



GV50M Series User Manual

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

QSZTRACGV50MUM0203

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WARNING: The device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) The device may not cause harmful interference.
- (2) The device must accept any interference received, including interference that may cause undesired operation.

Change or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC RF Exposure Statement:

The normal use condition for the product is at least 20cm away from the body of the user, so the user must keep a distance of at least 20cm from the product.

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0. Revision History

Version	Date	Author	Description of change
1.00	2017-11-08	Jake Su	Initial Version
2.00	2017-11-30	Jake Su	Revision Version
2.01	2018-04-02	Louis Wang	Add positive trigger in Section2.6
2.02	2018-05-25	Todd Tang	Modify the flashing time of LED lights
2.03	2019-02-19	Jake Su	Modify the title

1. Introduction

The GV50M Series includes GSM and LTE micro GPS trackers designed for a wide variety of vehicle tracking applications. They have multiple I/O interfaces that can be used for monitoring or controlling external devices. The built-in GPS receiver has superior sensitivity and fast initial positioning. Their multiband LTE Cat-M1 and Cat-NB1 allow the GV50M Series' location to be monitored in real time or periodically tracked by a backend server and mobile devices. 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 alarm, geo-fence boundary crossings, as well as external power supply monitoring and position reports.

1.1. Reference

Table 1. GV50M Protocol Reference

SN	Document name	Remark
[1]	GV50M @Track Air Interface Protocol	The air protocol interface between GV50M and backend server.

1.2. Terms and Abbreviations

Table 2. Terms and Abbreviations

Abbreviation	Description
RXD	Receive Data
TXD	Transmit Data
VIN	External DC Power Input
IGN	Ignition
OUT1/IN1	Output 1/Input 1
OUT2	Output 2
GND	Ground

2. Product Overview

2.1. Appearance



Figure 1. GV50M Appearance

2.2. Interface Definition

The GV50M has a 7-pin interface connector. It contains the connections for power, and I/O. The sequence and description of the connector are shown in the following figure:

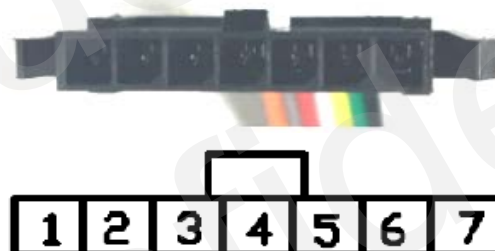


Figure 2. 7-pin Connector of the GV50M

Table 3. Description of 7-pin Connections

Index	Description	Comment
1	RXD	UART RXD; TTL
2	TXD	UART TXD; TTL
3	VIN	External DC power input, 8-32V
4	IGN	Ignition input, positive trigger
5	OUT1/IN1	Digital output/input; Open drain,150mA max
6	OUT2	Open drain, 150mA max
7	GND	GND

2.3. LED Description

GV50M has two status LEDs: CELL LED (Green color) and GPS LED (Red color).

Table 4. LED Description

CELL	Device is searching for CELL network.	Fast flashing
	SIM card needs PIN code to be unlocked.	ON
	Device has registered to CELL network.	Slow flashing
GPS	GPS is asleep.	OFF
	GPS is fixed.	ON
	Device is searching for GPS.	Fast flashing

Note:

1. Fast flashing intervals are about 100ms ON/200ms OFF.
2. Slow flashing intervals are about 200ms ON/1000ms OFF.

2.4. Power Connection

VIN (pin 3)/GND (pin 7) are the power input pins. The input voltage range for this device is from 8V to 32V. The device is designed to be installed in vehicles that operate on 12V/24V systems without the need for external transformers.

