

| | | | |
|-----------|-------------------|------|----------|
| File Name | PT200 User Manual | Ver. | 1.0 |
| Update | 2021-01-12 | Page | 19 of 18 |

2G Vehicle GPS Tracker PT200 User Manual V1.0



Content

| | |
|--|----|
| Content..... | 2 |
| 1. Copyright and Disclaimer..... | 3 |
| 2. Product Description..... | 3 |
| 3. Product Function..... | 3 |
| 4. Product Specification..... | 4 |
| 5. Products and accessories..... | 5 |
| 5.1 Standard accessories..... | 5 |
| 5.2 Optional accessories..... | 5 |
| 6. Product Appearance..... | 6 |
| 7. Product Operation..... | 6 |
| 7.1 Recharge..... | 6 |
| 7.2 Install SIM card..... | 6 |
| 7.3 Turn on Device..... | 7 |
| 7.4 Track by SMS..... | 7 |
| 7.5 Parameter configuration..... | 8 |
| 7.6 Track by GPS Tracking Platform..... | 8 |
| 8. Product Installation..... | 9 |
| 8.1 Power Cable Function Introduction..... | 9 |
| 8.2. Power Connection..... | 10 |
| 8.3 Digital inputs installation..... | 10 |
| 8.4 Analog Input Installation..... | 11 |
| 8.5 Output Control Wire Installation..... | 13 |
| 8.6 Temperature Sensor Installation..... | 14 |
| 8.7 RFID Reader Installation..... | 14 |
| 8.8 iButton Installation..... | 16 |
| 8.9 Ultrasonic Fuel Sensor Installation..... | 17 |
| 8.10 OBD Reader Installation..... | 19 |

1. Copyright and Disclaimer

PICTOR and **PICTOR**[®] are registered trademarks of **Pictor Telematics Pvt. Ltd.**

This manual cannot be copied for any purpose, disseminated in any way without the written authorization of iStartek.

iStartek shall not be liable for direct, indirect or all losses (including but not limited to economic losses, personal injuries, property and assets) caused by the use or inappropriate use of the product or documents.

2. Product Description

PT200 is a 2G based GPS vehicle tracker. With built-in high-precision GPS positioning module reports the vehicle location and vehicle status to the vehicle tracking service platform through the 2G network for real-time vehicle monitoring, anti-theft, and dispatch management. It can be applied to fleet management, public transportation management, school bus management, taxi operation management, vehicle insurance company management, leasing management and private car anti-theft, etc.

PT200 has a built-in 128Mb Flash memory. When the device enters blind area, it will automatically save historical positioning data. When the network recover, it will automatically resend historical positioning data to the service platform.

PT200 contains an RS232 port, which can be connected to RFID to perform identity recognition and vehicle control for vehicle drivers; It can also be connected to OBD reader to read car ECU data and other RS232 peripherals to achieve corresponding functions.

3. Product Function

- ◇ GPS+GSM base station dual-mode positioning
- ◇ Real-time tracking
- ◇ Track by time interval
- ◇ Track by distance
- ◇ Heading change report
- ◇ Mileage report
- ◇ External power failure alarm
- ◇ SMS alarm
- ◇ SOS alarm
- ◇ Low battery alarm
- ◇ Engine and door status change alarm
- ◇ Support dual servers
- ◇ Geo-fence alarm
- ◇ Speeding alarm
- ◇ GPS signal loss alarm

- ✧ Harsh acceleration alarm
- ✧ Harsh deceleration alarm
- ✧ Harsh turning alarm
- ✧ Impact alarm
- ✧ Vibration (towing) alarm
- ✧ Idling alarm
- ✧ Fatigue driving alarm
- ✧ Fuel theft alarm
- ✧ Low fuel alarm
- ✧ High and low temperature alarm
- ✧ 128 Mb Flash
- ✧ FOTA upgrade
- ✧ Set ACC ON, ACC OFF time interval
- ✧ Remote control fuel/electricity
- ✧ RFID, iButton driver identification (optional)
- ✧ Buzzer alarm (optional)
- ✧ Fuel sensor (optional)
- ✧ Temperature sensor (optional)
- ✧ OBD reader (optional)

4. Product Specification

| Item | Specification |
|-----------------------------------|---|
| Size | 99 x 54 x 19.5mm |
| Weight | 106g |
| Input voltage | DC 9 - 100V/1.5A |
| Waterproof level | IP66 |
| Inbuilt Battery | 500mAh/3.7V (High temperature resistant battery) |
| Average standby power consumption | 65mA/h |
| Operating hours | 33hours in power saving mode and 7.5 hours in normal working mode |
| Working temperature | -20°Cto 80°C |
| Working humidity | 5% to 95% |
| GSM Bands | 850/900/1800/1900MHz |
| GPS Sensitivity | -165dB |
| Positioning accuracy | 2.5 meter |
| LED Indicator | 2 LED lights indicate GPS/GSM status |
| GSM antenna | Built-in FPC |
| GPS antenna | Built-in ceramic antenna (25 X 25 X 4mm) |
| Flash | 128M bit |
| Sensor | 3D accelerometer |
| Switch | External toggle switch |

| | |
|-----------------|---|
| SIM card | Nano SIM card, external push-push type |
| I/O | <p>3 Digital inputs (Can be configured as high and low level trigger mode, Input3 can be configured as AD mode)</p> <p>1 Analog input (0~36V)</p> <p>2 Outputs</p> <p>1 1-wire</p> <p>1 RS232</p> <p>1 5V output wire</p> <p>1 Micro USB</p> <p>1 Speaker</p> <p>1 Microphone</p> |

