



TrackingTheWorld
GPS Tracking Solutions

TrackingTheWorld.com

CAT-110
Ankle Tracker
Tracking Device



USER MANUAL

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0. Revision History

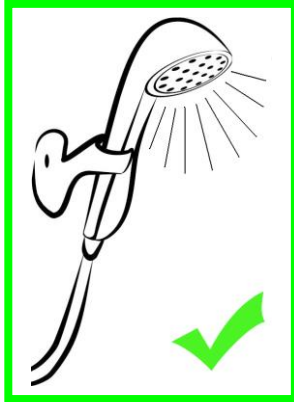
Revision	Date	Author	Description of Change
1.3	2016-04-15	Amy	Update

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1. Waterproof Notices and Disclaimers

Do not let the tracker stay in the water too long, take out the tracker immediately if it falls into the water, and then siphoning off the water with a towel or paper towel.



Can be showered



Cannot be flooded

The structural design of our products fully complies with the requirements of waterproof IP67 rating, in no event shall our company be liable for direct, indirect, special, incidental, or consequential damages (including but not limited to economic loss, personal injury, and loss of asset and property) arising out of use or inability or illegality to use the product or documentation.

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2. Product Overview

Thank you for purchasing our product!

It is an industry waterproof IP67, small, and light tracker. It is easy to take and specially designed for parolee, field staff/lone-worker, security guard, elderly, Alzheimer patient, and animal/pet.

Build in U-blox GPS module, GPRS module and low power ARM processor.

Through GPS (Global Positioning System), tracker can get its position and send the position data to your smart phone via map (Google Earth or Google Map). At the same time, it will send the position data to the internet server by GPRS, so you can track the tracker's position.

Tracker has the following features and functions:

- Waterproof (waterproofing grade: IP67)
- AGPS position assisted
- Two-way communication
- Monitoring mode
- Pet mode
- Long standby time mode
- SMS and GPRS (TCP/UDP) communication
- Support up to 5 authorized cell phone numbers
- Real time tracking
- SOS emergency calling
- Geo-fence alarm
- Over speed alarm
- Low battery alarm
- Vibration alarm
- Data Logger in no GSM signal area using Micro SD card (Max: 2GB)
- Belt-off alarm

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3. Specifications

Items	Specification
Charging Voltage	DC 4.8V - 5.5V / 500mA
Battery	Rechargeable, lithium-polymer battery 750mAh, 3.7V
Dimension	61mm x 49mm x 22mm
Weight	173.0g
Operating Temperature	-25°C to 60°C
GSM Module	Quad Band GSM 850/900/1800/1900MHz
GPS Chipset	Ublox-6M
	Telit-SL869 (Glonass+GPS)
Memory	Micro SD card (Max: 2GB)

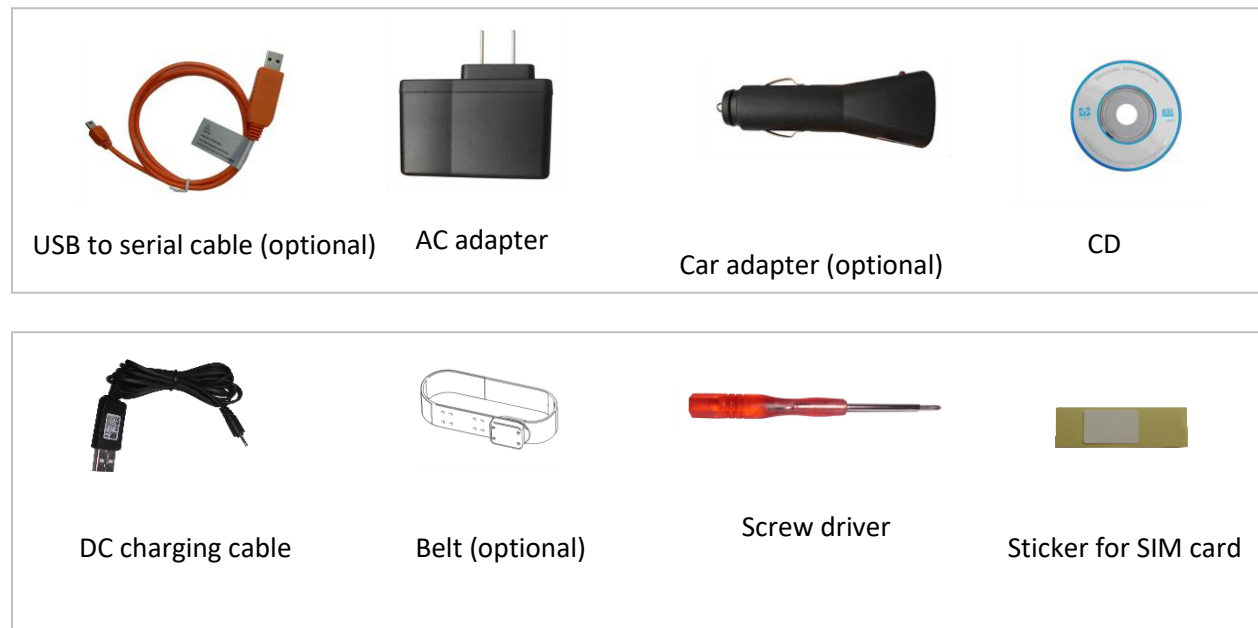
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4. Overview

