason	Solution
After the device is turned on, the CEL LED always flashes quickly.	The signal is too weak. The device isn't registered to the network.	Move the device to a place with good network coverage.
Messages can't be reported to the backend server by network.	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 place. 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

- Magnetic Buckle Kit (Optional)
- Steel Cable & Steel Plates (Optional)
- GL601 Series Data Cable (optional)

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

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.