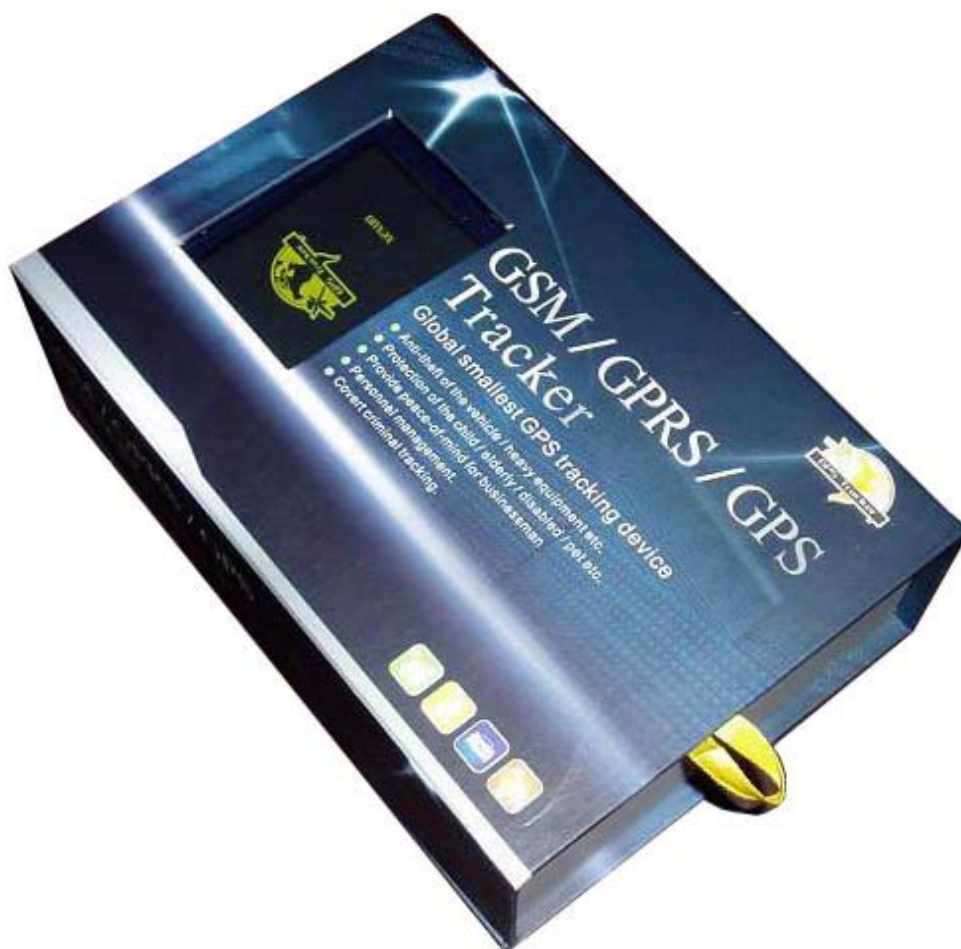

GSM / GPRS / GPS VEHICLE TRACKER

TK103-2



USER MANUAL

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1. Preface

Thank you for purchasing our **tk103-2** GPS Vehicle Tracker. This manual shows you how operate with device smoothly and correctly. Make sure to read this manual carefully before using tracker.

Please note that specifications and informations are subject to changes without prior notice. Any change will be integrated in the future release.

The manufacturer assumes no responsibility for any errors or omissions in this document.

