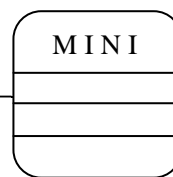


Mini Tracker

User Manual

VA1.0

MT90X



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1. Products Overview

Thanks for purchasing our product !

MT90X is a waterproof (IP67), small, light tracker.

MT90X is easy to take and specially designed for children, old man, disabled people and pet.

Through GPS and GSM or GPRS communication, MT90X can get its position and send the position data to your telephone or sever for personal tracking.

MT90X supports SOS button to send SMS alarm for rescue, and has a special charger.

MT90X has the following features and functions:

- ◆Waterproof (IP67)
- ◆SMS and GPRS TCP/UDP Communication
- ◆Support setting 5 authorized cell phone numbers
- ◆Track on demand
- ◆Track by time interval
- ◆Geo-fencing control
- ◆Spot Alarm
- ◆SOS button for immediate rescue and alarm
- ◆Speed limit alarm
- ◆Low battery alarm
- ◆Vibration alarm
- ◆Hit alarm
- ◆AGPS
- ◆3G-sensor
- ◆Data Logger in no GSM signal area using Micro SD card (Max: 2GB)



2. MT90X Characteristics

Items	Specification
Charging Voltage	DC 4.2-5.5V/400mA (Mini USB port)
Battery	Rechargeable 750mAh battery (3.7V),
Dimension	50mm X 40mm X 20mm
Weight	50g (with battery)
Operating Temperature	-20°C to 55°C
Humidity	5% to 95% Non-condensing
GSM Module	Quad Band GSM 850/900/1800/1900MHz
GPS Chipset	U-blox GPS Chipset
GPS Sensitivity	-159 dB
GPS Frequency	L1 1575.42MHz
C/A Code	1.023 MHz chip rate
Channels	20 channel all-in-view tracking
Position Accuracy	< 15 M 2D RMS
Velocity Accuracy	0.1 M/S
Time Accuracy	1 us synchronized to GPS time
Reacquisition	0.1 ms
Hot Start	1 sec., average
Warm Start	35 sec., average
Cold Start	37 sec., average
Altitude Limit	18,000 meters (60,000 feet) max.
Velocity Limit	514 meters/second (1000 knots) max.
Acceleration Limit	Less than 4g
Work Time	Send GPRS data every 1 minutes, work 18 hours
	Send GPRS data every 3 minutes, work 37 hours
	Send GPRS data every 5 minutes, work 45 hours
	Send GPRS data every 10 minutes, work 60 hours
Standby Time	Search the satellite every 10 minutes, standby time is 4 days
	Turn off the GPS module, standby time is 7 days.
Memory	Micro SD card (MAX:2GB) (optional)
LED	1 LED lights to show GPS, GSM and other status.
Button	1 SOS button to send SMS for rescue

3. Getting Started

This section will describe how to set up your MT90X.

