Queclink
WIRELESS SOLUTIONS

GSM/GPRS/GPS Tracker **GV304N**

User Manual

Application Notes: **TRACGV304NUM001**

Revision: **1.00**

THIS SIDE TOWARDS THE SKY
Designed and Engineered in USA

PWR

GV304N

GPS

GSM

IMEI:862170019025129

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

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

Made in China

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0. Revision History

Revision	Date	Author	Description of change
1.00	2016-06-16	Super Zhao	Initial

1. Introduction

The GV304N is a powerful GPS locator designed for vehicle or asset tracking. It has superior receiver sensitivity, fast TTFF (Time to First Fix) and supports quad band GSM frequencies GSM850/GSM900/DCS/PCS. Its location can be monitored in real time or periodically tracked by a backend server or other specified terminals. The GV304N has multiple input/output interfaces that can be used for monitoring or controlling external devices. Based on the integrated @Track protocol, the GV304N can communicate with a backend server through the GPRS/GSM network to transfer reports of emergency, geo-fence boundary crossings, low backup battery and scheduled GPS position as well as many other useful functions. Users can also use GV304N to monitor the status of a vehicle and control the vehicle by its external relay output. System integrators can easily set up their tracking systems based on the full-featured @Track protocol.

WARNING: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
FCC RF Exposure Statement:
For the product, under normal use condition is at least 20cm away from the body of the user, the user must keeping at least 20cm distance to the product.

1.1 Reference

Table 1. GV304N Protocol Reference

SN	Document name	Remark
[1]	GV304N @Track Air Interface Protocol	The air protocol interface between GV304N 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 Parts List

Before starting, check whether all the following items have been included with your GV304N. If anything is missing, please contact your supplier.

Figure 1. Appearance of GV304N

2.2. Parts List

Table 3. Parts List

Name	Picture
GV304N Locator	94*57*24.5 mm
User Cable	
Extend Cable (Optional)	
GPS Antenna (Optional)	
DATA_CABLE_M (Optional)	

2.3. Interface Definition

The GV304N has a 16 PIN interface connector which contains the connections for power, I/O, RS232, microphone, speaker, etc. The sequence and definition of the 16PIN connector are shown in the following figure:

Figure 2. The 16 PIN Connector on the GV304N

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, 150 mA max
8	OUT2	Open drain, 150 mA max
9	EARP	Differential output, 32 ohm 1/4w speaker
10	EARN	
11	PWR	External DC power input, 8-32V
12	IN2	Digital input, negative trigger
13	IN1	Digital input, negative trigger
14	OUT1	Open drain, 150 mA max ,with latch circuit
15	AD1/IN3	Multifunction input, analog or digital input 0-16V
16	AD2	Analog input 0.3-16V

2.4. GV304N User Cable Color

Table 5. GV304N User Cable Color 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	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

As shown, Roll the four screws counter clockwise with a screwdriver ,you can easily open the product.

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. Use a screwdriver clockwise to tighten four screws.

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 GV304N 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 GV304N. The GV304N will automatically detect and use an external antenna when connected.

Figure 8. GPS Antenna of GV304N

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 (PIN11) / 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.
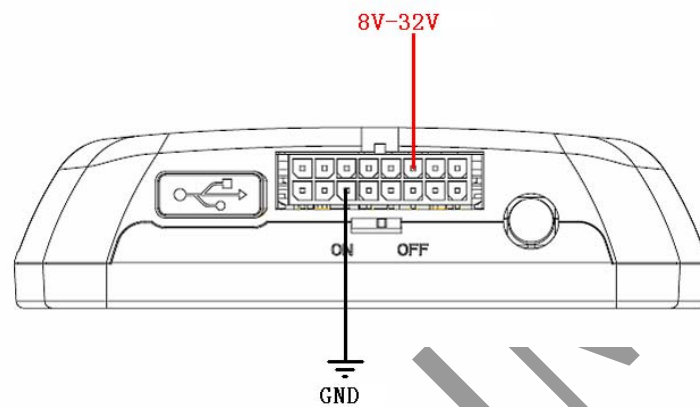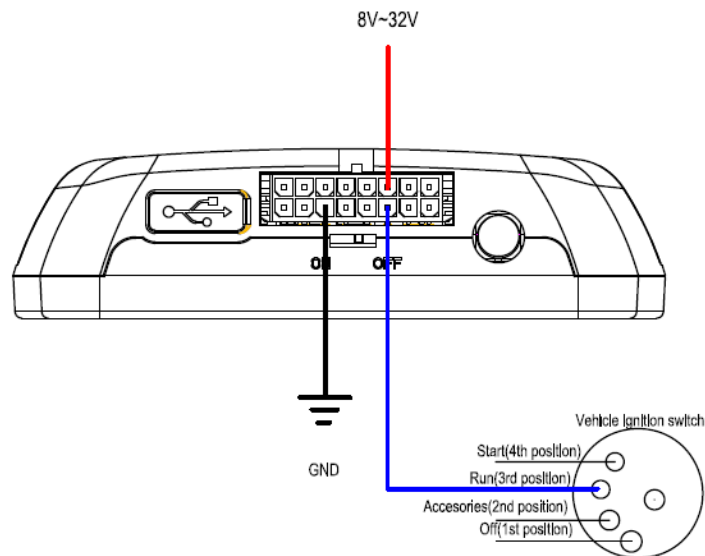

