

# iStartek Vehicle GPS Tracker VT900-L 4G Tracker User Manual V1.0



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## 2. Product Overview

VT900-L is a 4G LTE network based GPS Car tracker with inbuilt high-precision GPS positioning module. Device report location and vehicle status to vehicle tracking platform through the LTE network, and performs real-time monitoring, anti-theft and dispatch management of the vehicle. It can be applied to fleet management, public transportation management, school bus management, taxi operation management, vehicle insurance management, car leasing management and private car anti-theft.

VT900-L has built-in 8MB Flash memory. When the device cannot connect to the service platform to send data (no GSM network, service platform downtime, etc.), the historical positioning data will be automatically saved. When the device returns to normal, the historical positioning data will be automatically resending to server.

The VT900-L contains an RS232 port that can be connected to peripherals such as RFID and magnetic card readers to perform identification and vehicle control for vehicle drivers. You can also read the car ECU data from the OBD box.

## 3. Product Features

- ◇ GPS+GSM Dual mode localization
- ◇ Dual server data transmission ( Optional )
- ◇ Real time tracking
- ◇ Track by time interval
- ◇ Track by distance
- ◇ Heading change report
- ◇ Track by SMS command
- ◇ SOS alarm
- ◇ External power cut alarm
- ◇ Engine, door status change alarm
- ◇ Geo-fence
- ◇ Overspeed alarm
- ◇ GPS blind area alarm
- ◇ Accelerated alarm
- ◇ Deceleration alarm
- ◇ Internal battery low power alarm

- ✧ External power supply low power alarm
- ✧ Mileage report
- ✧ 8 MB Flash memory
- ✧ GPS Log
- ✧ FOTA
- ✧ Authorization limit firmware upgrade and parameter configuration
- ✧ Set different time interval when ACC ON、ACC OFF
- ✧ Remotely control fuel/electricity
- ✧ GSM anti-jamming ( optional )
- ✧ Tow alarm ( optional )
- ✧ RFID、iButton Driver identification ( optional )
- ✧ Buzzer alarm ( optional )
- ✧ Capacitive fuel sensor ( optional )
- ✧ Ultrasonic fuel sensor ( optional )
- ✧ Temperature sensor ( optional )
- ✧ Alcohol sensor ( optional )
- ✧ OBD Box ( Optional )

#### 4. Product Specification

Item	Specification
Size	65 x 61 x 26mm
Weight	106g
Input voltage	DC 9 - 36V/1.5A
Inbuilt battery	500mAh/3.7V
Standby	65mA/h
Working time	33hours in power saving mode and 7.5 hours in normal mode
Working temperature	-20°C ~ 55°C ( Normal temperature battery ) -10°C ~ 80°C ( High temperature battery )
Working humidity	5% to 95%
LTE/WCDMA/GSM Band	<p><b>LMN : Cat-M/NB/GSM</b>            LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25*/B26*/B28            LTE-TDD: B39 (for Cat M only)            EGPRS: 850/900/1800/1900MHz</p> <p><b>LEC(EU) : Cat-1</b>            LTE-FDD: B1/B3/B7/B8/B20/B28            WCDMA: B1/B8            GSM: B3/B8</p> <p><b>LNS(US) : Cat-1</b>            LTE-FDD: B2/B4/B5/B12/B13/B25/B26</p>

	WCDMA: B2/B4/B5
<b>GPS Sensitivity</b>	-165dB
<b>Positioning Accuracy</b>	2.5 meter
<b>LED Indicator</b>	2 LED indicators GPS/GSM status indicating
<b>Antennas</b>	External GSM antenna , external GPS antenna
<b>Flash memory</b>	8MB ( 16192 GPRS , 256 SMS buffer )
<b>Sensor</b>	Vibration sensor
<b>I/O</b>	3 digital inputs ( 1 negative trigger , 2 positive trigger ) 1 analog input ( 0~24V ) 2 outputs 1 RS232 1 USB for configuration IN2 could be customized as AD2 IN2 could be customized as 1-wire