5. Products and accessories

5.1 Standard accessories



Main Unit

5.2 Optional accessories



RFID Card Reader



RFID Tag



iButton Reader



iButton



Ultrasonic Fuel Sensor



Capacitive Fuel Sensor



Temperature Sensor



12V/24V Relay



OBD Reader



USB Cable



Buzzer



Speaker



Microphone



SOS Button

6. Product Appearance



7. Product Operation

7.1 Recharge

When using V200 for the first time, please connect the tracker's red wire (positive) and black (ground wire) to a 12V or 24V power supply and charge for at least 2 hours to ensure sufficient power. After configuration and testing are completed, install it on the vehicle.

7.2 Install SIM card

The device supports 2G SIM card;

Please make sure that the SIM card has sufficient balance, the GPRS function has been activated and the correct

APN of the SIM card has been confirmed;

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

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

Please make sure the device is turned off before installing SIM.

- A. Remove the waterproof rubber plug;
- B. Install the SIM card in the correct direction.



7.3 Turn on Device

Switch ON device or connect to external power supply, V200 will start up and run.

LED lights indicate operating conditions:

| GPS Indicator (Blue) | |
|--------------------------------------|---|
| OFF | Power OFF or in sleep mode |
| Flash (every 0.1 sec) | GPS module is starting or restarting |
| Fast Flash (0.1 sec ON, 2.9 sec OFF) | GPS signal received |
| Slow Flash (1sec ON, 2 Sec OFF) | No GPS signal |
| GSM Indicator (Green) | |
| ON | There is an incoming call or is in a call |
| OFF | Device is OFF or in sleep mode |
| Fast Flash (every 0.1 sec) | GSM module is starting or restarting |
| Fast Flash(0.1 sec ON, 2.9 sec OFF) | GSM signal received |
| Slow Flash (1sec ON, 2 Sec OFF) | No GSM signal |

7.4 Track by SMS

Send SMS command to VT200:

0000,800

You will receive a text message with a link to Google maps. Click to open the link to display the current location on Google maps.

Please refer to "iStartek GPS Tracker Communication Protocol V1.0" for the description of SMS content and

more SMS commands

7.5 Parameter configuration

Download and install the USB cable driver "PL2303_Prolific_Driver".

After the device is turned on, connect the PT200 to the computer via a USB cable, run the "iStartek Parameter Editor_V1.00" configuration software and open the port to enter the parameter configuration state.

Com: COM3 [Open]

Operation: Auth Code: [] [Read All] [Write All] [Default]

SN: []
IMEI: []
Firmware: []

GPRS-1 Buffer: [] pcs [Clear]
GPRS-2 Buffer: [] pcs [Clear]
SMS Buffer: [] pcs [Clear]
GPS Log: [] pcs [Clear]
Mileage: 0 m [Set]

Disconnect | Idle

For more parameter configuration, please refer to "iStartek Parameter Editor User Manual".

7.6 Track by GPS Tracking Platform

You can set the server IP, Port, and APN parameters through SMS commands **100**, **109**, and **200**, and you can also use the iStartek Parameter Editor software to configure related parameters.

For more SMS command functions and parameter configuration, please refer to "iStartek GPS tracker Communication Protocol V1.0" and "iStartek Parameter Editor User Manual".

