MEITRACK® GPS Vehicle Tracker

T1

Contents

1. Copyright and Disclaimer

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2. Applications

- Vehicle Real Time Tracking
- Car Security/Anti-Hijack
- Fleet Management

3. Product Function and Specifications

3.1 Product Function

- SiRF IV GPS and Quad Band GSM 850/900/1800/1900Mhz
- AGPS (with GSM Base Station ID)
- Track by SMS/GPRS (TCP/UDP) (MEITRACK Protocol)
- Track on Demand
- Track by Time Interval
- Track by Distance Interval
- Track on Mobile Phone
- Listen-in (Voice Monitoring) or Two-way Audio (Optional)
- Internal 8MB Memory for Logging
- Inbuilt Motion Sensor
- Inbuilt Acceleration Sensor
- 850mAh Internal Backup Battery
- SOS Alarm
- Geo-fence Alarm
- GPS Blind Area Alarm

- Low Battery Alarm
- Speeding Alarm
- Tow Alarm
- GPS Antenna Cut Alarm
- External Power Cut Alarm
- Mileage Report
- Engine Cut (Engine immobilization)
- Over-the-Air Technology(OTA)
- Inbuilt Super Magnet (optional)
- Handset (optional)
- Camera(optional)
- LED- Display(optional)
- A21 Vehicle LCD Player(optional)
- A52 Digital Temperature Sensor (optional)
- A53 Resistive voltage-output mode fuel sensor (optional)
- 3 Digital Inputs (1 positive triggering and 2 negative triggering), 3 Outputs.
- 2 Analog Input Detection
- 1 RS232 Interface (for connecting to handset/RFID reader/A21/camera, etc.)

3.2 Specifications

Items	Specifications
Dimension	105*65*26mm
Weight	190g
Input Voltage	DC 11V~36V/1.5A
Back-up Battery	850mAh/3.7V
Power consumption	65mA standby current
Operating Temperature	-20℃~55℃
Humidity	5%~95%
Work Time	43 hours in power-saving mode and 10 hours in normal mode
LED	2 LED lights to show GPS, GSM and other status
Button	1 SOS (for SMS or making call) and 1 power on/off
Memory	8M Byte
Sensor	Vibration sensor (for vibration wakeup)& acceleration sensor(auxiliary judgment of move and standstill)
GSM Frequency	GSM 850/900/1800/1900MHz
GPS Chip	Latest GPS SIRF-Star IV chipset
GPS Sensitivity	-159dB
Positioning Accuracy	10 meters, 2D RMS

I/O	3 Digital Input (1 positive triggering and 2 negative triggering) 2 Analog Input Detection 3 Output 1 RS232 Interface 1 USB port

4 T1 and Accessories

T1 with Battery

GPS Antenna

GSM Antenna

I/O Cable + SOS Button

USB Data Cable

CD

Optional Accessories

Camera

Handset Phone

RFID Reader

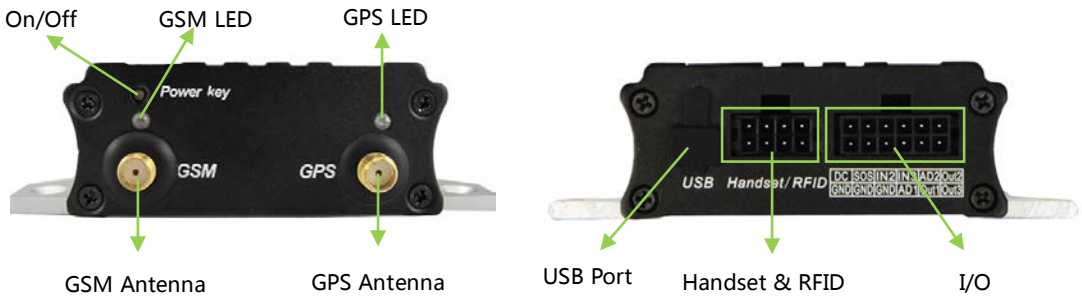
A21 LCD Player(dialing, calling, show SMS)

A53 Fuel Sensor

A52 Digital Temperature Sensor +A61 sensor box

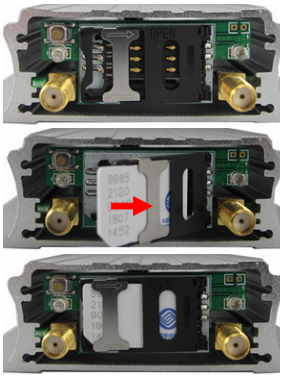
LED-Display

5 View



6 First Use

6.1 Install SIM Card



Make sure SIM card has enough balance (test the SIM in a phone to make sure it can send and receive SMS);

Make sure the SIM Lock code is turned off;

If you require the function of sending an SMS location report to the authorized phone number when it makes a call to the T1, please make sure the SIM installed supports displaying caller ID.

Before installing the SIM card, turn off the power for T1.

Unscrew and remove cover.

Insert the SIM card by sliding it into the card holder with the chip module facing to the connectors on PCB.

Replace the cover and screw it in.

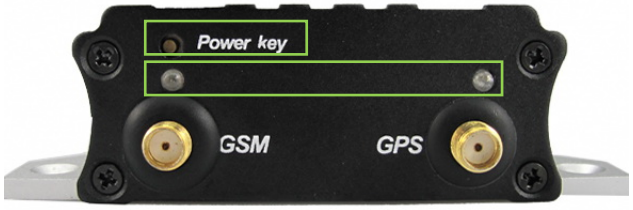
6.2 Charging

Please connect GND (-Black) and Power (+Red) wires to 12V or 24 external power and make sure to charge the battery for at least 3 hours. 8 hours is highly appreciated.

Configuration and testing suggested be prior to installation.

6.3 LED Indications

Press and hold the Power On/Off button for 3~5 seconds to turn on/off T1.



GPS LED (Blue)	
On	One button is pressed or input is active.
Flashing (every 0.1 second)	Initializing or back-up battery power is low
Flashing (0.1 second on and 2.9 seconds off)	GPS signal available
Flashing (1 second on and 2 seconds off)	No GPS signal
GSM LED (Green)	
On	A call is coming in / a call is being made
Flashing (every 0.1 second)	Initializing
Flashing (0.1 second on and 2.9 seconds off)	GSM signal available
Flashing (1 second on and 2 seconds off)	No GSM signal

6.4 Track by Calling

Make a call to T1 and it will report with one SMS.