## 5. Product and Accessories

### 5.1. Standard accessories



Main Unit



Power cable



GPS Antenna



GSM Antenna

### 5.2. Optional Accessories



RFID Reader



RFID Tag



iButton Reader



iButton Tag



Ultrasonic Fuel Sensor



Capacitive Fuel Sensor



Temperature Sensor



Relay



Magnetic Card Reader



USB Cable



Buzzer

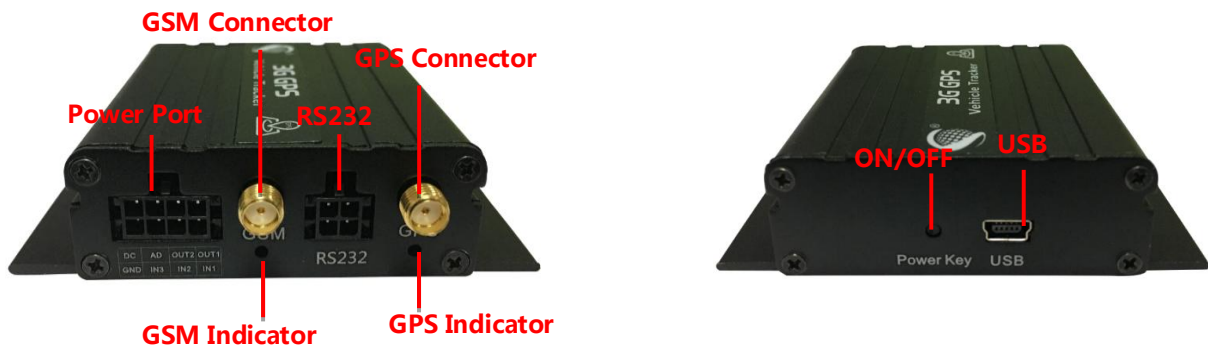


Alcohol Sensor



OBD BOX

## 6. Product Appearance



## 7. Production Operation

### 7.1. Charging

For the first time using the VT900-L, please connect the DC (positive) and GND (ground) to the 12V or 24V power supply for at least 2 hours to ensure sufficient power. After configuration and testing, install it on the vehicle.

### 7.2. Insert SIM Card

VT900-L support 2G. 3G. 4G network.

Please ensure that the SIM card has sufficient balance, and has opened the GPRS/3G/4G function and obtained the correct APN of the SIM card;

Please make sure that the PIN lock function of the SIM card has been turned off;

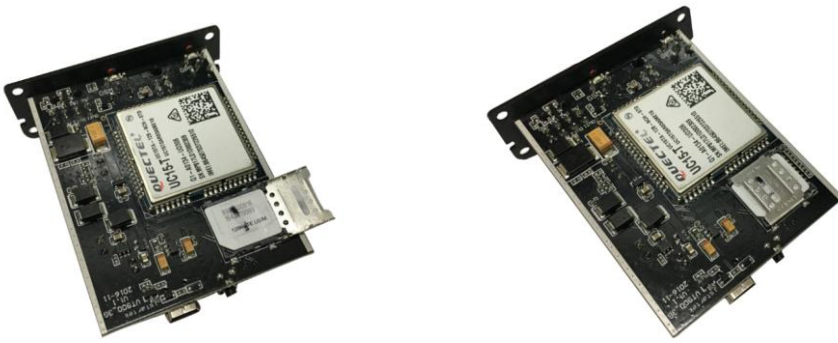
If you need to use the call to reply to the location information function, please make sure that the SIM card has caller ID function;

Make sure the device is turned off before installing the SIM.

- a. Unscrew the front baffle screw and take out the PCBA



b. Insert SIM Card :



c. Fit on PCBA and screw on

### 7.3. GSM/GPS antenna connection

Connect GSM antenna on the SMA connector labeled "GSM" and connect the GPS antenna on the SMA connector labeled "GPS" , also ensure that both antennas are tightened.

The GSM antenna can be hidden in any place away from the power supply and cannot be attached to the metal surface, otherwise it will affect the GSM signal strength.

GPS antenna is used to receive satellite signal in the sky and should be fixed to face the sky and can not be installed in a place with metal shielding.



### 7.4. Turn on VT900-L

Long press the ON/OFF button for 3-5 sec, or connect to the external power supply, VT900-L will start up.

