GV56RS User Manual

GSM/GPRS/GNSS Tracker

TRACGV56RSUM001

Version: 1.05

International Telematics Solutions Innovator

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0. Revision History

Version	Date	Author	Description of Change
1.00	2018-11-26	Oliver Ding	Initial version.
1.01	2019-01-17	Frank Zhang	Updated picture of GV56RS.
1.02	2019-03-07	Frank Zhang	Added Chapter 4.3 regarding motion sensor direction.
1.03	2019-06-10	Frank Zhang	Updated the pictures in Chapter 3.4, Chapter 3.5 and Chapter 3.6.
1.04	2019-06-12	Oliver Ding	Modified the description and updated Figure 12 in Chapter 2.9.
1.05	2019-06-14	Oliver Ding	Modified the description and added Figure 13 in Chapter 2.9.

1. Introduction

The GV56RS is a micro GNSS tracker designed for a wide variety of vehicle tracking applications. It has multiple digital/analog I/Os, a 1-wire interface and a half duplex RS485 serial port. Its built-in GNSS receiver has Best-in-Class sensitivity and fast time to first fix. It has built-in Bluetooth which supports both data and voice transmission. 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: GV56RS Protocol Reference

SN	Document name	Remark
[1]	GV56RS @Track Air Interface Protocol	The air protocol interface between GV56RS and backend server.

1.2. Terms and Abbreviations

Table 2: Terms and Abbreviations

Abbreviation	Description
AGND	Analog Ground
AIN	Analog Input
DIN	Digital Input
DOUT	Digital Output
GND	Ground
MIC	Microphone
RXD	Receive Data
TXD	Transmit Data
SPKN	Speaker Negative
SPKP	Speaker Positive

2. Product Overview

2.1. Appearance

Figure 1: GV56RS Appearance

2.2. Interface Definition

The GV56RS has a 9-pin interface connector. It contains the connections for power, and I/O. The sequence and definition of the 9-pin connector are shown in the following figure:

Figure 2: The 9-pin Wire Harness of GV56RS

Table 3: Description of 9-Pin Connections

Index	Description	Remark
1	Pink [RS485B]	Inverting Receiver Input and Inverting Driver Output.
2	Brown [RS485A]	Non-Inverting Receiver Input and Non-Inverting Driver Output.
3	Blue [AIN]	Analog input, 0V-30V
4	Orange [Date_1Wire]	1-wire data bus
5	Yellow [VDD_1Wire]	1-wire device power output
6	Green [OUT]	Open drain, 150mA max
7	White [IGN]	Ignition input, positive trigger
8	Black [GND]	GND
9	Red [VIN]	External DC power input, 8V-32V

2.3. LED Description

GV56RS has two status LEDs which include CELL LED and GNSS LED.

Table 4: LED Description

CELL (Note 1)	Device is searching network.	Fast flashing
	Device has been registered to network.	Slow flashing
GNSS (Note 2)	GNSS chip is powered off.	OFF
	GNSS sends no data or data format error occurs.	Slow flashing
	GNSS chip is searching GNSS information.	Fast flashing
	GNSS chip has got GNSS information.	ON

Note:

1. CELL LED cannot be configured.
2. GNSS LED can be configured to turn off after a period of time using the configuration tool.
3. Fast flashing is about 60ms ON/ 780ms OFF.
4. Slow flashing is about 60ms ON/ 1940ms OFF.
5. When LED ON is 2, each time the device powers on, both LEDs will work for 10 minutes and then turn off.

2.4. Power Connection

VIN(red)/ GND(Black) 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 or 24V vehicle without the need for external transformers.

Figure 3: Typical Power Connection

2.5. Ignition Detection

IGN(White) is used for ignition detection. It is strongly recommended to connect this pin to ignition key "RUN" position as shown in the figure below.

An alternative to connecting 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 start transmitting information to backend server when the ignition is on, and enter power saving mode when the ignition is off.

