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GPS

Vehicle and Personal Multi-purpose Positioning Tracker

User Manual V1.1

Contents

1. Products Overview

Thanks for purchasing our product !

It is a vehicle and personal multi-purpose positioning tracker.

Tracker has built-in terminals of GPS (global positioning system) module and GSM communication module, which are used for getting the location data and send it to authorized phone number via SMS, and tracking through free maps Google Earth or Google Map; If your mobile phone is smart phone and opened with GPRS service, it is more convenient to see location of the tracker on smart phone by setting the SMS location format to be Google Link. At the same time, the GPRS data can be sent to the internet server, which can realize the checking, monitoring and managing of the tracker on computer.

The tracker has GSM anti-interference function. When the ACC is off, once the tracker detects the interference, it will cut off the fuel and engine automatically.

Tracker has the following features and functions:

◆Water resistance (close to IP67)
◆Compatible with built-in or external antennas
◆Remove alarm
◆Tracking via SMS/GPRS (TCP/UDP)
◆Real time tracking
◆Tracking regularly
◆Power saving mode
◆Two way communication（optional）
◆SOS emergency calling
◆Geo-fence alarm
◆Over speed alarm
◆Vibration alarm
◆Low battery alarm
◆No GPS signal alarm
◆Data logger (built-in 8M flash memory)
◆Monitoring remote or two-way communication (optional)
◆Has 2 digital outputs, 3 digital inputs and 2 analog inputs
◆ACC detection
◆Oil detection
◆Remote fuel/engine cut off
◆Cut external power off alarm
◆Hitting alarm
◆AGPS
◆GSM anti-interference

2. For Your Safety

Read these simple guidelines. Not following them may damage to the tracker or not perform proper function of application.

Correct Connection	When connecting with other tracker, read carefully its manual so as to carry out correct installation. Do not connect it to other incompatible trackers.
Chosen Accessories	Use our chosen accessories to avoid damage to tracker.
Hidden Installation	In order to avoid damage by external force intentionally, please install tracker in a hidden place.
Protect from blasting	Follow related restrictions. Do not use tracker when blasting is in progress.
Repair and service	Only qualified engineer with technical support can repair tracker.
Water resistance	Tracker is water resistant (close toIP67).

3. Tracker Characteristics

Items	Specification
Power Supply	DC 7.5-24V/3A
Backup Battery	Rechargeable 750 mAh battery (3.7V),
Normal Power Consumption	50mA
Dimension	88mm*50mm*20mm
Weight	87g
Operating Temperature	Built in battery -25°C to +60°C standard（-40°C w/optional battery）
Humidity	5% to 95% Non-condensing
GSM Module	Quad Band GSM 850/900/1800/1900Mhz
GPS Chipset	The newest SKYTRAQ Chipset
GPS Sensitivity	-165 dB
GPS Frequency	L1, 1575.42 MHz
C/A Code	1.023 MHz
Channels	65 channel
Position Accuracy	< 10 M CEP
Velocity Accuracy	0.1 M/S
Time Accuracy	1 us synchronized to GPS time
Reacquisition	0.1 s (average)

Hot Start	3 sec., average
Cold(warm) Start	39 sec., average
Altitude Limit	18,000 meters (60,000 feet) max.
Velocity Limit	515 meters/second (1000 knots) max.
Acceleration Limit	Less than 4g
LED	3 LED lights to show power (red), GPS (yellow), GSM (blue).
Button	SOS button, use for SOS emergency calling and sending SOS SMS.
Interface	2 digital outputs; 3 digital inputs; 2 analog inputs.

4. Getting Started

This section will describe how to use the tracker.

