GV300CAN User Manual

GPS Tracker

TRACGV300CANUM001

Revision: R1.02

Document Title	GV300CAN User Manual
Version	R1.02
Date	2018-01-22
Status	Release
Document Control ID	TRACGV300CANUM001

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0. Revision History

Revision	Date	Author	Description of change
1.00	2017-09-12	Super Zhao	Initial
1.01	2017-12-19	Super Zhao	Adjust the pictures and some description
1.02	2018-01-22	Pablo Dang	Add the note for SYNC switch

1. Introduction

The GV300CAN is a compact GPS tracker designed for a wide variety of vehicle tracking applications. It has multiple digital/analog I/O interfaces that can be used for monitoring or controlling external devices. At the same time, it has integrated CAN and J1708 which decodes information from vehicles digital buses (CANbus and J1708).It also includes a 1-wire interface used for driver ID and temperature monitoring. Its built-in GPS receiver has superior sensitivity and fast time to first fix. Its dual band GPRS subsystem supports 850/1900 MHz
allowing the GV300CAN's location to be monitored in real time or periodically tracked by a backend server and mobile devices. Its built-in 3-axis accelerometer allows motion detection and extends battery life through sophisticated power management algorithms. 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, geo-fence boundary crossings, driving behavior, low battery and scheduled GPS position.

1.1 Reference

Table 1. GV300CAN Protocol Reference

SN	Document name	Remark
[1]	GV300CAN @Track Air Interface Protocol	The air protocol interface between GV300CAN and backend server.

1.2 Terms and Abbreviations

Table 2. Terms and Abbreviations

Abbreviation	Description
AIN	Analog Input
DIN	Digital Input
DOUT	Digital Output
GND	Ground
J1708_A	J1708 BUS output A
J1708_B	J1708 BUS output B
RXD	Receive Data
TXD	Transmit Data
CAN_H	CAN BUS output high
CAN_L	CAN BUS output LOW
1-wire	1-wire BUS

2. Product Overview

2.1. Check Parts List

Before starting, check whether all the following items have been included with your GV300CAN. If anything is missing, please contact your supplier.

Figure 1. Appearance of GV300CAN

2.2. Parts List

Table 3. Parts List

Name	Picture
GV300CAN Locator	80*49*26 mm
User Cable	
GPS Antenna (Optional)	
MiniUSB_DATA_CABLE_1.5M (Optional)	

2.3. Interface Definition

The GV300CAN has a 16 PIN interface connector which contains the connections for power, I/O, RS232, CAN, J1708, 1-wire, etc. The sequence and definition of the 16PIN connector are shown in the following figure:

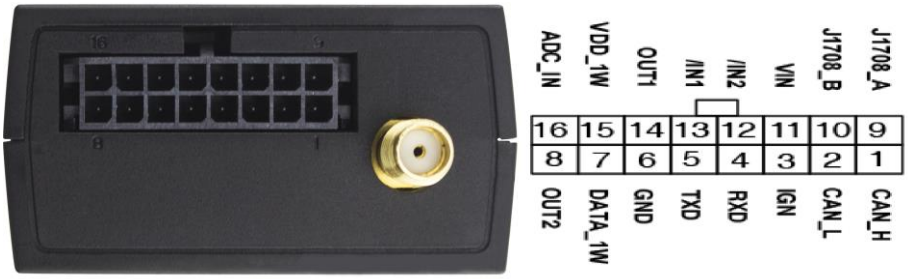

Figure 2. The 16 PIN Connector on the GV300CAN

Table 4. Description of 16 PIN Connections

Index	Description	Comment
1	CAN_H	CAN BUS output H
2	CAN_L	CAN BUS output L
3	IGN	Ignition input, positive trigger
4	RXD	UART RXD, RS232
5	TXD	UART TXD, RS232
6	GND	Power and digital ground
7	DATA_1W	1-Wire DATA
8	OUT2	Open drain, 150 mA max
9	J1708_A	J1708 BUS output A
10	J1708_B	J1708 BUS output B
11	VIN	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	VDD_1W	1-wire device power output
16	ADC_IN	ADC input

2.4. GV300CAN User Cable Color

Table 5. GV300CAN User Cable Color Definition

Definition	Color	PIN No	Cable	PIN No	Color	Definition
OUT2	Yellow	8		16	Brown/White	ADC_IN
DATA_1W	Brown	7		15	Green	VDD_1W
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	VIN
CAN_L	Gray/Black	2		10	Purple/White	J1708_B
CAN_H	Gray	1		9	Purple	J1708_A

