Queclink
WIRELESS SOLUTIONS

GSM/GPRS/GPS Tracker **GV300**

User Manual

Application Notes: **TRACGV300UM001**

Revision: **1.09**

GV300

Designed by Queclink

Internal Battery: **250** mAh, 3.7V
Operating Voltage: DC 8 - 32V

FCC ID:YQD-GV300

Warning!!!
Don't expose to temperature above 60 °C
May explode if disposed of in fire.

CE 0678

Made in China

IMEI:862170013909997

THIS SIDE TOWARDS SKY

EARP	9 / 1	MICP
EARN	10 / 2	AGND
PWR	11 / 3	IGN
IN2	12 / 4	RXD
IN1	13 / 5	TXD
OUT1	14 / 6	GND
AD1/IN3	15 / 7	OUT3
AD2	16 / 8	OUT2

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WIRELESS ®

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Contents

Table Index

Figure Index

0. Revision History

Revision	Date	Author	Description of change
1.00	2011-8-10	Owen Feng	Initial
1.01	2011-8-19	Owen Feng Leo Lei Vivi Zhu	First review
1.02	2011-09-09	Owen Feng	Add picture of new case(V3)
1.03	2011-09-27	Owen Feng	Add "Switch ON the Backup Battery" Add new feature output with PTC over current protection
1.04	2011-10-10	Owen Feng	Add page 7 add notes of FCC
1.05	2011-12-16	Owen Feng	Add battery off position note
1.06	2012-04-10	Owen Feng	1) Change analog input range 2) Add user cable colour definition
1.07	2012-05-10	Owen Feng	Add certification info
1.08	2012-08-09	Owen Feng	Add uart Garmin connection
1.09	2014-01-26	Ricker Liu	1> Change user cable colour definition 2> Repair the relay connection figure

1. Introduction

The GV300 is a powerful GPS locator designed for vehicle or asset tracking. It has superior receiver sensitivity, fast TTFF (Time to First Fix) and supports Dual-Band GSM frequencies 850/1900, its location can be monitored in real time or be periodically tracked by a backend server or other specified terminals. The GV300 has multiple input/output interfaces that can be used for monitoring or controlling external devices. Based on the integrated @Track protocol, the GV300 can communicate with a backend server through the GPRS/GSM network to transfer reports of Emergency, geo-fence boundary crossings, low backup battery or scheduled GPS position as well as many other useful functions. Users can also use GV300 to monitor the status of a vehicle and control the vehicle by its external relay output. System Integrators can easily setup their tracking systems based on the full-featured @Track protocol.

1.1 Reference

Table 1. GV300 Protocol Reference

SN	Document name	Remark
[1]	GV300 @Track Air Interface Protocol	The air protocol interface between GV300 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. Check Part List

Before starting, check all the following items have been included with your GV300. If anything is missing, please contact your supplier.

Figure 1. Appearance of GV300

2.2. Parts List

Table 3. Part List

Name	Picture
GV300 Locator	80*49*26 mm
User Cable	
Extend Cable (Optional)	
GPS Antenna (Optional)	
DATA_CABLE_M (Optional)	

2.3. Interface Definition

The GV300 has a 16 PIN interface connector. It contains the connections for power, I/O, RS232, microphone, speaker, etc. The sequence and definition of the 16PIN connector are shown in following figure:

Figure 2. The 16 PIN connector on the GV300

Table 4. Description of 16 PIN Connections

Index	Description	Comment
1	MICP	Single end, 2-2.2k microphone, internal bias
2	AGND	Analog ground
3	IGN	Ignition input, positive trigger
4	RXD	UART RXD, RS232
5	TXD	UART TXD, RS232
6	GND	Power and digital ground
7	OUT3	Open drain, 150mA max
8	OUT2	Open drain, 150mA max
9	EARP	Differential output, 32ohm 1/4w speaker
10	EARN	Differential output, 32ohm 1/4w speaker
11	PWR	External DC power input, 8-32V
12	IN2	Digital input, negative trigger
13	IN1	Digital input, negative trigger
14	OUT1	Open drain, 150mA max ,with latch circuit
15	AD1/IN3	Multifunction input, analog or digital input 0-16V
16	AD2	Analog input 0.3-16v