3.1. Hardware and Accessories



USB Cable



Charger Connector



Wall Charger



Vehicle Charger



CD Rom

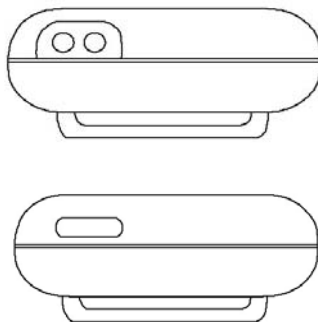


Spare Tools

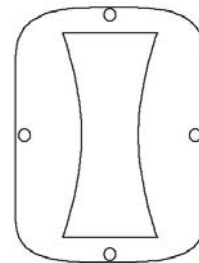
3.2. View



Front View

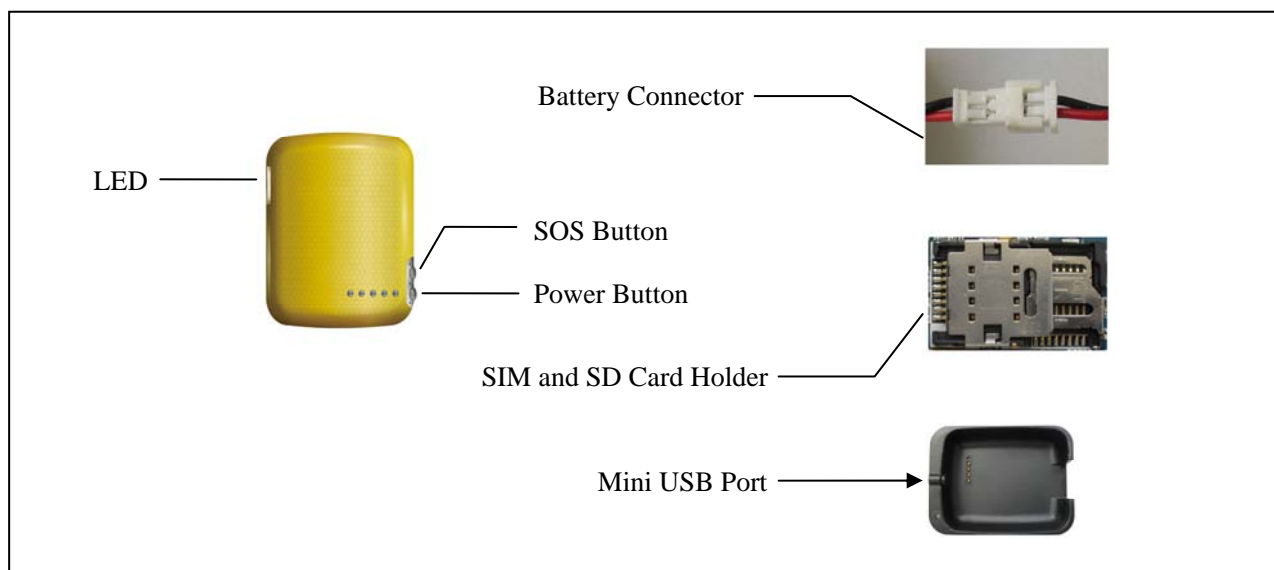


Side View



Back View

3.3. Functional Parts



LED	
0.5s on and 0.5s off	Initializing / Low battery
1s on and 1s off	Registered to the GSM network and searching satellite
1s on and 3s off	GPS fixed
Buttons	
Power Button	Press it for 3 seconds to turn on or turn off tracker
SOS Button	Press it for 3 seconds to send a SMS to authorized numbers.
Other connectors	
Battery Connector (Inside)	Connect the Backup-Battery-Connector when first use the tracker.
SIM and SD Card Holder (Inside)	Insert SIM and SD card here
Mini USB Port	Used for charging, firmware update, configuration on PC

3.4. Connecting and Installation

Please read this manual before using MT90X and check if all parts are included in the packaging box.

3.4.1 Ensure that your MT90X has a working SIM card.

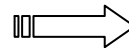
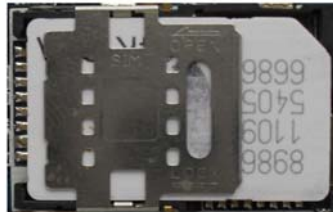
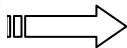
- Check that the SIM card has not run out of credit (Test the SIM card in a phone to make sure it can send and receive SMS)
- Check that lock code of the SIM card is turned off.
- If you require the function of sending an SMS location report to the authorized phone number when it makes a call to the MT90X, please make sure the SIM card installed supports displaying caller ID.

3.4.2 Insert SIM/SD card and install backup battery.

- Unscrew the back cover of MT90X as below picture shows:



- Firstly insert the SD card, secondly insert the SIM card, lastly connect the Backup Battery Connector.