3. Get Started

3.1. Open the Case

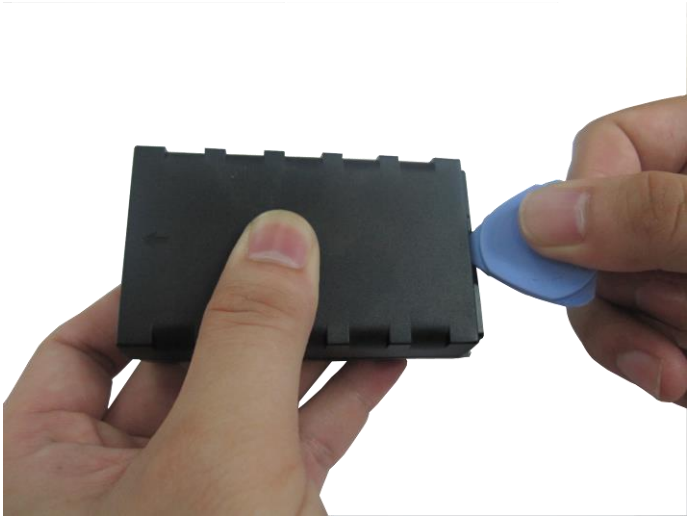

Figure 3. Open the Case

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

3.2. Close the Case

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

3.3. Install a SIM Card

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

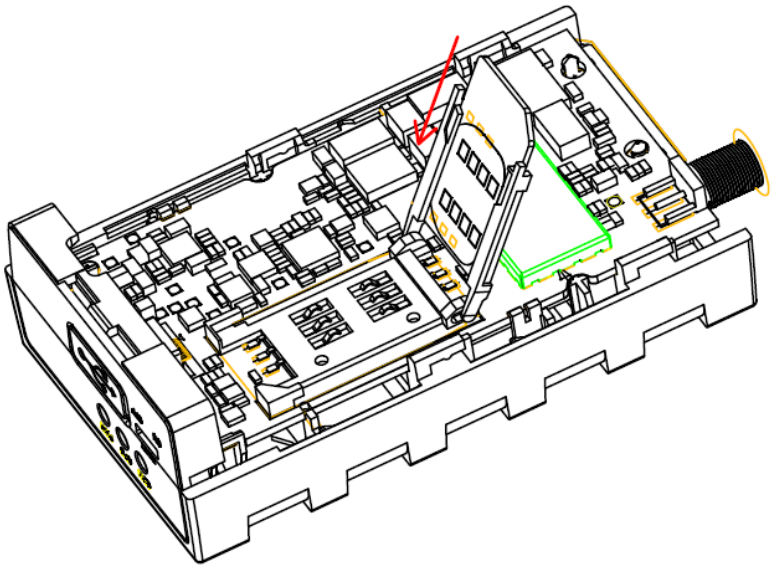

Figure 4. SIM Card Installation

3.4. Install the Internal Backup Battery

GV300CAN has an internal backup Li-ion battery.

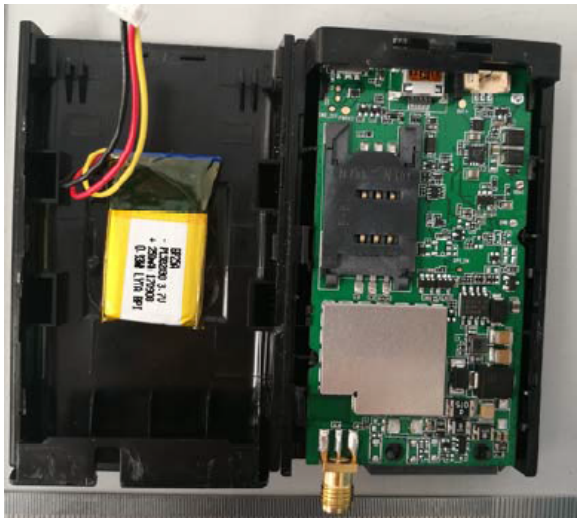

Figure 5. Backup Battery Installation

3.5. SYNC Switch

The switch was used to Synchronize the car model. You can push the switch to the left as the Arrow direction， and hold it approximately 3 seconds to Synchronize the car model。

Figure 6. SYNC Switch

Note:

If device is configured for any car, synchronization can be started in the following way:

1. Make sure the CAN function is enabled before you push the SYNC switch.
2. Connect the power for the device. The CAN LED lights red.
3. Press the button on the front panel of the device (you can hold it while connecting power supply).
4. After approximately 8 seconds, the CAN light will light green. Then release the button.