For example,

Now,110727 02:48,V,16,23Km/h,61%,http://maps.google.com/maps?f=q&hl=en&q=22.540103,114.082329 &ie=UTF8&z=16&iwloc=addr&om=1

Click on the link then the location can be shown directly on Google Maps on your mobile phone.

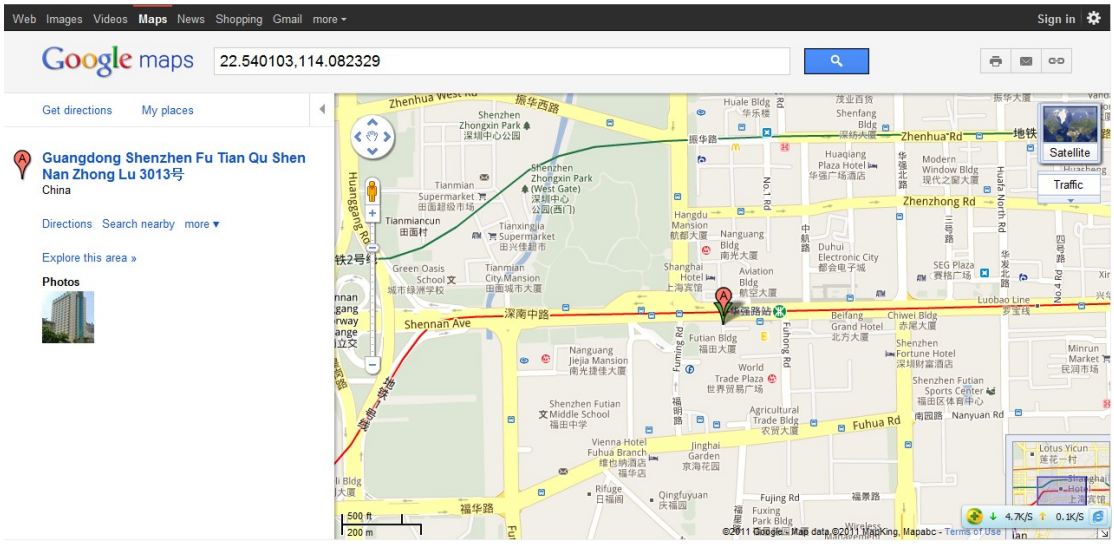
Report description:

Now,110727 02:48,V,16,23Km/h,61%,http://maps.google.com/maps?f=q&hl=en&q=22.540103,114.082329 &ie=UTF8&z=16&iwloc=addr&om=1

Content	Description	Note
Now	Current Location	Alarm Type
110721 16:40	Date & Time: 21 July, 2011, 16:40pm	Date & Time in YYMMDD HH:MM
V	No GPS fixed	GPS Status Indicator: A = valid, V = invalid
10	GSM signal=10	GSM Signal. Decimal Digit (0~31)
0Km/h	Speed=0	KM/h. Decimal digit
97%	Battery Power: 97%	Battery Power Balance (Percentage)

http://maps.google.com/maps?f=q&hl=en&q=22.540103,114.082329&ie=UTF8&z=16&iwloc=addr&om=1	Latitude: 22.513015 Longitude: 114.057235	Google Maps Web Link with Latitude and Longitude. Click on the link to get the location.

If your mobile cannot visit HTTP websites, input the latitude and longitude into Google Maps as the following picture shows to get the position:



More SMS commands

You can configure T1 by mobile phone or by computer using the Meitrack Manager.

For more details, please refer to part 6.5 **Configure by Computer**.

Note:

1. *Password is 4 digits only and defaulted as 0000. You can change the password by using the Meitrack Manager and SMS command.*
2. *T1 will only accept commands and send SMS report from a user with the correct password.*
   If preauthorized phone number was set, only this phone number can receive the preset event SMS reports.

6.4.1 Multiple Phone numbers– A71

Command: 0000, A71, phone number 1, phone number 2, phone number 3

SMS Get: IMEI, A71, OK

Note:

Authorize a phone number for SOS alarm, calling for location report, geo-fence alarm, and low battery alarm.

Phone Number: Max 16 characters.

If no preset phone number, it is empty (default is empty).

Send command “0000, A71” to delete all phone numbers.

When the SOS button is pressed, T1 will make a call to phone number 1, 2 and 3. It will stop calling when one

number answers.

Example: 0000,A71,13811111111,13822222222,13833333333

SMS Get: 353358017784062,A71,OK

6.4.2 Listening-in (Voice Monitoring)–A72

Command: 0000, A72, phone number 1, phone number 2

SMS Get: IMEI, A72, OK

Note:

Authorize a phone number to make a silent call to the tracker. The tracker will answer the call automatically and allows the caller to listen to what is happening around the tracker. There is no sound when the tracker is working.

Phone Number: 2 monitoring numbers at the most can be set, 16 characters per number.

If no preset phone number, it is empty (default).

If no phone number, but has ",", the number related to this "," is deleted.

Send command "0000, A72" to delete all phone numbers.

Example: 0000,A72,13844444444,13855555555

SMS Get: 353358017784062,A72,OK

6.4.3 Sleep Mode – A73

Command: 0000,A73,X

SMS Get: IMEI,A73,OK

Note:

This setting is for power saving.

X=0, turn off sleep mode (default)

X=1, normal sleep. GSM module work, GPS module work by sleep mode intermittently. The device can work 25% longer than no sleep mode. Note: this is not recommended for users who set "track by interval" or short time interval, because it will affect the completeness of tracking.

X=2, deep sleep, the tracker will enter this mode after it is inactive or stationary(No SOS/any triggered by the button/input/incoming calls/message/movement) for 5 minutes. GPS module stops working and GSM module enters sleep mode. The tracker remains in this mode until it is activated by SOS/any triggered by the button/input/incoming calls/message/movement. After that, it will repeat above processes.

Note: In any condition, the device will directly quit the sleep mode and back to normal working mode by SMS or GPRS command to turn off the sleep mode.

Example: 0000,A73,2

SMS Get: 353358017784062,A73,OK

6.4.4 Geo-fence Alarm – B05

Command: B05,P,latitude,longitude,radius,in,out

SMS Get: IMEI,B05,OK

Note:

P: 1 to 8. Max 8 Geo-fence waypoints can be set.