Table 5: Electrical Characteristics of Ignition Detection

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

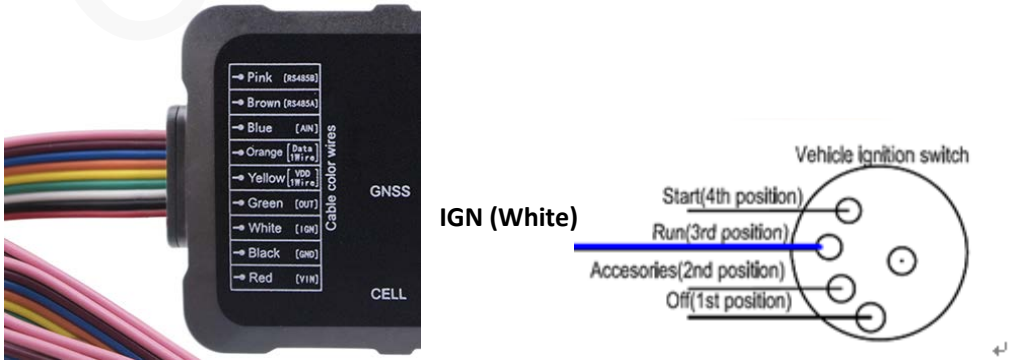


Figure 4: Typical Ignition Detection

2.6. Digital Output

There is a digital output (OUT) on GV56RS. It is of open drain type and the maximum drain current is 150mA.