After starting the device, sync CAN light blinks red. After several seconds (up to half a minute), synchronization is done and:

- if the green CAN light lights – car has been synchronized successfully, turn the power supply off and on after 5 seconds - now the device is synchronized with the car.
- if the CAN light flashes alternating green / red - it means an invalid connection to the CAN-bus. Make sure the CAN-bus wires are not swapped (CAN-H against CANL), and the ignition is turned on. If these conditions are met – the device is not connected to any CAN-bus.
- if the red CAN light - CAN bus connection is correct, but the car has not been recognized. The current version of the software will not work with this car model.

CAN-bus synchronization may also be performed through the serial port.

On request, the device may be delivered with the proper configuration for the selected car model.

3.6. Install the External GPS Antenna (Optional)

There is a SMA GPS antenna connector on GV300CAN. The GV300CAN will automatically detect and use an external antenna when connected.

Figure 7. GPS Antenna of GV300CAN

3.6.1. GPS Antenna Specification

Table 6. GPS Antenna Specification

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

3.7. Power Connection

VIN (PIN11)/GND (PIN6) is the power input pin. 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.

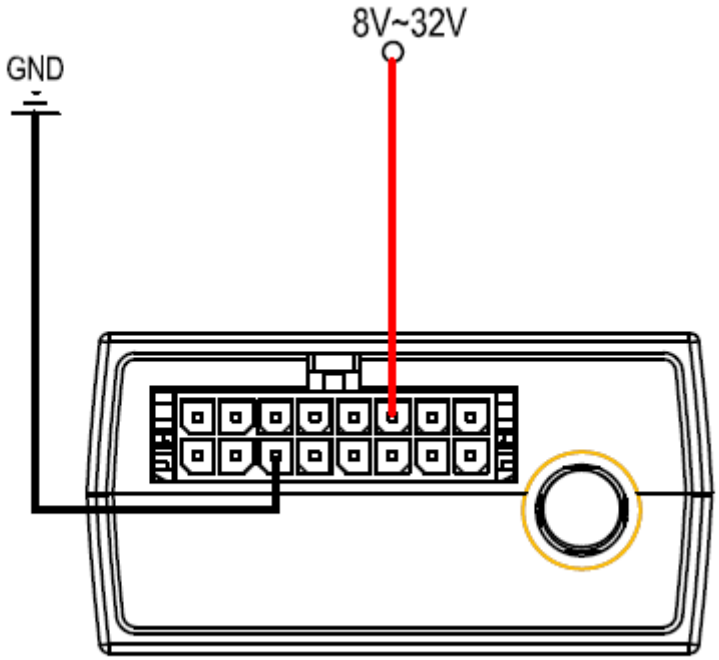

Figure 8. Typical Power Connection

3.8. Ignition Detection

Table 7. Electrical Characteristics of Ignition Detection

Logical status	Electrical characteristics
Active	5.0V to 32V
Inactive	0V to 3V or open