Latitude: Latitude in decimal degrees of the waypoint center.

Longitude: Longitude in decimal degrees of the waypoint center.

Radius: [1, 4294967295] in meters.

In = 0, turn off the alarm when the tracker enters the waypoint;

In = 1, turn on the alarm when the tracker enters the waypoint.

Out = 0, turn off the alarm when the tracker exits the waypoint;

Out = 1, turn on the alarm when the tracker exits the waypoint.

Example: 0000,B05,1,22.91319,114.07988,1000,0,1

SMS Get: 353358017784062,B05,OK

Once the tracker goes outside of the circle (center: 22.91319,114.07988 and radius 1000 meters), the following message will be received.

353358017784062,ExitGEO,22.918186,114.089823,080229123816,A,10,22,16,32,1,21,6667,850,,0000,,

6.4.5 Time Zone– B35

Command: 0000,B35,T

SMS Get: IMEI,B35,OK

Note:

Default time of the tracker is GMT. You can use this command to change the time on your tracker to your local time. This command is for SMS tracking only.

Time zone of SMS report is separated with that of GPRS data. If you need to set time zone in GPRS data, please use SMS command: 0000, B36, T

T=0, to turn off this function.

T=[-32768,32767] to set time difference in minutes to GMT.

For those ahead of GMT, just input the time difference in minutes directly. For example, GMT+8, W000000,032,480

'-'is required for those behind GMT. For example, W000000,032,-120.

Example: 0000,B35,480

SMS Get: 353358017784062,B35,OK

For more details regarding SMS commands, please refer to MEITRACK SMS Protocol.

6.5 Configure by Computer

This part mainly shows you how to use the **Meitrack Manager.**

Note: Don't connect T1 to external battery when configuring.

Please refer to the **Meitrack Manager User Guide** for more information regarding configuration and functions.

Before using the Meitrack Manager, please first install USB driver and Meitrack Manager Software.

Run 'PL2303_Prolific_DriverInstaller' to install the driver for the USB data cable.

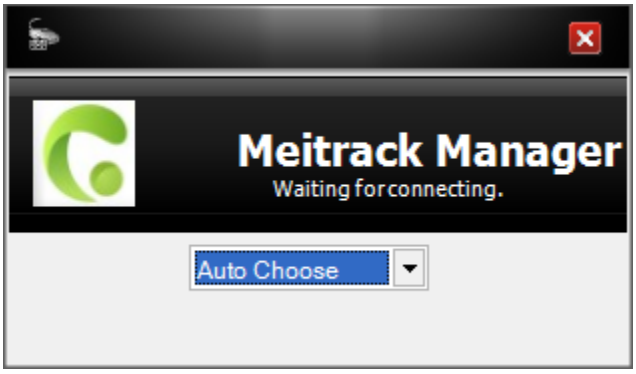
Note: PL2303_Prolific_DriverInstaller is in the folder 'USB-232 Driver' in the CD.

Connect the USB Data Cable between T1 and PC.

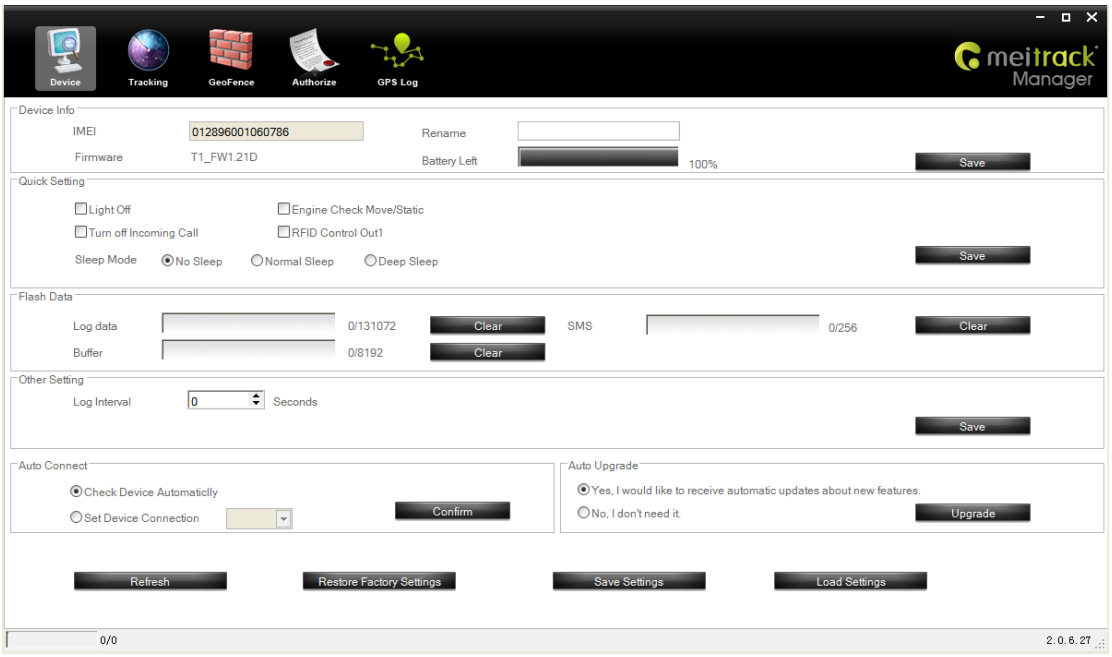
Check if the USB driver is installed: Open **Device Manager** (right-click "My Computer" –"Manage" –"Computer Management"- "Device Manager ") Click "Port(COM and LPT)", and find "Prolific USB-to-Serial Comm Port" as below. If 'Prolific USB-to-Serial Comm Port' cannot be found, you need to re-install the USB driver (for detailed installation instructions, please refer to *Meitrack Manager User Guide*)

Note: Remember this Com number. It needs to be input into the Meitrack Manager. It is COM3 in this example and it would be COM4 or COM5… in your computer.

Run 'Meitrack Manager.exe' and the following window will pop up:



The device is power on and the Meitrack Manager will automatically identify the device and enter into configuration interface (column 1:Device) and display the default parameters.



