GL320M Series User Manual

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

QSZTRACGL320MUM0101

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0. Revision History

Version	Date	Author	Description of Change
1.00	2021-04-06	Arry Wang	Initial
1.01	2023-08-31	Max Wu	1. Deleted the description to not use the device in airplane. 2. Added more information to GL320M Device Cable Color.

1. Introduction

The GL320M Series is IPX5 compliant GPS trackers designed for lone worker, vehicle, pet and asset tracking applications. The thumb sized button makes the series ideal for applications requiring SOS button or setting of Geo-fences based on current locations. The built-in GPS receiver has superior sensitivity and fast initial positioning. The LTE allows the GL320M location to be monitored in real time or periodically tracked by a backend server or other specified terminals. The built-in 3-axis accelerometer allows motion detection and sophisticated power management algorithms extend battery life. System integration is straightforward as complete documentation is provided for the full featured @Track protocol. The @Track protocol supports a wide variety of reports including emergency, Geo-fence boundary crossings, low battery and scheduled GPS position reports.

1.1. GL320M Series Product

Table 1. GL320M Series Product

Model No.	Region	Technology	LTE Category	Operating Band
GL320MG	Global	GSM/LTE	eMTC/NB-IoT	Cat M1/Cat NB2: **Cat M1:** B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85 **Cat NB2:** B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85 **EGPRS:** 850/900/1800/1900MHz

1.2. Reference

Table 2. GL320M Series Protocol Reference

SN	Document Name	Remark
[1]	GL320M Series @Track Air Interface Protocol	The air interface protocol between GL320M series and backend server.

1.3. Terms and Abbreviations

Table 3. GL320M Series Terms and Abbreviations

Abbreviation	Description
RXD	Receive Data
TXD	Transmit Data
IGN	Ignition

2. Product Overview

2.1. Product Appearance

Figure 1. GL320M Product View

2.2. Key/Type-C Interface Description

Table 4. GL320M Button/Mini USB Interface Description

Power Key	● Turn on GL320M ● Turn off GL320M when it is not being charged (if the power key is enabled).
Function Key	● Geo-fence mode Long press the key to enable/disable Geo-fence ID0. ● Geo-fence around the current position mode Long press the key to enable/disable Geo-fence ID0. If Geo-fence ID0 is enabled, the current position is used as the center of Geo-Fence ID0. ● SOS mode (default) Long press the key to activate SOS alarm.
Type-C Interface	● Connecting a 5V DC adapter to power up GL320M and charge the internal battery. ● Connecting a 3.7V Li-ion or Li-Polymer battery to power up GL320M. ● Backend server developer or administrator can use the Data Cable to configure GL320M.

2.3. LED Description

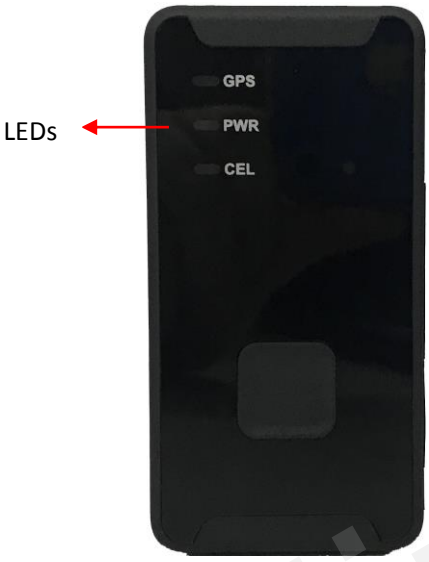

Figure 2. GL320M LEDs

There are three LEDs on GL320M. For details, please see the table below.

Table 5. GL320M LED Description

LED	Device Status	LED Status
CELL LED	Searching for network	Fast flash
	The device has been registered to network.	Slow flash
	Power off	Dark
	SIM-PIN locked	Solid
	<LED On> is set to 2.	Dark
GPS LED	GPS has fixed a position.	Solid
	GPS is in the process of fixing.	Fast flash
	GPS is on and GPS data is wrong.	Slow flash
	GPS is off.	Dark
	150 seconds have passed after power on when *<LED On>* is set to 2.	Dark
	<LED On> is set to 2.	Dark
PWR LED	Power on and normal	Dark
	Charger inserted and charging completed	Solid
	Charger inserted and charging	Fast flash
	Power key is pressed to power off the device.	Fast flash
	Power low alert	Slow flash
	The power light is turned off by command.	Dark
	<LED On> is set to 2.	Dark

Note: Please refer to *GL320M Series @Track Air Interface Protocol* for the settings of *<LED On>*.