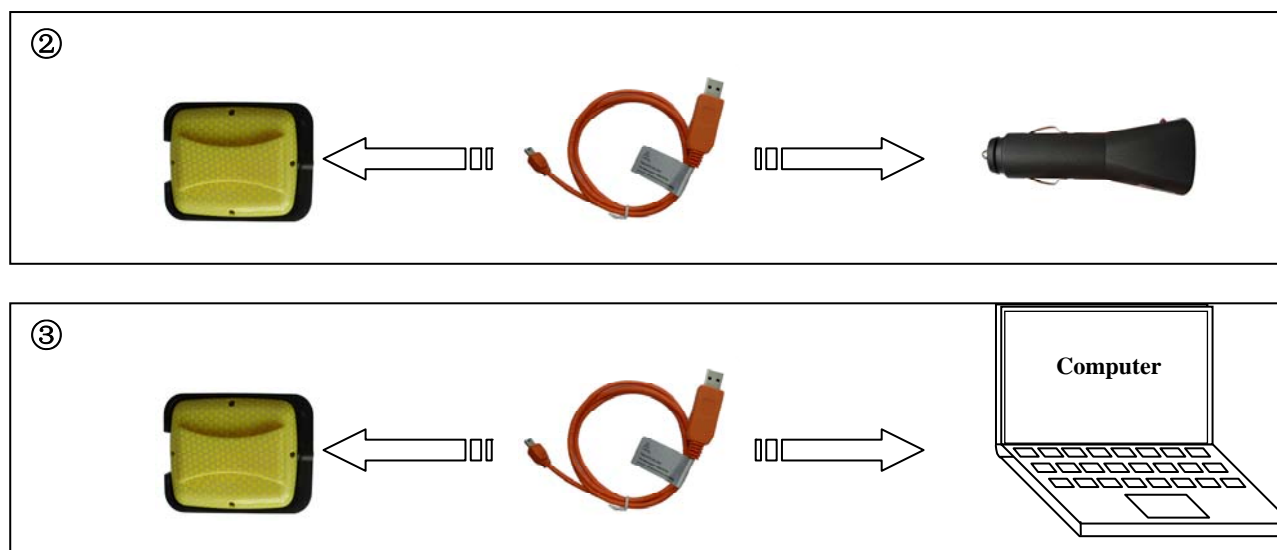


- Put back the back cover and screw it up.

3.4.2 First use of MT90X, please charge the battery for at least 3 hours in power-off status using the wall charger or vehicle charger. Or you can connect the tracker directly to computer by USB for charging.

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





3.4.2 Find a suitable place for installing MT90X, make sure the front cover face sky.

- Check that the LED is 3s off and 1s on.
- Make a missed phone call the MT90X using a mobile phone to check if the calling can go through.

4. Change Password

Command: facid,*****,password,#####;

Description: Change user's password.

Note:

All commands are case insensitive!

1. ***** is user's password and the default password is 123456. Device 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:

facid,123456,password,000000;

facid,000000,password,123456;

5. Default

Command: facid,123456,default;

Description: Restore all default settings.

Note:

Be careful to use this command.

Example:

Facid,123456,default;

6. Authorization

Command: facid,123456,authorize,offset=phone number;

Description: Set authorized phone numbers.

Note:

1. **offset:** 1~5, totally you can set five authorized numbers
2. **phone number:** 0~15 chars, authorized phone number
3. **Cancel command:** facid,123456,authorize;

Example:

facid,123456,authorize,1=131111111111;

facid,123456,authorize,1=131111111111,4=134444444444;

facid,123456,authorize,1=131111111111,2=132222222222,3=133333333333,4=134444444444,5=135555555555;

7. SMS

7.1. Track by SMS

Command: facid,123456,sms,fast;

Description: Get the latest location

Note:

Tracker will reply back a SMS with latest location to user after sending this command.

Example:

facid,123456,sms,fast;

You will receive a SMS look like:

lat:22.636707N long:114.032707E,SP:0.00,19/09/11

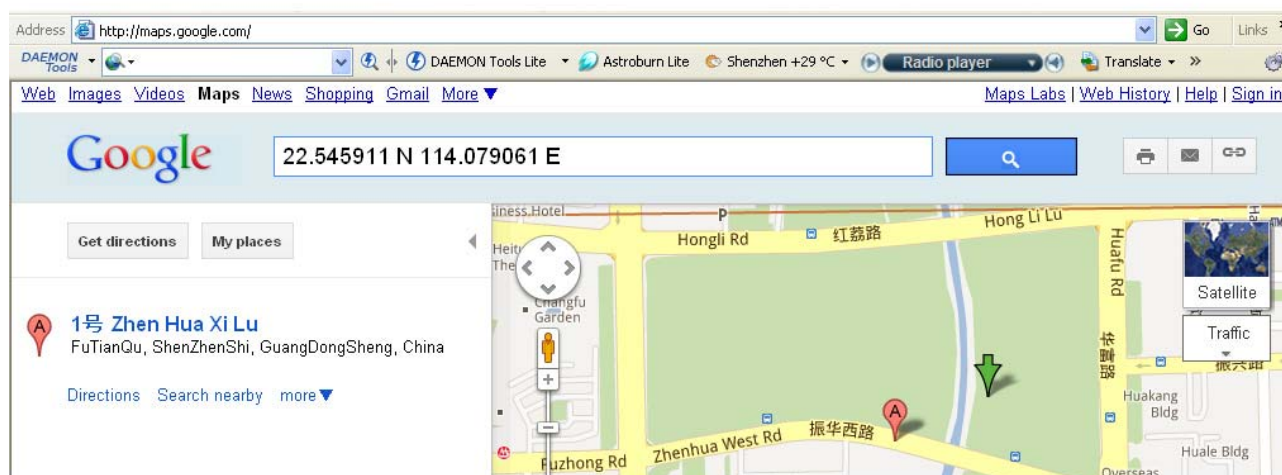
12:13,BAT=20%,SGL:CUR,LowBattery,GPS:04,122.5,460,01,2531,6447