LED operation status:

GPS Indicator ( blue )	
On	Input is active
Off	Device Turn off or in sleeping mode
Flashing ( every 0.1 sec )	GPS module is starting up or restarting
Flashing ( 0.1 sec on and 2.9 sec off )	VT900-L Received GPS signal
Flashing ( 1 sec on every 2 sec )	No GPS signal
GSM Indicator ( green )	
On	A call is coming in/a call is being made
Off	Device Turn off or in sleeping mode
Flashing ( every 0.1 sec )	GPS module is starting up or restarting
Flashing ( 0.1 sec on and 2.9 sec off )	VT900-GReceived GSM signal

Flashing ( 1 sec on every 2 sec )	No GSM signal
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## 7.5. Track by phone

Make a missed call to the tracker and it will report its location by SMS with the following Google link format, clicking on the link the location will be shown directly on your mobile phone.

SMS content description:

142161102222,Current! 20171123 15:53,A,0Km/h,http://maps.google.com/?q=22.540103,114.082329

Content	Instruction
142161102222	ID number
Current!	Alarm character, different alarm events have different alarm character
20171123 15:53	Date and time , YYYYMMDD hh:mm
A	GPS status, A is valid, V is invalid
0Km/h	GPS speed
http://maps.google.com/?q=22.540103,114.082329	Google link

## 7.6. Track by SMS

Send SMS command to VT900-L, W000000,100

The device will receive a text message with a link to Google maps. Clicking on the link will display the current location of the device on Google maps.

**Please refer to 《iStartek SMS Protocol》 for SMS descriptions and more SMS commands.**

## 7.7. Parameter Configuration

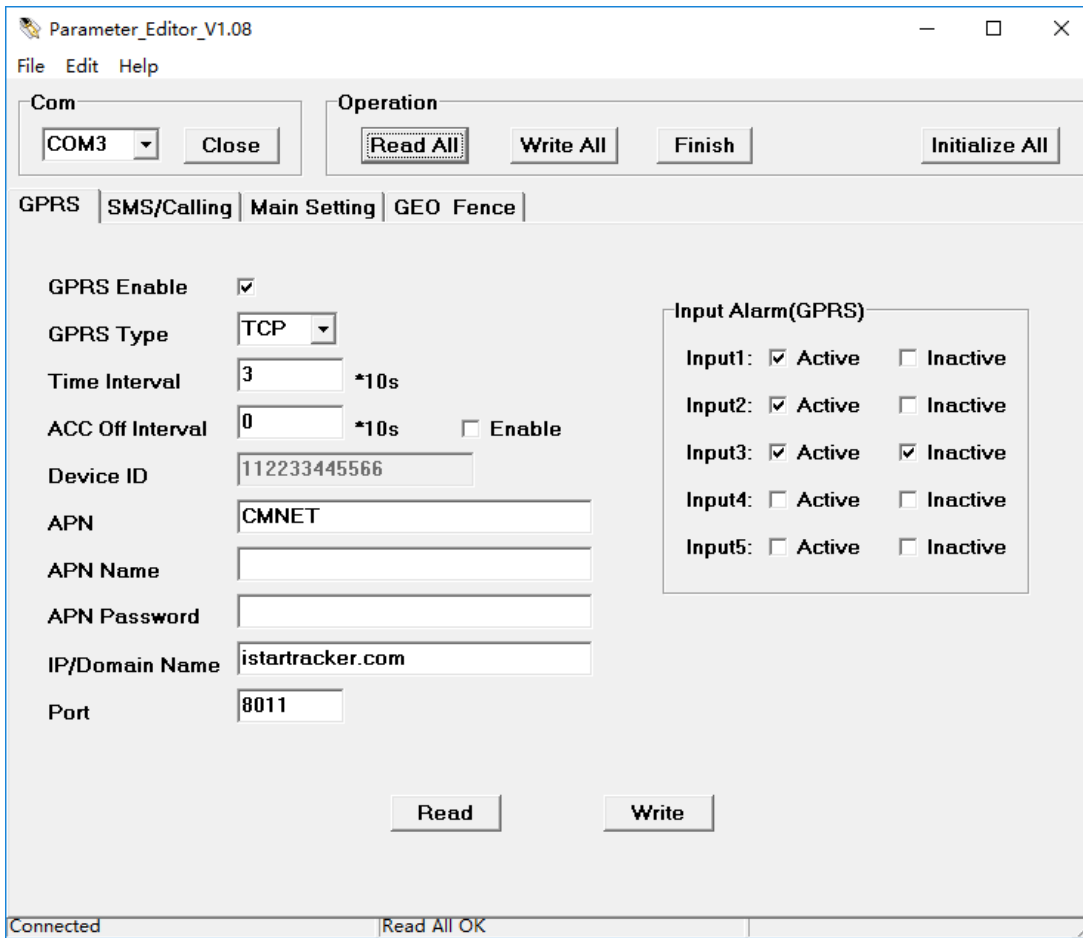
Download and install USB cable driver 《PL2303\_Prolific\_Driver》。

