



# GV75MG User Manual

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

QSZTRACGV75MGUM0101

Version: 1.01

*International Telematics Solutions Innovator*

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## 0. Revision History

Version	Date	Author	Description of change
1.00	2019-09-05	Heymi Lin	Initial Version
1.01	2019-11-11	Heymi Lin	Modified Table 4 and Table 5

## 1. Introduction

The GV75MG is a micro-type GSM and LTE GPS tracker designed for a wide variety of vehicle tracking applications. It has 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 GV75MG location to be monitored in real time or periodically tracked by a backend server or 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. GV75MG Series Products

Table 1. GV75MG Products

Model No.	Region	Technology	Operating Band (MHz)
GV75MG	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/B 18/B19/B20/B25/B28

### 1.2. Reference

Table 2. GV75MG Protocol Reference

SN	Document name	Remark
[1]	GV75M @Track Air Interface Protocol	The air protocol interface between GV75MG and backend server.

### 1.3. Terms and Abbreviations

Table 3. GV75MG Terms and Abbreviations

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

## 2. Product Overview

### 2.1. Product Appearance



Figure 1. GV75MG Appearance

### 2.2. LED Description

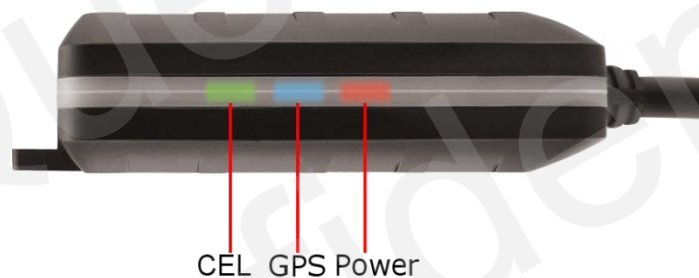


Figure 2. GV75MG LEDs

There are three LEDs on GV75M. For details, please see the table below.

Table 4. GV75MG Series LED Description

CELL (green)	The device is searching GSM network.	Fast flashing
	The device has been registered on GSM network.	Slow flashing
	SIM card needs pin code to unlock.	ON
GPS (Blue)	GPS chip is powered off.	OFF
	GPS sends no data or data format error occurs.	Slow flashing
	GPS chip is searching GPS information.	Fast flashing
	GPS chip has got GPS information.	ON
PWR (Red)	No external power is supplied and backup battery voltage is more than 3.5V.	OFF
	No external power is supplied and backup battery voltage is	Slow flashing

	lower than 3.5V.	
	External power is inserted and backup battery is charging.	Fast flashing
	External power is inserted and backup battery is fully charged.	ON

**Note:**

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

**2.3. Parts List**

Table 5. GV75MG Series Parts List

Name	Picture	Description
GV75MG Locator	 102mm*46mm*20.5mm	EGPRS/LTE Cat-M1/LTE Cat-NB1/GNSS tracker
User Cable		GV75MG standard cable
GV75MG Configuration Kit (Optional)		12V DC Supply USB-RS232 cables

### 3. Interface Definition

The GV75MG has an 8-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 3. 8-pin Connector of the GV75MG


Table 6. Description of 8-pin Connections

Index	Description	Comment
1	RXD	UART RXD; RS232
2	TXD	UART TXD; RS232
3	OUT1	Digital output
4	OUT2	Open drain, 150mA max
5	IGN	Ignition input, positive trigger
6	IN1	Digital Input
7	GND	GND
8	VIN	External DC power input, 8~32V



## 4. Device Cable Color

Table 7. GV75MG Device Cable Color Definition

Definition	Color	Pin No.	Cable
RXD	Gray	1	
TXD	Violet	2	
OUT1	Blue	3	
OUT2	Green	4	
IGN	White	5	
IN1	Yellow	6	
GND	Black	7	
VIN	Red	8	

## 5. Getting Started

### 5.1. Opening and Closing the Casing



Figure 4. Open Top Cover

To open/close: Loosen or fasten the screws to open or to close.

### 5.2. Installing 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 5. SIM Card Installation

### 5.3. Power Supply Connection

The red wire is power line and the black wire is ground line. The input voltage range for this device is from 8V to 32V DC. The device is designed to be installed in vehicles that operate on 12V/24V systems without the need for external transformers.

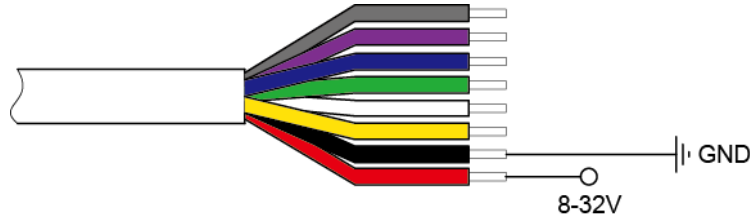


Figure 6. Typical Power Connection

### 5.4. Ignition Detection

The white wire is used for ignition detection. It is recommended to connect this line 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 8. Electrical Characteristics of Ignition Detection