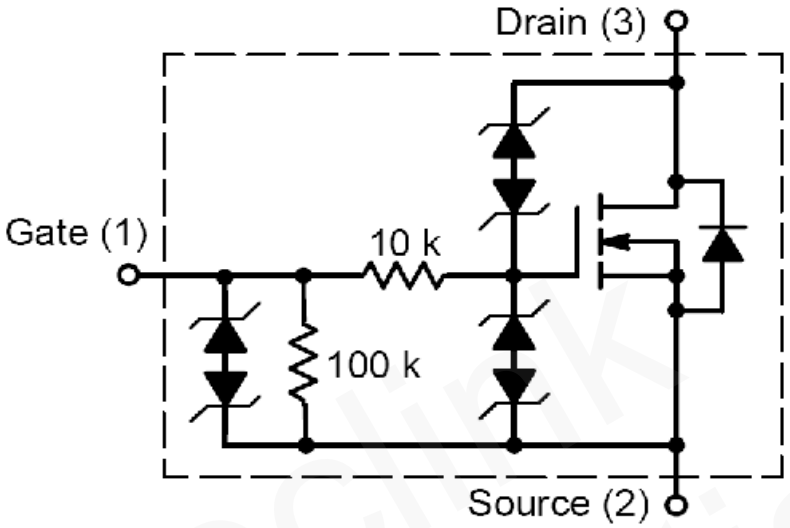


Figure 5: Digital Output Internal Drive Circuit

Table 6: Electrical Characteristics of Digital Output

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

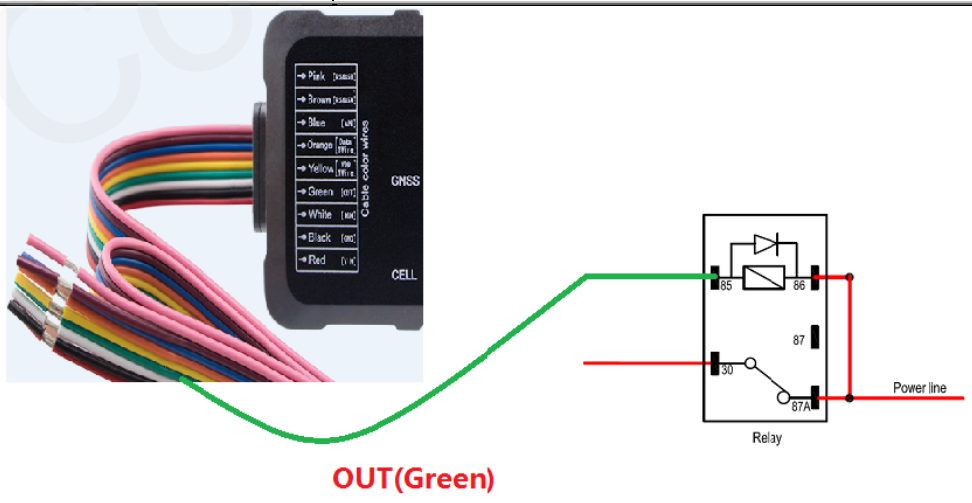


Figure 6: Typical Connection with Relay

2.7. Analog Input

There is one input can be configured as an analog input or a negative trigger input on GV56RS.

For the analog input, the range of analog input voltage is from 0V to 30V.
The following figure shows the recommended connection.

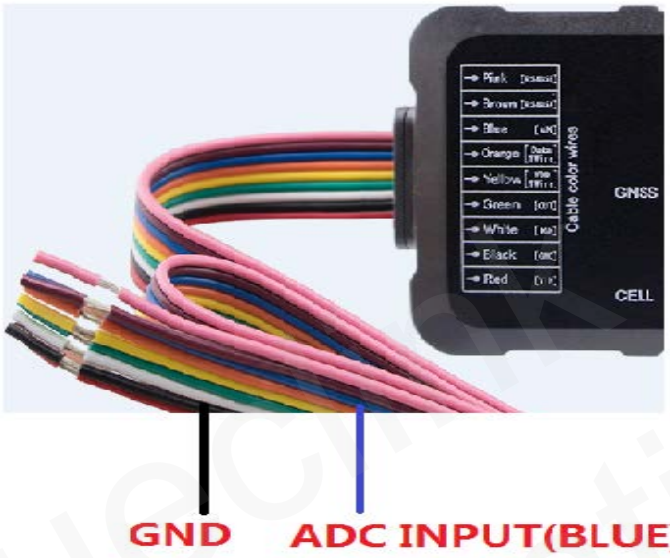


Figure 7: Connection for Analog Input

For the negative trigger input, the electrical conditions are as follows:

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

Table 7: Electrical Conditions of Negative Trigger Input

Figure 8: Connection for Negative Trigger Input

2.8. 1-wire Device Connection