Connect VT900-L to the computer via USB cable. Operating Parameter Editor configuration software and open the port.

Press the on/ off button for 1sec to make device enter Parameter Editor configuration state.







For more parameters configuration, please refer to the user guide of Parameter Editor.

## 7.8. Platform location tracking

You can set server IP, Port and APN, GPRS interval by SMS commands 011, 012, 013, 014, or you can use Parameter Editor software to configure related parameters.

For more SMS command functions and parameter configuration, please refer to «iStartek SMS Protocol» and «Parameter Editor User Guide» .

## 8. Product Installation

### 1.1. 8.1. Functions introduction for Inputs/outputs



GND	IN3	IN2	IN1
-----	-----	-----	-----

PIN	Color	Function
DC	Red	DC In (power input). Input voltage: 9V~36V. 12V/24V suggested.
GND	Black	Ground
IN1	White	Digital input 1, negative trigger. Can be used to connect SOS button.
IN2	White	Digital input 2, positive trigger. Can be used to connect the starting door trigger signal line and detect the status of the door.
IN3	White	Digital input 3, positive trigger. Can be used to connect ACC and detect the ignition status of the car.
OUT1	Yellow	Output 1. Low level (0V) when the output is valid, open leakage output (OD) when it is invalid. The maximum withstand voltage of open leakage output (invalid) is 45 v. The maximum withstand current at low voltage is 500 ma. External relays can be connected to remotely cut off the oil line/engine power supply, etc.
OUT2	Yellow	Output 2. Low level (0V) when the output is valid, open leakage output (OD) when it is invalid. The maximum withstand voltage of open leakage output (invalid) is 45 v. The maximum withstand current at low voltage is 500 ma. It can be connected with external buzzer alarm, etc.
AD	Blue	10-digit analog input, effective input voltage value is 0-24v. Can be used to connect external sensor, such as fuel sensor, etc.

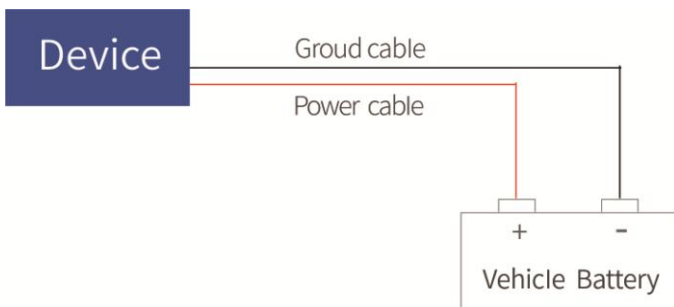
## 8.2. RS232 Port

RS232 port can connect with RFID, magnetic card reader and other accessories.