8. Product Installation

8.1 Power Cable Function Introduction

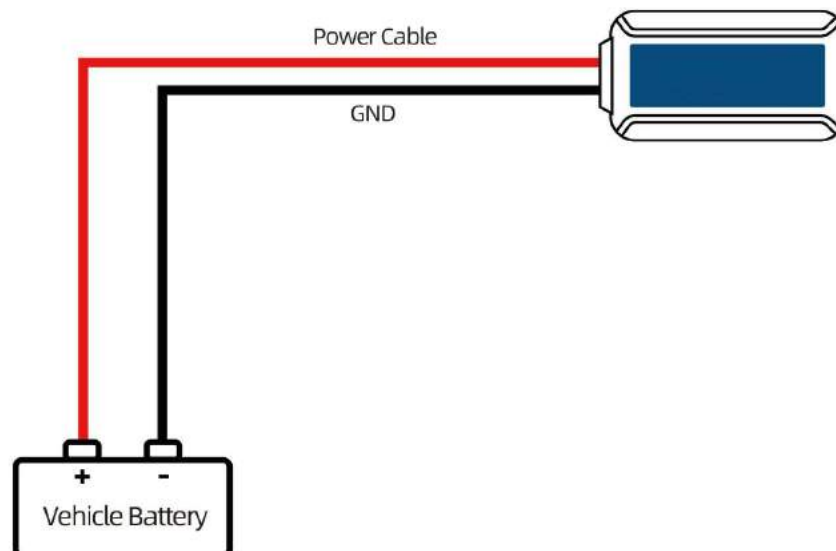


| PIN | Color | Function |
|-----------------|--------|--|
| DC | Red | DC In (power input), connect to the positive pole of the car battery. Input voltage: 9V~36V. 12V/24V suggested. |
| GND | Black | GND, connect to the negative pole of the car battery, or to the iron place on the car. |
| IN1 | Whit | Digital input 1, default is negative trigger. Positive and negative trigger can be configured by Parameter Editor. Used to connect to the SOS button. |
| IN2 | Orange | Digital input 2, default is positive trigger. Positive and negative trigger can be configured by Parameter Editor; Used for ACC detection. |
| IN3 | Grey | Digital input 3, default is positive trigger. Can configure positive and negative trigger or AD2 input (0-6.6V) by Parameter Editor. |
| AD1 | Blue | AD1 input, positive trigger and AD1 input (0-36V) can be configured by Parameter Editor. |
| OUT1 | Yellow | Open-drain output, drive capacity greater than 500MA; An external relay can be connected to remotely cut off the car's fuel/engine power supply, etc. |
| OUT2 | Brown | Open-drain output, drive capacity greater than 500MA; Can connect an external buzzer to alarm, etc. |
| 1-wire | Purple | Digital, can be connected to iButton and temperature sensor, can support up to 8 temperature sensors. |
| GND | Black | GND |
| 5V | Red | DC 5V output, available for temperature sensor and serial port accessories. |
| RX | Green | RS232 RX |
| TX | White | RS232 TX |
| Speaker- | Yellow | External speaker, two-way conversation. |

| | | |
|-----------------|--------|--|
| Speaker+ | Orange | External MIC, two-way conversation or listening. |
| Mic+ | Brown | |
| Mic- | Grey | |

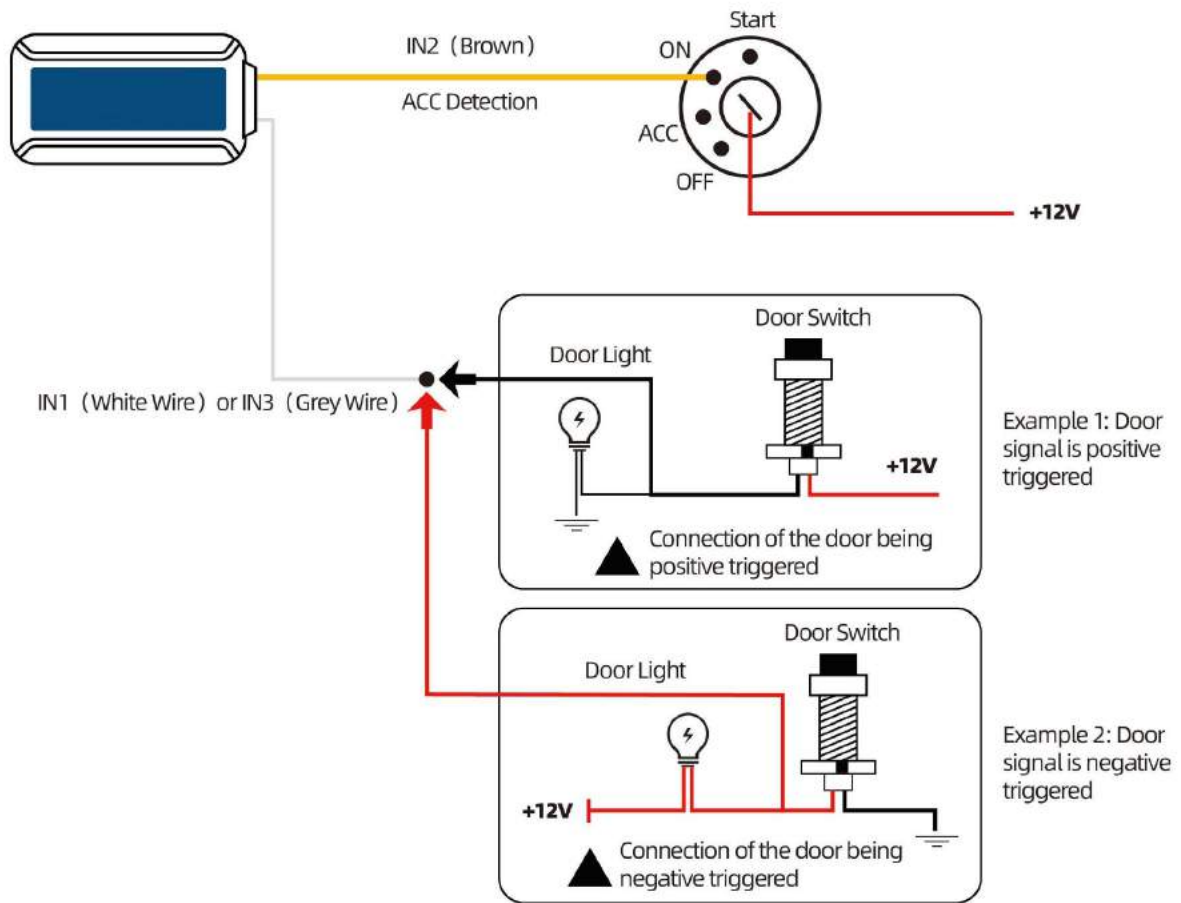
8.2. Power Connection

Connect the red power wire and black ground wire to the positive and negative pole of the car battery to get power supply:



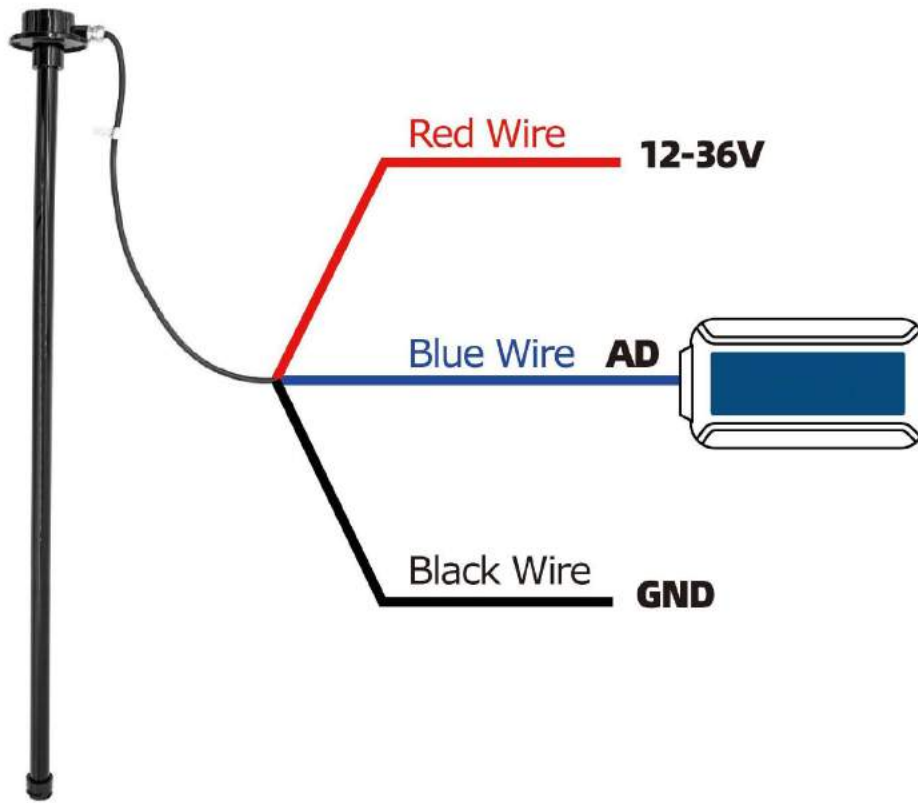
8.3 Digital inputs installation

Input2 can be connected to the vehicle ignition to detect ignition status.
 Input1 or Input3 can be connected to the car door to detect the state.



8.4 Analog Input Installation

The range of analog input AD1 is 0-36V, and the range of AD2 is 0-6.6V. Two voltage output sensors such as fuel sensors can be connected. The wiring connection is as follows:



After connected wires, can set the size of the fuel tank (length, width, height), sensor type (capacitive fuel sensor or ultrasonic fuel sensor), liters of fuel stolen, fuel stolen time, low fuel alarm by Parameter Editor.

| | | | | | |
|------|------|------|------|-----|-------|
| Info | GPRS | Main | Auth | GE0 | Event |
|------|------|------|------|-----|-------|

| | | |
|-------------------------|---------------------|--------|
| GPS Log Interval | 0 | second |
| Distance Interval | 0 | meter |
| Heading Change | 0 | degree |
| Heartbeat Interval | 60 | minute |
| Speeding | 0 | km/h |
| Sleep Mode | Close | |
| Period Time Enter Sleep | 0 | second |
| Vibration Sensitivity | 3 | |
| Tow Time | 0 | second |
| Tow Mode | ACC Off and Tremble | |
| Idle Time | 0 | minute |
| Low Ext-Bat | 11.40 | volt |
| Harsh Accelerate | 450 | mg |
| Harsh Braking | 800 | mg |
| Harsh Turning | 19 | |
| Impact Sensitivity | 5 | |
| Fatigue Driving | 0 | minute |
| Fatigue Relieve | 0 | minute |
| Overtime Driving | 0 | minute |
| GSM Jammed | 0 | second |

| | |
|-------------|------------------------------|
| Input Mode | |
| Input1 | Low Active Active Time 0 ms |
| Input2 | High Active Active Time 0 ms |
| Input3(AD2) | High Active Active Time 0 ms |
| Input4(AD1) | High Active Active Time 0 ms |

| | | | |
|-------------|------------|-------------|-----------|
| Tank1 (AD1) | | | |
| Name | Right Tank | Sensor Type | Stick |
| Length | 1000 mm | Steal | 20 Liter |
| Wide | 500 mm | Steal Time | 60 second |
| High | 1000 mm | Low Fuel | 10 Liter |

| | | | |
|-------------|-----------|-------------|-----------|
| Tank2 (AD2) | | | |
| Name | Left Tank | Sensor Type | No Sensor |
| Length | 0 mm | Steal | 0 Liter |
| Wide | 0 mm | Steal Time | 0 second |
| High | 0 mm | Low Fuel | 0 Liter |

For example, as above parameters setting, if the fuel tank connected to AD1 decreases more than 20 liters within 60 seconds, a fuel theft alarm will be generated; and if the fuel volume is less than 10 liters, a low fuel alarm will be generated.