Figure 9. Typical Power Connection

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.
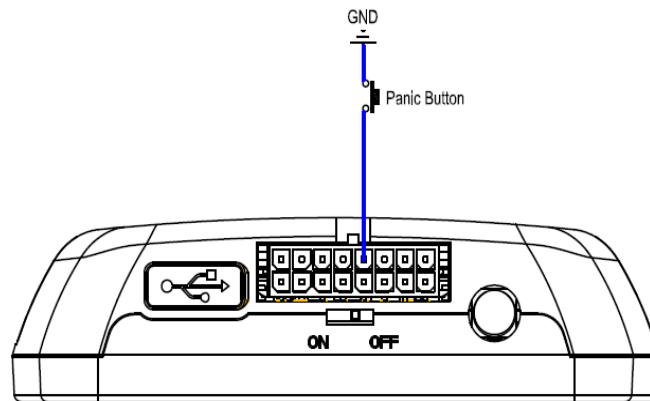
There are three general purpose digital inputs on GV304N. They are all negative trigger.

3.9. Digital Inputs

Table 8. Electrical Characteristics of the digital inputs

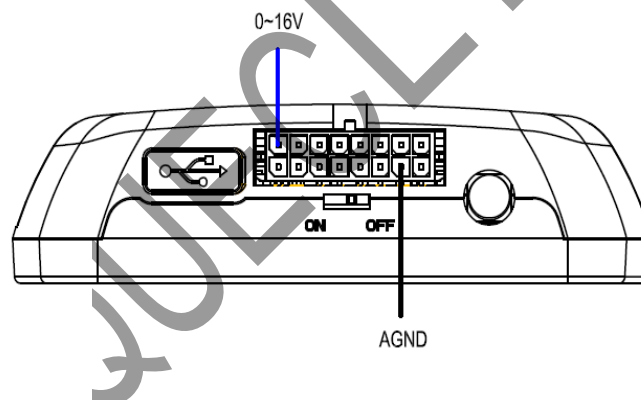| Logical State	Electrical Characteristics
Active	0V to 0.8V
Inactive	Open

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 GV304N, the analog input voltage range is from 0 to 16V. The following diagram shows the recommended connection.
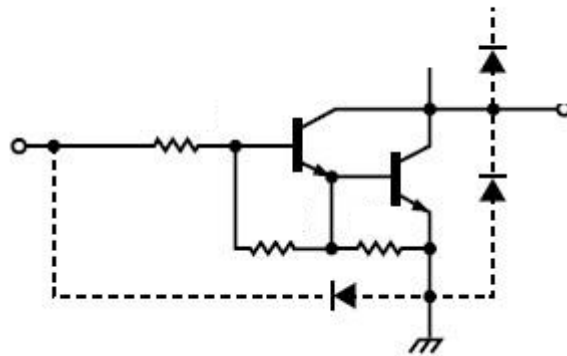

Figure 12.   Typical Analog Input Connection

Note:

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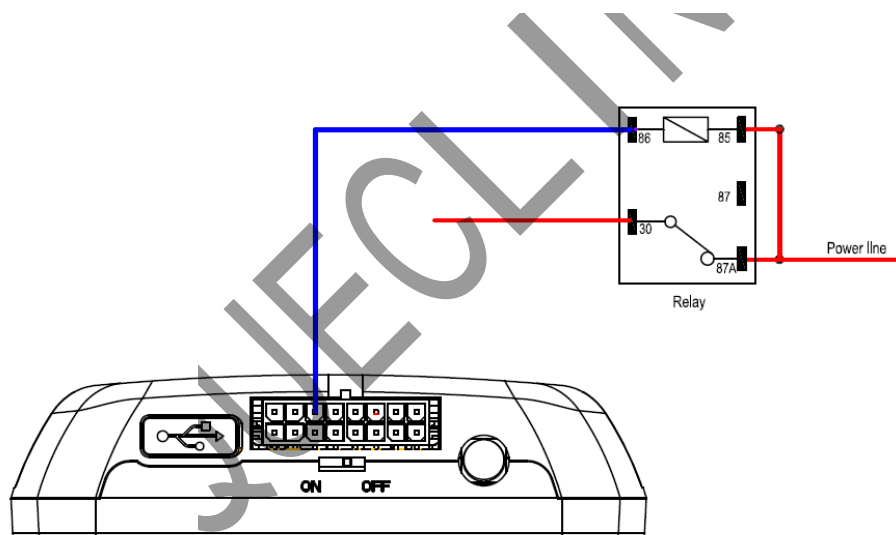
3.11.   Digital Outputs