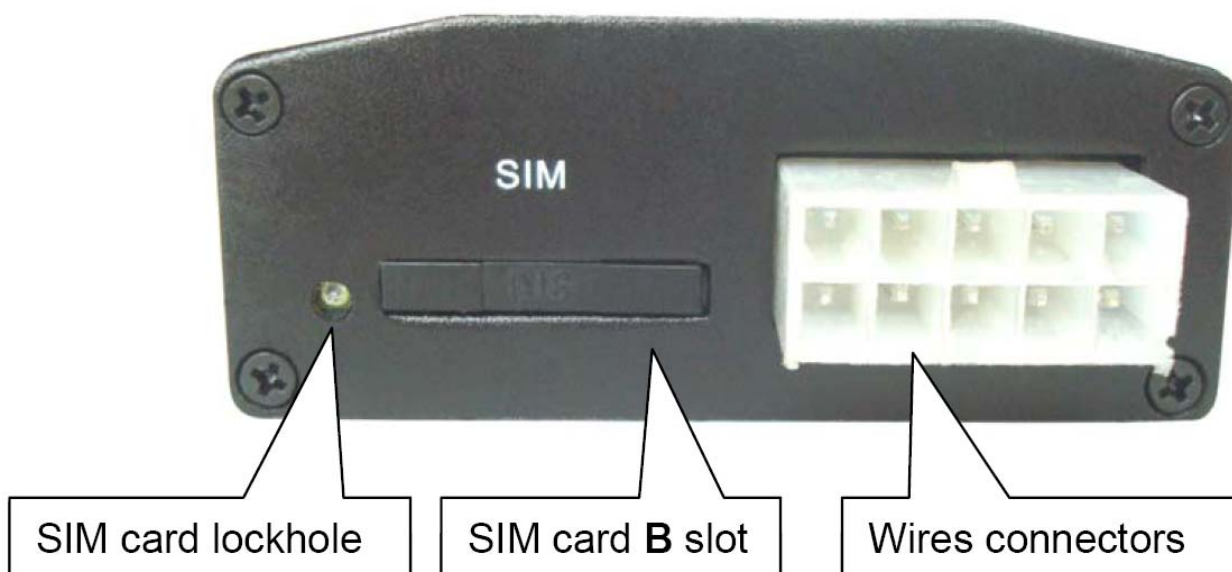
2. Package Contents

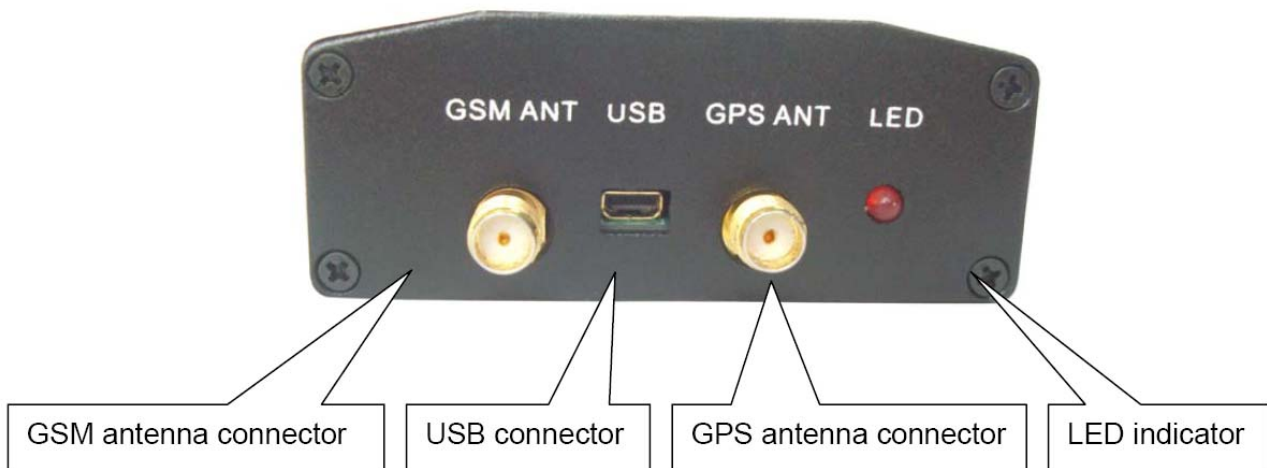


- Tracker **tk103-2**
- GPS antenna
- GSM antenna
- External relay
- Cable with microphone and SOS button
- CD-Rom