1 DC 5V output	3 VT900 RX
2 GND	4 VT900 TX

## 8.3. GND installation

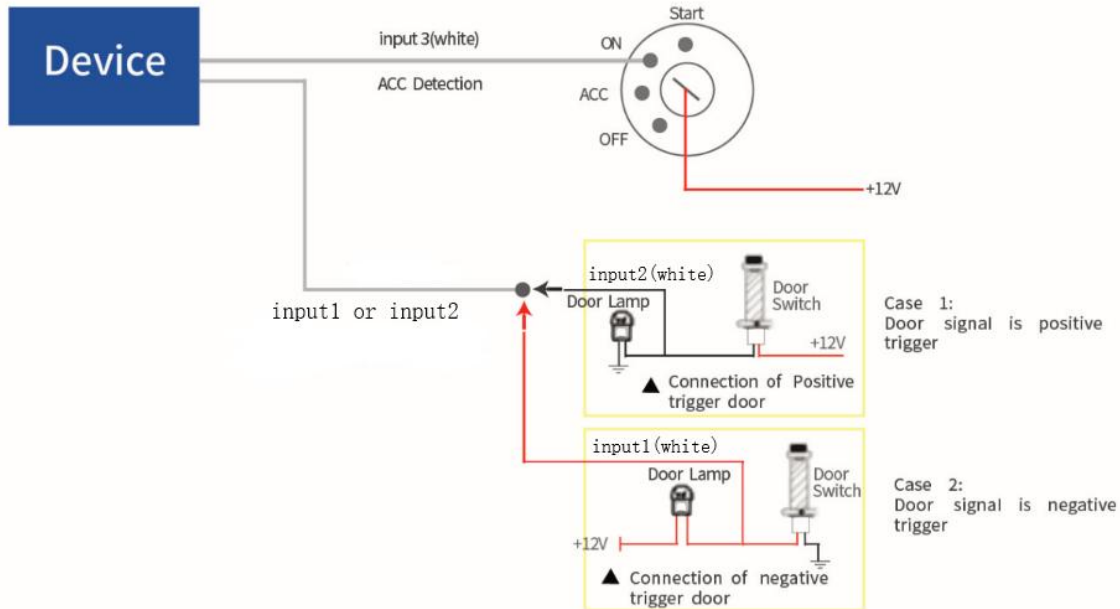
Connect respectively the power cable and GND to the positive pole and negative pole of the car battery to give Power supply :



## 8.4. Digital inputs installation

Input3 can be connected to the ignition switch of the car to detect the ignition.

Input1 or Input2 can be connected to the car door to detect the status of the door.



Input1 (VIL) can also be connected to PIN switch to detect the status of hood:



## 8.5. Analog Input (AD1) installation

Analog input range is 0-24v, it can be connected to the voltage output type sensor, such as fuel sensor.

Input voltage calculation formula :  $\text{Input Voltage} = (\text{AD} * 24) / 1024$

Example:

094506.000,A,2232.5412,N,11404.6919,E,0.00,,290709,,\*12|1.7|110|0000|00AA,0000

AD = 0x00AA = 170

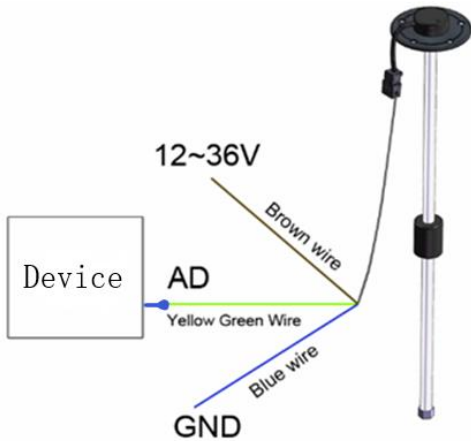
Input Voltage =  $(\text{AD} * 24) / 1024 = (170 * 24) / 1024 = 3.984375\text{V}$ .

Example: Analog input connect with fuel sensor , Yellow-green wire of the sensor is connected to the blue wire of VT900 L.

Output voltage of the sensor is 0V when the fuel tank is empty, Output voltage of the sensor is 5V when the fuel Tank is full.