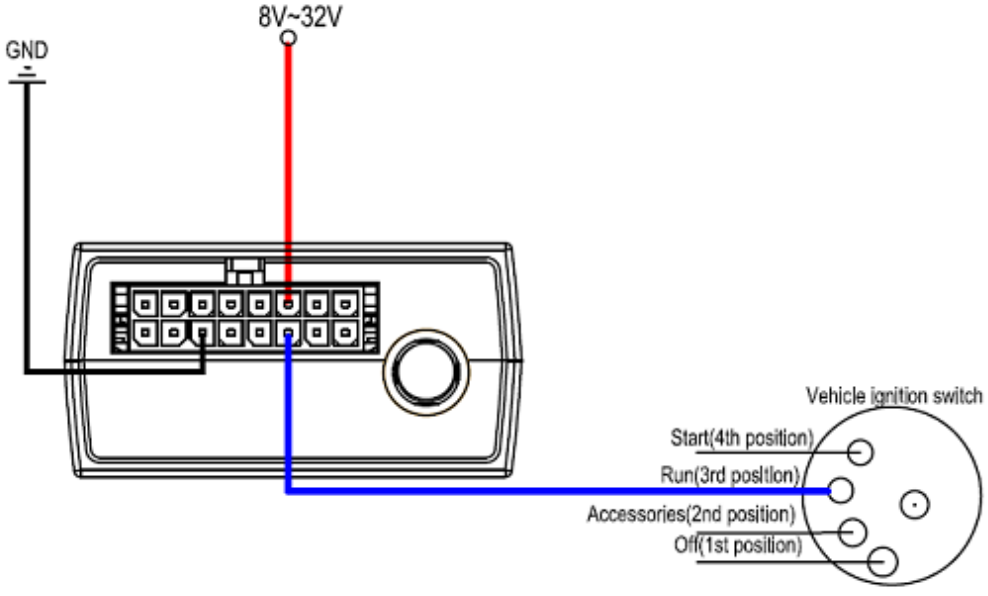

Figure 9. Typical Ignition Detection

IGN (Pin3) is used for ignition detection. It is strongly recommended to connect this pin to ignition key “RUN” position as shown above.
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 the backend server when ignition is on, and enter the power saving mode when ignition is off.

3.9. Digital Inputs

There are two general purpose digital inputs on GV300CAN. They are all negative triggers.

Table 8. Electrical Characteristics of the Digital Inputs

Logical status	Electrical characteristics
Active	0V to 0.8V
Inactive	Open

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

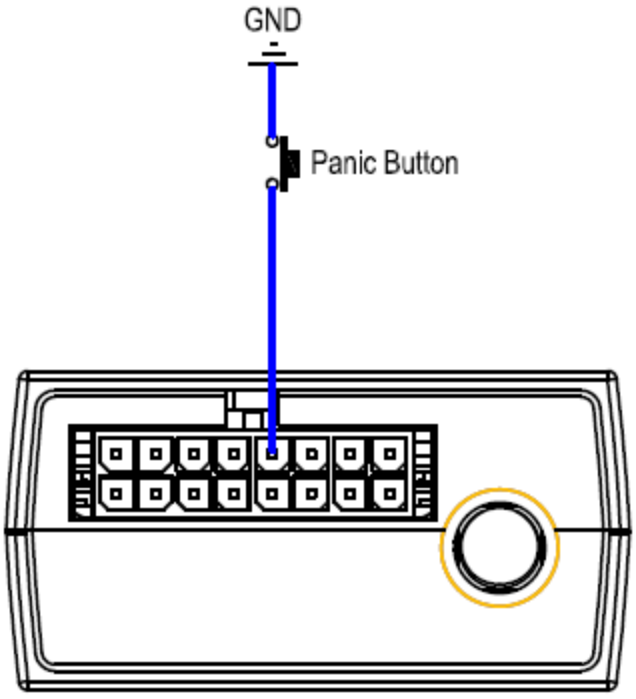

Figure 10. Typical Digital Input Connection

3.10. Analog Inputs

There are one analog input on GV300CAN, The analog input voltage range could be selectable, Including 0-12V and 0-30V, and the default range is from 0 to 30V. The following diagram shows the recommended connection.

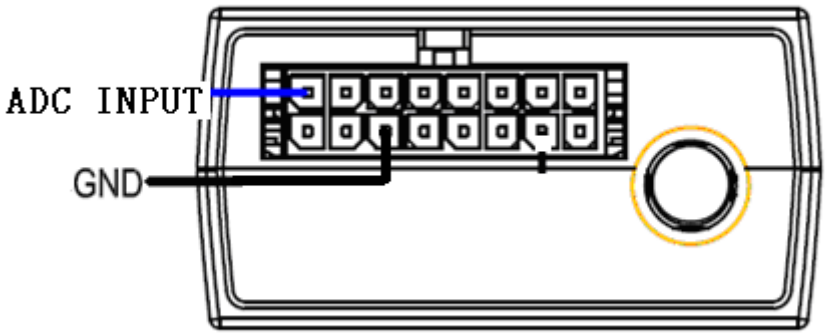

Figure 11. Typical Analog Input Connection

3.11. Digital Outputs

There are two digital outputs on GV300CAN. All are of open drain type and the maximum drain current is 150 mA. Each output has the built-in over current PTC resettable fuse.