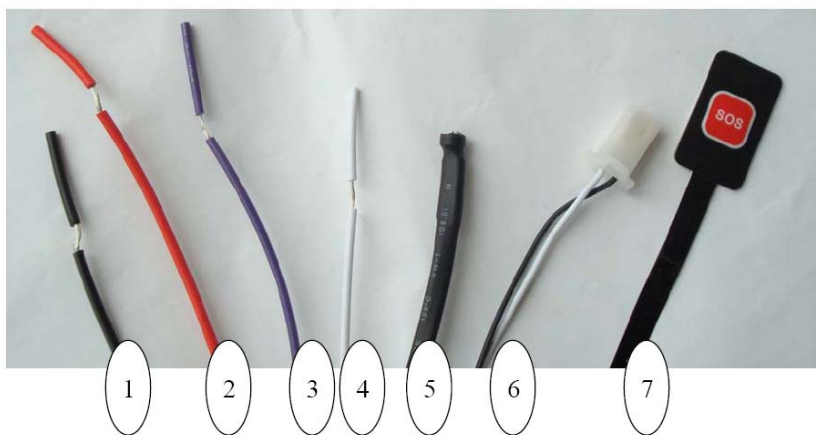
3. Hardware description

3.1. Connectors



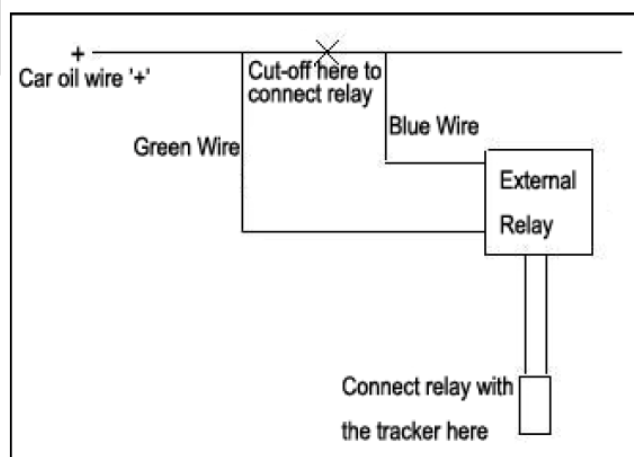
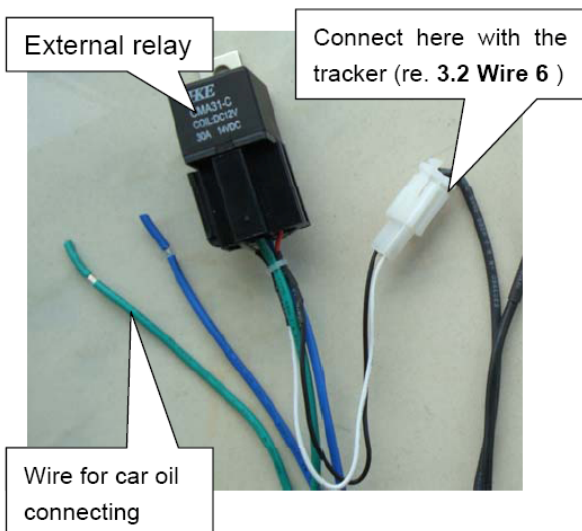


3.2. Wires connection



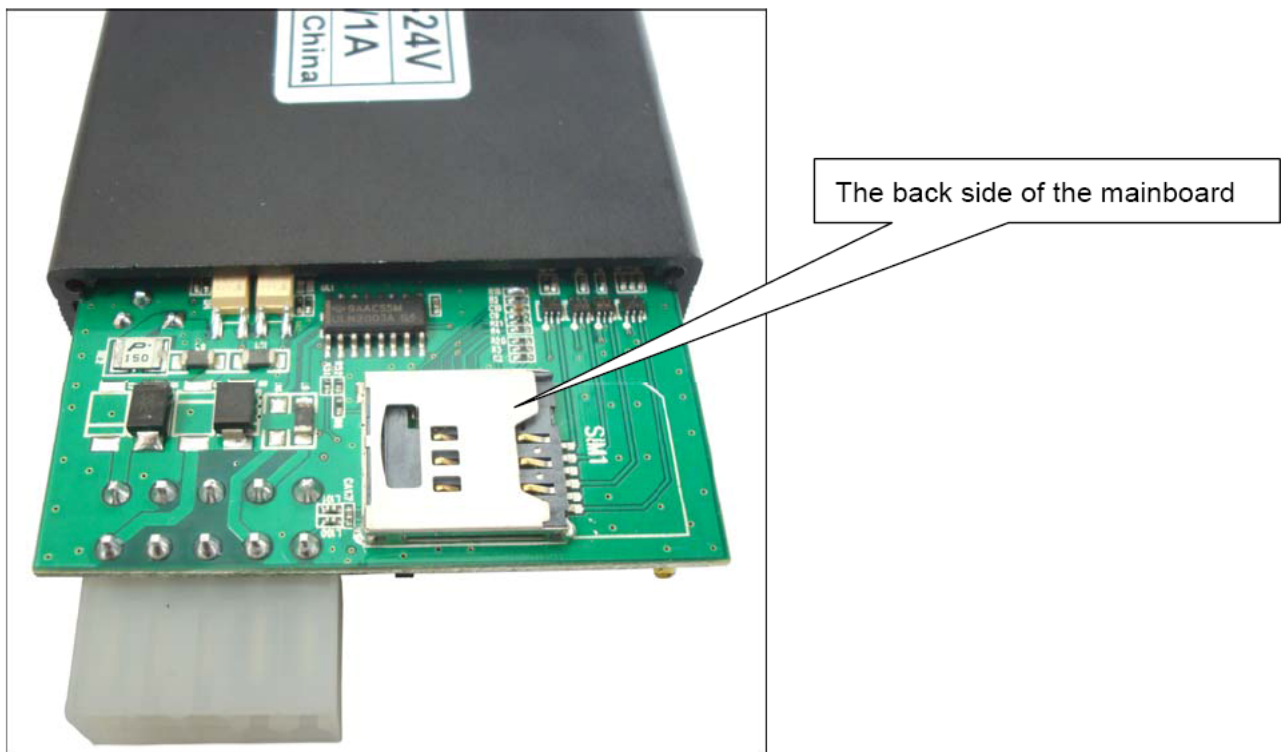
1. Black wire: -12V
2. Red wire: +12V
3. Purple wire: ACC
4. White wire: connecting guard against theft implement (reserve-wire, it can be connected or not)
5. Microphone
6. External-relay connector
7. SOS button

3.3. External relay connection



Note: in certain country you cannot cut car main power cable.