4.1 Hardware and Accessories

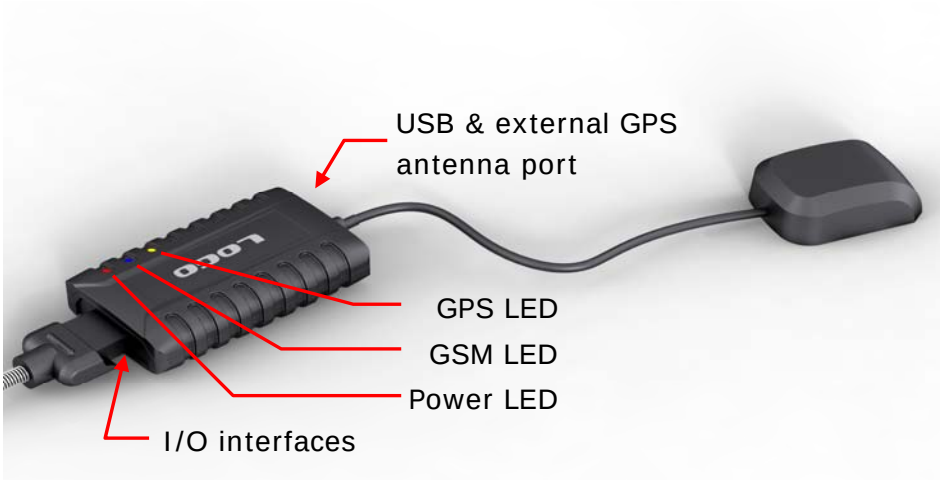
Tracker
(Built in battery)

GPS external antenna
(Optional)

I/O connector

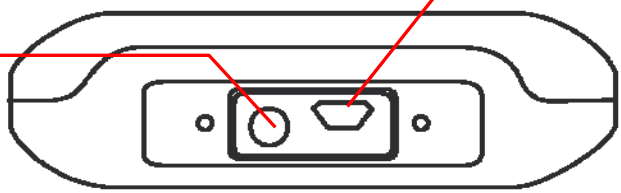
USB cable DC charger cable CD Magnet (Optional)

4.2 Function key and Interfaces

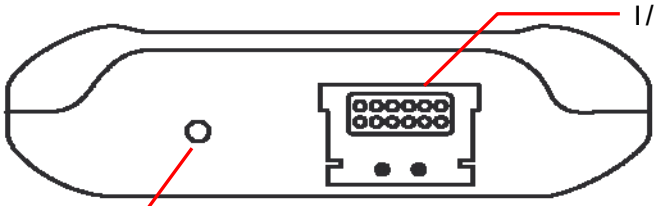


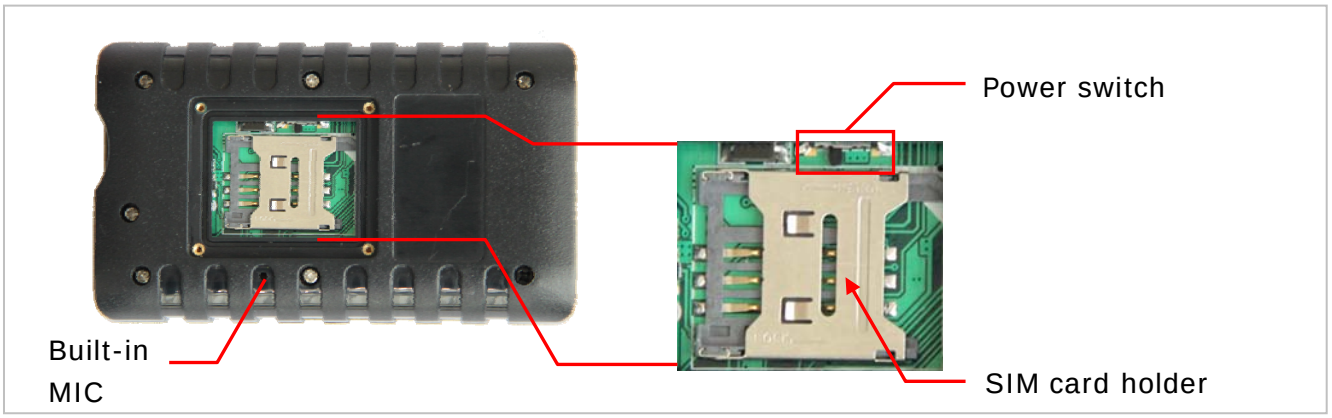
USB & external antenna port:

External antenna connector



I/O port:





Red LED- Power	
Always on	Charging
1s on and 3s off	Normally work
Blue LED- GSM	
0.3s on and 0.3s off	GSM module is initializing
Always on	Failed to registered network
1s on and 3s off	GSM module is registered network
0.1s on and 3s off	GSM module is registered network and GPRS function works well
Orange LED- GPS	
0.3s on and 0.3s off	GPS module initializing
1s on and 3s off	GPS module works well, but GPS position is not fixed
0.1s on and 3s off	GPS module works well and GPS position is fixed
Buttons	
SOS Button	Press it for 3 seconds to make a call and/or send a SMS to authorized numbers.
Other connectors	
Switch	Turn on/off tracker
GPS Antenna interface	Compatible with built-in or external antennas (optional)