Example: The fuel tank height is 100cm and full fuel is 50 liters, GPRS data as below:

```
&&A147,021104023195429,000,0,,180106093046,A,22.646430,114.065730,8,0.9,54,86,76,326781,460|0|27B3|0EA7,27,0000000F,02,01,04E2|018C|01C8 |0000,1,0104B0,01013D|02813546\r\n
```

AD1 voltage is **0x01C8** (hexadecimal)=456 (decimal), **AD1=456/100** (fixed value)=4.56V;

AD2 voltage is **0x0000=0**, **AD2=0/100=0V**;

Example: Connect the GPS Tracker analog input to capacitive fuel sensor, the yellow-green wire of the sensor are connected to the blue wires (AD) of the VT200.

When the fuel is empty, the sensor output voltage is 0V, when the fuel is full, the sensor output voltage is 5V

Calculate the percentage of remaining fuel:

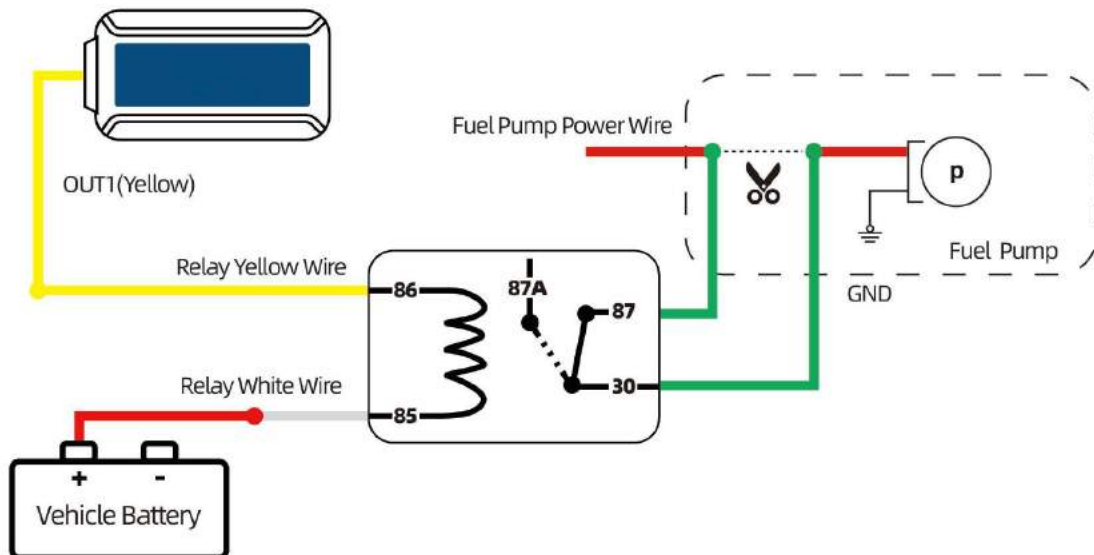
Fuel percentage=(AD/5)*100%=(4.56/5)*100%=91.2%.

Calculate the remaining fuel in liters:

The remaining fuel in liters = **(AD/5) * 50 liters = 45.6 liters**

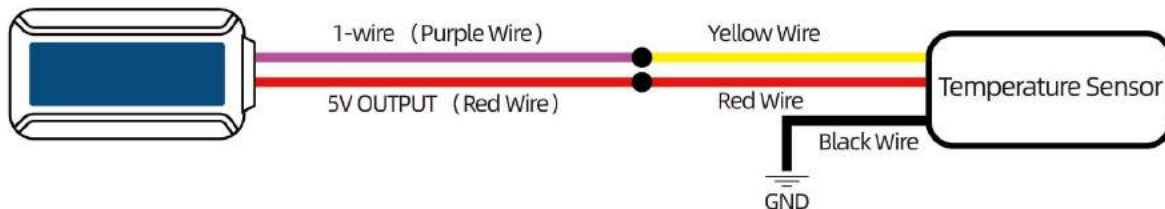
8.5 Output Control Wire Installation

The output wire can be connected to an external relay to cut off fuel/electricity and control the vehicle. You can also connect the buzzer to alarm.



8.6 Temperature Sensor Installation

Connect device to a temperature sensor, the wiring connection is as below:



After connected wires, the temperature sensor can be configured through SMS commands, set high and low temperature alarms, and collect temperature value. For related parameter setting instructions, please refer to "iStartek GPS tracker Communication Protocol V1.0".

Example: after connected a temperature sensor as shown above,

1) Configure temperature sensor, can send command: **0000,135,1,Storage room**

Description: 1 is the serial number of the temperature sensor, and Storage room is the name of the temperature sensor.

2) Set high and low temperature alarms, you can send commands: **0000,136,1,40.5,-10**

Description: 1 is the serial number of the temperature sensor, 40.5°C is the high temperature alarm, and -10°C is the low temperature alarm.