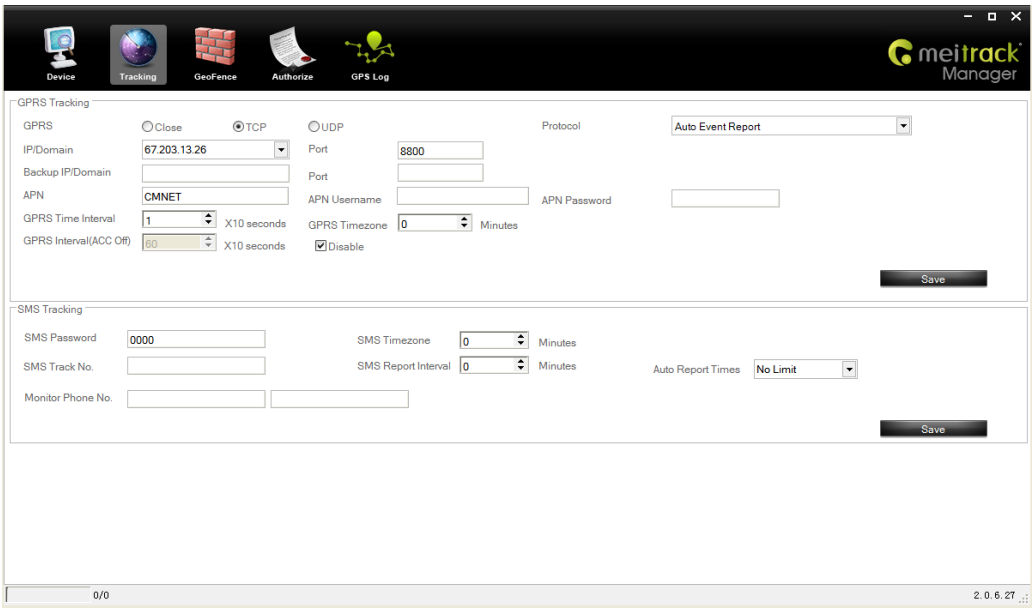
Note: Meitrack Manager is in the CD. The language will be automatically adjusted to be the same as your PC operation system's language. Please use "Ctrl+L" to change the language.

6.5.1 GPRS Tracking

Select Column2: Tracking

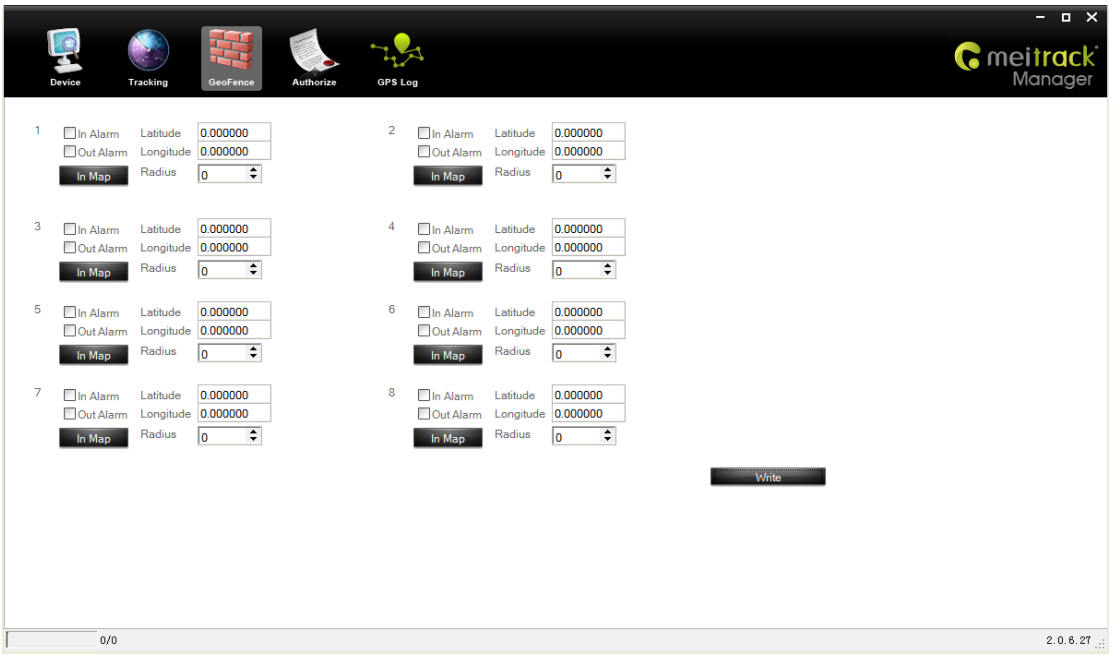
To set GPRS parameters, Select this column to modify. Setup server IP and Port (Meitrack Server IP/Domain: 67.203.13.26, Port: 8800), APN, Time Interval, etc. This column is also used to setup SMS Tracking & monitoring phone number.

For more details, please refer to Meitrack Manager User Guide.



6.5.2 Geo-fence Configuration

Select Column 3: Geo Fence



Geo-fence: it is a circular fence which is based on a center point with preset radius. Maximum 8 geo-fence.

Enter Geo-fence: alarm while the device entering geo-fence, the left textbox will show corresponding SMS Header, default as “In Alarm”.