SIM Card Holder (Inside)		Insert SIM card here
Mini USB Port		Used for charging, firmware update, configuration on PC
Input/Output Interface		
Distinguish the inputs and outputs from color		
Color	PIN	Function
Red	VCC	DC In (power input) Input voltage: 7.5V ~ 24V/3A
Black	GND	Ground
Green	OUT1	digital output 1, use for control relay(drive current is 500mA, max voltage: 50 v)
Yellow	OUT2	digital output 2, use for control relay(drive current is 500mA, max voltage: 50 v)
Blue	AIN1	Analog input 1 (input voltage: 0 ~ 3V), normally use for Fuel Detection.
Grey	AIN2	Analog input 2 (input voltage: 0 ~ 3V)
Orange	SOS	To connect the SOS button
Brown	IN1	Digital input 1
White	IN2	Digital input 2
Purple	ACC	Normally use for Ignition Detection.
Pink	SPK+	Speaker

4.3 First Start

Please read this manual before using tracker and check if all parts are included in the packaging box.

4.3.1 Ensure that your tracker has a working SIM card.

- Check that the SIM card has not run out of credit (Test the SIM card in a phone to make sure it can send and receive SMS)

- Check that lock code of the SIM card 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 tracker, please make sure the SIM card installed supports displaying caller ID.

Insert SIM card:
- Unscrew the screws on front cover, as below picture shows.

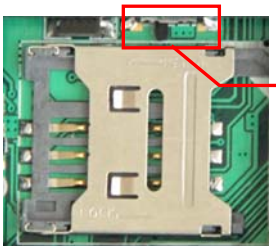
- Open the SIM holder and insert the SIM card, and turn on the power switch, see pictures below:

Insert SIM card:

Open SIM holder Insert SIM card Lock SIM holder

Turn on power:

Power off ⟷ Power on

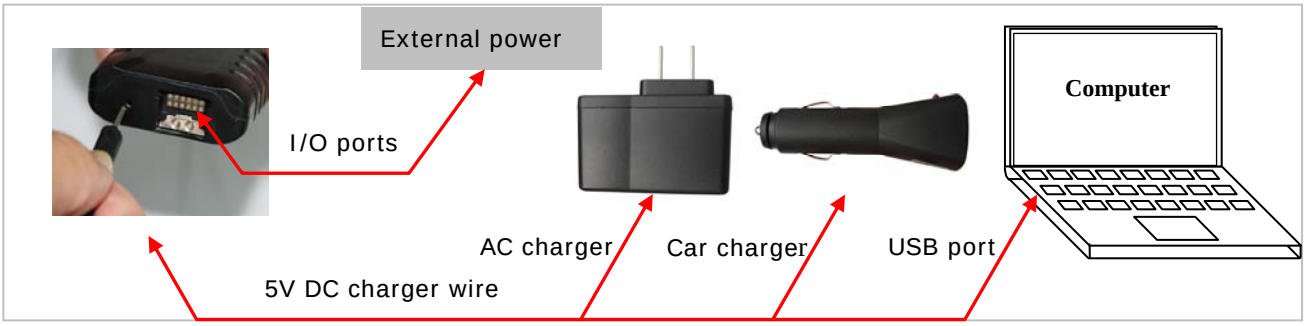


Power switch

- Put back the cover and screw it up tightly.

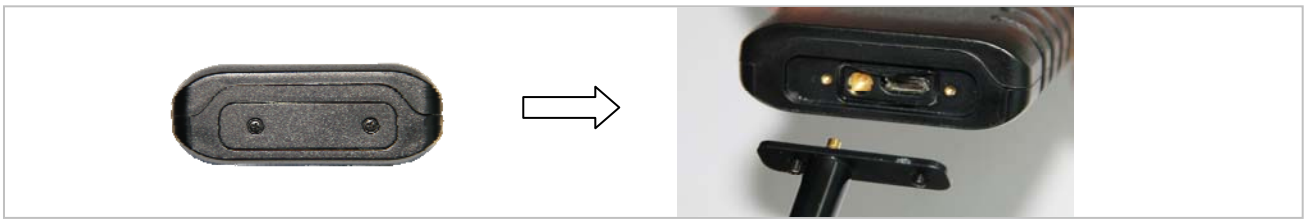
4.3.2 Use tracker as a personal tracker at first time, please charge it for 3 hours or more at turn-off state. There are 4 ways for charging: travel charger, car charger, USB charger, and external charging (see picture below).