2.4. Parts List

Table 6. GL320M Parts Lists

Name	Picture	Description
GL320M Locater		EGPRS/LTE Cat-M1/LTE Cat-NB2/GNSS Tracker
AC-DC Power Adapter (standard accessory)		Used to charge the internal battery of GL320M
AC-DC Power Adapter (fast charging) (Optional)		Used to charge the internal battery of GL320M
GL320M Data Cable (Optional)		USB data cable which can be used for firmware upgrade and device configuration
GL320M Extension Cable (Optional)		Extension cable which allows the connection to the charger interface and external battery interface as well as the ignition detection interface on GL320M

3. Interface Definition

The GL320M has a 12-pin (two sides) Type-C interface which contains the connections for power, ignition detection, input, etc. The sequence and definition of the 24-pin connector are shown in the following figure:

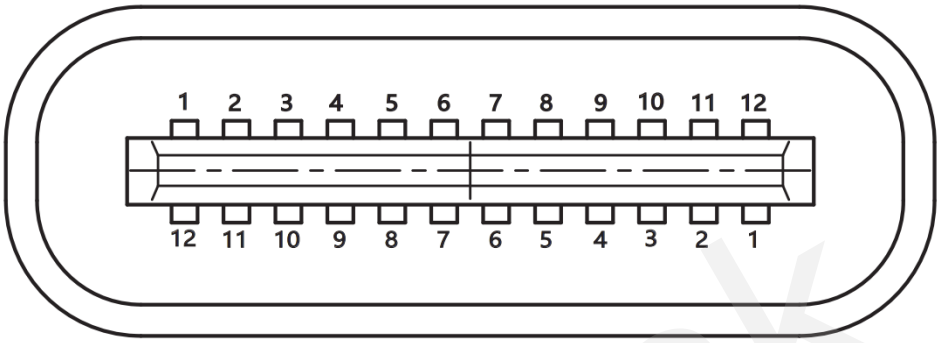

Figure 3. 12-pin (two sides) Type-C Interface of the GL320M

Table 7. Description of 24-pin Connections

Pin No.	Pin Name	Function Description
1	GND	Power GND
2	IN1	Negative input1
3	IGN Input/ADC_IN1	The ignition input(0--24V)/PT100 AD Output (0--3.0V)
4	VBUS	USB+5.0V
5	CC1	Charging protocol
6	USB DP	LTE module USB DP
7	USB DM	LTE module USB DM
8	EXTBAT /VDD OUT	External battery input/3.0--3.9V Output
9	VBUS	USB+5.0V
10	UART_RXD	Debug Receive Data
11	UART_TXD	Debug Transmit Data
12	GND	Power GND

4. GL320M Device Cable Color (Optional Extension Cable)

GL320M Extension Cable has a Type-C connector with six wires which allows the connection to the external power interface, ignition detection interface and input interface for GL320M. Please find the details in the following table.

Figure 4. GL320M Device Cable Color

Color	Name	Cable
RED	External DC IN (5V)	
Black	Ground	
Blue	External Battery IN (DC 3.4V to 4.2V)	
White	Ignition Detection	
Green	NSW (negative trigger input)	
Yellow (for 7-pin cable)	UART_RXD	
Grey (for 7-pin cable)	UART_TXD	

5. Getting Started

5.1. Battery Charging

1. Connect AC-DC power adapter to GL320M.
2. Insert the AC-DC power adapter into the power socket.
3. During charging, the PWR LED flashes fast. When the battery is fully charged, the PWR LED will be always on.
4. You can also charge the battery via USB cable which connects GL320M to the PC.
5. Charging time is about 3.5 hours.

Note:

Before using GL320M for the first time, please fully charge the battery.

5.2. Turning On/off the Device

To turn on the device:

- Method 1: Press the Power key at least 3 seconds and then release it to turn on GL320M. At the same time, PWR LED will also turn on.
- Method 2: Connect the device to the charger or external battery. The device will turn on automatically, and PWR LED will also turn on.

To turn off the device:

- Method 1: Press the power key about 2 seconds. PWR LED will flash fast and then turn off. It indicates that GL320M is turned off. The time needed to power off the device depends on the quality of the network. The maximum time needed for power off is 90 seconds. This method is only valid for turning off the device when internal battery is used. Please note the end-user cannot power off GL320M through Method 1 when the power key is disabled by Protocol.
- Method 2: If external battery is used, the device will power off when the external battery is disconnected.