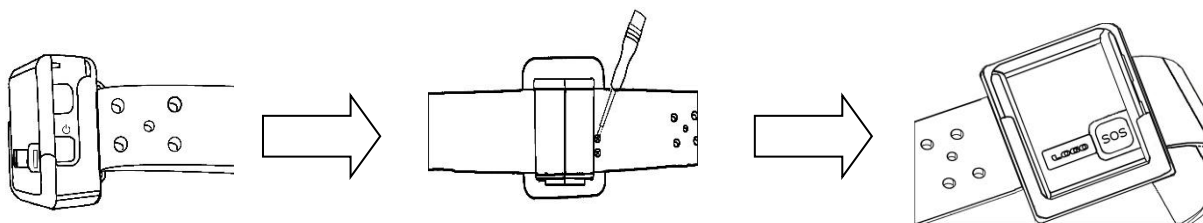
This section will describe how to use the tracker.

4.1. What is in the Package



4.2. How to Use the Belt

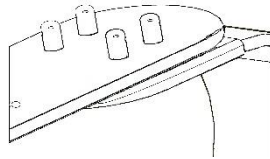
—insert and fixed the belt



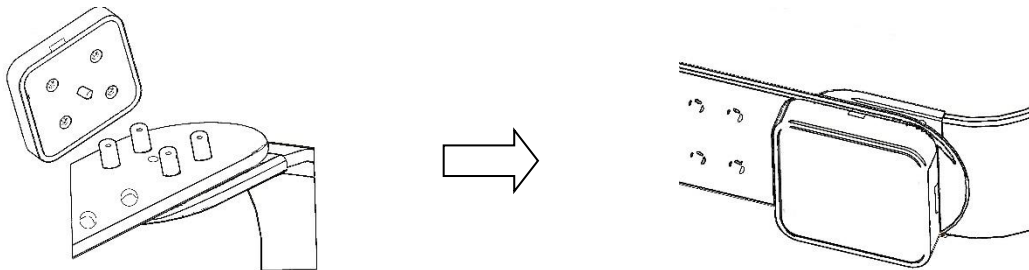
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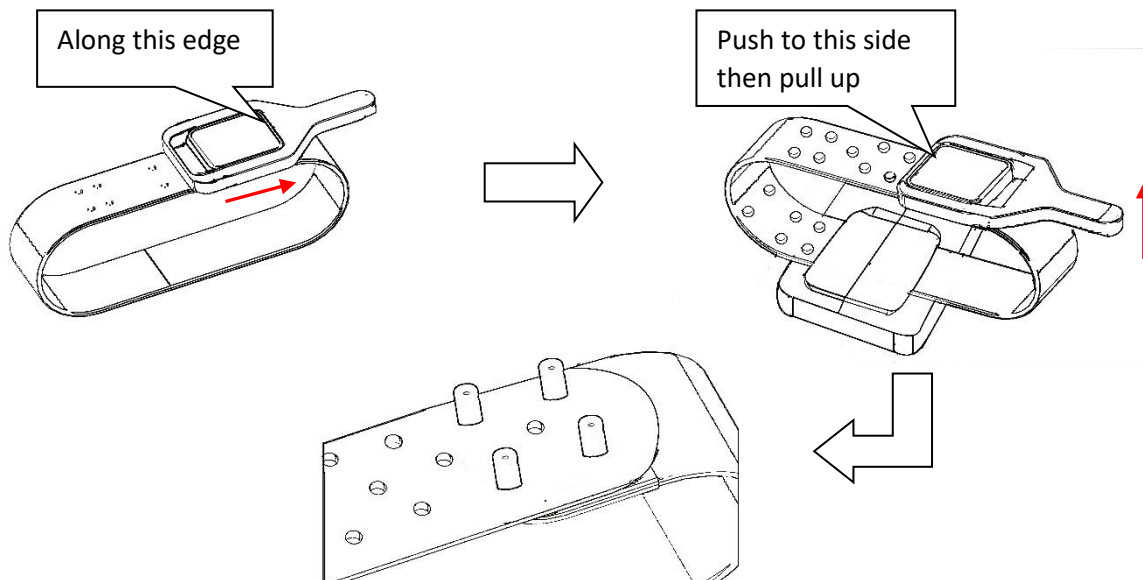
— adjust to suitable size and buckle the belt