Analysis:

lat:22.636707N	Latitude	
long:114.032707E	Longitude	
SP:0.00	Speed is 0.00 Km/h	
19/09/11 12:13	Date and time	
BAT=20%	Battery power	
SGL:CUR	SGL:CUR	GPS is fixed when sending data

	SGL:LAST	GPS is not fixed when sending data
LowBattery	Alarm information	
GPS:04	Number of valid satellite	
122.5	Altitude	
460	MCC(Mobile Country Code)	
01	MNC(Mobile Network Code)	
2531	LAC(Location Area Code)	
6447	Cell ID	

7.2. Get Position in Google Map



7.3. Track by Calling

Any authorized number makes a missed call to the tracker and the tracker will report its longitude and latitude by SMS.

7.4. Track by Preset Interval

Command: facid,123456,loc,i=**interval**,t=**times**,L=**distance override**;

Description: Set an interval for the tracker to continuously send its location by SMS to authorized phone number.

Note:

1. **interval**: 0~65535, unit is second, 0 means no setting
2. **times**: 0~999, 0 means no data to send, 999 means unlimited times to send data
3. **distance override**: 0~65535, distance override to send data, 0 means no setting. *May be*

this option is difficult to understand, so you can see the *Example1* and *Example2* for more information.

4. **Cancel command:** facid,123456,loc;

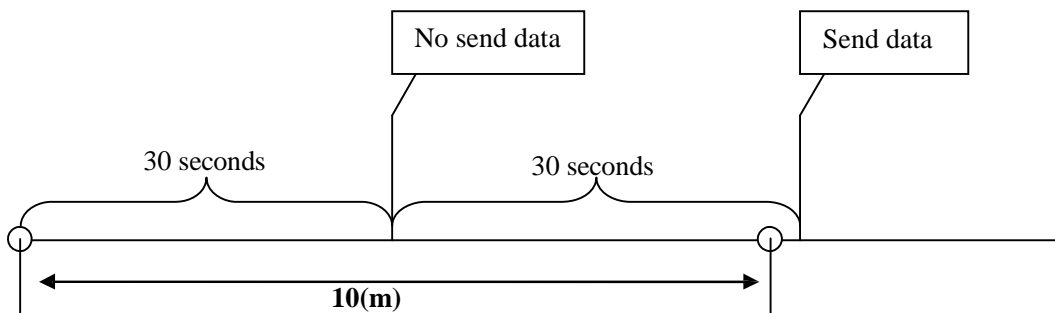
Example:

facid,123456,loc,i=30,t=50,L=0;

The tracker will send location back to authorized phone number every 30 seconds, total 50 locations.

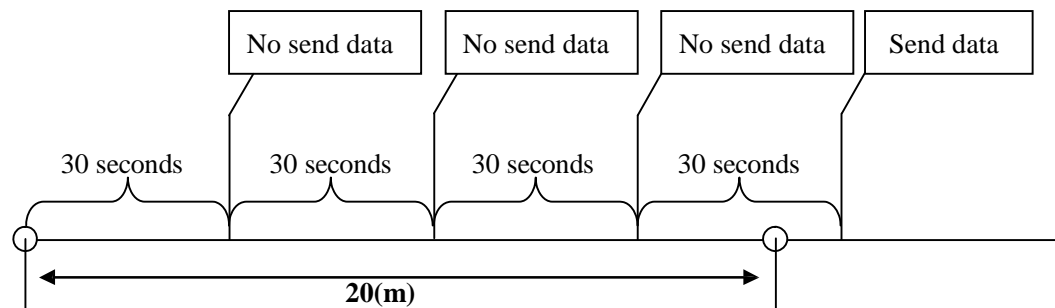
Example1:

Interval=30, Limited Times=999, Distance Override=10



Example2:

Interval=30, Limited Times=999, Distance Override=20



7.5. SMS Format

Command: facid,123456,sms,format;

Description: Set the SMS format.