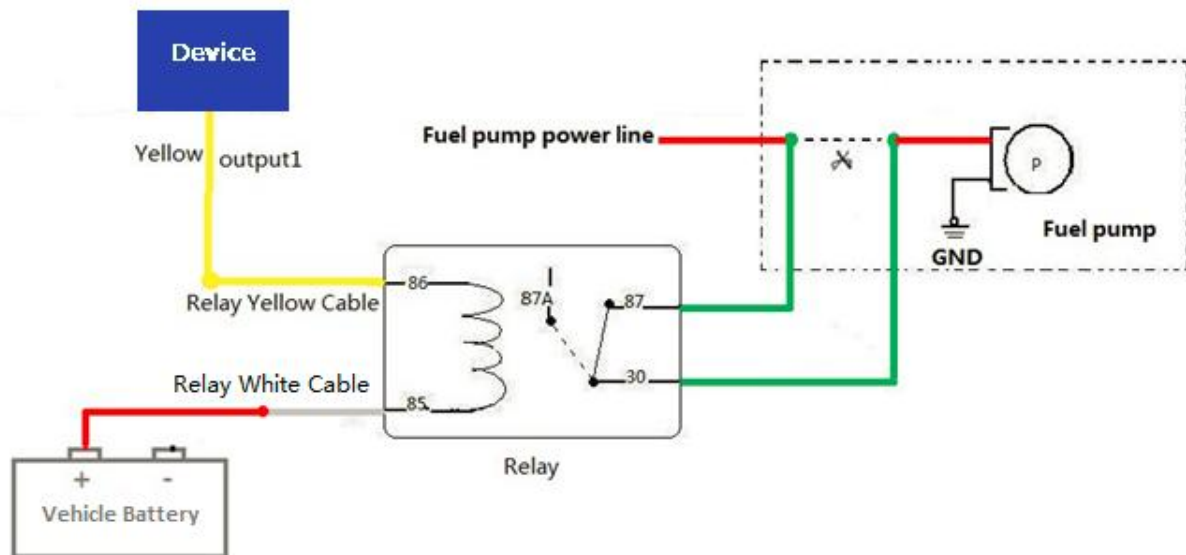
Calculate the percentage of Remaining oil :

Oil percentage =  $((\text{AD} * 24) / 1024) / 5 * 100\%$



### 8.6. Output Control wire installation

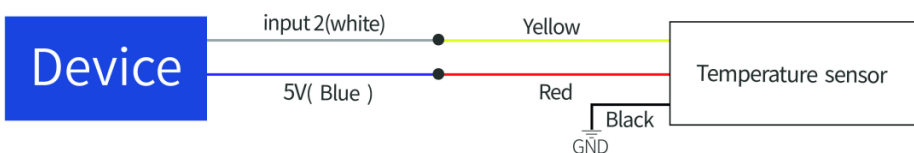
Output can be connected with relay to cut off oil/electricity and control the vehicle. Can also be connected to a buzzer.



### 8.7. Temperature sensor installation (customized version)

Customized hardware and software versions are required when the device connect the temperature sensor.

Need to customize input2 to 1-wire cable, change the AD line to the 5V voltage supply of the temperature sensor , the wiring diagram as follows :



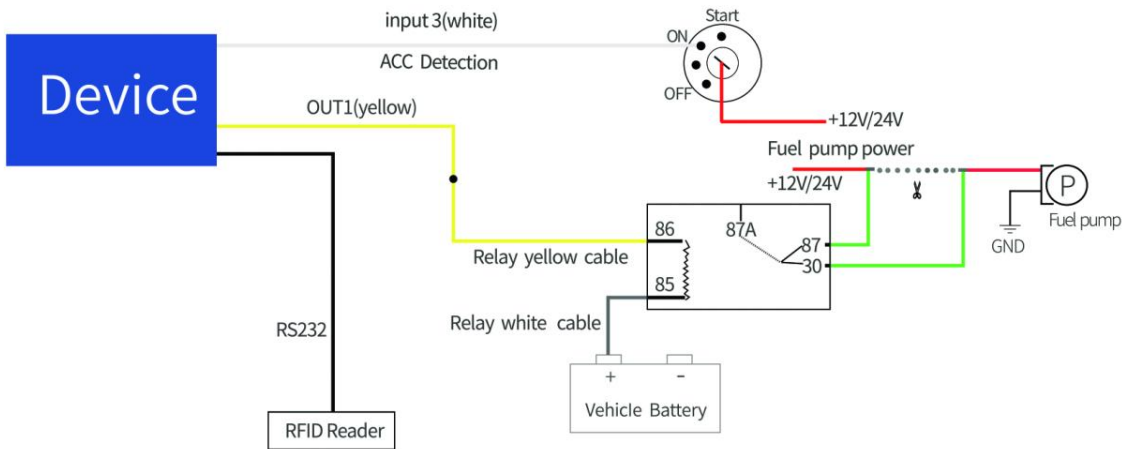
### 8.8. RFID Card Reader installation

Device connect with RFID Reader can prevent driver start vehicle illegally , the wiring diagram as follows :

When the driver starts the vehicle without swiping the authorized card, it is considered to start illegally, and the device will

automatically disconnect the oil and electricity and fail to start the vehicle.