3.4. Internal mainboard



4. Applications

This product can locate and monitor any remote targets by SMS or GPRS using existing GSM/GPRS network and GPS satellites. It can be very useful to guard against vehicle theft. Rental vehicle, Fleet management, etc. Covert tracking.

5. Installation

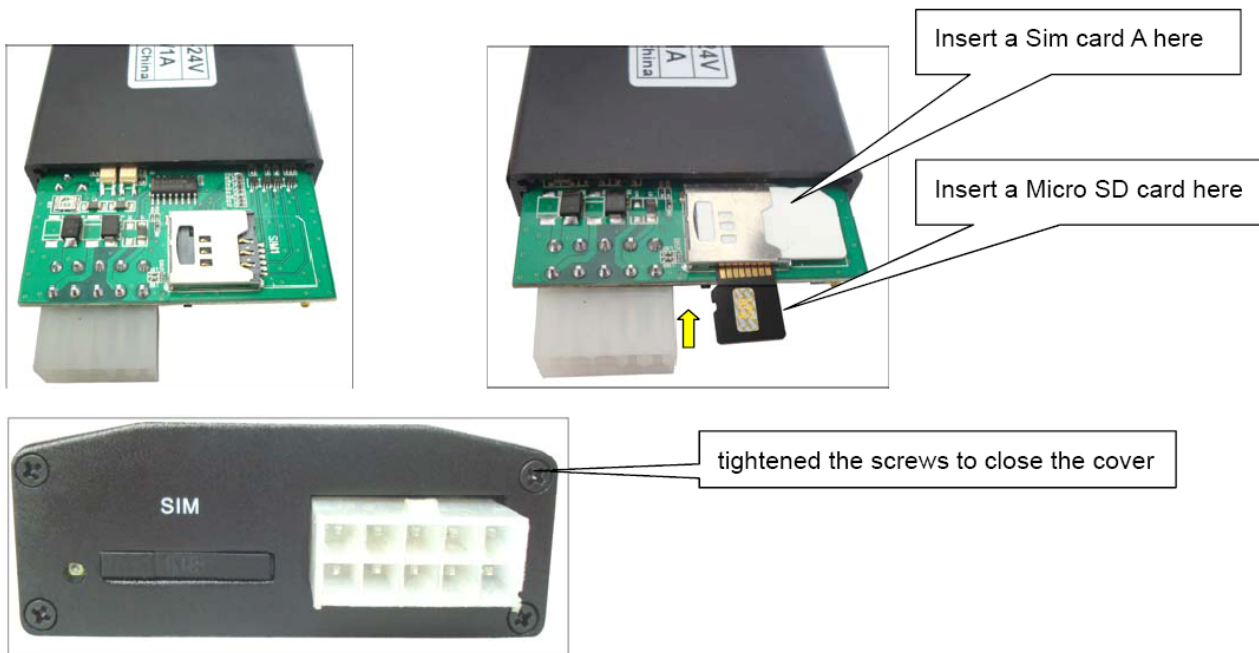
Make sure SIM card have no call transfer, show calling ID is active and PIN code request is off.