5.3. External Power Supply Connection

5.3.1. External DC Charger Connection

Pin 4 and Pin 9 on the Type-C connector is used for charging and named as VBUS pins. It can be connected to a 5V DC power supply to power up GL320M and charge the internal battery.

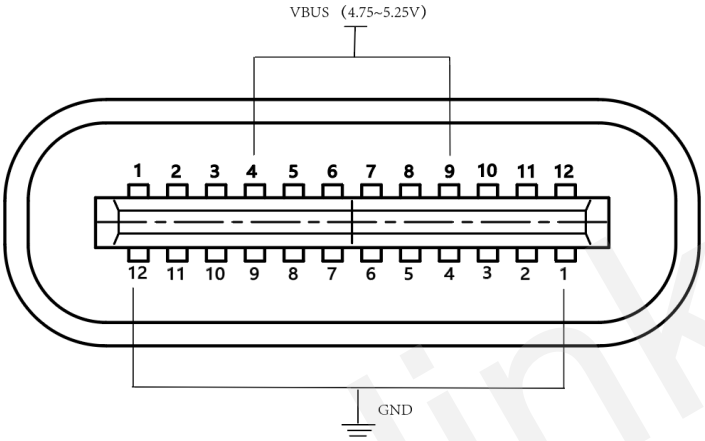

Figure 5. External DC Charger Connection of GL320M

5.3.2. External Battery Connection

Pin 8 on the Type-C USB connector is for external battery and named as EXTBAT pin. It can be connected to a 3.7V Li-ion or Li-Polymer battery to power up GL320M.

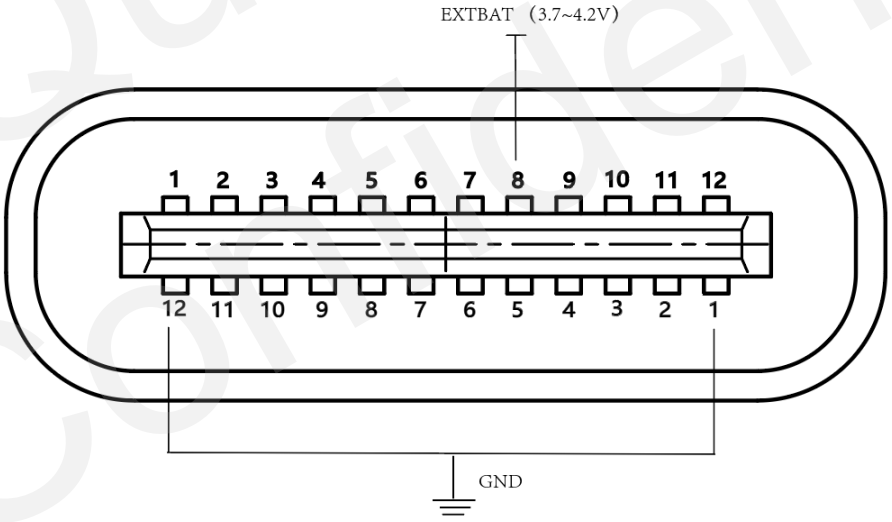

Figure 6. External Battery Connection of GL320M

5.4. Ignition Detection

Pin 3 on the Type-C connector is for ignition detection when GL320M is used in vehicle tracking application. It is named as IGN_INPUT pin.