— lock the belt



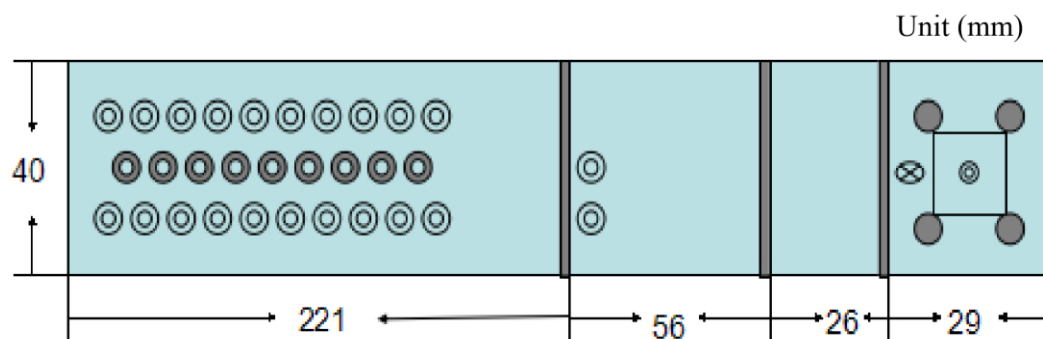
— unlock the belt



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— belt specifications



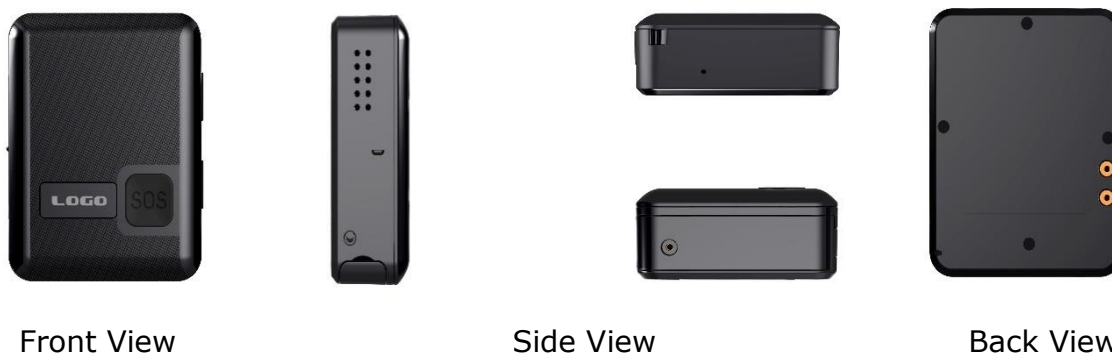
Warranty Statement of Device Belt

Under normal usage, the warranty time is 6 months from the date of purchase.

Please note the device belt belongs to consumable item category. Any extreme usage, externality damage and other causes may result in material aging and cracking, thereby decreases working lifetime. In view of this, the warranty does not cover the following:

- 1) Any damages by externality.
- 2) Any breakdown by extreme usage.
- 3) Any breakage by inappropriate physical environment.

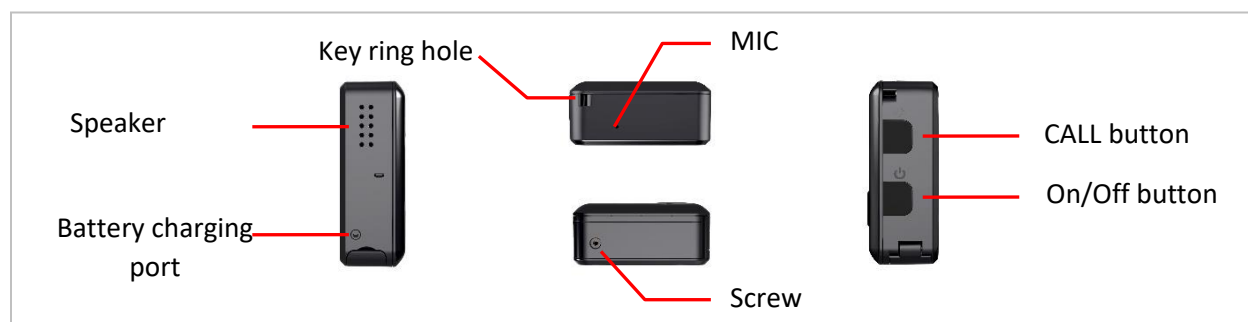
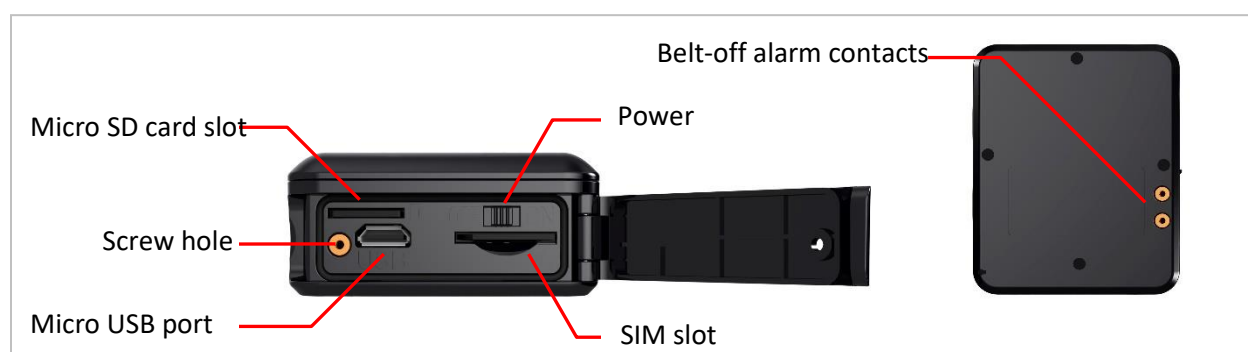
4.3. Tracker Views