(Note: Please turn off the tracker when charging!)



4.3.3 Connect to external antenna (optional)

- If users choose to external antenna, firstly unscrew the top cover and take off the cover, then screw the customized external antenna to the tracker. See picture below:



Note: External GPS antenna is directive antenna. It is better to fix it to face the sky directly(to be placed under the windshield is recommended) and flat side down, black side up, and use double-side tape to keep the antenna to avoid effecting the GPS signal.

4.4.4 Install the tracker

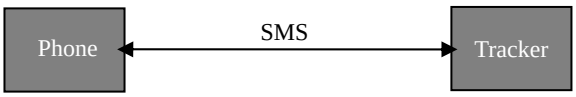
Please install the tracker at a hidden place, keep those I/O wires tied up with tape. Other wires need to be insulated by tape as well. Finally, please check I/O wire connection and connect the tracker to external power (car power or battery).

Note: please check the tracker LED status to confirm working normally.

5. Parameter Configuration

There are 3 ways to set parameter: set by SMS, set by PC software, set by GPRS.

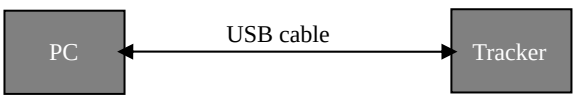
5.1 Set by SMS



Users can set the parameter of tracker by mobile phone SMS, see <command list> from the <Communication protocol>.

Note: all commands are SMS commands in this manual.

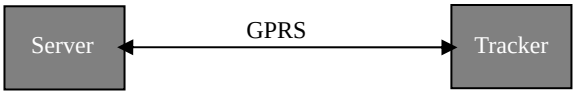
5.2 Set by Software on PC.



Users can set the parameter of tracker by PC software; see <setup software instruction>.

Note: Please use customized USB to serial cable or USB to serial Dongle. Do not use any other USB cable.

5.3 Set by GPRS.



Users can set the parameter of tracker by server, see <command list> from the <Communication protocol>.

6. Change Password

Command: M******,00,######
Description: Change user's password.
Note:
ALL ENGLISH LETTERS IN THE COMMAND MUST BE IN CAPITAL LETTER!
1. ****** is user's password and the default password is 000000. Tracker will only accept commands from a user with the correct password. Command will be ignored if with wrong password.
2. ###### is the new password. Password should be 6 digits.

Example:
M000000,00,123456
M123456,00,888888

7. Restore Default

Command: M000000,00,RESET
Description: Factory default. It is used for forgetting the password and restoring back to the initial password '000000'.
Notice: '000000' in this command is fixed string, not password.

8. Authorized Number

Command: M000000,01,NO.,Phone Number,ABCDEFGHIJK
Description: Authorize phone numbers for receive SMS alarms. (See 11.1 Alarm)
Note:
NO.: should be 1 to 3.
Phone Number: Preset phone number. Max. 16 digits
A: SOS alarm
B: Help alarm
C: Call for location
D: SMS Tracking

E: Low battery alarm
F: No GPS signal alarm
G: Geo-fence alarm
H: Over speed alarm
I: Surveillance mode
J: Vibration alarm
K: Remove off tracker alarm
(1: enable alarm, 0: disable alarm)
Example:
Preset the authorized phone number 13800000000, and just enable SOS alarm.
M000000,01,1,13800000000,10000000000

9. Tracking Via SMS

Receive the location SMS through mobile phone.