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

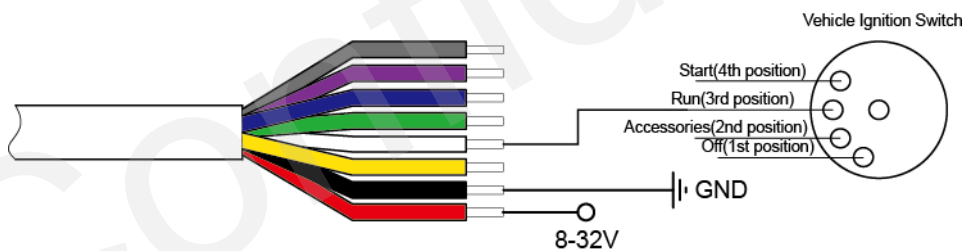


Figure 7. Typical Ignition Detection

### 5.5. Digital Input

There is a negative trigger input on GV75MG. For negative trigger input, the electrical conditions are:

Table 9. Electrical Characteristics of Digital Input

Logical State	Electrical State
Active	0V to 0.8V
Inactive	1.7V to 32V or Open

The example connection is shown as follows:

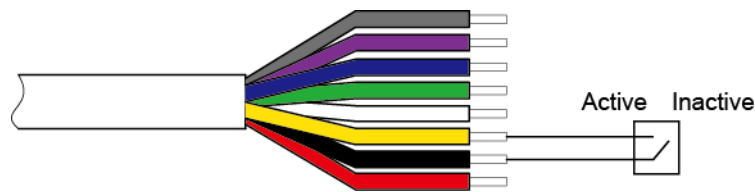


Figure 8. Example of Connection for Negative Trigger Input

## 5.6. Digital Outputs

The outputs are of open-drain type with no internal pull-up resistor and it can also be used to control a relay. It means that the user has to connect a pull-up resistor or a relay coil between the output pin and any positive voltage (32V max) to generate a correct output. Each output can drive a continuous current of 150mA max.

The green wire is low side 150mA max, and the blue wire is low side 150mA max with latch.

The electrical conditions are:

Table 10. Electrical Characteristics of Digital Outputs

Logical State	Electrical State
Enable	<1.5V, drive current is 150mA
Disable	Open or the pull-up voltage (max 32V)

### Note:

1. The relay output can be latched by software, so even if GV75MG is restarted or powered down in some cases, the relay output will not change. To use the latch function, the main power and backup battery should work normally. Otherwise, the relay will always be in normally closed status as it is.

Digital outputs are used for cutting/restoring GND. The examples of connections are:

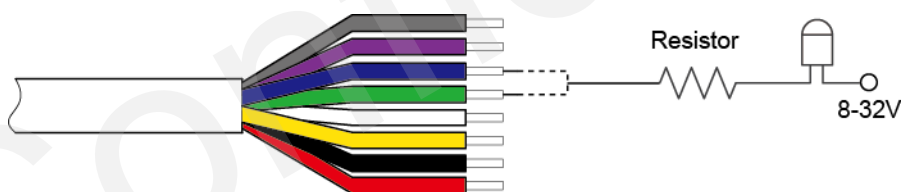


Figure 9. Example Connection to Drive an LED

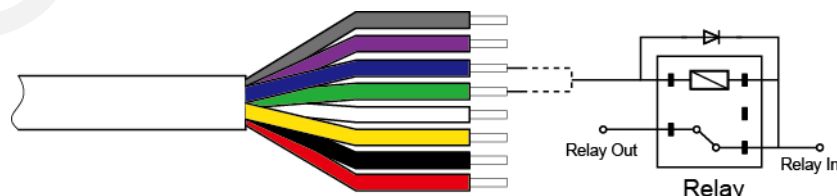


Figure 10. Example Connection to Drive a Relay

**Note:** All outputs are internally pulled up to PWR pin by a diode, so no external flyback diode is needed when the output is connected to an inductive load.

**Warning:** Many modern relays come with a flyback diode pre-installed internal to the relay itself. If the relay has this diode, insure the relay polarity connected is properly used. If this diode is not internal, it should be added externally. A common diode such as a 1N4004 will work in most circumstances.

## 5.7. UART Interface

There is one UART interface on GV75MG. UART is used for configuration and firmware upgrade. Please note that the UART interfaces are all of RS232 level. For RS232, valid signal levels are 3V to 15V and -3V to -15V, and the -3V to +3V is not a valid level. 3V to 15V corresponds to logic 0 of RS232 level, while -3V to -15V corresponds to logic 1. The examples of connections of UART with female DB-9 and with external devices are shown as follows.

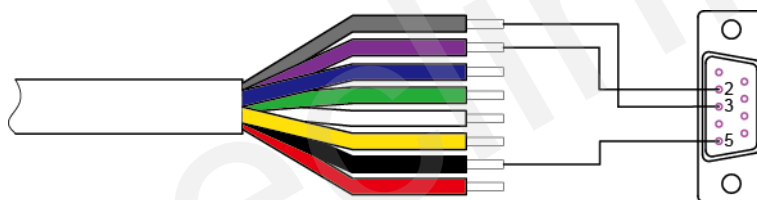


Figure 11. Connection of UART with Female DB-9

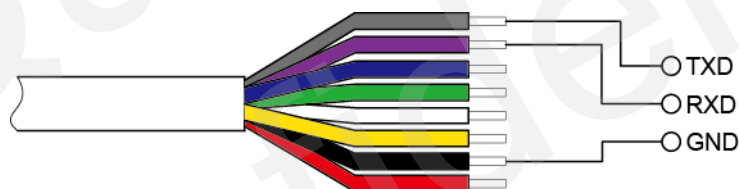


Figure 12. Connection of UART with External Devices

## 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 11. GV75MG 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.

### 7.2. 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 the device on the airplane or near medical equipment.

## 8. Appendix: Supported Accessories

Currently, no external accessory is supported.

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