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4.4. LED Status, Ports and Buttons Description



Blue LED — GSM LED

Blue LED flashing 0.5s on & 0.5s off	Initializing
Blue LED flashing 1s on & 3s off	Registered to GSM network

Red /Yellow LED — Power LED

The red LED is always on	Charging
--------------------------	----------

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The red LED turn Yellow	Fully charged
Green LED — GPS LED	
Green LED flashing 1s on & 3s off	Positioning success
Green LED flashing 1s on & 1s off	Searching for satellite signal
Button	
On/Off button	Press for 3s to turn tracker on/off
CALL button	Press for 1s to pick up a call, press for 3s to call to an authorized number (vibration touch for calling)
SOS button	Press it for 3s to send an alarm SMS with coordinates
Other ports	
Main power switch	Slide switch to ON position to power on tracker
SIM card and micro SD card slots	Insert SIM and micro SD card
Micro USB port	For setup the parameter and firmware upgrade

4.5. Getting Started

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

4.5.1. Ensure that your tracker has a working SIM card

- Please make sure SIM card has enough credit.
- Please make sure that the SIM is not locked and do not require a password to operate.
- Please make sure the SIM card is supporting caller ID display.

4.5.2. Insert SIM/micro SD card and switch on the main power switch

- Twist off the screws and then open the cover



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-- Attach supplied sticker onto the back of the SIM card, as follow:



- Insert a SIM card, and micro SD card (optional), and switch on the main power switch, as follow:

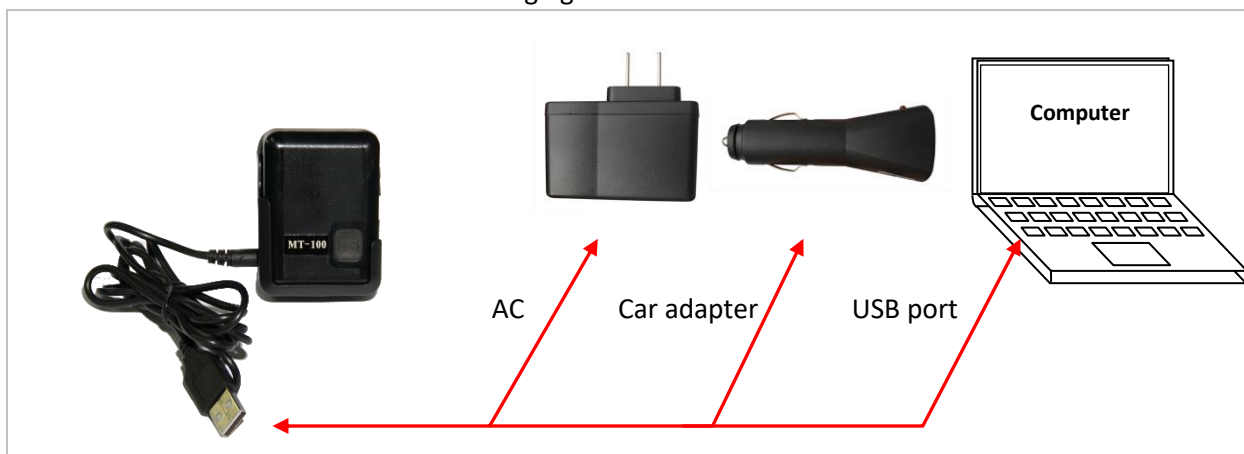


- Close the cover and seal it up with the screw

4.5.3. Charging the Tracker

When using tracker for the first time please charge the battery for at least for 3 hours with the main power switched off. There are three ways to charge: using supplied AC adapter, car adapter, and connecting USB charging cable to USB port of any computer.