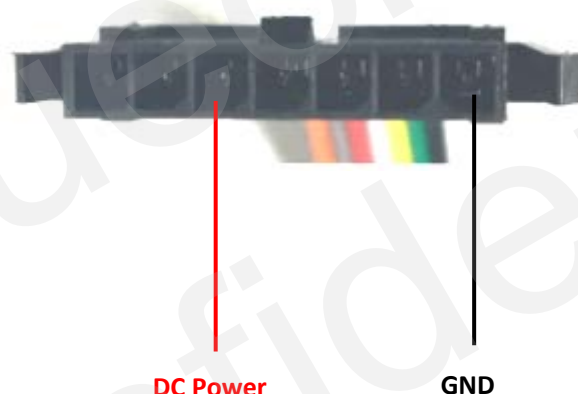


Figure 3. Typical Power Connection

2.5. Ignition Detection

IGN (pin 4) is used for ignition detection. It is recommended to connect this pin to the “RUN” position of the vehicle ignition switch as shown below.

An alternative to connect to the ignition switch is to find a non-permanent power source that is only available when the vehicle is running. For example, the power source for the FM radio. IGN signal can be configured to transmit information to the backend server when ignition is on and enter power saving mode when ignition is off.

Table 5. Electrical Characteristics of Ignition Detection

Logical State	Electrical Characteristics
Active	5.0V to 32V
Inactive	0V to 3V or Open loop

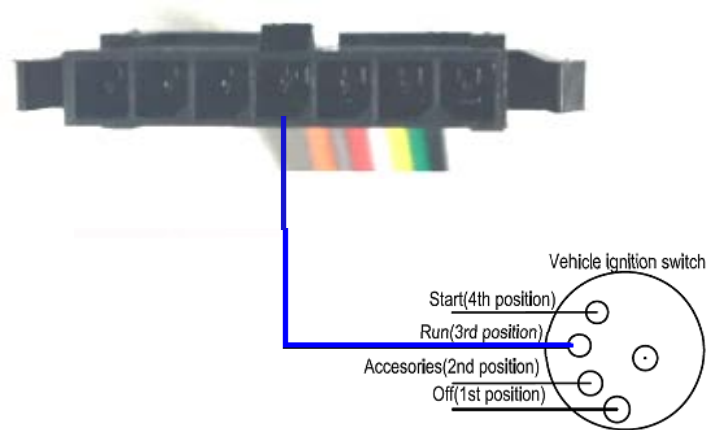


Figure 4. Typical Ignition Detection

2.6. Digital Output/Input Connection

OUT1/IN1 (pin 5) is a digital Output/Input on GV50M. It is of open drain type and the maximum drain current is 150mA. The OUT1/IN1 (pin 5) can be used either as a digital output or a (positive and negative trigger) digital input.

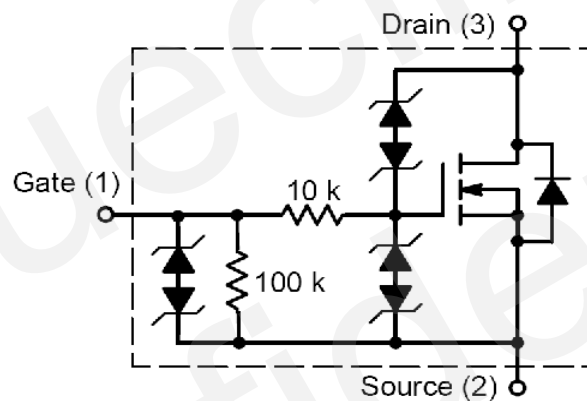


Figure 5. Digital Output Internal Drive Circuit

Table 6. Electrical Characteristics of Digital Output

Logical State	Electrical Characteristics
Enable	<1.5V @150mA
Disable	Open drain

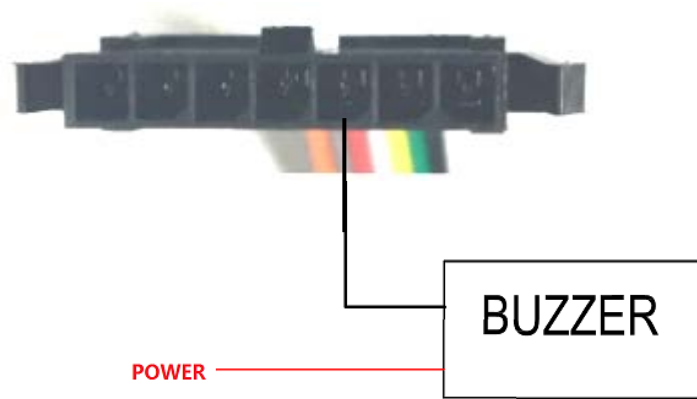


Figure 6. Typical Connection with a Buzzer as Digital Output

Table 7. Electrical Characteristics of Digital Input

Logical State	Electrical Characteristics
Active	0V to 0.8V
Inactive	Open loop

The following shows the recommended connection of a digital input.