9.1 Real Time Tracking

Command: M000000,02
Description: Get the latest location
Note:
Tracker will reply back a SMS with latest location to user sent this command.
Example:
M000000, 02
You will receive a SMS as:
Lat=22 23.61N Lng=114 22.56E,MMC:460,02,CellID:27B3,0E59,
Speed=0Km/hr,05/7/2011,03:30,SMS

9.2 Google Map Link

Command: M000000,10,X
Description: set the format of SMS tracking.
Note: X=1: Set the format to be Google map link, log into the link to check the location directly on smart phone.
X=0: Set the format as latitude and longitude

Google map SMS likes below:
CurLoc http://map.google.com/maps?f=q&hl=en&q=22.545712,114.079500
MMC:460,01,CellID:252A,07F4,Speed=0Km/h,06/23/2011,05:42,Call

Standard SMS as below:
CurLoc Lat = 22 32 44.62N Lng = 114 04 45.70E,
MMC:460,01,CellID:252A,07F4,Speed=0Km/h,06/23/2011,05:57,Call

Example:

M000000,10,1

9.3 Tracking By Calling

Description: Any authorized number makes a call to the tracker for location and the tracker will send its longitude and latitude by SMS. If tracker does not get GPS signal successfully, it will reply a Google link to the authorized phone.
Note: please confirm the <call for location> function is enabled(see 8. Authorization).

9.4 Tracking Regularly Via SMS

Command: M000000,03,X
Description: Set an interval for the tracker to continuously send its location by SMS to authorized phone number.
Note: please confirm the <SMS tracking> function is enabled(see 8. Authorization).
1. X is the interval in minute. (max. 65535)
2. if X=0 to turn off SMS sending at preset interval

Example:
M000000,03,30
The tracker will send location back to authorized phone number every 30 minutes.

10. Tracking Via GPRS

Receive the location data though tracking platform.

10.1 Enable/Disable GPRS

Command: M000000,21,X
Description: Enable GPRS tracking function.
Note:
X=0, turn off GPRS tracking (default)
X=1, enable GPRS tracking via TCP
X=2, enable GPRS tracking via UDP
Example:
M000000,21,1

10.2 Set Tracker ID

Command: M000000,22,ID
Description: Set tracker ID
Note:
ID, max. 16 digits

Example:
M000000,22,123456789

10.3 APN Setting

Command: M000000,23,APN,Username,Password
Description: Set APN parameters for the tracker
Note:
1. APN username and password are optional. If no APN username and password are required, just input APN only;
2. APN + username + password should not over 64 characters.

Example:
M000000,23,CMNET

10.4 IP and Port Setting

Command: M000000,24,IP,PORT
Description: Set IP and Port for tracker for GPRS communication.
Note:
1. IP is your server's IP
2. Port: max. 65535

Example:
M000000,24,192.168.111.111,6000

10.5 Tracking Regularly Via GPRS

Command: M000000,25,X
Description: Set the interval for sending GPRS packets.
Note:
X: should be 5 to 65535 in second (default 30 seconds)
Example:
M000000,25,60
The tracker will send GPRS data to server every 60 seconds.

10.6 GPRS Distance Override Setting

Command: M000000,26,X
Description: Set the smallest distance for sending GPRS packets. If the distance measured by GPS is greater than or equal to the preset distance, the tracker will send the GPRS data to server no matter if the time is not reached at the preset time interval.
Note:
X: 0~65535(default to be 0), unit is meter.
X=0:disable distance override
Example:
M000000,25,100
The tracker will send GPRS data to server every 100 meters no matter what time interval set.

10.7 GPRS Corner Sending Setting

Command: M000000,27,X
Description: Set the smallest angle for sending GPRS packets. If the angle difference measured by GPS is greater than or equal to the preset angle, the tracker will send the GPRS data to server no matter what time and distance interval set.
Note:
X: 0~360(default to be 0), unit is degree.
X=0:disable corner sending
Example:
M000000,27,10
The tracker will send GPRS data to server every 10 degree corner.

11. Alarm

Detailed description of each alarm.

11.1 SOS Alarm

Description: when the SOS button is pressed for 3 seconds or more than 3 seconds, tracker will send an SMS to authorized phone number or send this alarm to server (if GPRS connected).
Note: please confirm the <SOS alarm> function is enabled to the specific authorized number (see 8.Authorization).

11.2 Over Speed Alarm

Command: M000000,05,XXX
Description: Turn on speeding alarm. When the tracker's speed is higher than the preset value, it will send an SMS to authorized phone number or send this alarm to server (if GPRS is connected).
Note: Please confirm the <over speed alarm> function is enabled(see 8. Authorization).
X is the preset value of speed, in Km/hr (max. 200Km/hr)
X = 0, turn off this alarm.
The preset value should be more than 50 to avoid reporting alarm too frequently.
Example:
M000000,05,80
When the tracker's speed is over 80Km/hr, speeding alarm will be sent out.