3) Get the temperature value, you can send the command: **0000,137**

Reply: 137, 1: 29.0, 2: 28.8

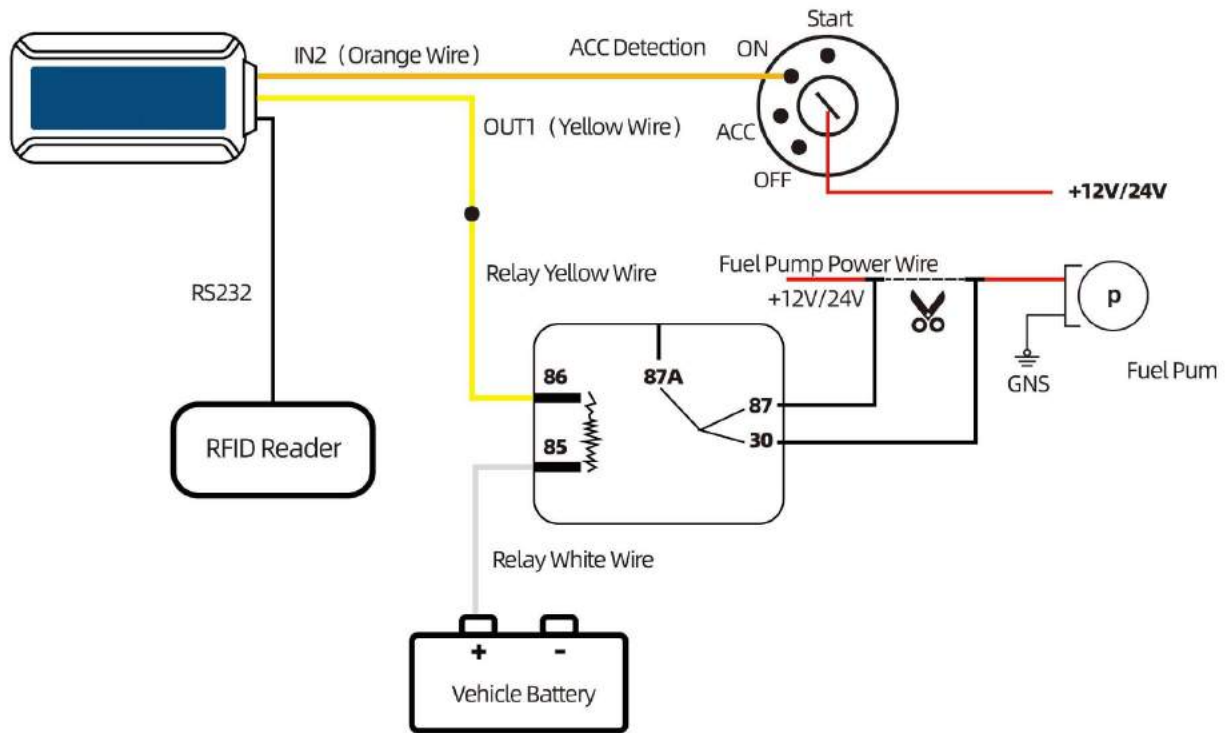
Description: 1 is the first temperature sensor with a temperature value of 29.0°C; 2 is the second temperature sensor with a temperature value of 28.8°C.

8.7 RFID Reader Installation

When the device is connected to an RFID card reader, it can prevent illegal starting of the vehicle. The wiring connection is as follows:

When the driver does not swipe the authorized card to start the vehicle, it is considered to be illegally started, the device will automatically disconnect the fuel supply and electricity, and the vehicle cannot be started.

For related parameter setting instructions, please refer to "iStartek GPS tracker Communication Protocol V1.0".



After connected wires as above, you can authorize the RFID card, delete the RFID card, and query the authorization status of the RFID card according to the SMS instructions.

Example: to authorize an RFID card, you can send SMS command: **0000,144,123456789,987654321**

Description: The authorization ID number is 123456789,987654321.

To delete the RFID card, you can send the SMS command: **0000,145,123456789,987654321**

Delete the ID number 123456789,987654321.

Description: To query the authorization status of the RFID card, you can send the SMS command:

0000,146,123456789,987654321

Query ID number 123456789,987654321,

SMS reply 146,123456789:1,987654321:1

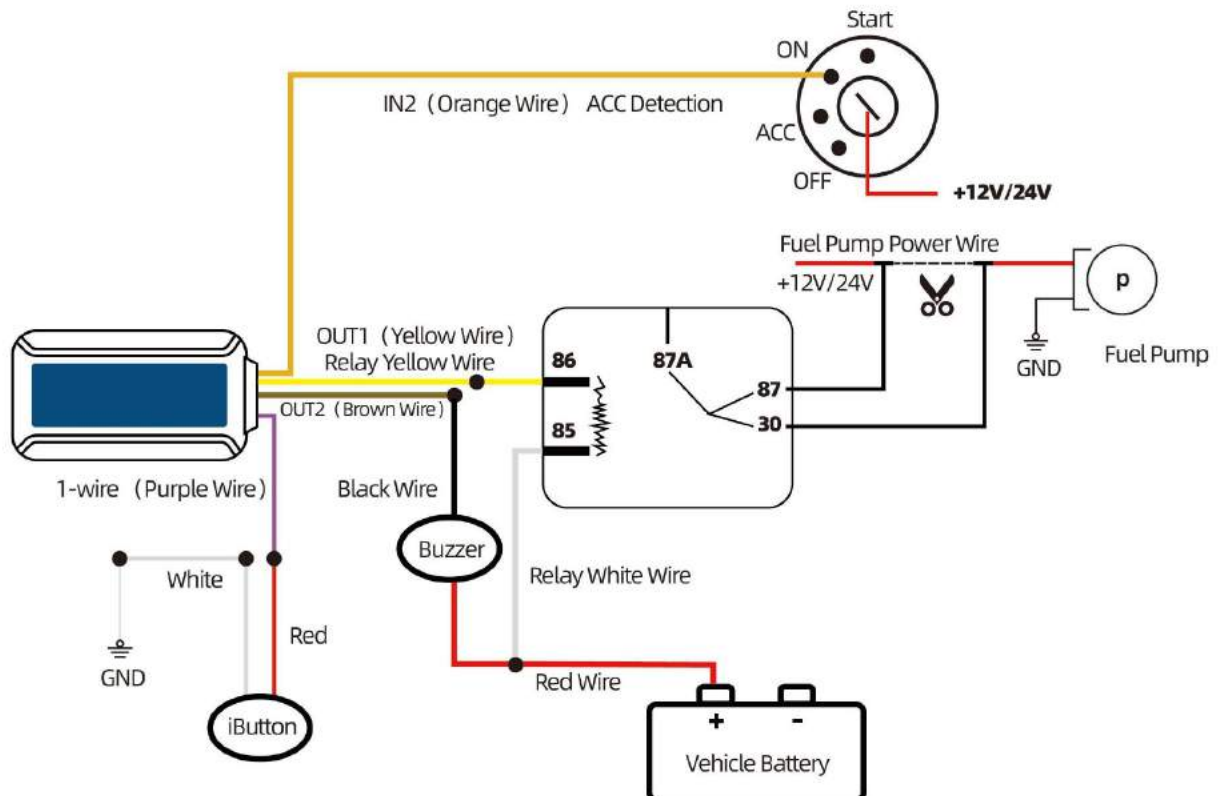
Description: 1 means authorized (authorization status: 0 means not authorized, 1 means authorized).

8.8 iButton Installation

When the device is connected to an iButton, it can prevent illegal starting of the vehicle. The wiring connection is as follows:

When the driver does not swipe the authorized button to start the vehicle, it is considered to be illegally started, the device will automatically disconnect the fuel supply and electricity, and the vehicle cannot be started.

For related parameter setting instructions, please refer to "iStartek GPS tracker Communication Protocol V1.0".



After connected wires as above, you can authorize the iButton ID, delete the iButton ID, and query the authorization status of the iButton ID according to the SMS instructions.

Example: to authorize an iButton ID, you can send SMS command: **0000,144,#00000A678C,#00000E4321F**

Description: The authorization ID number is 0x00000A678C,0x00000E4321F.

To delete the iButton ID, you can send the command: **0000,145,#00000A678C,#00000E4321F**

Delete the ID number 0x00000A678C,0x00000E4321F

Description: To query the authorization status of the iButton ID, you can send the command:

0000,146,#00000A678C,#00000E4321F

Query ID number 0x00000A678C,0x00000E4321F

SMS reply 146,#00000A678C:1,#00000E4321F:1

Description: 1 means authorized (authorization status: 0 means not authorized, 1 means authorized).

8.9 Ultrasonic Fuel Sensor Installation

The height measurement range of the ultrasonic fuel sensor is 0~100cm (0~250cm optional), and the corresponding voltage output range is 0~5V.

V200 L analog input connect to the ultrasonic fuel sensor, the green wire of the sensor is connected to the AD1 blue wire of the VT200 or the IN3 gray wire (AD2).

Example: When the fuel is empty, the sensor output voltage is 0V. With a fuel tank height of 100cm as the standard, then fuel sensor output voltage is 5V when fuel is full.

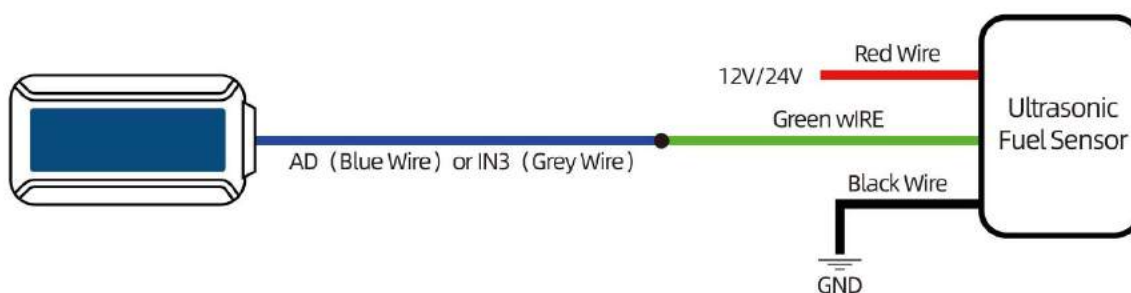
If the height of the fuel tank is H_0 cm and the fuel tank is full of F liters, the fuel sensor output voltage is $V = H_0/20$ when the fuel is full.