It has 1-wire bus on GV56RS, which supports temperature sensors and iButton. The bus includes 3 signals, VDD_1Wire (Yellow), Data_1Wire (Orange) and GND. VDD_1Wire is the power output for 1-wire device, and Data_1Wire is the data signal, with which GV56RS can get information from 1-wire device.

The following figures show the recommended connection of 1-wire device.

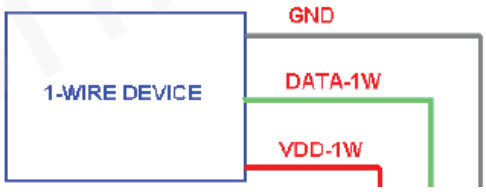


Figure 9: Typical Connection with 1-wire Device

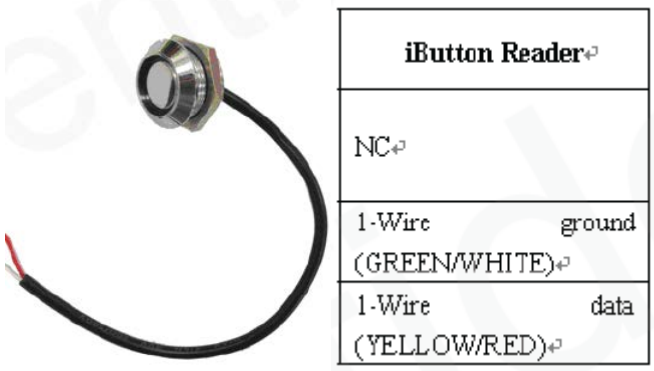


Figure 10: Typical Connection with iButton Reader

TEMP SENSOR DS18B20
1-Wire power (RED)
1-Wire ground (GREEN)
1-Wire data (YELLOW)

Figure 11: Typical Connection with Temperature Sensor

2.9. Serial Port

There is one half-duplex RS485 serial port on GV56RS, which supports TD-500 digital fuel sensor and Thinktec digital fuel sensor. It has 2 signals, RS485A (Brown) and RS485B (Pink). GV56RS can obtain the position of the liquid level through TD-500 or Thinktec digital fuel sensor in the tank.