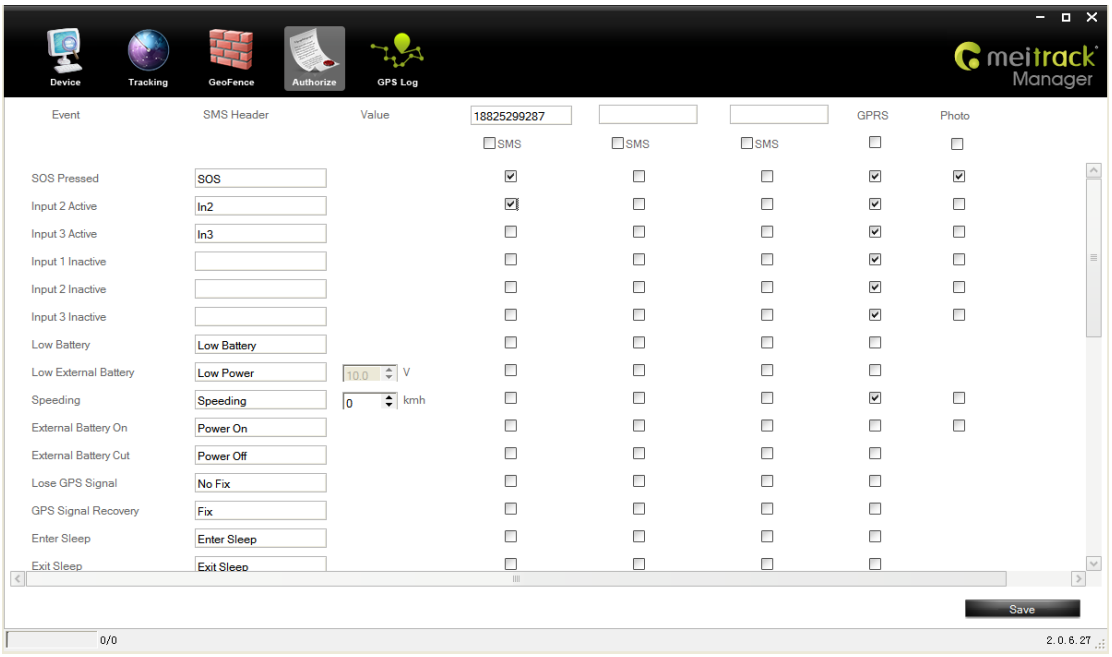
Exit Geo-fence: alarm while the device exiting geo-fence, the left textbox will show corresponding SMS Header, default as “Out Alarm”.

Map: click “In Map” to make and define geo-fence.

For complete software functions, please refer to Meitrack Manager User Guide.

6.5.3 Authorized Phone Number/GPRS Event

Select column 4 to set authorized alarm phone number, GPRS event and other functions. For complete software functions, please refer to Meitrack Manager User Guide.

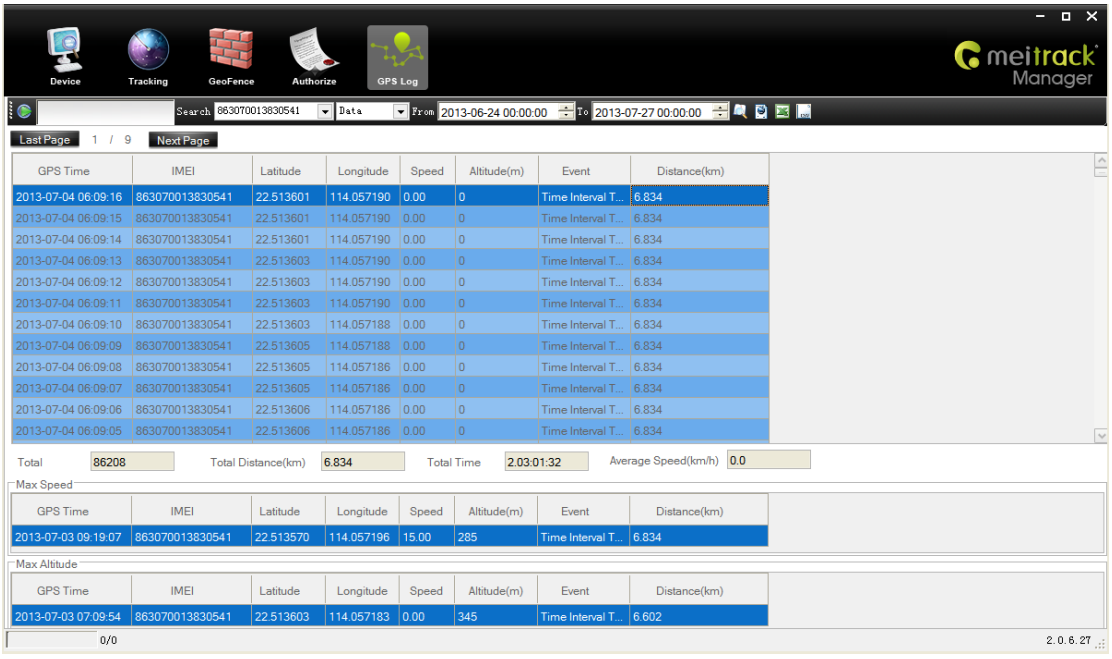


For more GPRS Settings, please refer to MEITRACK SMS Protocol and MEITRACK GPRS Protocol for details.

6.5.4 GPRS Log

Column 5: GPS Log

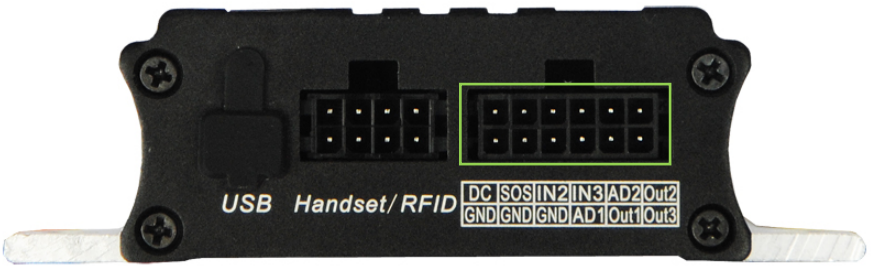
Before using this function, please first setup GPRS log time interval(to set this option under column 1 'Device' in Meitrack Manager), The terminal device will automatically save the log in the storage chip when there exits GPS signal. Recorded tracking & locating data can be exported under this column. No GPRS signal, no log.



7 Installation

7.1 Install I/O Cable

The I/O cable is a 12-pin cable including power, analog input, digital temperature sensor input, negative/positive input and output.