5.1. Install SIM card A

1. Open the tracker rear cover
2. Take out mainboard
3. Put SIM card A into its holder

5.2. Install SD card

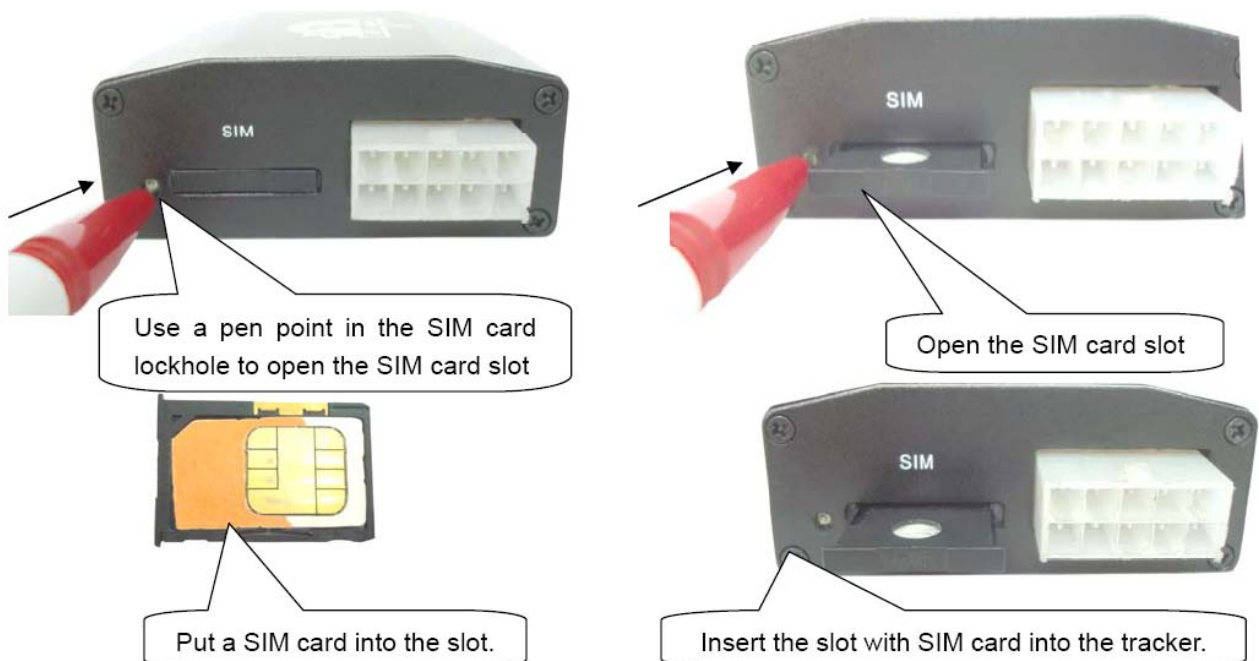
1. If you need, you can install one SD card into socket below SIM card A slot
2. Close the tracker back cover by tightened four screws



5.3. Install SIM card B

1. Use a pen to open the SIM card B slot
2. Put a SIM card B into the slot
3. Insert the slot with SIM card into the tracker

Note: If you use only one sim card, then SIM card must be insert into the SIM card B slot, not in the SIM card A slot on mainboard.



6. SMS format

Follow you can see an example of SMS you receive from tracker:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] [alarm message]* imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

[latitude]	GPS received latitude
[longitude]	GPS received longitude
[speed]	GPS received speed
[date]	GPS received data
[time]	GPS received time
F:[battery voltage]V,	battery voltage
[charging status]	"1" in charge, "0" no charge
Signal:[type of fix GPS]	"F" GPS fix, "0" no GPS fix
[alarm message]	it indicates alarm type (help me!, fortify, moved, etc.) *only present in case of SMS alarm
imei:[imei number]	GSM radio imei number
[number fix satellites]	GPS satellite fixed number
[altitude]	GPS received altitude
[MCC]	Mobile Country Code
[MNC]	Mobile Network Code
[LAC]	Mobile Network Code
[CellID]	GSM cell identities

Note: [MCC]+[MNC]+[LAC]+[CellID] can be added or deleted according to customer's requirement.

7. Startup

Put SIM card A, SD card and battery in place.

Put SIM card B into his slot.

Tracker turns on automatically when SIM card B is inserted into slot, and turns off automatically when SIM card B take out from slot.

Connect GSM antenna and connect GPS antenna to their port.

After you connect wires between tracker and car, you can see red indicator led lights around wires connector (see 3.1 wires connector).

Past 40-60 seconds, unit will start work and receive GSM signals as well as GPS signals. Indicator led start flashing every 1 second when the unit has received this signals. When this unit receives GPS signals normally, you can use it and do all following settings.

Please use following SMS to set up GMT time in SMS you receive from tracker

timezone+ [password]+ space+ [GMT TIME]

Note: power on your tracker outdoor the first time you use it: it can search GPS signal nearby and it also greatly shorten searching time for GPS fix future use.

8. Usage

Tracker has three working modes: **Fortifying** mode, **Tracking** mode and **Monitoring** mode. When you power on tracker, default mode is **Fortifying** mode.

You can send follow commands using SMS message to SIM card B:

Tracker+[password]	switch to tracking mode
monitor+[password]	switch to monitoring mode
fortify+[password]	switch to fortifying mode.

9. Fortifying mode

When you turn on tracker, default mode is **Fortifying** mode. In fortifying mode, you can call tracker to activate protection for your car or vehicle. The indicator will flash one time every 4 seconds when protection is active.

Protection will be deactivated when you call tracker again: indicator will flash one time every 1 second when deactivation is done.

Note: You cannot activate protection for your car while ACC is connected.

Tracker will be triggered to send an alert under one of following conditions:

9.1. Engine started alert

In fortifying mode, if protection is on, tracker examine ACC automatically. It will warn up you when engine is started.

Alert SMS format:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] fortify imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

9.2. Movement alert

This function is using to get an alert when tracker moves out of a restricted district (500m radius).

Alert SMS format:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] moved imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

9.3. Power cutoff alert

In this mode, the tracker will warn up you automatically when main power is cut off unwontedly, such as if someone cut wire connected car to device.

Alert SMS format:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] battery imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

Note: These three alerts occurred only when protection is activated in fortifying mode.