Note:

1. **Format=text:** default setting, reply SMS with latitude and longitude
2. **Format=link:** reply SMS with Google map link

Example:

facid,123456,sms,link;

facid,123456,sms,text;

8. GPRS

Command: facid,123456,gprs,addr=IP address,port=port number,name=user name,pass=password,APN=APN,ID=identifier,mode=mode,HBE=HBE ,HBN=HBN,HBI=HBI ,HBT=HBT,HBR=HBR,SaveAll=SaveAll;

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

Note:

1. IP address: 0~31 chars, IP address is your server's IP
2. port number: 0~65535, your server's port
3. user name and password: each 0~31 chars, user name and password are optional. If no username and no password are required, just input APN only.
4. APN: 0~31 chars, Access Point Name, please contact with your network provider for more information
5. identifier: 0~19 chars, identifier of you tracker, you can set as you want
6. mode: 0 or 1, communication mode, 0 means TCP, 1 means UDP
7. HBE: 1 or 0 enable/disable heartbeat
8. HBN: text message of heartbeat (0-15 chars)
9. HBI: heartbeat time interval in second (0-65535)
10. HBT: total times of heartbeat messages (0-999), if T=999 sending continuously
11. HBR: 1 or 0 enable/disable the restart the GPRS module
12. SaveAll: 0 or 1 send the data to server/ save to SD card
13. **Cancel command:** facid,123456,gprs;

Example:

facid,123456,gprs,addr=113.90.7.193,port=7000,name=,pass=,APN=CMNET,ID=88888,mode=0,HBE=1,HBN=HI,HBI=50,HBT=999,HBR=1,SaveAll=1;

Tracker will send GPRS data to server every 50 seconds, "HBT=999" means unlimited times, the server's IP is 113.90.7.193, the server's port is 7000.

9. Speeding Alarm

Command: facid,123456,ov,L=speed;

Description: When the tracker's speed become higher or lower than the preset value, it will send an SMS to authorized phone number or send this alarm to server (if GPRS connected).

Note:

1. speed: 0~65535, unit is Km/h
2. speed=0: turn off speeding alarm
3. **Cancel command:** facid,123456,ov;

Example:

facid,123456,ov,L=80;

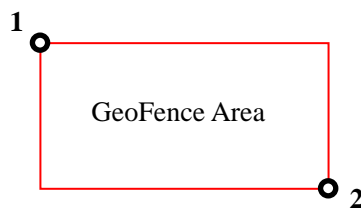
When the tracker's speed is higher or lower than 80Km/hr, speeding alarm will be sent out.

10. GeoFence Alarm

Command:

facid,123456,geofence,A1=114.000000e/22.400000n,A2=113.800000e/22.600000n,B1=114.000000e/22.400000n,B2=113.800000e/22.600000n,C1=114.000000e/22.400000n,C2=113.800000e/22.600000n,D1=114.000000e/22.400000n,D2=113.800000e/22.600000n,E1=114.000000e/22.400000n,E2=113.800000e/22.600000n;

Description:



When the tracker get into or out of the GeoFence Area, it will send an SMS to authorized phone number or send this alarm to server (if GPRS connected).