11.3 Geo-fence Alarm

Command: M000000,32,NO.,name,lat,lng,radius
Description: Turn on Geo-fence alarm. When the tracker moves in/out the preset geo-fence, it will send a SMS alarm to the authorized phone number and send this alarm to server via GPRS.
Note: please confirm the <geo-fence alarm> function is enabled(see 8. Authorization).

1. NO. should be 1 or 2 or 3
2. Name: max. 10 characters (ALL IN CAPITAL LETTER)
3. Lat: latitude, format is dd.dddddd. Unit is degree, pls set south latitude in minus, .
4. Lng: longitude, format is ddd.dddddd. Unit is degree, pls set west longitude in minus.
5. Radius: Max. 99999.00, unit is Km.

Example:
M000000,32,1,SCHOOL,22.12345,114.12345,10.50
M000000,32,2,OFFICE,12.12345,-45.12354,10.75

11.4 Vibration Alarm

Command: if the tracker is detected enough shock, it will send vibration alarm to authorized phone via SMS and the server via GPRS if the GPRS is connected.
Note: please confirm <vibration alarm> is enabled on authorized number (see 8.Authorization). The shock strength sensitivity can be set by setup software on PC. (see Setup Software Instruction)

11.5 Hitting Alarm

Description: when the hitting is detected by 3G-sensor, tracker will send this alarm to server (if GPRS connected).

11.6 Low Battery Alarm

Description: if the battery of tracker is lower than 15%, it will send low battery alarm to authorized phone via SMS and the server via GPRS if the GPRS is connected.
Note: please confirm <low battery alarm> is enabled on authorized number (see 8.Authorization).

11.7 No GPS signal Alarm

Description: If GPS signal is lost, tracker will send GPS signal is weak warning to authorized phone via SMS and to server via GPRS if GPRS is connected.

Note: please confirm <No GPS signal alarm> is enabled to the specific authorized number (see 8.Authorization).

12. SOS Emergency Calling

Command: M000000,06,X,Num.
Description:
If press SOS button 3 seconds, tracker will call the SOS phone number.
Note:
X=1 means setting SOS number
Num: SOS phone number (max. 16 digits)
Example:
M000000,06,1,13888888888
This command will set the SOS number as 1388888888

13. Monitoring Mode

Description: when the authorized phone call the tracker, tracker will answer automatically and the background voice sound can be heard by the authorized phone.
Note: please confirm <surveillance mode> is enabled on authorized number (see 8.Authorization).

14. Remove Alarm

Description: Tracker has built-in Magnetic sensor, if it keeps away from the effective range the tracker will send remove off tracker alarm to authorized phone via SMS and server via GPRS if the GPRS is connected.
Note: please confirm <remove off tracker alarm> is enabled to the specific authorized number (see 8.Authorization).

15. Data Output

Description: tracker has built in 8M data logger, which is used for storing location data of which could not be sent out via GPRS. Users can export the data in the data logger into PC (Output file is in TXT format, see setup software instruction).

Note: the tracker will erase the all the data that have been exported to PC, 8 M data logger can store about 80000 data packets.