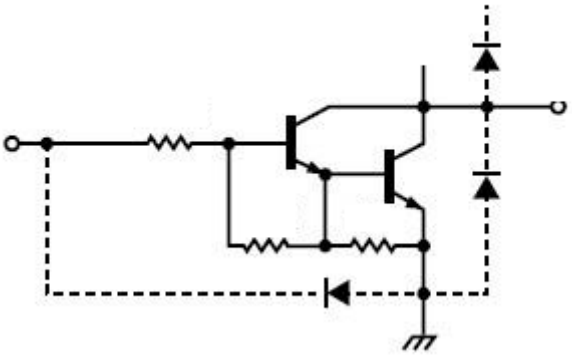

Figure 12. Digital Output Internal Drive Circuit

Table 9. Electrical Characteristics of Digital Outputs

Logical status	Electrical characteristics
Enable	<1.5V @150 mA
Disable	Open drain

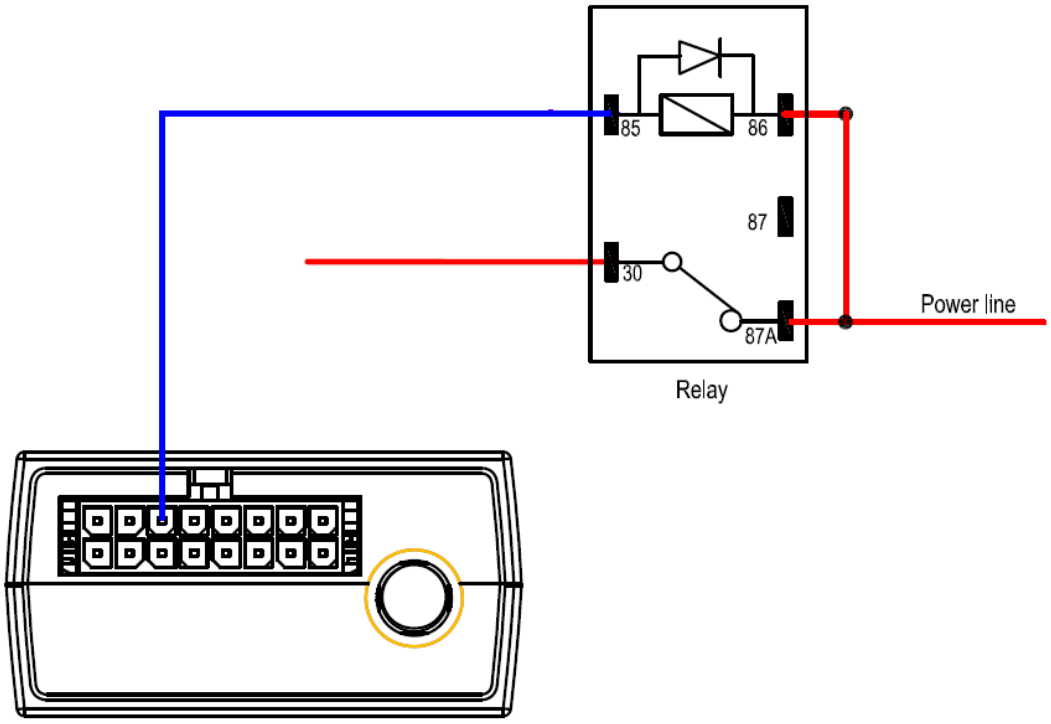

Figure 13. Typical Connection with Relay

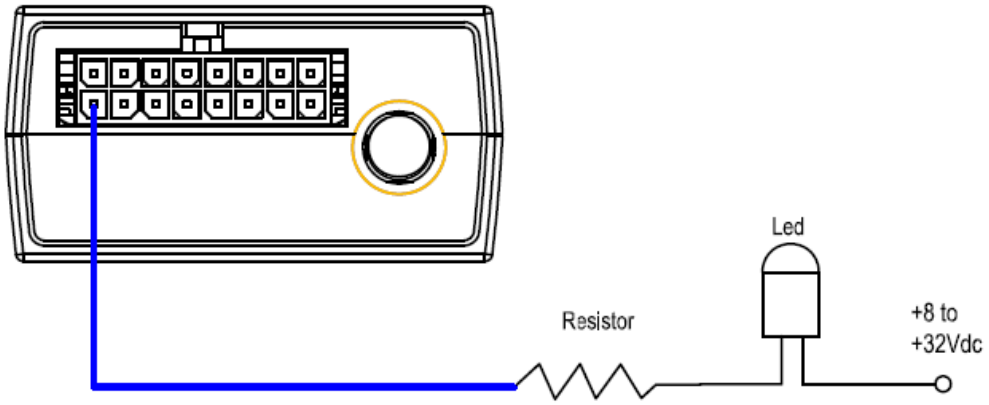

Figure 14. Typical Connection with LED

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, ensure the relay polarity is properly connected. 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. Serial Port/UART Interface