Note:

1. 114.000000e: longitude of point 1
2. 22.400000n: latitude of point 1
3. 113.800000e: longitude of point 2
4. 22.600000n: latitude of point 2
5. **Cancel command:** facid,123456,geofence;

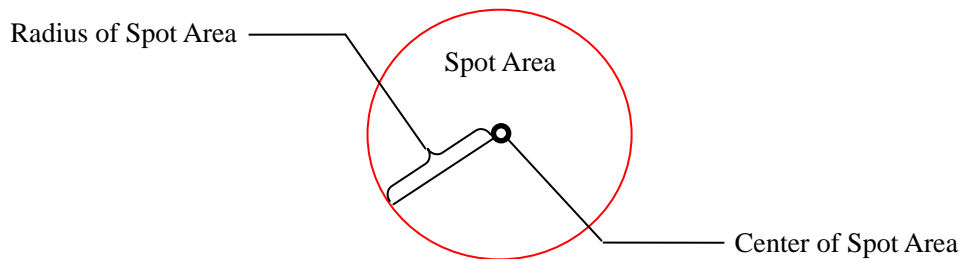
Example:

facid,123456,geofence,A1=114.000000e/22.400000n,A2=113.800000e/22.600000n,B1=114.000000e/22.400000n,B2=113.800000e/22.600000n,C1=114.000000e/22.400000n,C2=113.800000e/22.600000n,D1=114.000000e/22.400000n,D2=113.800000e/22.600000n,E1=114.000000e/22.400000n,E2=113.800000e/22.600000n;

11. Spot Alarm

Command: facid,123456,move,L=radius;

Description:



The center of Spot Area is the latest position. When the tracker get into or out of the Spot Area, it will send an SMS to authorized phone number or send this alarm to server (if GPRS connected).

Note:

1. **radius:** 0~65535, radius of Spot Area, unit is meter
2. **Cancel command:** facid,123456,move;

Example:

facid,123456,move,L=200;

12. Vibration Alarm

Command: facid,123456,vib,L=**sensitivity**;

Description: Set the vibration alarm. When the tracker detects enough strength of vibration, it will send an SMS to authorized phone number or send this alarm to server (if GPRS connected).

Note:

1. **sensitivity:** 0~10
2. **sensitivity**=0: turn off vibration alarm
3. **sensitivity**=1: lowest sensitivity
4. **sensitivity**=10: highest sensitivity
5. **Cancel command:** facid,123456,vib;

Example:

facid,123456,vib,L=5;

13. Motionless alarm

You will receive a warning message if the tracker in the stationary state for certain period. The motionless alarm will be enabled after configuring the vibration alarm.

FACID,123456,VIB,L=5

L= sensitivity of 3G-sensor (1-10). 1=low sensitivity, 10=high sensitivity.

If you only need motionless alarm rather than vibration alarm, please send the following command to disable vibration alarm of the tracker:

```
FACID,123456,LOC,SHAKE=1
```

SHAKE=1/0 disable/enable vibration alarm

14. Motionless time setting

To set the motionless time of the tracker please use command as below:

```
FACID,123456,CUSTOMIZE,NoMotion=900(0-65535s)
```

NoMotion = your specified time in second

To cancel this setting:

```
FACID,123456,CUSTOMIZE
```

15. Low Battery Alarm

Description: When battery voltage is lower than 3.7V(25%), tracker will send an SMS to authorized phone number or send this alarm to server (if GPRS connected).

16. 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).

17. Hit alarm

You will receive a warning message in case if the device suffered a hit by sending following command:

```
FACID,123456,GSensor,L=40,hit=40
```

L=40 shock sensitivity (0-50)

hit=40 hit detection sensitivity (0-50)

(Note: if hit>0, the setting if L is invalid.)

18. Time Zone

Command: facid,123456,time zone,v=value;

Description: Set the time zone of your place.

Note:

1. **value:** -15~15, time difference value, default value is 8

Example:

facid,123456,time zone,v=-9;

19. Pet Mode

Command: facid,123456,config,powere=switch,powereon=start time,powereoff=end time;

Description: set the pet mode.

Note:

1. **switch:** 0 or 1, 0 means to turn off pet mode, 1 means to turn on pet mode
2. **start time:** time to wake up the tracker
3. **end time:** time to make the tracker sleep
4. **Cancel command:** facid,123456,config,powere=0;

Example:

facid,123456,config,powere=1,powereon=10:50,powereoff=11:50;

The tracker will works from 10:50 to 11:50 everyday.

20. SD Card

Command1: facid,123456,sdcard,test;

Command2: facid,123456,sdcard,log=switch1;

Command3: facid,123456,sdcard,read=switch2;

Description: set the function of SD card. Command1 is to test whether the SD card is right or not. If the SD card works well, tracker will reply: "FACID sdcard ok".