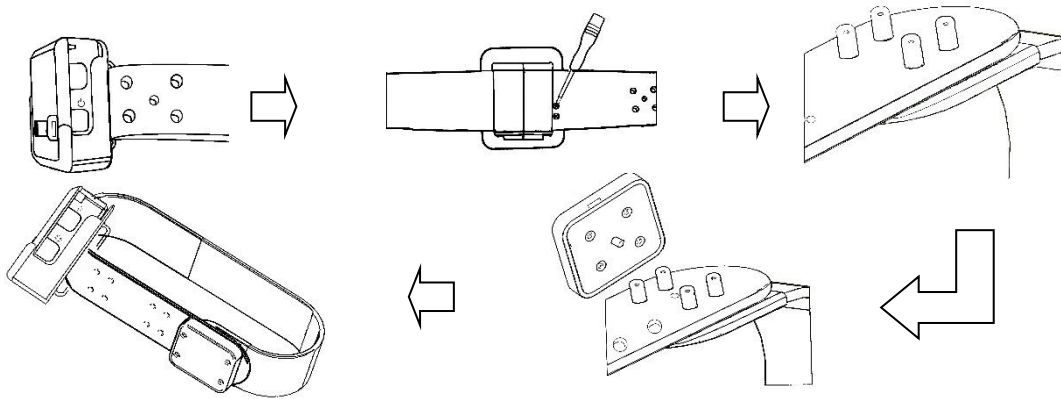
Note: Please turn off the tracker when charging!



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4.5.4. Following these steps to wear the special belt



Make sure that the tracker front side is up to the open sky when the main power is switched on

If the tracker operates normally and positioning successfully, the blue LED flashes 1s on & 3s off; the green LED flashes 1s on & 3s off.

5. Instruction and Function Applications

There are three ways to set up the tracker: SMS command, GPRS command and setup by computer.

Note:

1. All changes to setup require a password. Make sure that you are using correct password otherwise, changes will be rejected.
2. All commands are not case sensitive.

5.1. Change Password

For example:

Command: `FACID,123456,PASSWORD,V=888888`

You receive SMS reply: `FACID password ok!`

123456 is the factory default password, 888888 is the new one.

Password must by six digits!

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5.2. Authorized number

Tracker supports up to 5 authorized telephone numbers, which you can set at your choice. To receive alarms and calls from tracker you must set at least one authorized telephone number. If there are no any authorized number has been set the tracker cannot send out any alarm SMS (but you still can receive alarms through GPRS, if set) and cannot call out.

Advice: set the authorized number first when you first use!

Command:

```
FACID,123456,AUTHORIZE,1=13145826121,2=13145826122,3=13145826123,4=13145826124,5=13145826125
```

SMS reply: FACID authorize ok!

It means that set tracker success.

This command also can set 1 or 2 authorized number only, just don't fill in behind.

Cancel this command:

```
FACID,123456,AUTHORIZE
```

SMS reply: FACID authorize ok!

5.3. Working Mode

Tracking mode:

Default mode is tracking mode, if the tracker is in operation you can get SMS with its current location by dialing from an authorized telephone to the tracker.

If you already set the other working mode and then wanted to go back to tracking mode can use this command to set.

For example:

```
FACID,123456,MODE,Tracker
```

SMS reply: FACID mode ok!

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Call mode:

Command:

`FACID,123456,MODE,CALL`SMS reply: `FACID,123456,MODE,CALL`

At this working mode, if there is a phone call, you will hear a bell; press the CALL button for 1s to answer the phone. If you want to make a phone call by tracker, press the CALL button for 3s to calling the first authorized phone number, if the first authorized phone number can not get through, it will call the second authorized phone number...At the end, if there is no authorized phone number answer the incoming call, tracker will call all the authorized phone number in turn.

Monitoring mode:

Command:

`FACID,123456,MODE,MONITOR`SMS reply: `FACID mode ok!`

When in this mode the tracker will answer incoming call from an authorized number automatically without vibration or sound signal and you can monitor surroundings.

The speaker is mute automatically in surveillance mode.

Long time standby mode:

Tracker do not set up any work tasks; turn the GPS system power supply off via command, so tracker can be low standby power consumption.

For example:

`FACID,123456,config,gpsautosearch=610000` (0—9999999 seconds)SMS reply: `FACID config ok!`

Advice: GPS interval must be set 610000s or longer to activate this mode.

Cancel this command:

`FACID,123456,config,gpsautosearch=600` (600s is the factory standard parameters)

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SMS reply: FACID config ok!

In this mode, you can get its current position by calling to it from an authorized number.

Pet mode (set its working time):

This function is according to set the tracker's working time.

For example:

```
FACID,123456,config,poweron1=10:30,poweroff1=11:00,poweron2=18:30,poweroff2=19:00,powere=1
```

SMS reply: FACID config ok!