Figure 12: Typical Connection with TD-500 Digital Fuel Sensor

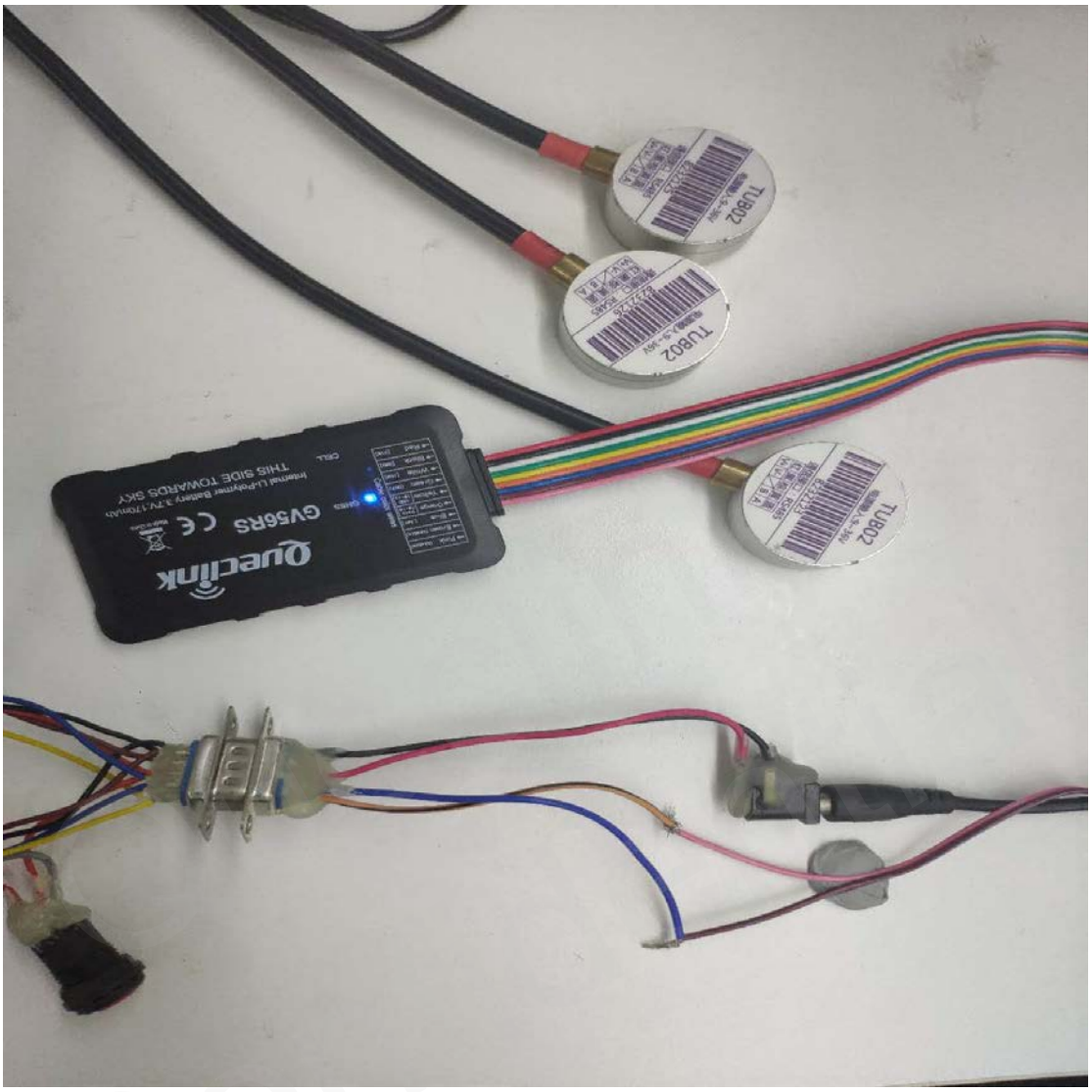


Figure 13: Typical Connection with Thinktec Digital Fuel Sensor

3. Getting Started

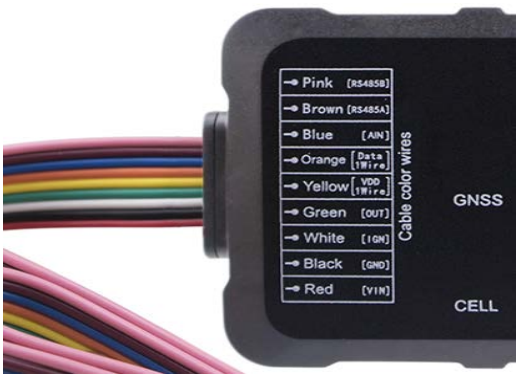
3.1. Parts List

Table 8: Parts List

Name	Picture
GV56RS Locator	
Data_Cable_M_V4 (Optional)	

3.2. GV56RS External Cable Interface

Table 9: GV56RS User Cable Colour Definition

Definition	Colour	PIN No.	Cable
RS485B	Pink	1	
RS485A	Brown	2	
AIN	Blue	3	
One_Wire_Data	Orange	4	
Vdd_ One_Wire	Yellow	5	
OUT	Green	6	

IGN	White	7
GND	Black	8
VIN	Red	9

3.3. Turn on / Turn off

To turn on the device, connect it to an external battery.
To turn off the device, disable the backup battery (i.e. set <*Backup Battery On*> in **AT+GTCFG** to 0) and then disconnect the device from the external battery.

3.4. Open the Case

Figure 14: Open the Case

When GV56RS is shipped, the case of GV56RS is not closed completely, which allows the user to open it relatively easily for SIM card and battery installation.

3.5. Install the SIM Card

Figure 15: SIM Card Installation

Open the case and ensure the device is not powered. Insert the SIM card into the holder as shown above with the gold-colored contact area facing down. Close the case.