9.4. Application in the car alarm system

If your car has an alarm system, you can connect white wire (re.3.2 wire 4) to positive alarm output on car alarm. Authorized number will receive an alert if car alarm sounds more than 10 seconds.

Alert SMS format:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] trigger imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

9.5. Checking the working status (fortify or no fortify)

You can send SMS command

fortified+[password]

to tracker: it will report “fortify” or “no fortify” to you.

Reply “no fortify” means protection is off during Fortifying mode.

Reply “fortify” means protection is on under Fortifying mode.

When tracker is in **Tracking** mode or **Monitoring** mode, send SMS command

fortify+[password]

to switch to the **Fortifying** mode.

Under **Fortifying** mode, make a call to activate or deactivate protection of your car or vehicle.

10. Tracking Mode

10.1. Initialization

Send SMS

begin + [password]

to tracker: it will reply “**begin ok!**” and initialize all settings.

Note: default password is “123456”

10.2. Change the password

Send SMS

password + [old password] + space + [new password]

to change password.

Note:

- Be sure to remember new password, you have to upload the software to restore original setting in case of losing password.
- Make sure that new password is 6 digits long or tracker cannot recognize it.

10.3. Authorization

Only 5 numbers can be authorized numbers.

10.3.1. Setup

Send SMS

admin+[password]+space+[phone number]

to set up first authorized number. Only the first authorized numbers can setup other authorized numbers. If one number is successfully authorized, the unit will reply SMS as **“admin ok!”**.

10.3.2. Cancel

Send SMS

noadmin+[password]+space+[authorized phone number]

to delete the authorized number.

Note: for roaming purpose, you have to add your country code before your cell phone number. For example: send SMS “admin123456 008613322221111” to tracker to set 13322221111 as an authorized number while country code is 0086.

10.3.3. Request GPS info

When an authorized number call tracker, it will hang up and report a real-time GPS-info as below:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

10.4. Auto-track

This function ask tracker to send user SMS with Geo-info in a certain period of time.

10.4.1. Setup

Send SMS to tracker

t[xxx][u][yyy]n+[password]

where

xxx=interval period in unit [u] between two SMS

u=unit: “s” seconds, “m” minutes, “h” hours

yyy=number of SMS you want receive

Setting [xxx] and [yyy] must be in 3 digits and at maximum 255 in value.

For example: t030s005n+[password] ask tracker to report you GPS-info at 30s intervals for 5 times.

You will receive a reply as **“T030S005N ok!”** if it set successfully.

For example: t030s***n+[password] ask tracker to report you GPS-info at 30s intervals without stop.

You will receive a reply as **“T030S***N ok!”** if it set successfully.

10.4.2. Cancel

Send SMS

notn + [password]

to delete “auto track”.

Note: interval between SMS must not be less than 30s.

10.5. Geo-fence

Set up a geo-fence for tracker to restrict its movement within a district. Unit will send message to authorized numbers when it moves out of this district.

Note: This function will be invalid if tracker moves outside the district. You need to re-set it if you want this function again.

10.5.1. Setup

Send SMS

stockade + [password] + space + [latitude,longitude;latitude,longitude]

to tracker to set restricted district.

Remark: first latitude&longitude is coordinate of the top left corner of Geo-fence, while second latitude&longitude is coordinate of the bottom right corner.

10.5.2. Cancel

Send SMS

nostockade + [password]

to deactivate this function.

Alert SMS format:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] stockade imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

10.6. Movement Alert

Tracker send an SMS alert when it moves out of a restricted district (500m).

10.6.1. Setup

Send SMS

move + [password]

to the unit to set the movement alert.

10.6.2. Cancel

Send SMS

nomove + [password]

to deactivate the movement alert.

Alert SMS format:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] moved imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

Note: tracker sends this alert one time only. After tracker moves outside district it deactivate this setting.

10.7. Overspeed alert

This function is using for the owner to control target's speed.

10.7.1. Setup

Send SMS

speed + [password] + space + [xxx]

where

xxx=speed limit in km/h

Tracker will reply **"speed ok!"**. When target moves exceeding [xxx] km/h speed limit, tracker will send SMS

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] speed [xxx] imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

to authorized numbers. It will keep sending such an alert every 3 minutes.

10.7.2. Cancel

Send SMS

nospeed + [password]

to deactivate the overspeed alert

Note: it is recommended that speed limit alarm is set at least 50km/h. Below that value it may cause false alert due to excursion of the GPS signal influenced by clouds etc.

Tracker will check speed limit in 3 minutes interval and alert you if it is overspeed.

10.8. IMEI checking

Send SMS

imei + [password]

to the unit to check the IMEI number of the unit.

10.9. SOS button

If you press SOS button for 3 seconds, tracker will send SOS SMS to all authorized numbers.