Poweren =1 Start the timing switch machine function. Poweren =0 Close the timing switch machine function

poweron1=10:30 turn on time

poweroff1=11:00 turn off time

poweron2=18:30 turn on time

poweroff2=19:00 turn off time

5.4. Tracking by Calling

This function is only effective in tracking mode.

Operation:

Tracker will hand up the phone when authorized number call and it will send a SMS with real time GPS location data. "CUR" means that GPS data by the real time.

1. If there is not the real time GPS data, tracker will send a last effective location data at first and began to search the satellite.
2. It will send a new effective GPS data or the last effective location data after search the satellite.

The last effective location data SMS:

lat: 37.796375N long: -

122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:LAST,,GNS:OGPS:04,92.9,460,00,262C,1073

Real time GPS location data SMS:

lat: 37.796375N long: -

122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:CUR,,GNS:OGPS:04,92.9,460,00,262C,1073

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5.5. Real Time Tracking

Function: send the command: `FACID,123456,SMS,FAST` and get the location by real time. You can get the location immediately when you send this command.

Then you will receive two reply SMS after send the command.

The first one is: `FACID sms ok!`

The second one is location data.

5.6. Upload Regularly Via GPRS

Function: Set an interval for the tracker to continuously send its location to server.

The first step: set GPRS parameter

Send command to tracker (for example):

```
FACID,123456,GPRS,ADDR=219.133.34.184,PORT=8000,NAME=,PASS=,APN=CMNET,ID=,MODE=0,HBE=0
,HBN=HI,HBI=50,HBT=100,HBR=1
```

Reply: `FACID gprs ok!`

ADDR: it is your server's IP.

PORT: your server's port.

NAME: access Point's user name.

PASS: access point's password.

APN: network service access point.

ID: device number.

MODE: communication mode, 0 means that TCP, 1 means that UDP.

HBE: 1 or 0 enable/disable heartbeat function.

HBN: text message of heartbeat.

HBI: heartbeat transmission time interval.

HBT: The number of heartbeat packets sent (when server receives the number of times is full, and it didn't feedback, device will restart.)

HBR: When the tracker can't get the server response, whether to restart (reset switch)

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ADDR,PORT,NAME,PASS,APN,ID,MODE,HBE,HBN,HBI,HBT,HBR (those are according to fill in yourself).

Cancel this command:

FACID,123456,GPRS

Reply: FACID gprs ok!

The second step: set the upload time interval.

Send the command via SMS to tracker: FACID,123456,LOC,I=60,T=20,L=45

Reply: FACID loc ok!

LOC means that command's name,

I=60 means that the upload time interval is 60s, range of: 10-65535.

T=20 means that the upload times is only 20 times, if T=999 means that unlimited upload times.

L=45 means that the distance is less than 45 meters compared to the last position (max: 65535), the tracker will not send the GPS location data to server or authorized number, L=0 means that unlimited

Cancel this command: FACID,123456,LOC

Reply: FACID loc ok!

5.7. Reset Remote

For example:

FACID,123456,RESTART

This command can make the tracker to restart but not reply SMS.

5.8. Restore Default

For example:

FACID,123456,DEFAULT

Reply: FACID default ok!

Restore default successfully.

Tracker has been successfully restored.

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5.9. Tracking Regularly Via SMS

Function: tracker will send the SMS to authorized number by timing.

Set the upload regularly and the upload number of times.

`FACID,123456,LOC,I=60,T=20,L=45`

Reply: `FACID loc ok!`

LOC: means that the command name with positioning regularly.

I=60: means that the location regularly is 60s, range of: 10-65535.

T=20: means that the upload number of times is 20, if T=999 means that unlimited times to upload.

L=45: means compared to latest position, the distance is closer than 45m and the tracker will not send the GPS position to authorized number via SMS; L=0 means that unlimited distance to upload data.

Cancel this command:

`FACID,123456,LOC`

Replay: `FACID loc ok!`

When you use this function, the server's parameter configuration must be cancelled otherwise, it will not send the upload data to authorize number!

5.10. SMS Format

The tracker has two kinds of SMS formats to reply:

1. Ordinary SMS, including longitude and latitude, location state, battery level and satellites act
Command: `FACID,123456,SMS,text`
Reply: `FACID sms ok!`
For example:
lat: 37.796375N long: -
122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:CUR,,GNS:0GPS:04,92.9,460,00,262C,1073
2. Google Link SMS, a data format with can link to Google map.
Command: `FACID,123456,SMS,link`
Reply: `FACID sms ok!`
For example: [http://maps.google.com/maps?f=q&hl=en&q=loc: 37.796375, -122.407872&SP:1.55](http://maps.google.com/maps?f=q&hl=en&q=loc:37.796375,-122.407872&SP:1.55) 21/03/14 17:35 BAT=100% SGL:LAST GNS:0GPS:5

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5.11. Set the Time Zone

Function: default is **GMT+8**, set the time zone of your place so SMS time consistent with local time.