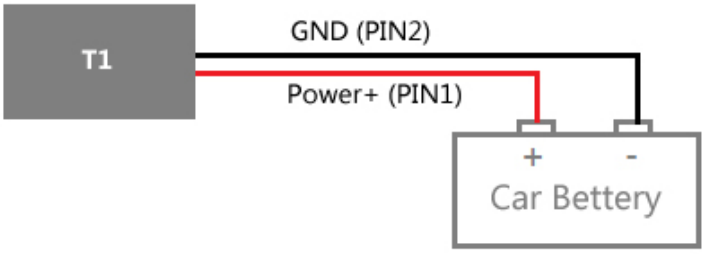
1 Power (+)	3 Input 1	5 Input 2	7 Input 3	9 Fuel Sensor	11 Output 2
2 GND (-)	4 GND (-)	6 GND (-)	8 AD Input 1	10 Output 1	12 Digital Temperature Sensor

PIN Number	Color	Description
1 (Power+)	Red	DC In (power source). Input voltage: 11V~36V. 12V suggested.
2 (GND)	Black	Ground.
3 (Input 1)	White	Digital Input 1 (negative triggering). Defaulted as SOS.
4 (GND)	Black	GND, connecting to input 1 to be SOS button.
5 (Input 2)	White	Digital Input 2 (negative triggering), for detecting status of vehicle door.
6 (GND)	Black	Ground, for connecting to analog senor.
7 (Input 3)	White	Digital Input 3 (positive triggering).
8 (AD Input 1)	Blue	10 Bits Resolution Analog Inputs. 0~6V DC Detection. It can be used to connect with temperature/fuel sensor etc.
9 (Fuel Sensor Input)	Blue	10 Bits Resolution Analog Inputs 2. 0~6V DC Detection. The AD cable with a white plug is used to connect A53 fuel sensor.
10 (Output 1)	Yellow	Output1. It can be used to connect with relay for engineer immobilization. Low voltage (0V) when effective and open collector (OC) when ineffective. Output open collector sink voltage (ineffective): 40V max. Output low voltage sink current (effective): 400mA max.
11 (Output 2)	Yellow	Output2. It can be used to connect with relay for engineer immobilization. Low voltage (0V) when effective and open collector (OC) when ineffective. Output open collector sink voltage (ineffective): 40V max. Output low voltage sink current (effective): 400mA max.
12 Digital Temperature	Yellow	TTL3.3V level, defaulted to be used to connect A52 digital temperature

Sensor Input		sensor with A61 sensor box Note: the current should be below DC/AC3.3V, otherwise, the device may be damaged

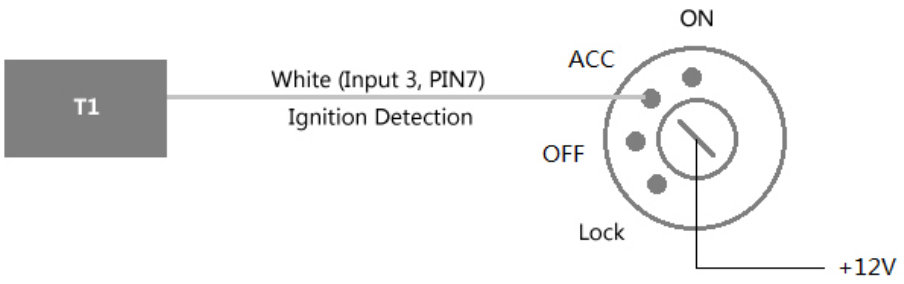
7.1.1 Power/GND (PIN1/PIN2)

Connect GND (-Black) and Power (+Red) wires to the battery of vehicle.

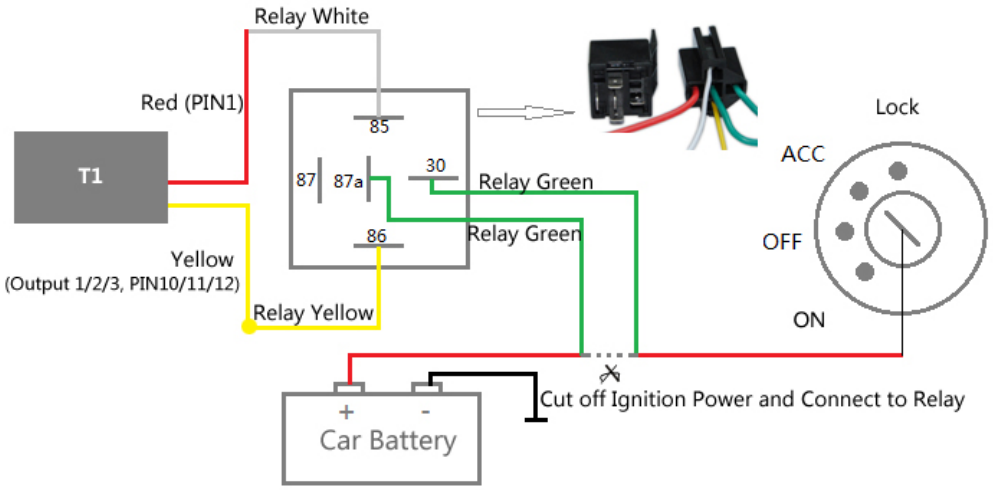


7.1.2 Digital Input (PIN3/PIN5 Negative Triggering)

7.1.3 Digital Input (PIN7 Positive Triggering)



7.1.4 Output (PIN10/PIN11)



7.1.5 Sensor Input (PIN8/PIN9)

7.1.5.1 Sensor Input Application 1– Inner battery voltage and external power voltage caculation formula

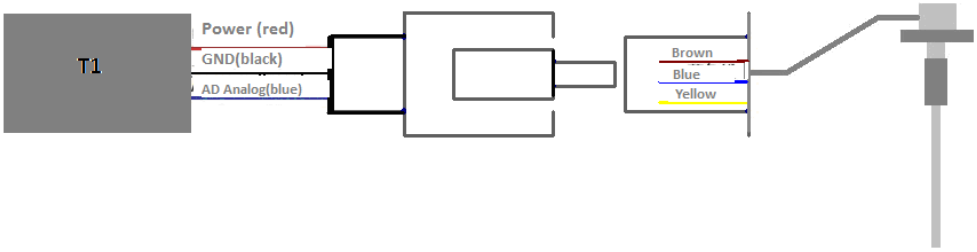
Inner battery voltage Caculating Formula: input voltage=(AD4*3.3*2)/4096

Inner battery percentage caculating formula: battery percentage = （（AD4-2114）*100/492）100%

External power voltage caculating formula: external power input voltage = AD5/4096*3.3*16

Remark: AD4 & AD5 inside the device are defaulted to detect inner battery and external power voltage, not indicated by the analogue input port. (Please refer to MEITRACK_GPRS Protocol for more details)