Alert SMS format:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] help me! imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

10.10. Low Battery Alert

If battery voltage is lower than 3.7V tracker begins send SMS to all authorized numbers every 30 minutes.

Alert SMS format:

lat:[latitude] long:[longitude] speed:[speed] [date] [time] F:[battery voltage]V,[charging status],Signal:[type of fix GPS] low battery! imei:[imei number] [number fix satellites] [altitude] [MCC] [MNC] [LAC] [CellID]

10.11. SMS centre (or appointed number)

10.11.1. Setup

Send SMS

adminsms+ [password] + space+ [SMS centre phone number]

to setup SMS centre.

If SMS centre is set up, when an authorized number sends SMS or makes a call to tracker, it will reply with Geo-info & authorized number to SMS centre.

10.11.2. Cancel

Send SMS

noadminsms+ [password]

to cancel SMS center.

Response SMS format: **“authorized number+Geo-info”**.

Note: SMS message must be in text format, it can't be identified in PDU format.

10.12. GSM ID

There is GSM ID info in each SMS from tracker. Tracker's location can be found according to GSM ID in case of no GPS fix. GSM ID is make up from MCC (Mobile Country Code), MNC (Mobile Network Code), LAC (Location Area Code) and Cell ID.(refer to par. 7)

Note: this function can be added or deleted according to customer's requirements.

10.13. Motion sensor

Tracker sends you an SMS alert if someone touches it.

10.13.1. Setup

Send SMS

shake+ [password] + space+ [xx]

where

xx= 01 to 10

to tracker to set up this function (1-10 indicates intensity level).

For example: **shake+[password]+space+1** set tracker to lightest intensity level. Tracker will send you alert if someone touches unit slightly.

shake+[password]+space+10 set to strongest intensity level: tracker will send you alert if someone touches unit heavily.

10.13.2. Cancel

Send SMS

shake+[password]+space+0

to remove this function.

Note: this function can be added or deleted according to customer's requirements.

10.14. SD card function

A micro SD card can be put in the tracker's SD card slot. GPS data can be saved in SD card if GPRS network is off. Tracker will send data to server again when GPRS is on again.

10.14.1. Setup

Send SMS

sdlog[password]+space+1

to tracker to activate storing data in SD card function.

10.14.2. Cancel

Send SMS

sdlog[password]+space+0

to tracker to deactivate storing data in SD card function.

10.14.3. Start send data

Send SMS

readsd+[password]+space+1

to ask tracker to send data stored in SD card to server using GPRS.

10.14.4. Stop send data

Send SMS

readsd+[password]+space+0

to ask tracker to stop sending data stored in SD card to server using GPRS.

10.15. SIM card A-B switch

When you insert two SIM cards into tracker, SIM card A and B are not working at the same time. Default working card is SIM card B, but you can switch between two SIM sending SMS to tracker.

10.15.1. Switch SIM A to work

While SIM card B is working, send SMS command

selectsim+[password]+space+a

to SIM card B.

One minutes later, SIM card A starts to works while SIM card B stop working.

10.15.2. Switch SIM A to work

While SIM card A is working, send SMS command

selectsim + [password] + space + b

to SIM card A.

One minutes later, SIM card B will start to work again instead of SIM card A.

Note: When you insert two SIM cards into tracker and working SIM card loses GSM signal, tracker will work with other SIM automatically.

11. Monitoring Mode(voice surveillance mode)

11.1.1. Setup

Send SMS

monitor + [password]

tracker responds to you “**monitor ok!**” and switch itself into “Monitoring mode”.

When you call tracker, you can hear voices and sounds around tracker.

11.1.2. Cancel

Send SMS

Fortify + [password]

or

Tracker + [password]

to deactivate “Monitoring mode” and switch tracker to “Fortifying mode” or “Tracking mode”.

12. Remote oil & electricity cut-off function

This function is using for the car owner to send a SMS remotely to stop a moving vehicle. Please note that in certain country you cannot cut car main power cable.

12.1.1. Setup

Send SMS command

powercar + [password] + space + 00

to tracker to cut off car oil and electricity.

Tracker reply “**POWERCAR ok!**” to you when setting is successful.

12.1.2. Cancel

Send SMS command

powercar + [password] + space + 11

to tracker to restart car again.

Tracker reply “**POWERCAR ok!**” to you when setting is successful.

13. GPRS setting

If you want to use GPRS function, you need to set IP, Port and APN (access point name).

Note: Some GSM operators may request to set APN User Name and APN Password, too.

13.1. Set an IP address and port:

13.1.1. Setup

Send SMS

adminip+[password]+space+[IP address]+space+[port]

Tracker will reply with SMS **"ADMINIP ok!"**

13.1.2. Cancel

Send SMS

noadminip+[password]

13.2. Set APN

13.2.1. Setup

Send SMS

apn+[password]+space+[APN-SIM-B]+space+[APN-SIM-A]

Tracker will reply with SMS **"APN ok!"**.