For example:

`FACID,123456,TIME ZONE,V=+9`

Reply: `FACID time zone ok!`

(-12,-11,-10,-9,-8,-7,-6,-5,-4.5,-4,-3.5,-3, -
2,1,0,+1,+2,+3,+3.5,+4,+4.5,+5,+5.5,+6,+6.5,+7,+8,+9,+9.5,+10,+11,+12,+13)

5.12. SD Card Test

If the tracker has an SD card and it cannot receive the GSM signal, the GPRS location data will be saved to the SD card. Upon re-establishing GSM signal, the data will be package for upload!

Send the command:

`FACID,123456,SDCARD,TEST`

Insert SD card, and use this command to test whether the SD card is working or not

Reply: `FACID sdcard ok !` Or `FACID sdcard fail !`

If receive `FACID sdcard fail !` , please check if the SD card is working or not again.

5.13. Over Speed Alarm

Function: both of that will send an alarm when the moving speed is bigger or less than preset value if you set this function.

For example:

`FACID,123456,OV,L=50`

Reply: `FACID ov ok!`

L=50: 65535 is the maximum value, unit is: KM/H

Cancel this function:

`FACID,123456,OV`

Replay: `FACID ov ok !`

Advice: it is suggested to set it higher than 50km/h in order to improve the tracker accuracy

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5.14. Geo-fence Alarm

Function: if already set a Geo-fence, when the tracker is get into or out of the Geo-fence area, it will send an alarm message.

For example:

```
FACID,123456,GEOFENCE,A1=-122.408419e/37.796687n,A2=-122.406756e/37.796068n,B1=-122.408419e/37.796687n,B2=-122.406756e/37.796068n,C1=-122.408419e/37.796687n,C2=-122.406756e/37.796068n,D1=-122.408419e/37.796687n,D2=-122.406756e/37.796068n,E1=-122.408419e/37.796687n,E2=-122.406756e/37.796068n
```

Reply: FACID geofence ok!

Note: A1, B1, C1, D1, E1 for the preset range of the longitude and latitude in the upper left corner, and A2, B2, C2, D2, E2 is preset in the lower right corner of the latitude and longitude

Cancel this function:

```
FACID,123456,GEOFENCE
```

Reply: FACID geofence ok!

5.15. Moving Alarm

Function: if already set this function, when the tracker gets into or out of the moving area, it will send an alarm message.

```
FACID,123456,MOVE,L=200
```

Reply: FACID move ok!

L=200(max: 65535), unit: meters, L: radius.

Send this command and the tracer will search for the first time location of the GPS signals as the center, the tracker will report alarm when it is move in or out of the radius is 200 meters circle.

Cancel this function:

```
FACID,123456,MOVE
```

Reply: FACID move ok!

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5.16. Vibration Alarm

Function: Set the vibration alarm. When the tracker detects enough strength of vibration, it will send an alarm message.

For example:

FACID,123456,VIB,L=5

Reply: FACID vib ok!

Sensitivity level: 1-10 (max: 10)

Cancel this function:

FACID,123456,VIB

Reply: FACID vib ok!

Also can set 3G sensor with this function:

FACID,123456,GSensor,L=40

Reply: FACID gsensor ok!

3G sensor's sensitivity level: 0~50 (max: 50).

Cancel this function:

FACID,123456,GSensor

Replay: FACID gsensor ok!

5.17. Low Battery Alarm

Function: **When the battery level is lower than 30%**, the tracker will send a low battery alarm message to remind users to charge in time.

5.18. SOS Emergency Calling

Function: in an emergency, press the SOS button for 3 seconds (**keep pressed and the LED will extinguish and tracker will vibrate when it is active**), tracker will send an alarm SMS

1. If there is no real-time GPS data, the tracker will send the last effective location data at first and began to search the satellite.
2. It will send a new effective GPS data or the last effective location data after searching the satellite.

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The last effective location data SMS:

lat: 37.796375N long:-

122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:LAST,SOS,GNS:0GPS:04,92.9,460,00,262C,1073

Real time GPS location data SMS:

lat: 37.796375N long:-

122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:CUR,SOS,GNS:0GPS:04,92.9,460,00,262C,1073

5.19. Belt-off Alarm

You will receive a “Belt Off” warning message if the belt lock is unconnected.

1. If there is no real-time GPS data, the tracker will send the last effective location data at first and began to search the satellite.
2. It will send a new effective GPS data or the last effective location data after searching the satellite.

The last effective location data SMS:

lat: 37.796375N long:-122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:LAST,Belt Off,GNS:0GPS:04,92.9,460,00,262C,1073

Real time GPS location data SMS:

lat: 37.796375N long:-122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:CUR,Belt Off,GNS:0GPS:04,92.9,460,00,262C,1073

You will receive a “Belt Up” warning message if the belt lock is connected.