Related SMS commands please refer to iStartek SMS protocol and iStartek GPRS Protocol.



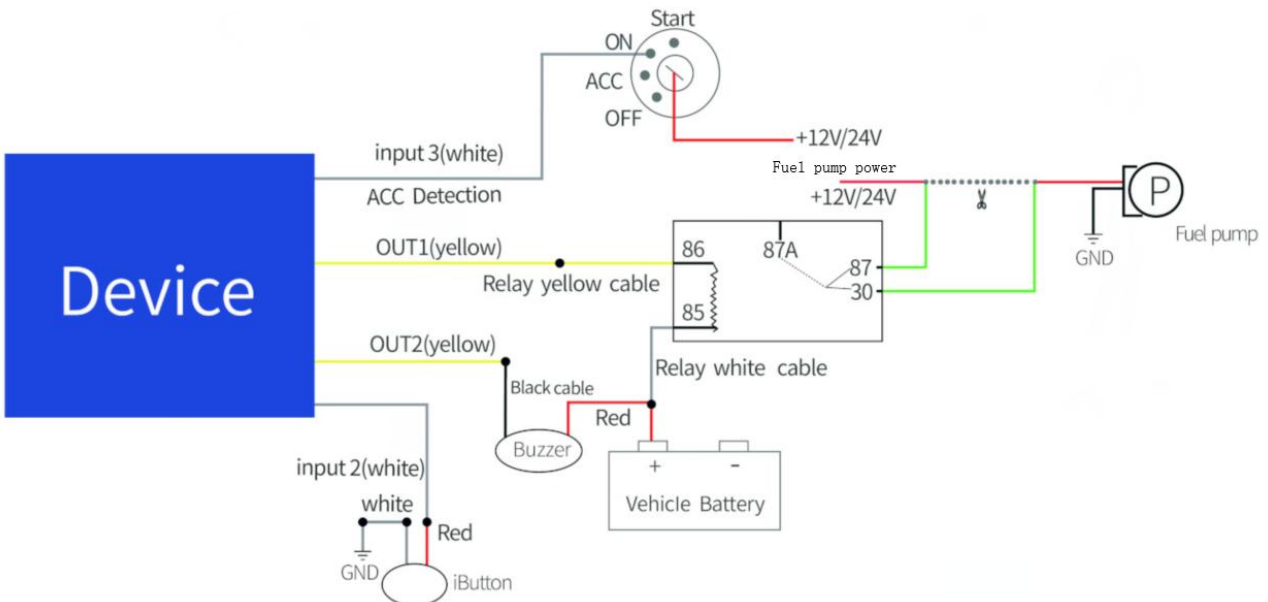
### 8.9. iButton Installation (customized version)

Customized hardware and software versions are required, need to customize input2 to 1-wire cable.

Device connect with iButton can prevent driver start vehicle illegally , the wiring diagram as follows :

When the driver starts the vehicle without swiping the authorized card, it is considered to start illegally, and the device will automatically disconnect the oil and electricity and fail to start the vehicle.