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

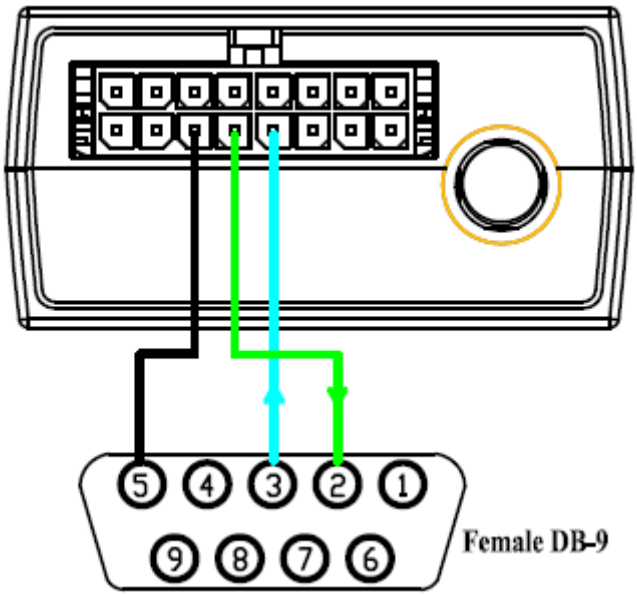

Figure 15. Typical Connection with RS232 Port

3.13. 1-Wire device Connection

It has 1-wire bus on GV300CAN, which supports temperature sensors and iButton. The bus includes 3 signals, namely, VDD-1W, DATA-1W and GND. VDD-1W is the power output for 1-wire device, and DATA-1W is the data signal, with which GV300CAN can get information from 1-wire device.

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

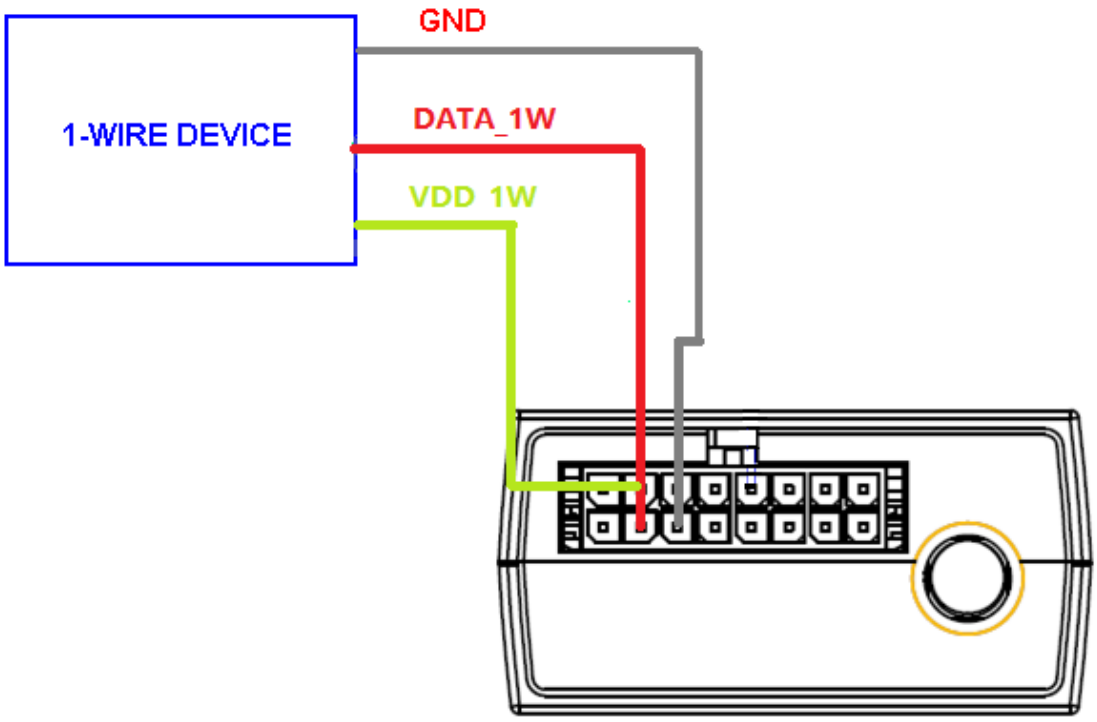

Figure 16. Typical Connection with 1-wire Device

iButton Reader
NC
1-Wire ground (GREEN/WHITE)
1-Wire data (YELLOW/RED)