2.4. GV300 User Cable Colour

Table 5. GV300 User Cable Colour definition

Definition	Color	PIN No	Cable	PIN No	Color	Definition
OUT2	Yellow	8		16	Brown/White	AD2
OUT3	Brown	7		15	Green	AD1/IN3
GND	Black	6		14	Blue	OUT1
TXD	White/Black	5		13	Orange	IN1
RXD	Green or Pink	4		12	Orange/Black	IN2
IGN	White	3		11	Red	PWR
AGND	Gray/ Black	2		10	Purple/White	EARN
MICP	Gray	1		9	Purple	EARP

3. Getting Started

3.1. Opening the Case

Figure 3. Opening the Case

Insert the triangular-pry-opener into the gap of the case as shown below, push the opener up until the case unsnapped.

3.2. Closing the Case

Figure 4. Closing the Case

Place the cover on the bottom in the position as shown in the following figure. Slide the cover against the direction of the arrow until it snapped.

3.3. Installing a SIM Card

Open the case and ensure the unit is not powered (unplug the 16Pin cable and switch the internal battery to off position). Slide the holder right to open the SIM card. Insert the SIM card into the holder as shown below with the gold-colored contact area facing down taking care to align the cut mark. Close the SIM card holder. Close the case.
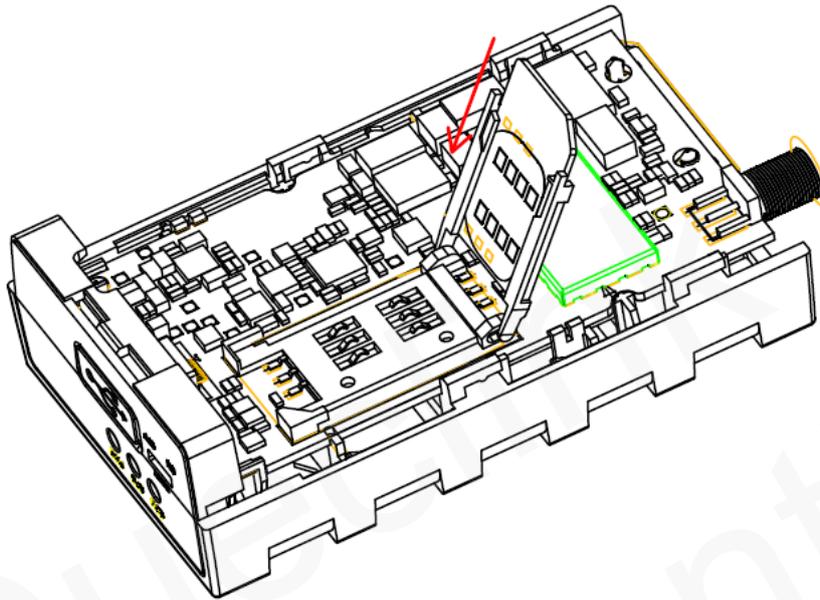

Figure 5. SIM Card Installation

3.4. Installing the Internal Backup Battery

Figure 6. Backup Battery Installation

There is an internal backup Li-ion battery,

3.5. Switch ON the Backup Battery

To use the GV300 backup battery, the switch must be at the ON position. Switch on the case and ON/OFF position are shown below.

Figure 7. Switch and ON/OFF position

Note:

1. The switch must be on the "OFF" position when shipped on an aircraft.

2. When the switch is on the "OFF" position, the battery cannot be charged or discharged.

3.6. Installing the External GPS Antenna (Optional)

There is a SMA GPS antenna connector on GV300. The GV300 will automatically detect and use an external antenna when connected.

Figure 8. GPS Antenna of GV300

3.6.1. GPS Antenna Specification

Table 6. GPS Antenna Specification

GPS antenna:	Frequency: 1575.42MHz
Bandwidth:	>5MHz
Beam width:	>120 deg
Supply voltage:	2.7V-3.3V
Polarization:	RHCP
Gain:	Passive: 0dBi min
	Active: 15dB
Impedance:	50Ω
VSWR:	<2
Noise figure:	<3