3.6. Install the Internal Battery

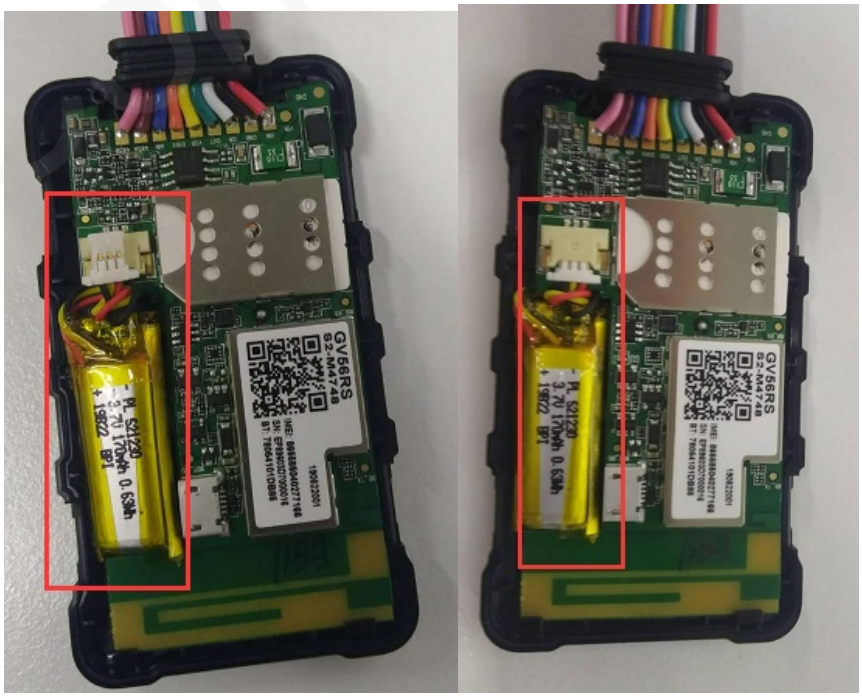


Figure 16: Battery Installation

When GV56RS is shipped, the internal battery is not installed. Thus, the battery needs to be installed as shown above before use.

3.7. Close the Case

Figure 17: Close the Case

Put the upper cover on the lower cover, and press the covers to make sure they are closed completely.

4. Troubleshooting and Safety Information

4.1. Troubleshooting

Trouble	Possible Reason	Solution
After GV56RS is turned on, the CELL LED always flashes quickly.	The signal is too weak; GV56RS can not be registered to the network.	Please move GV56RS into places with good GSM coverage.
Messages can not be reported to the backend server.	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.
Unable to power off GV56RS.	Charger is connected.	Disconnect charger, and try again.
GV56RS can not get successful GNSS fix.	The GNSS signal is weak.	Please move GV56RS to a place with open sky.
		It is better to let the top surface (the surface with indication LED) face the sky.

4.2. Safety Information

- Please do not disassemble the device by yourself.
- Please do not put the device in overheated or too humid place, and avoid exposure to direct sunlight. Too high temperature will damage the device or even cause battery explosion.
- Please do not use GV56RS on airplane or near medical equipment.

4.3. Motion Sensor Direction

GV56RS has an internal 3-axis accelerometer supporting driving behavior monitoring, power conservation and motion detection. The following shows the direction of the motion sensor.

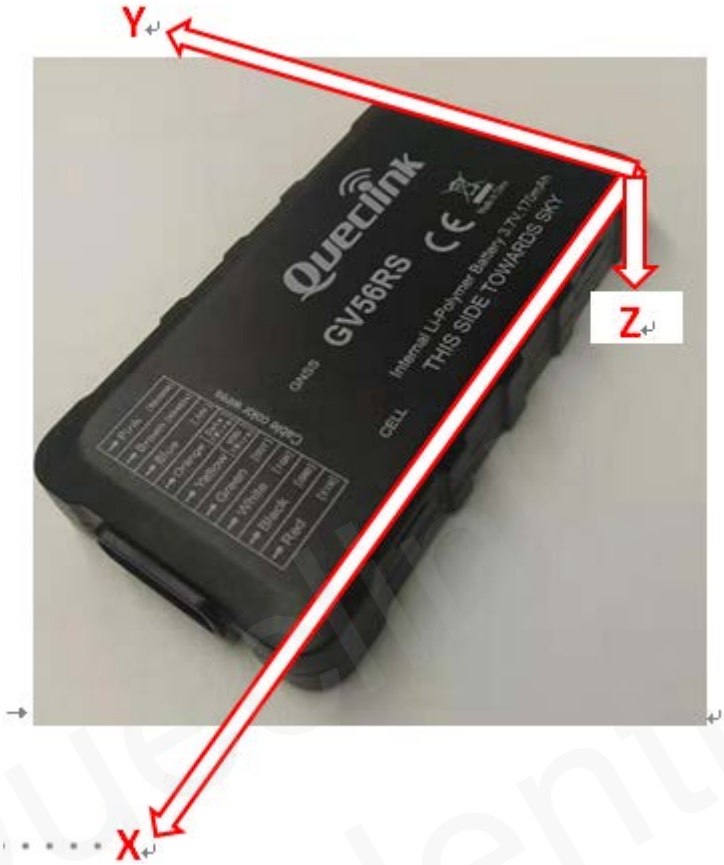


Figure 18: Motion Sensor Direction