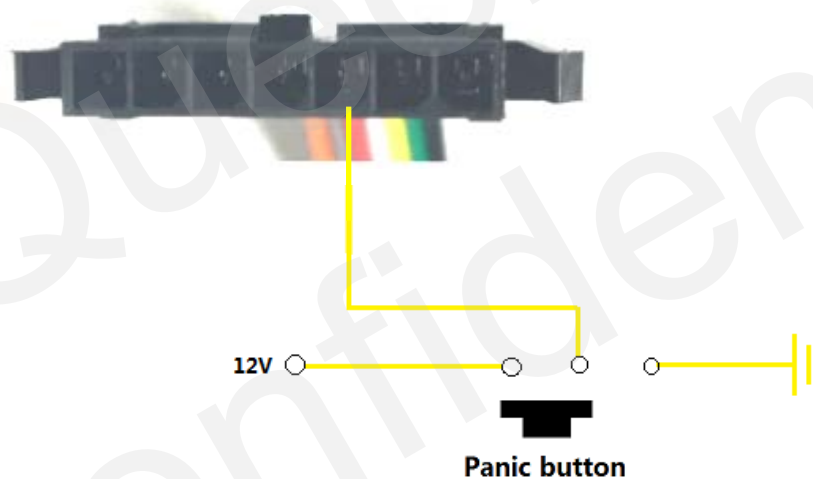


Figure 7. Typical Digital Input Connection

2.7. Digital Output

There is a digital output (pin 6) on GV50M. It is of open drain type and the maximum drain current is 150mA.

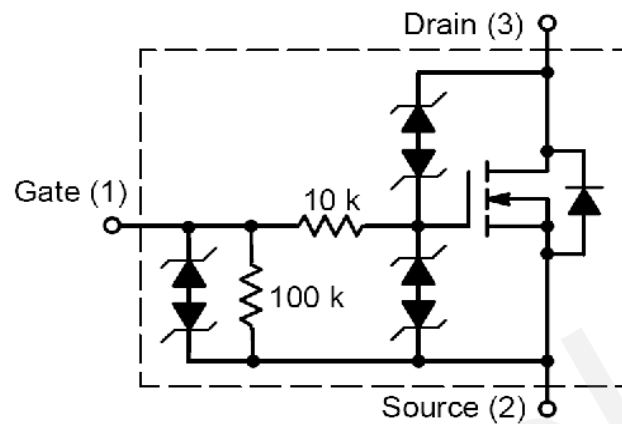


Figure 8. Digital Output Internal Drive Circuit

Table 8. Electrical Characteristics as Digital Outputs

Logical State	Electrical Characteristics
Enable	<1.5V @150mA
Disable	Open drain

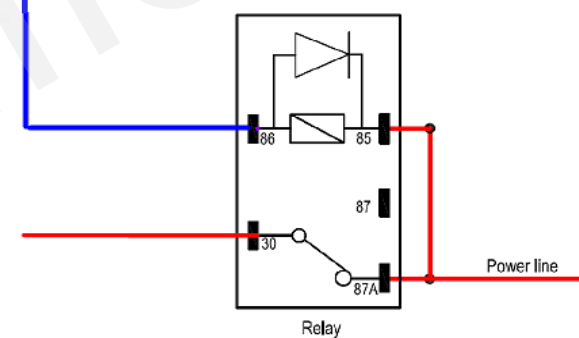




Figure 9. Typical Connection with a Relay

3. Getting Started


3.1. Parts List

Table 9. Parts List

Name	Picture
GV50M Locator	 <p>90mm*55mm*13mm</p>
Extension Harness	

3.2. GV50M Device Cable Interface

Table 10. GV50M User Cable Colour Definition

Definition	Color	Pin No.	Cable
RXD	Orange	1	
TXD	Gray	2	
VIN	Red	3	
IGN	White	4	
OUT1/IN1	Yellow	5	
OUT2	Green	6	
GND	Black	7	

3.3. Open the SIM Card Cover



Figure 10. Open the SIM Card Cover

Follow the direction on the case and push to open the SIM card cover.