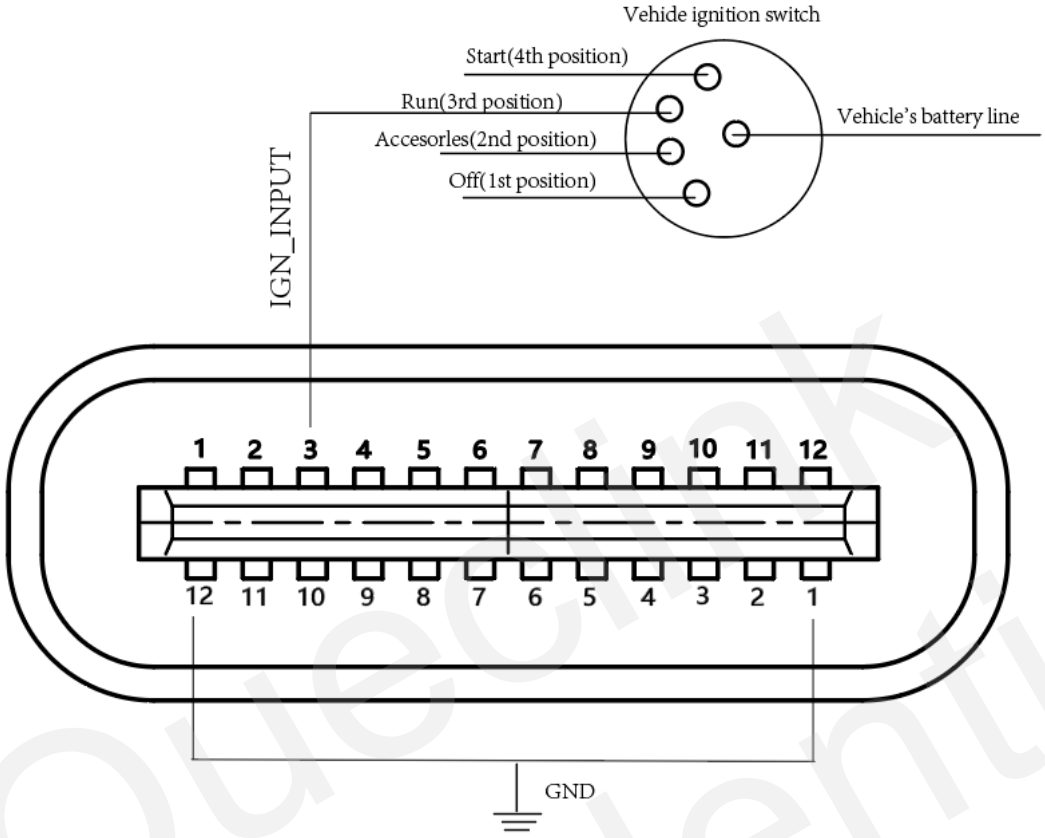

Figure 7. Ignition Detection Connection of GL320M

Another easy way is to connect PIN3 to a power output which is only enabled when the vehicle is ignition on (e.g. the power output for radio FM) in the fuse box of the vehicle.

5.5. External Input Connection

Pin 2 on the Type-C USB connector is a negative trigger input. It is named as IN1 pin.

For negative trigger input, the electrical characteristics are:

Logic State	Electrical Characteristics
Active	0V to 0.8V
Inactive	1.7V to 32V or Open loop

An input example is shown as the following figure:

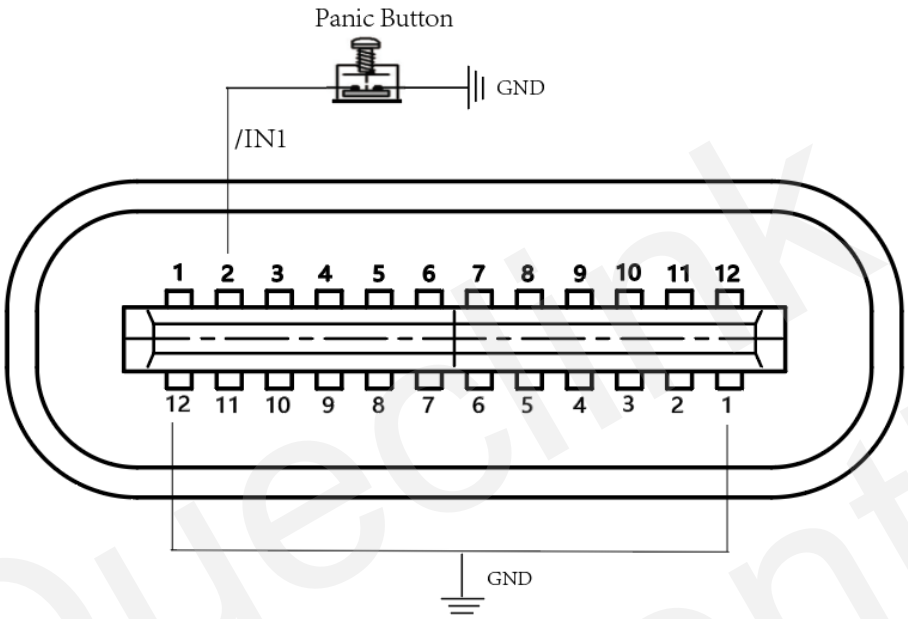

Figure 8. Example of /IN1 pin connected to a panic button

6. 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.

7. Troubleshooting and Safety Info

7.1. Troubleshooting

Table 8. GL320M Troubleshooting List

Trouble	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.
The device cannot be powered off.	The function of power key is disabled by **AT+GTFKS**.	Enable the function of power key by **AT+GTFKS**.
	The device cannot be powered off if charger is connected or external battery is used.	Disconnect charger or external battery and try again.
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.

7.2. 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 GL320M near medical equipment.

8. Appendix: Supported Accessories

- External large volume battery pack