1. If there is no real-time GPS data, tracker will send the last effective location data at first and began to search the satellite.
2. It will send a new effective GPS data or the last effective location data after searching the satellite.

The last effective location data SMS:

lat: 37.796375N long:-122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:LAST,Belt Up,GNS:0GPS:04,92.9,460,00,262C,1073

Real time GPS location data SMS:

lat: 37.796375N long:-122.407872E,SP:0.47,18/04/14 10:19,BAT=100%,SGL:CUR,Belt Up,GNS:0GPS:04,92.9,460,00,262C,1073

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6. Problem and Solutions

Problem: Tracker will not turn on	
Possible cause	Resolution
The power button is not pressed long enough	Press and hold the ON/OFF button for 3 second or more
Battery needs charging	Recharge battery for 3 hours
Problem: Tracker will not reply with SMS	
Possible cause	Resolution
Can not registered to the GSM network (LED flash 0.5 second on and 0.5 second off)	Make sure the GSM signal is good Check the SIM card, Inspect SIM card again If re-inserting does not help, try another one
GSM network is slow	Some GSM networks slow down during peak time or when they have equipment problems.
The SIM card has run out of credit	Replace or top up the SIM card
Problem: LED flash 1 second on and 1 second off	
Possible cause	Resolution
Tracker does not have clear view of the sky	Move the tracker to a location where the sky is visible. Tall buildings, trees, heavy rain, can cause problems with the GPS reception.
Bad GPS reception	Place the front side of tracker towards sky
Problem: Fails to Connect to Server via GPRS	
Possible cause	Resolution
SIM card does not support GPRS function	Enable SIM card GPRS function
GPRS function of tracker is turned off	Turn on GPRS function

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Incorrect IP address or port	Set the right IP address and port, then reset
GSM signal is weak	Move the tracker to a location with good GSM reception

Appendix: SMS Data Format

The cell phone (authorized number) will get the position information via tracker SMS.



There are two kinds of SMS data formats: Latitude and longitude format and Google link format.

Latitude and Longitude format:

lat: 37.796375N long:-122.407872E,SP:0.47,18/04/14

10:19,BAT=100%,SGL:CUR,LowBattery,GNS:OGPS:04,92.9,460,00,262C,1073

Data analysis:

For example	Explain	
lat: 37.796375N	Latitude	
long: -122.407872E	Longitude	
SP: 0.47	Real time speed is 0.47 Km/h	
18/04/14 10:19	Date/time	
BAT=100%	State Of Charge	
SGL:CUR	SGL:CUR	Real time positioning success

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	SGL:LAST	Last valid data
LowBattery	Alarm information, as follow:	
	Alarm type	Explain
	Move in	Tracker gets into preset warning area.
	Move out	Tracker out of the preset warning area.
	Geo in(A,B,C,D,E)	Tracker gets into the preset Geo-fence area.
	Geo out(A,B,C,D,E)	Tracker out of the preset Geo-fence area.
	OverSpeed	The moving speed is higher than preset value
	LowSpeed	The moving speed is lower than preset value
	Help	The SOS button is pressed for 3 seconds or more than 3 seconds
	VIB	Tracker detects enough strength of vibration
	LowBattery	Battery level is lower than 30%
GNS:0	The number of available GLONASS satellites	
GPS:8	The number of available GPS satellites	
92.9	Altitude (unit: meter)	
460	MCC (mobile country code)	
00	MNC (mobile network code)	
262C	LAC (location area code)	
1073	Cell identification code	

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Google link format:

For example:

<http://maps.google.com/maps?f=q&hl=en&q=loc: 37.7855395,-122.4042081&SP:1.55> 21/03/14 17:35 BAT=100% SGL:LAST LowBattery GNS:0GPS:5

Data analysis:

For example	Explain	
http://maps.google.com/maps?f=q&hl=en&q=loc: 37.7855395,-122.4042081&SP:1.55	Google link	
21/03/14 17:35	Date	
BAT=100%	State Of Charge	
SGL:LAST	SGL:CUR	Real time positioning success
	SGL:LAST	Last valid data

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LowBattery	Alarm information, as follow:	
	Alarm type	Explain
	Move in	Tracker gets into preset warning area
	Move out	Tracker out of the preset warning area
	Geo in (A,B,C,D,E)	Tracker gets into the preset Geo-fence area
	Geo out(A,B,C,D,E)	Tracker out of the preset Geo-fence area
	OverSpeed	The moving speed is higher than preset value
	LowSpeed	The moving speed is lower than preset value
	Help	The SOS button is pressed for 3 seconds or more than 3 seconds
	VIB	Tracker detects enough strength of vibration
	LowBattery	Battery level is lower than 30%
GNS:0	The number of available GLONASS satellites	
GPS:5	The number of available GPS satellites	

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