3.7. Power Connection

PWR (PIN12) / GND (PIN6) 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 systems without the need for external transformers.
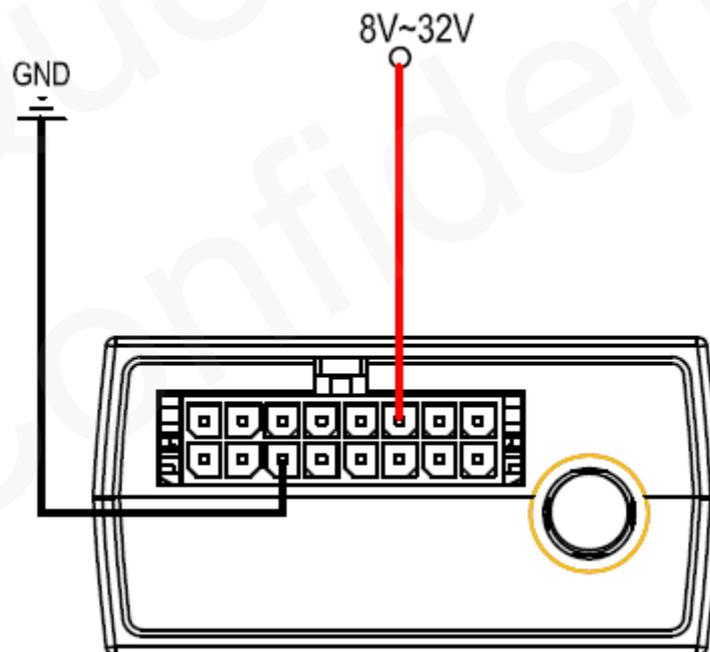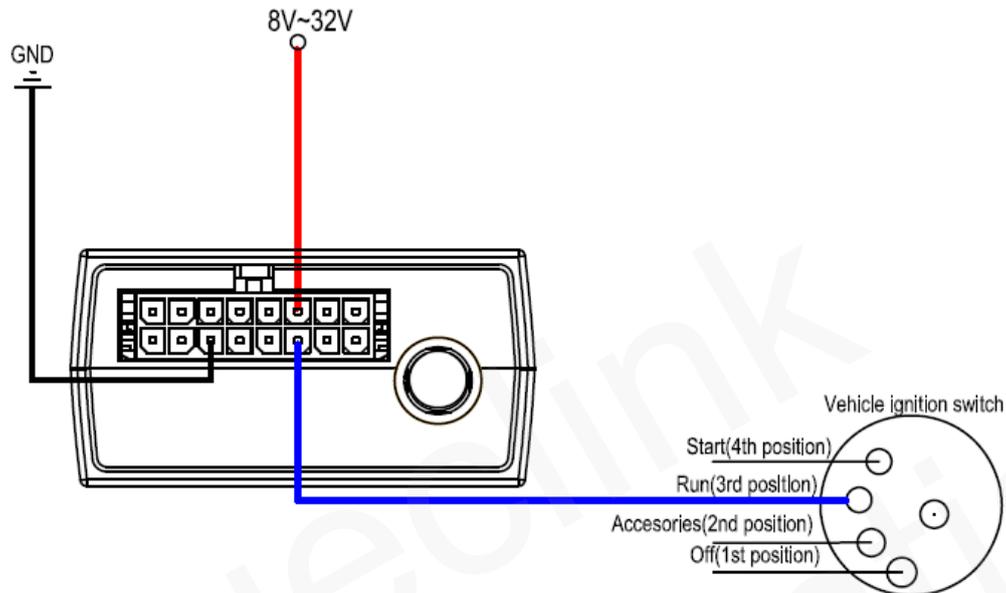

Figure 9. Typical Power Connection

3.8. Ignition Detection

Table 7. Electrical Characteristics of Ignition Detection

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

Figure 10.   Typical Ignition Detection

IGN (Pin3)is used for ignition detection. It is strongly recommended to connect this pin to ignition key "RUN" position as shown up.

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 ignition is on; and enter power saving mode when ignition is off.

There are three general purpose digital inputs on GV300. They are all negative trigger.