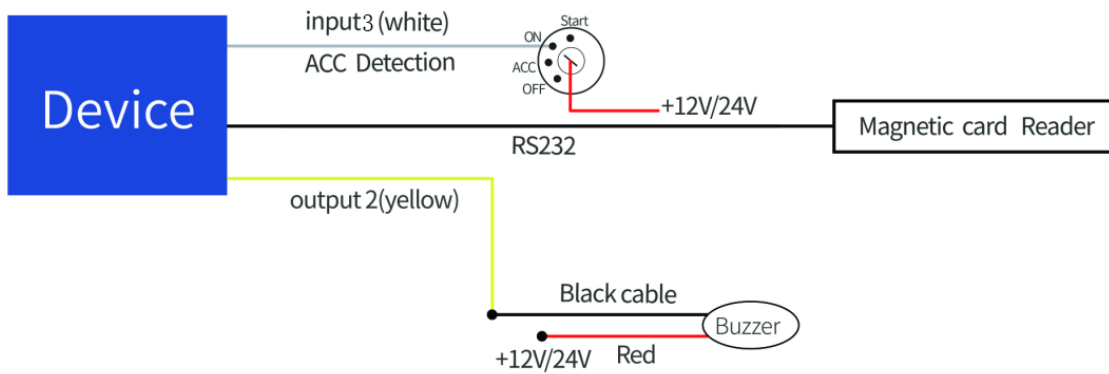
For related parameter setting instructions, please refer to iStartek SMS protocol and iStartek GPRS Protocol.



### 8.10. Magnetic Card Reader installation (customized)

Customize the software version for DLT.

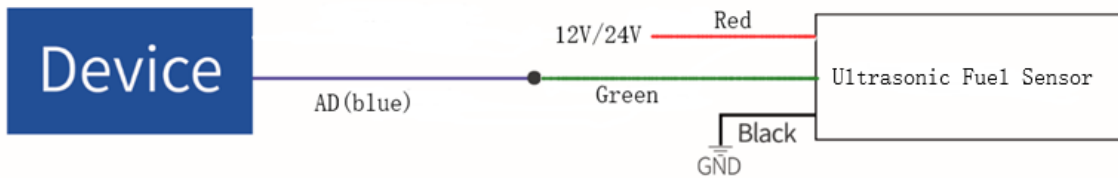
For related parameter setting instructions, please refer to iStartek SMS protocol and iStartek GPRS Protocol.



### 8.11. Ultrasonic fuel sensor installation

The height measurement range of ultrasonic fuel sensor is fixed at 0~100cm (100-200cm customizable), and the corresponding output voltage range is 0~5V.

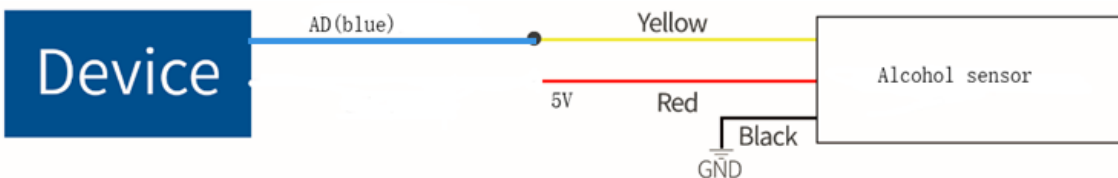
Formula to calculate oil height :  $h = ((AD * 24) / 1024) / 5 * 100\text{cm}$



### 8.12. Alcohol sensor installation (Customized version)

Customized firmware version is required when the device is connected to an alcohol sensor.

The AD line of the device is connected to the voltage output line of the alcohol sensor, and the red line of the alcohol sensor is connected to the 5V voltage. The wiring diagram is as follows:

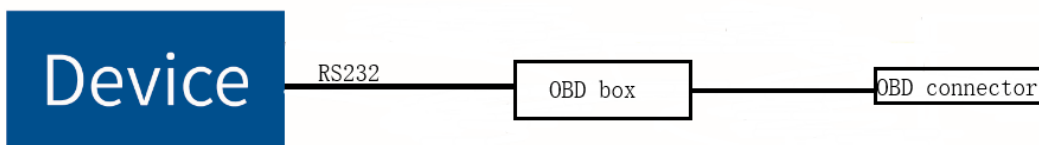


### 8.13. OBD BOX installation (Customized version)

Customized firmware version is required for connecting with OBD Box. Customizable reading of the car's individual data.

For related parameter setting instructions, please refer to iStartek SMS Protocol and iStartek GPRS Protocol.

The wiring diagram is as follows:



If you have any other questions, please send an email to [info@istartek.com](mailto:info@istartek.com), we are happy to serve you.