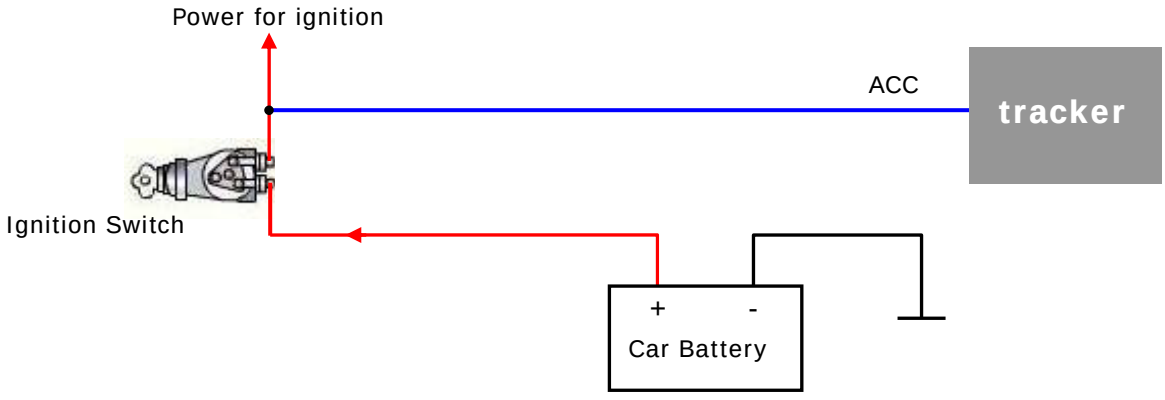
16. Working Mode

Command: M000000,07,X
Description: Set the work mode of the tracker (mode 1 :normal vehicle & personal mode; mode 2: personal long standby mode)
A: If the tracker is applied to vehicle, it is better to set it to be mode 1.
In mode 1: tracker will not consider saving power, all functions will normally work.
B: If tracker is applied to persons, both mode 1 and mode 2 are selectable.
In mode 2: tracker will consider saving power for extending working time and standby time. Please note some functions (geo-fence alarm, over speed alarm, GPS signal is weak warming) could not normally work.
Description: When there is no task, GPS module will be off and GSM module will be in sleep mode; When there is task(receives SMS, call or needs to send SMS alarm, etc), the tracker will wake up GSM module and open GPS module to work. After task is done, it will keep GSM module in sleep mode and turn off the GPS module again.

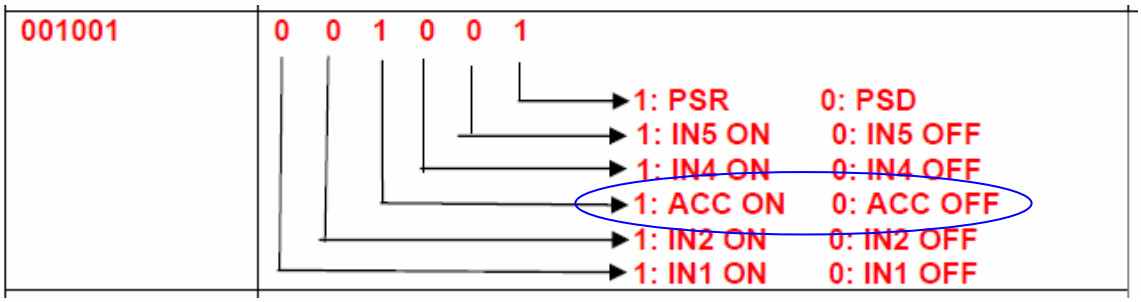
Note:
X=0 :normal vehicle & personal mode(default)
X=1 :personal long standby mode
Example:
M000000,07,1

17. Application Examples for Inputs

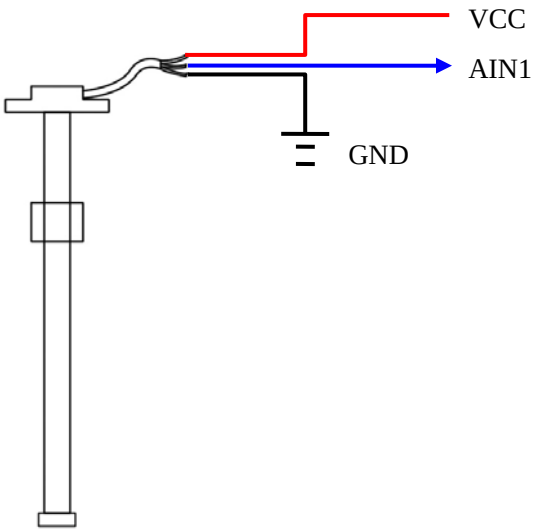
17.1 Ignition Detection



Digital input 3 (ACC) can be used for ignition detection. The detection flag and alarm (when flag changes) will be sent to the server via GPRS. Please refer to <GPRS Communication Protocol> for more information.



17.2 Fuel Detection



Analog input1 (AIN1) can be used for fuel detection. The remaining-fuel-percent will be sent to the server via GPRS. Please refer to <GPRS Communication Protocol> for more information.