3.9. Digital Inputs

Table 8. Electrical Characteristics of the digital inputs

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

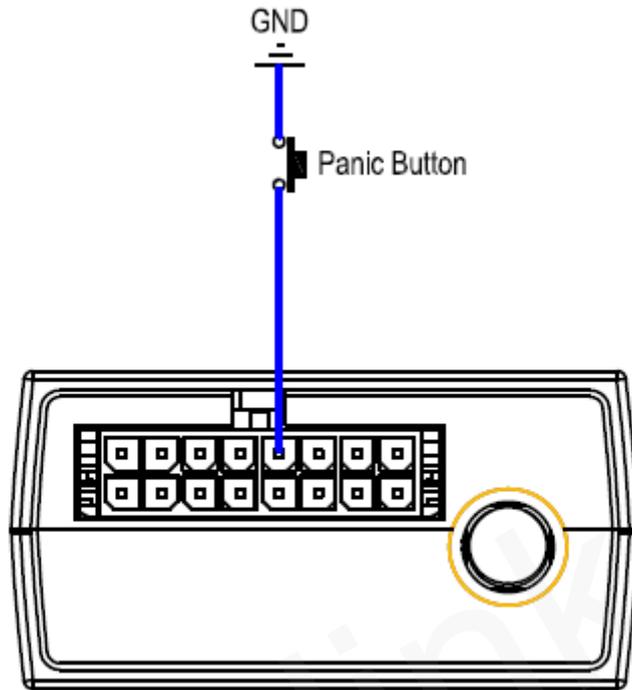The following diagram shows the recommended connection of a digital input.

Figure 11.   Typical Digital Input Connection

3.10.   Analog Inputs

There are two analog inputs on GV300, the analog input voltage range is from 0 to 16V. The following diagram shows the recommended connection.
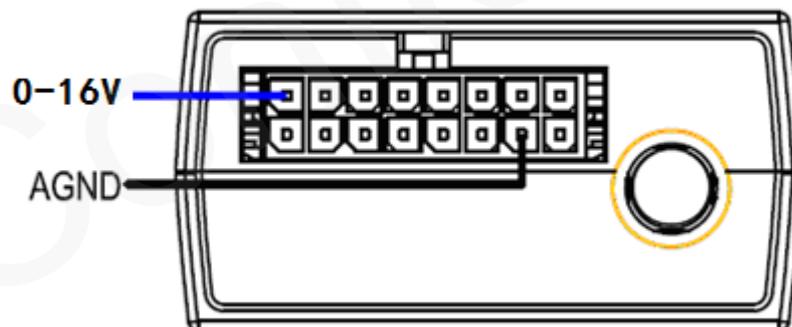

Figure 12.   Typical Analog Input Connection

Note:

PIN 15 is an multifunction pin: it can be configured as a digital input or an analog input.

3.11. Digital Outputs

There are three digital outputs on GV300. All are of open drain type and the maximum drain current is 150 mA. Each output has the built-in over current and recovery PTC fuse
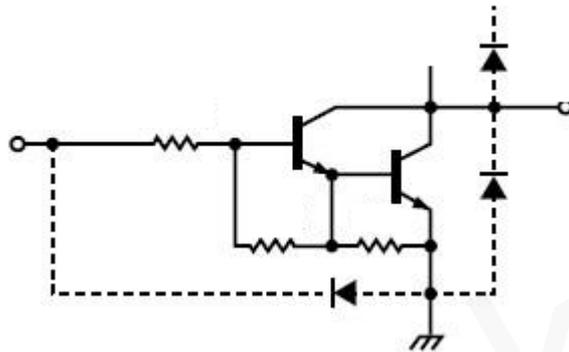