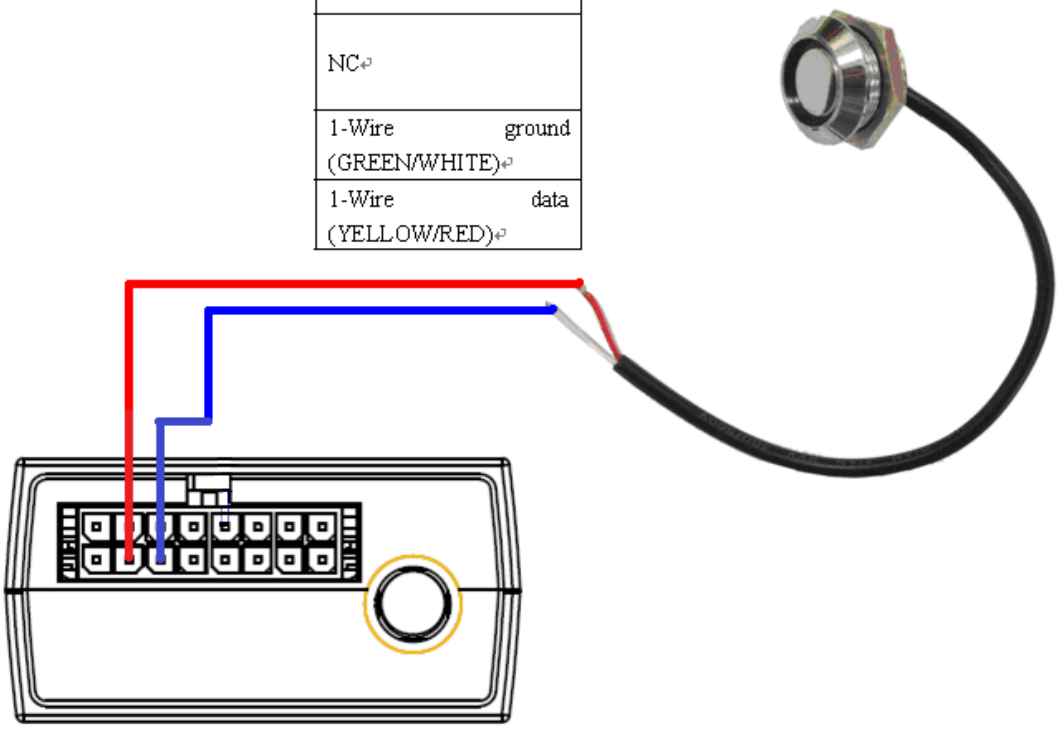

Figure 17. Typical Connection with iButton Reader

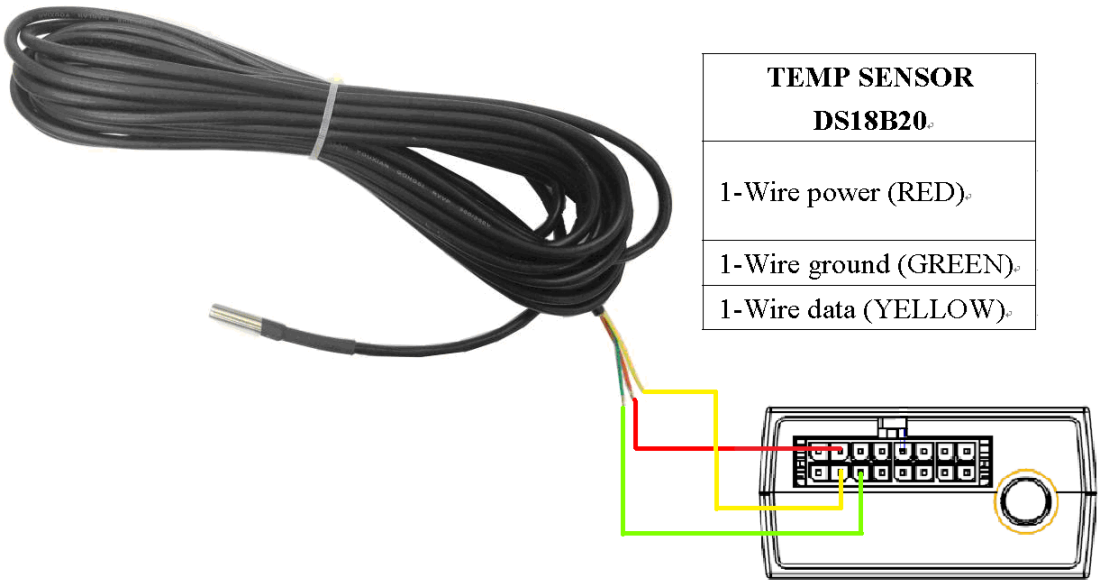

Figure 18. Typical Connection with Temperature Sensor

3.14. Device Status LED

Table 10. Definition of Device Status and LED

LED	Device status	LED status
GSM (Note 1)	Device is searching GSM network.	Fast flashing (Note 3)
	Device has registered to GSM network.	Slow flashing (Note 4)
	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 occurs.	Slow flashing
	GPS chip is searching GPS info.	Fast flashing
	GPS chip has gotten GPS info.	ON
CAN	Start the synchronization procedure.	Blinking red
	Synchronization is complete and successfully.	Lights green
	Synchronization is complete. CAN-bus connected properly, but the car is not recognized.	Lights red
	Invalid connection to the CAN-bus.	Flashes green/red
	CAN-Logistic connected successfully to vehicle's bus(es). (Note 5)	Interval one second, Green LED blinks once
	CAN-bus does not read CAN-bus data. (Note 5)	Interval 4 seconds, Green LED blinks once
	CAN-Logistic connected successfully to vehicle's bus(es). (Note 6)	Interval one second, Green LED double blink
	CAN-Logistic reads only one bus(CAN or J1708) (Note 6)	Interval one second, Green LED blinks once
	CAN-Logistic reads none bus(neither CAN nor J1708) (Note 6)	Interval 4 seconds, Green LED blinks once

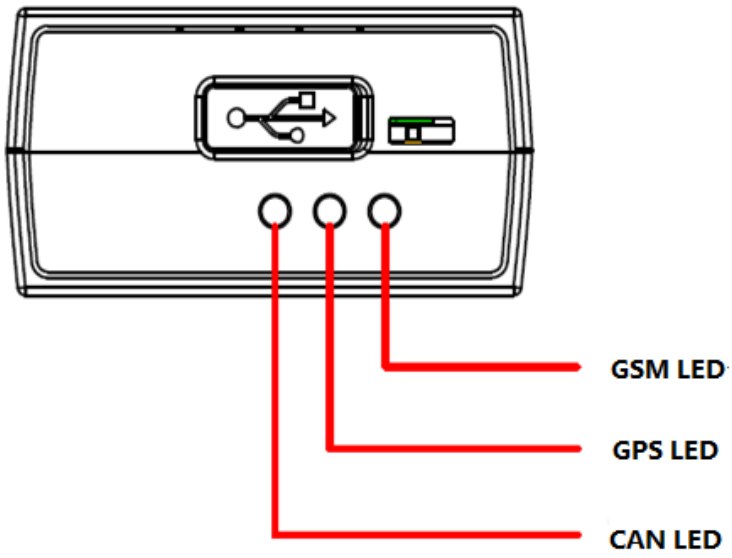

Figure 19. GV300CAN LED on the Case

Note:

1. GSM LED cannot be configured.
2. GPS LED and PWR LED can be configured to turn off after a period of time by using the configuration tool.