Calculate the remaining fuel volume:

Percentage of fuel = $(AD/V) * 100\%$

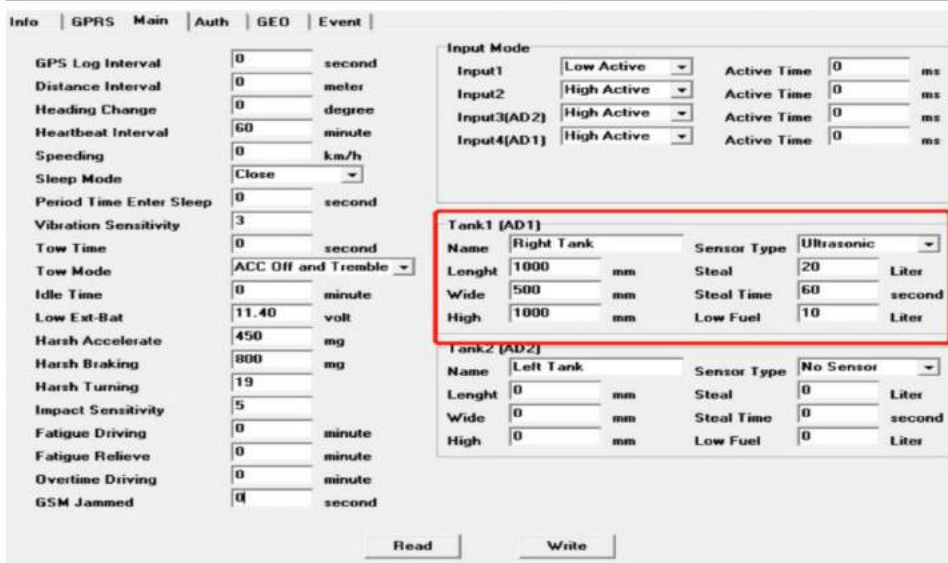
The fuel volume height is: $H = (AD/5) * 100\text{cm}$

The remaining liters of fuel volume = $(AD/V) * F$ liters



After connected wires, can set the size of the fuel tank (length, width, height), sensor type (capacitive fuel sensor or ultrasonic fuel sensor), liters of fuel theft alarm, fuel theft time, low fuel alarm by Parameter Editor.

- 1) **Configuration by Parameter Editor:** Set the fuel tank name to Right Tank; Fuel tank type to ultrasonic fuel sensor; Fuel tank size, 1000mm in length, 500mm in width, and 1000mm in height; Set the fuel theft alarm to active when the fuel reduction exceeds 20 liters within 60 seconds; Set low fuel alarm to active when the fuel volume is less than 10 liters.



- 2) **Configuration by SMS Command:** Set fuel tank parameters through SMS commands **138, 139, 140, and 141**. For related parameter setting commands, please refer to "iStartek GPS tracker Communication Protocol V1.0".

Send above parameters by SMS commands:

Set fuel tank parameters, you can send commands: **0000,138,1,1000,500,1000**

Description: 1 is the serial number of the fuel tank. The length of the fuel tank is 1000mm, the width is 500mm, and the height is 1000mm.

Set the type of fuel sensor, you can send commands: **0000,139,1,1,Right Tank**

Description: The first "1" is for the serial number of the fuel tank, the second "1" is AD1 connected to ultrasonic fuel sensor, and Right Tank is the name of the fuel tank.

Set the fuel theft alarm, you can send commands: **0000,140,1,20,60**

Description: Set AD1 as the corresponding fuel tank, and the fuel theft alarm will be triggered when the fuel reduction exceeds 20 liters within 60 seconds.

Set low fuel alarm, you can send commands: **0000,141,1,10**

Description: Set AD1 as the corresponding fuel tank, and a low fuel alarm will be triggered when the fuel volume is less than 10 liters.

Note: The 138, 139, and 141 commands must be set to detect fuel alarms.

For example: GPRS data with a fuel tank height of 100cm and a full fuel of 50 liters

```
&&A147,021104023195429,000,0,,180106093046,A,22.646430,114.065730,8,0.9,54,86,76,326781,460|0|27B3|0EA
7,27,0000000F,02,01,04E2|018C|01C8 |0000,1,0104B0,01013D|02813546\r\n
```

AD1 voltage is **0x01C8 (hexadecimal)=456 (decimal), AD1=456/100 (fixed value)=4.56V;**

AD2 voltage is **0x0000=0, AD2=0/100=0V;**

Fuel percentage=**(AD1/5)*100%=(4.56/5)*100%=91.2%**

Fuel height: **H=(AD1/5)*100cm=(4.56/5)*100cm =91.2 cm**

The remaining fuel volume in liters = **(AD1/5) * 50 liters = 45.6 liters**

| | | | |
|-----------|-------------------|------|----------|
| File Name | PT200 User Manual | Ver. | 1.0 |
| Update | 2021-01-12 | Page | 19 of 18 |

8.10 OBD Reader Installation

When connect device with OBD reader, a customized firmware is required. Reading various data of the car can be customized.

For related parameter setting instructions, please refer to "iStartek GPS tracker Communication Protocol V1.0".

The wiring connection is as follows:



If you have any other questions, please send an email to info@pictortelematics.com we are happy to serve you.