13.2.2. Cancel

Old APN will be deleted automatically when you set a new APN.

13.3. Set APN User Name

13.3.1. Setup

Send SMS

apnuser+[password]+space+[APN user name]

Tracker will reply with SMS **"APNUSER ok!"**.

13.3.2. Cancel

Old APN user name will be deleted automatically when you set a new APN user name.

13.4. 12.4 Set APN Password

13.4.1. Setup

Send SMS

apnpasswd+[password]+space+[APN password]

Tracker will reply with SMS **"APNPASSWORD ok!"**.

13.4.2. Cancel

Old APN password will be deleted automatically when you set a new APN password.

13.5. GPRS transport protocols

After you set IP & Port & APN, you can use tracker as describe in Fortify or Tracker mode. Tracker will report alarm GPS info to server with IP address you indicate using “adminip” command, too.

Tracker send message to server using this format:

[serial number],[authorized number],[GPRMC],[type of fix GPS],[message],imei:[imei number],[number fix satellites],[altitude],[battery status],[charging status],[GPSlen],[crc16],[MCC],[MNC],[LAC],[CellID]

[serial number]	GPS date+GPS time
[authorized number]	Tracker authorized number
[GPRMC]	Nmea GPS info string
[type of fix GPS]	“F” GPS fix, “L” no GPS fix
[message]	it indicates message type (help me!, fortify, moved, etc.)
imei:[imei number]	GSM radio imei number
[number fix satellites]	GPS satellite fixed number
[altitude]	GPS received altitude
[battery status]	“F:4.11V” full battery, “L:3.65V” low battery
[charging status]	“1” in charge, “0” no charge
[GPSlen]	GPS string length
[crc16]	CRC16 checksum
[MCC]	Mobile Country Code
[MNC]	Mobile Network Code
[LAC]	Mobile Network Code
[CellID]	GSM cell identities

For example:

090907070718,13145826175,GPRMC,070718.000,A,2234.0228,N,11403.0764,E,0.00,,070909,,A*73,F,,imei:354776030042714,05,50.1,F:4.11V,0,132,40512,460,01,2533,720B

Notes:

- GSM ID can be added or deleted according to customer’s requirement.
- Our tracker supports TCP or UDP protocol: please confirm what protocol you need before order.
- Please use SIM card with GPRS function.

13.6. Set website

13.6.1. Setup

Please use following SMS to set up your website in SMS you receive from tracker
home+[password]+space+[httplink]

13.6.2. Cancel

Please use following SMS to delete your website in SMS you receive from tracker
home+[password]+space+space

14. Cautions

- Keep the unit dry. Any liquid as rain, moisture, etc, may destroy or damage electronic mainboard.
- Don't use or store tracker in dusty places.
- Don't put tracker in overheated or overcooled places.
- Handle carefully.
- Don't vibrate or shake it violently.
- Clear tracker with a piece of dry cloth. Don't clean using chemicals detergent.
- Don't paint tracker: this may cause some foreign materials left in between parts.
- Don't disassemble or refit tracker.
- Please use battery (and charger if you need) provided by manufacturer. Using other batteries and chargers will cause unwanted situation.
- Don't dismount antenna randomly, or use different antennas. This may interfere transmission, and increase radiation as well.

15. Faults & solutions

<i>Faults</i>	<i>Solutions</i>
Startup fail	Check battery charge or battery correct installation
Hangup fail	If authorized number is set, an unauthorized number call tracker. Please initialize tracker and re-setup correct authorized number
Monitor fail	Check if authorized number is setup or GSM intensity level
Indicator keep on flashing quickly	Check SIM card to see if it is put in correct place
SD card storing data fail	Check SD card to see if it is put in correct place.
Location report in zeroes digits	Tracker has no GPS fix: place tracker outdoor, especially when starting it up

Notes:

- *Tracker can send alarm SMS one time for each alarm event, or many time for each alarm event, according to customer's requirements.*
- *Tracker supports receive commands by GPRS server or by USB cable, with same syntax of SMS commands.*

16. Specifications

Content	Specs.
Dimension.	80mm x 60mm x 25mm
Weight	100g
Network	GSM/GPRS
Band	850/900/1800/1900Mhz or 900/1800/1900Mhz
GPS chip	SIRF3 chip
GPS sensitivity	-159dBm
GPS accuracy	5m
Time To First Fix	Reacquisition 0.1s Cold status 45s Warm status 35s Hot status 1s
Car charger	12-24V input 5V output
Battery Chargeable	changeable 3.7V 1100mAh Li-ion battery
Standby	50hours
Storage Temp.	-40°C to +85°C
Operation Temp.	-20°C to +55°C
Humidity	5%-95% non-condensing

Your notes:

[illegible]