3. Fast flashing: for GSM LED is about 60 ms ON/780 ms OFF; for GPS LED and PWR LED is about 100 ms ON/100 ms OFF.
4. Slow flashing: for GSM LED is about 60 ms ON/1940 ms OFF; for GPS LED and PWR LED is about 600 ms ON/600 ms OFF.
5. When only CAN-bus is connected.
6. When both buses (CAN i J1708) are connected.

3.15. Bluetooth

The device role of Bluetooth could be Master and Slave.

When the device role is Slave, the device will provide below services: device information service, battery information service, virtual serial port service. Other devices can read or use these services after connecting devices.

When the device role is Master, the device will provide below services: the others devices can read or use the above services after connecting devices, connect the designated device to read the data or related information of the designated Bluetooth devices. After reading the data, the server can be reported to the server by the corresponding message.

3.15.1. Bluetooth usage

Install Lightblue APP on your smartphone for IOS, and install NRF Connect for Android.
Send command:
“AT+GTBTS=gv300can,1,,GV300CAN_BT,7,3,666,1D07,0003,0,123456,,,,,,,,,,FFFF$”
by Manage Tool to device to turn on Bluetooth. The device will connect to smartphone.
Send command
“AT+GTBTS=gv300can,0,,GV300CAN_BT,7,3,666,1D07,0003,0,123456,,,,,,,,,,FFFF$”
by Manage Tool to device to turn off Bluetooth. The device will disconnect to smartphone.

FCC Statement

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.