3.4. Close the SIM Card Cover



Figure 11. Close the SIM Card Cover

Align and push to close the SIM card cover.

3.5. Install a SIM Card

Install the SIM card into the holder when power is off as shown below. Take care to align the cut mark, and then close the case.

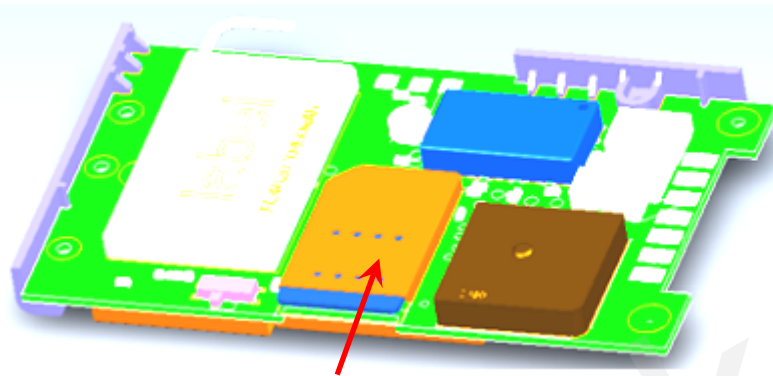


Figure 12. SIM Card Installation

3.6. Switch on the Backup Battery

To use the GV50M backup battery, the switch must be at the ON position. The switch and the ON/OFF position are shown as below.

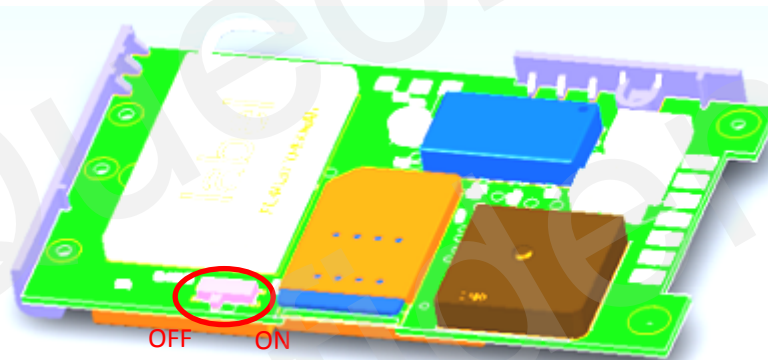


Figure 13. Switch ON/OFF Position

Note:

1. The switch must be at the "OFF" position when the GV50M is being shipped on an aircraft.
2. When the switch is at the "OFF" position, the battery cannot be charged or discharged.

4. Troubleshooting and Safety Info

4.1. Troubleshooting

Problem	Possible Reason	Solution
After GV50M is turned on, the CELL LED always flashes quickly.	GV50M isn't registered to the ISP.	Please register the GV50M again and make sure the device gets the correct MDN.
	The signal is too weak, and GV50M can't be registered to the network.	Please move GV50M into places with good LTE coverage.
Messages can't be reported to the backend server by LTE.	The IP address or port of the backend server is wrong.	Make sure the IP address for the backend server is an identified address on the Internet.
GV50M cannot power off no matter the device is in charge or not.	Unable to power off GV50M if charger is connected.	Disconnect charger and try again.
GV50M can't get successful GPS fixing.	The GPS signal is weak.	Please move GV50M to a place with open sky.
		It is better to let the top surface (which comes with LED indicator) face the sky.

4.2. Safety Info

- Do not disassemble the device by yourself.
- Do not put the device in over heated too humid place, and avoid exposure to direct sunlight. Too high temperature will damage the device or even cause battery explosion.
- Do not use GV50M on the airplane or near medical equipment.