0.00	Analog input (Unit: V Range of: 0.00~3.00)
0.02	Analog input (Unit: V Range of: 0.00~3.00)
0.00	Analog input (Unit: V Range of: 0.00~3.00)

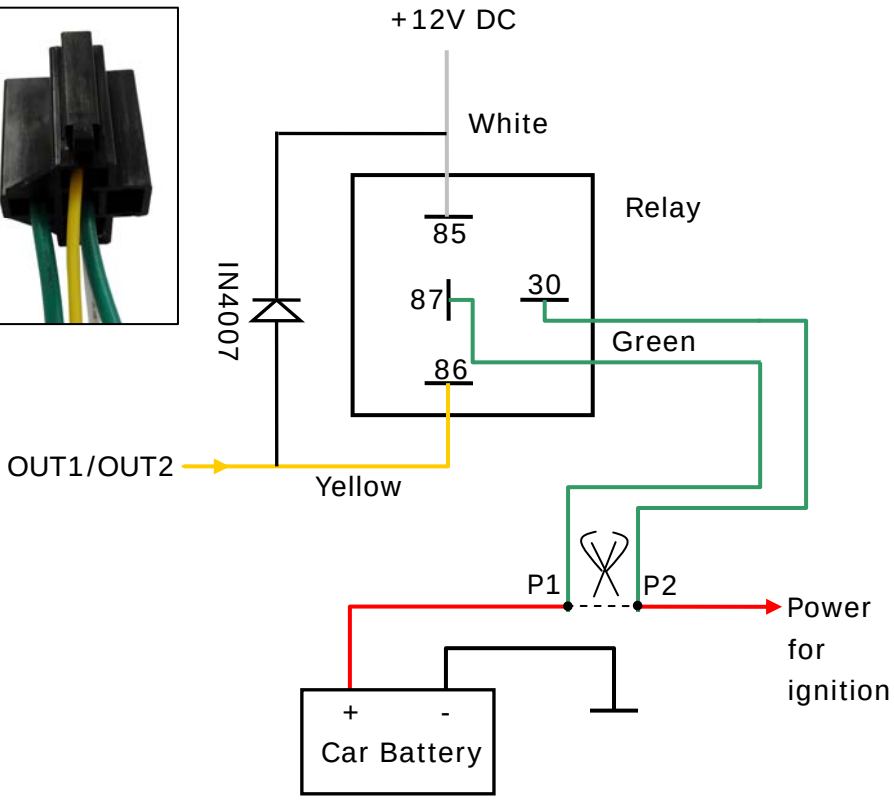
18. Output Control

18.1 Output Command

Command: M000000,50,NO.,X
Description: This command is to enable/disable the status of tracker.
Note:
NO. should be 1 or 2 (‘1’ refer to output 1, ‘2’ refer to output 2.)
X=1 to open the output, it can drive a relay.
X=0 to close the output.
Example:
M000000,50,1,1

18.2 Application Examples for Outputs

Relay



Engine ignition loop

Normally two green wires are connected solidly (P1 and P2 are normally close in relay), when output is open, two green wires will disconnect so that the engine is cut.

SMS example:

M000000,50,1,1 (engine-cut)

M000000,50,1,0 (cancel engine-cut)

Indemnity: We are not responsible for any consequence after adopting this function to stop the power/fuel of the vehicle. Users must be very cautious for this function application.

19. Problems & Diagnostics

Problem: Tracker can not turn on	
Possible cause	Solution
Low power	Charging
Problem: Tracker can not reply with SMS	
Possible cause	Solution

GSM network is busy		Please wait a moment. Tracker maybe not react instantly when GSM network is busy or tracker is in failure.
Wrong password in your SMS or wrong SMS format		Write correct password or SMS format.
The SIM card has run out of credit		Replace or recharge value of the SIM card.
SIM card is damaged or warped		Inspect SIM, and clean the contact. If re-inserting does not help, try another one.
Problem: tracker cannot get the GPS location		
Possible cause		Solution
As a vehicle tracker	GPS external antenna is not installed	Install GPS external antenna.
	GPS external antenna is incorrectly installed	Reinstall GPS external antenna correctly (see 4.3.First start).
As a personal tracker	The GPS signal is weak.	Move the unit to a location where the sky is visible. Tall buildings, trees, and heavy rain, can cause problems with the GPS reception.
	The front side of tracker is down	Place the front side of tracker towards clear sky.
Problem: Tracker Fails to Connect to Server via GPRS		
Possible cause		Solution
SIM card in tracker does not support GPRS function		Enable SIM card GPRS function.
GPRS function of tracker is turned off		Turn on GPRS function of tracker.
Incorrect IP address or PORT		Get the right IP address and PORT and reset to tracker.
GSM signal is weak		Move the tracker to a location with good GSM reception.