There are three digital outputs on GV304N. 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
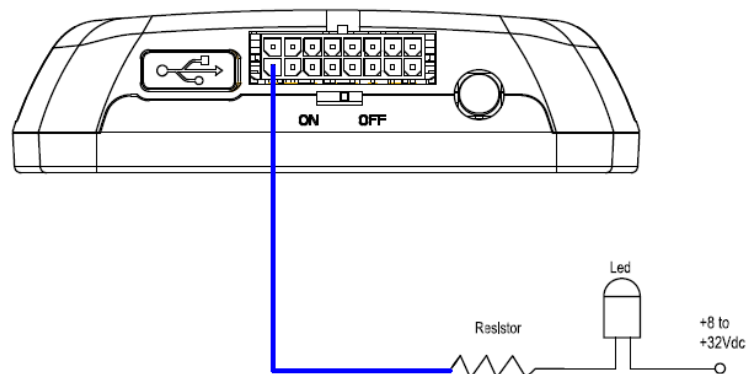
Figure 13. **Digital Output Internal Drive Circuit**

Table 9. Electrical Characteristics of Digital Outputs

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

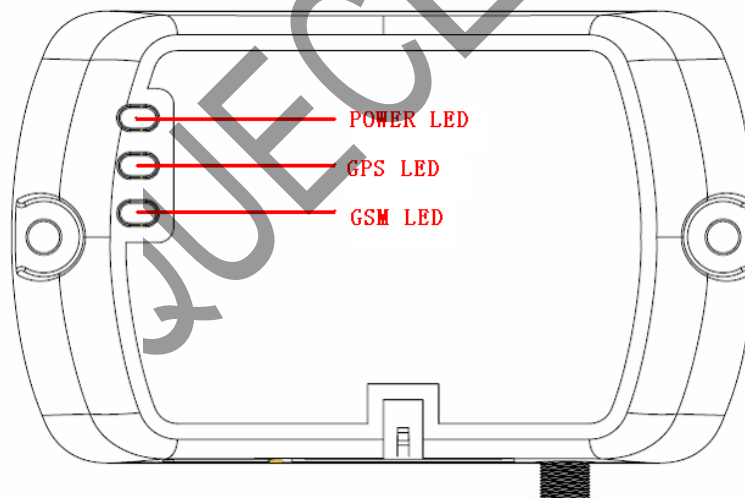**Figure 14.** **Typical Connection with Relay**

Figure 15.   Typical Connection with LED

Note:

1. OUT1 will latch the output state during reset.

2. 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.

3.12. Device Status LED

Figure 16.   GV304N LED on the Case
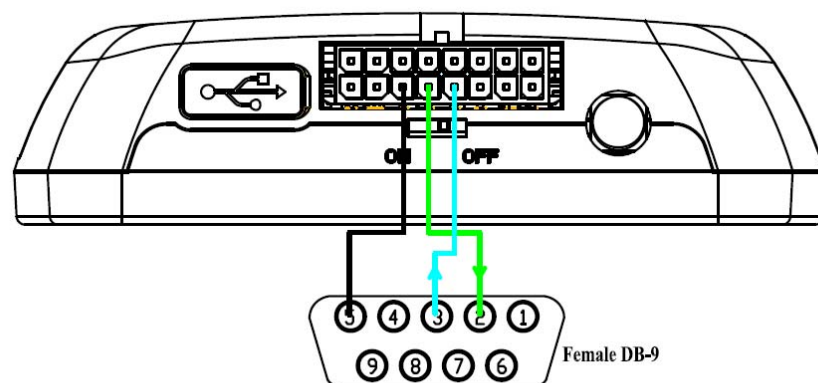
Table 10. Definition of Device status and LED

Note:

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

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

GV304N can communicate with Garmin GPS Set. The following typical connection is using Queclink AG100 cable.

Figure 18.　　GV304N connection with Garmin GPS set

Note:

GV304N some version maybe connects with Garmin GPS set by Garmin FMI10/FMI15 cable, please consult with Queclink for detail information.