7.1.5.2 Application 2 –Analog Fuel Detection (percentage of fuel)



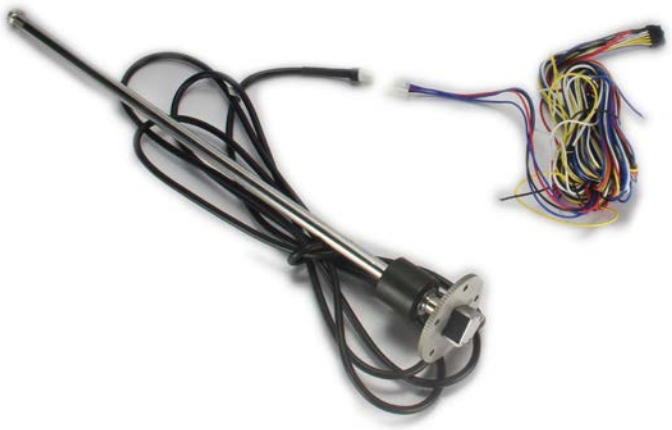


Figure2

The fuel sensor we provide is A53 resistive voltage-output mode sensor, which needs to connect external power to work. This sensor has three cables: the Power Cable (brown), GND(blue), and data output cable (yellow). Power Voltage : DC 11V-36V, shared with terminal power. Data output voltage: 0-5V. The terminal AD2 cable has a white plug to connect with the white plug of the fuel sensor.（Figure 2）. If connecting AD1 to fuel sensor, you need to the white plug of the sensor and connect the three cables to the terminal as per figure 1.

Note: T1 defaults AD2 connect A53 fuel sensor and the program has used the formula to work out the value that AD2 detected, that is, it uploads percentage result of fuel capacity in hexadecimal to the server and the server only needs to resolve the result into decimal

For example: 0X2129(hexadecimal)=>High level 21 in decimal is 33, low level 29 in decimal is 41, then the percentage of the residual oil detected is 33.41%

Connect AD1 with fuel sensor, thus, use a formula to calculate the result.

*Formula: AD1*3.3*2/4096/5*

*Detect AD1 as 0x040D, then 0x040D=>1037（in decimal）=>1037*3.3*2/4096/5=0.3341=33.41%.*

AD analog input voltage calculating formula:

Voltage caculating formula:Input Voltage=(AD*3.3*2)/4096

0x0C9B=>3227(in decimal)=>(3227*3.3*2)/4096=5.1997V(voltage)

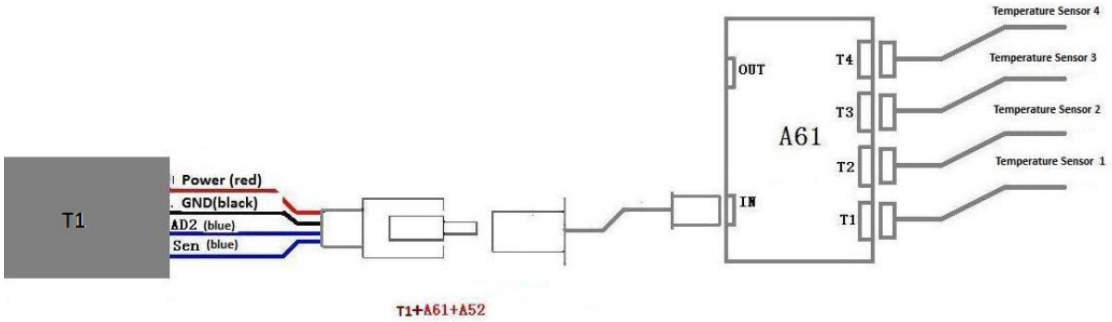
0x0D9D=>3845(in decimal)=>(3845*3.3*2)/4096=5.6154V(voltage

7.1.5.3 Digital Temperature Sensor Input

T1 can connect with A53 Fuel Sensor directly as 7.1.5.2 mentioned above. It also can connect A52 Temperature Sensor and A53 Fuel Sensor through the A61 sensor box, illustrated as the following three cases:

Case A:（A61+A52 Temperature Sensor）

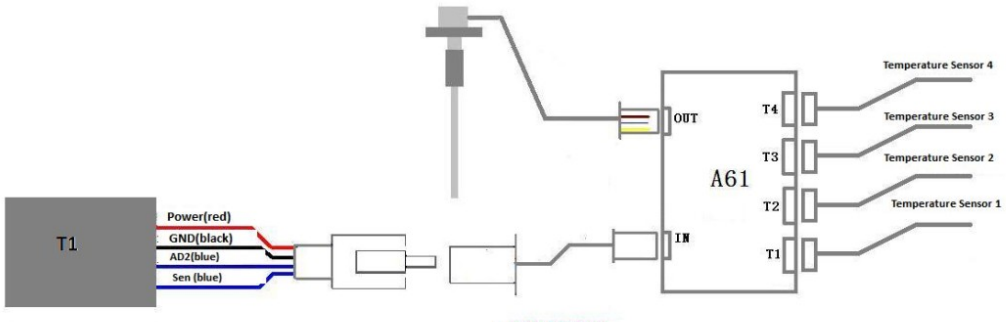
T1 sen port（Digital Temperature Sensor Input Port） is connected to four temperature sensor probes with a A61 sensor box, to meausre four different temperature spots simultaneously.（such as car: car rear, carriage, car air conditioner air-out, the engine, etc）, illustrated as the picture below:



T1+A61+A52

Case B: (A61+A52 Temperature Sensor +A53 Fuel Sensor)