Note:

1. **switch1:** 0 or 1, 1 means to enable function of storing data into SD card, 0 means to disable function of storing data into SD card.
2. **switch2:** 0 or 1, 1 means to enable function of reading data from SD card, 0 means to disable function of reading data from SD card.

Example:

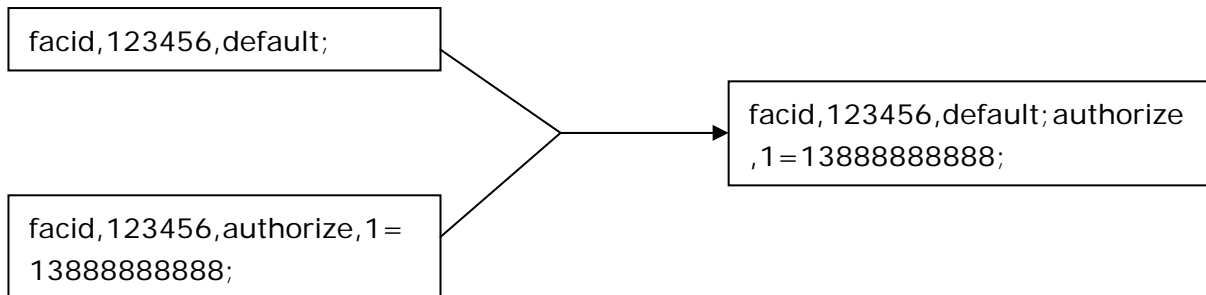
facid,123456,test;

facid,123456,sdcard,log=1;

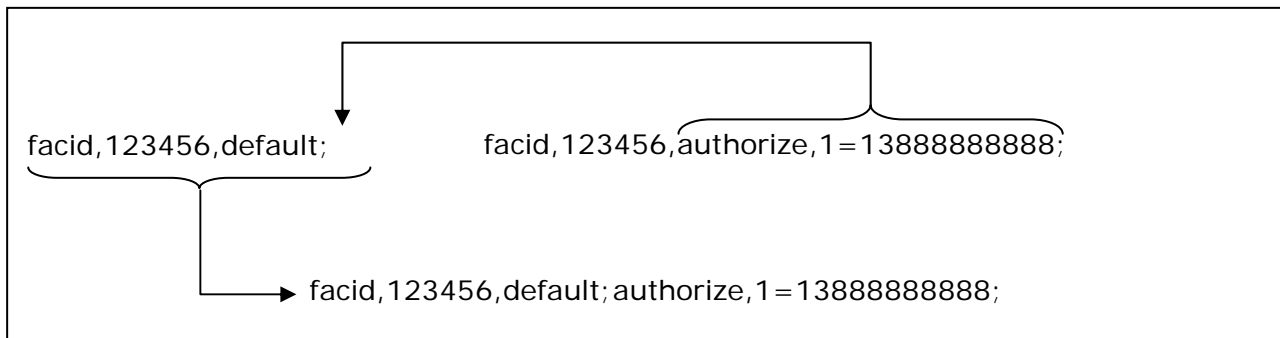
facid,123456,sdcard,read=1;

21. Multiple SMS commands

Sending multiple SMS commands is a good way to set your tracker quickly.
We can combine two or more commands to one command:



The principle as below:



22. Parameter Editor

The tracker can be configured by computer using the Terminal Setting System instead of sending SMS commands.



Please refer to file <MT90X Terminal Setting System> for more information.

23. Problems & 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 4 hours
Problem: Tracker will not reply with SMS	
Possible cause	Resolution
LED flash 0.5 second on and 0.5 second off	Make tracker connect to GSM network
GSM network is slow	Some GSM networks slow down during peak time or when they have equipment problems.
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 top up the SIM card
Problem: LED flash 1 second on and 1 second off	

Possible cause	Resolution
Unit does not have clear view of the sky	Move the unit 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
Battery is low	Recharge the unit
Problem: Unit Fails to Connect to Server via GPRS	
Possible cause	Resolution
SIM card in unit does not support GPRS function	Enable SIM card GPRS function
GPRS function of unit is turned off	Turn on GPRS function of unit
Incorrect IP address or PORT	Get the right IP address and PORT and reset to unit
GSM signal is weak	Move the unit to a location with good GSM reception