Figure 13.   Digital Output Internal Drive Circuit

Table 9. Electrical Characteristics of Digital Outputs

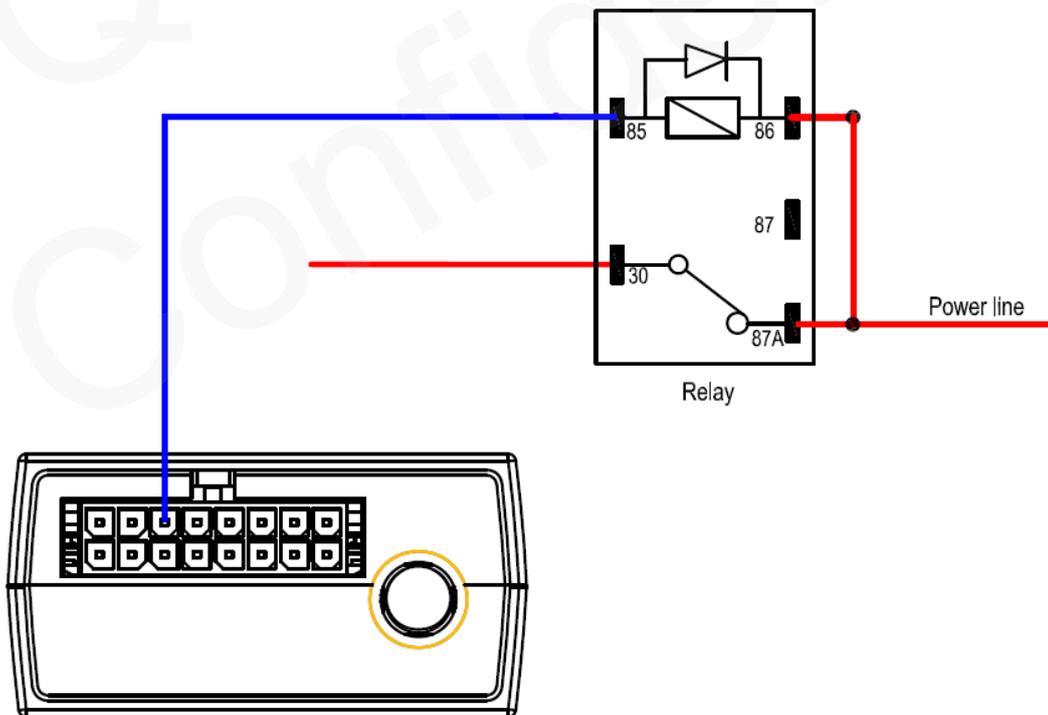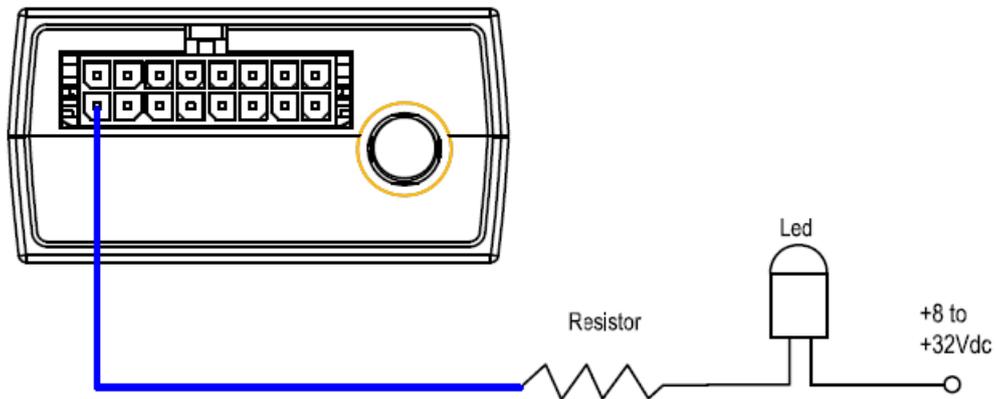| Logical State	Electrical Characteristics
Enable	<1.5V @150mA
Disable	Open drain

**Figure 14.   Typical Connection with Relay**

Figure 15.   Typical Connection with LED

Note:

1. OUT1 will latch the output state during reset.

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

3.12.   Device Status LED
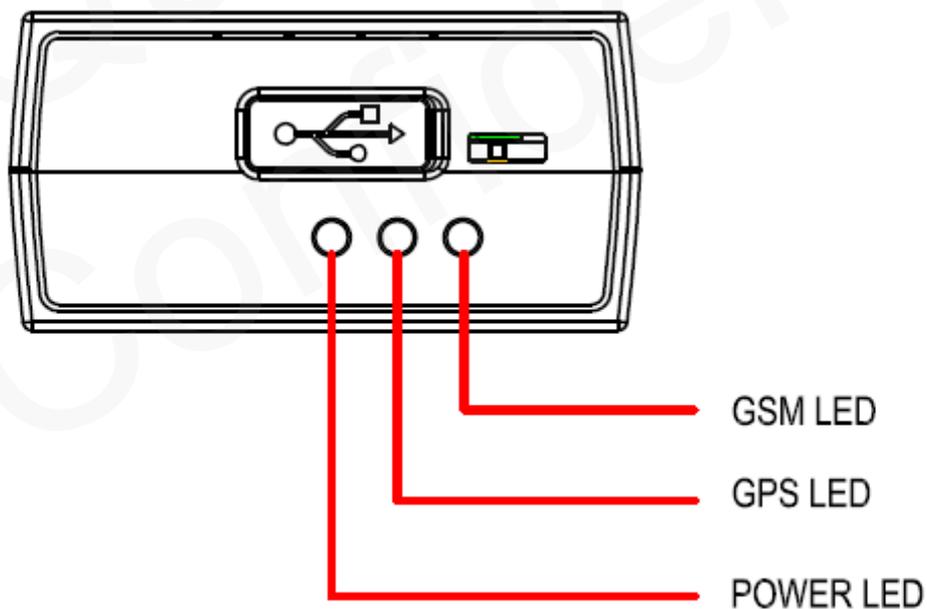
Figure 16.   GV300 LED on the Case

Table 10. Definition of Device status and LED

LED	Device status	LED status
GSM (note1)	Device is searching GSM network	Fast flashing (Note3)
	Device has registered to GSM network.	Slow flashing (Note4)
	SIM card needs pin code to unlock.	ON
GPS (note 2)	GPS chip is powered off	OFF
	GPS sends no data or data format error.	Slow flashing
	GPS chip is searching GPS info.	Fast flashing
	GPS chip has gotten GPS info.	ON
PWR (note 2)	No external power and internal battery voltage is lower than 3.35V.	OFF
	No external power and internal battery voltage is below 3.5V.	Slow flashing
	External power in and internal battery is charging	Fast flashing
	External power in and internal battery is fully charged	ON

Note:

1. GSM LED cannot be configured.

2. GPS LED and PWR 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

3.13.   Serial Port / UART Interface

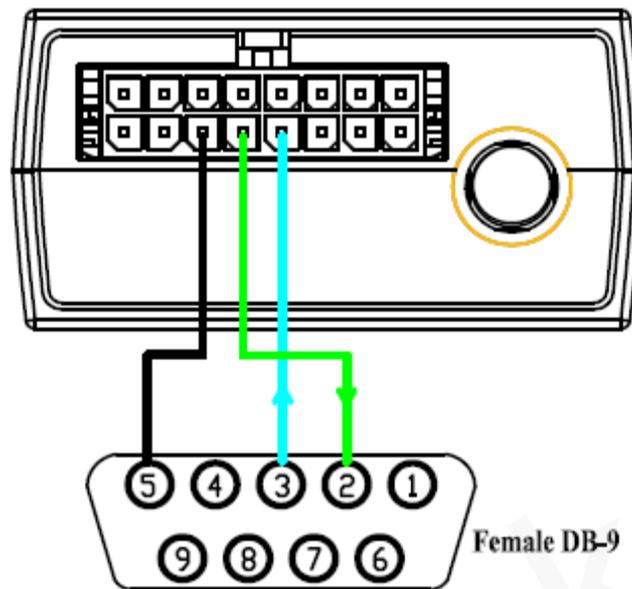There are two lines dedicated to the Serial Port / UART interface (TXD and RXD).TXD / RXD are standard RS232 signal.

Figure 17.   Typical Connection with RS232 Port

3.13.1. Connect With Garmin GPS Set

GV300 can communicate with Garmin GPS Set. The following typical connection is using Queclink AG100 cable.

Figure 18.   GV300 connection with Garmin GPS set

Note:

GV300 some version maybe connects with Garmin GPS set by Garmin FMI10/FMI15 cable, please consult with Queclink for detail information.

4. GV300 certification

4.1. FCC certification

GV300 has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

This device complies with part 15B, part 22 and part 24 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, including interference that may cause undesired operation.

Power Output is ERP for Part 22 and EIRP for Part 24.End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

GV300 FCC IDENTIFIER: YQD-GV300

4.2. European CE 0678

GV300 has been manufactured in accordance with the European R&TTE directive. This product, complies with the European CE/LVD (Low-Voltage Directive;2006/95/EC) standard (IEC 60950-1: 2005 (2nd Edition)+A1: 2009; EN 60950-1: 2006+A11: 2009+A1: 2010).

4.3. PTCRB certification

GV300 has been awarded PTCRB certification.PTCRB certification is an industry operator requirement needed to be met in order to sell GSM cellular communication products in the North American market.

4.4. Anatel certification

GV300 has been homologated (tested) in Brazil and is ANATEL@APPROVED for all installations in Brazil.

Anatel ID: 0633-12-7782