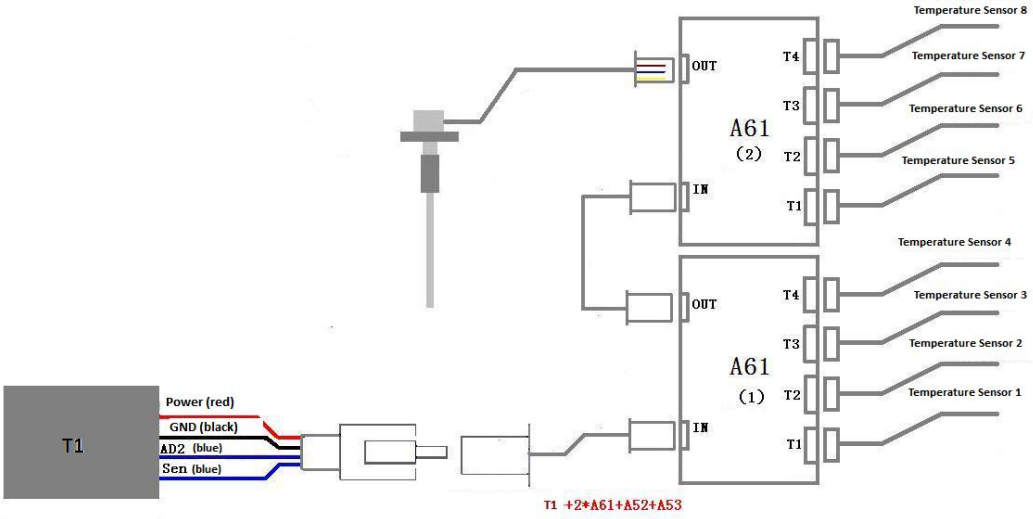
To connect four temperature sensor probes and one fuel sensor at the same time, just need to connect A53 Fuel Sensor with the OUT port of A61 sensor box, illustrated as the picture below:



T1+A61+A52+A53

Case C: (2*A61+A52 Temperature Sensor +A53 Fuel Sensor)

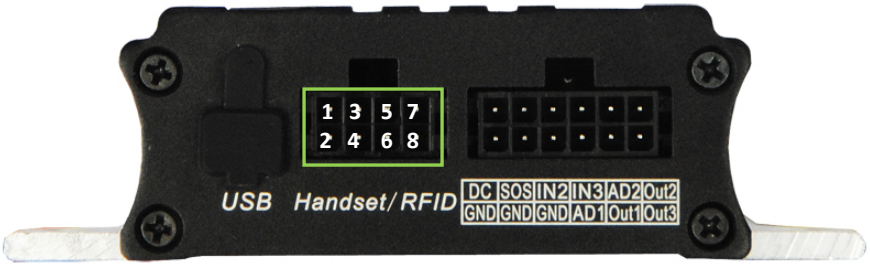
To connect multiple temperature sensors (4+) and the fuel sensor simultaneously, you just need to use an adapter cable to connect the OUT port of A61 with the IN port of another A61. Both the A61 are connected with corresponding sensors, illustrated as the picture below:



Note 1: The white plug of T1 harness is made up of four cables: Power Cable (red), GND(black), AD2(blue), sen (blue).

Note2: T1 can connect two A61 sensor boxes at most. The number of A52 temprature sensor probe is subject to demands(min:1, max:8).

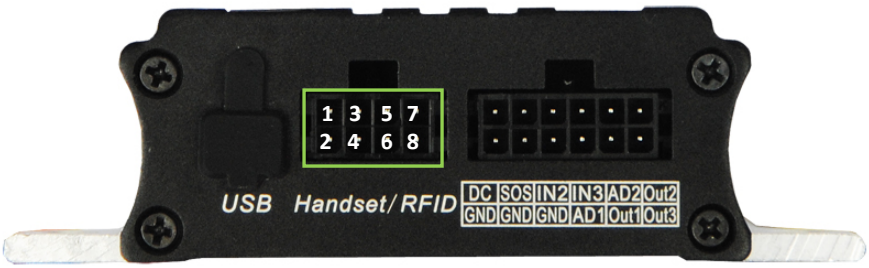
7.2 Install Handset Phone (RS232 Interface)



PIN Number	Color	Description
1	Red	Power Output. Output Voltage: 5V
2	Black	Ground
3	Orange	Handset Phone RS232 TX (T1 RX)
4	Yellow	Handset Phone RS232 RX (T1 TX)
5	Blue	Microphone Positive
6	Green	Microphone Negative
7	Purple	Speaker Positive
8	White	Speaker Negative

Note: This interface also supports RFID reader. It only can be used to connect to handset or RFID reader at the same time.

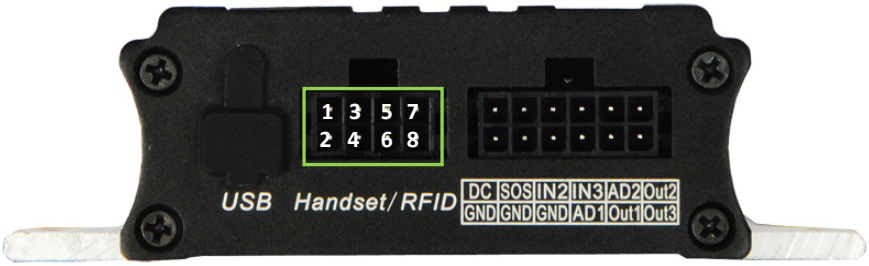
7.3 Install RFID Reader (RS232 Interface)



PIN Number	Color	Description
1	Red	Power Output. Output Voltage: 5V
2	Black	Ground
3	Green	RFID Reader RS232 TX (T1 RX)
4	White	Reserved (RFID Reader RS232 RX, T1 TX)
Remark: T1 RFID is not compatible with MVT600 RFID, MVT600 is the Wiegand interface		

Note: This interface also supports handset. It only can be used to connect to handset or RFID reader at the same time.

7.4 Install Camera (RS232 Interface)



PIN Number	Color	Description
1	Red	Power Output. Output Voltage: 5V
2	Black	Ground
3	Green	RX, Camera RS232 TX (T1 RX)
4	White	TX, Camera RS232 RX, T1 TX

Note: when connecting T1 with camera, the below connecting wire is needed. The 8PIN interface connects to T1, and the 4PIN interface to camera.

The interface can only be connected to one of the camera, handset and RFID reader.

7.5 Install GPS/GSM Antennas

GSM Antenna GPS Antenna

Connect the GSM antenna to the SMA connector which is 'GSM' text labeled. The GSM antenna is non-directional, so you can hide it in any place of vehicle.

Connect GPS antenna to the GPS connector which is labeled 'GPS'. The optimum location for the GPS antenna is on the roof of the vehicle. The covert and GPS antenna are directional. Make sure they are facing up and laying as flat as possible. Secure them in place with glue or zip ties.
Note: Do not shield or cover the GPS antenna with any objects containing metal.

7.6 Mount the T1 unit

If mounting required, there are 4 screw holes on the T1, 2 along either side that act as fixing points to the vehicle

Please do not hesitate to email us at info@meitrack.com if you have any questions.