

# **MC-602**

## **User Manual**

### **GPS/GSM Vehicle Tracker**

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**V 500**

**V1.3**

MC-602 GPS/GSM Vehicle Tracker User Manual V 2.0

#### **1 Prelude**

##### **1.1 Brief Introduction**

The MC-602 GPS/GSM Vehicle Tracker combines GSM & GPS technology perfectly, owns compact size and elegant appearance, and carries top technology style. It is the typical model of the combination of communication products and GPS/GSM Vehicle Tracker.

This product shows advanced technology strength in GSM & GPS field. As a professional security and locating company, we will provide you more and better products and service.

Before you use it, please spend some time to read this guide to know the operation details, so as to get better service.

##### **1.2 Caution**

1.2.1 Please read this handbook carefully and operate in right way, to avoid anything wrong;

1.2.2 You need to choose a safe place to install your product, some dangerous places such as car airbag, and somewhere easy to hit driver or passengers when there is an accident, are all unsuitable to place products. Besides, please don't operate it when driving, to avoid unnecessary accidents.

1.2.3 The introduction in this book is just for your reference, if some of the content or operating procedures are different from the real products, please follow the products. If you have any questions please visit our Web site.

## 2 About the device

The MC-602 GPS/GSM Tracker is a vehicle remote position device with build-in GPS and GSM/GPRS modules. It is a small size, high accuracy remote location tracking device. Based on GPS satellite, it provides accurate position information under dynamic conditions. Personal remote position device transmit the longitude and latitude coordinate to authorized cell phone.

### Applications

MC-602 GPS/GSM vehicle tracker mainly uses for motorcycle, electric golf cars, and ordinary car. The devices built in antenna, integrative machine and easy to assemble.

You can use these features for a security purpose and other purpose which needs remote positioning such as asset protection and tracking.

### 2.1 Components



## 2.2 Features

1. Support GSM 850/900/1800/1900 MHz. Works worldwide!
2. High sensitivity, JRC low power GPS chipset!
3. Excellent for fixing the position even at a weak signal status, work well even in areas with limited sky view like urban canyons
4. Fast Signal Acquisition
5. Support single location and continuous tracking
6. Support alarm, have 3 preset phone number
7. Support check location and real-time and historical trajectory by SMS or Internet
8. SOS button send out exact location for immediate rescue/action.
9. Support cut-off electricity and oil function and recovery command
10. High reliability circuit design, in line with the automotive electronics industry standards

## 2.3 Specification

GSM module MTK program, GSM 900/1800/850/1900 dual-band or quad-band Support the TCP protocol GPS Chipset JRC chipset

GPS sensitivity -164dB

C/A Code 1.023MHz chip rate

Channels 210 channel all-in-view tracking

GPS frequency L1, 1575.42MHz

GPS Position Accuracy 2.5 meters, CEP

GSM Position Accuracy Later will realize

Velocity Accuracy 0.1m/s

Time Accuracy Synchronized to GPS time

Cold Start 35sec., average

Hot Start 1sec., average

Warm Start 30sec., average

Altitude Limit 18,000 meters (60,000feet) max.

Velocity Limit 515 meters/second (1000knots) max.

Acceleration Limit Less than 4g

## 2.4 Others

Operating temperature -20° C—65° C

Humidity 5%To 95% Non-condensing

Dimension 88mm× 46mm× 18mm

Voltage 12V

Average Current When stand-by <84mA

LED Green/ Blue/ Red LED showing GPS、GSM and power status

Out set SOS Key One SOS emergency key: for urgent call

## **2.5 LED State Description**

Blue LED--- indicate the GSM signal state

### **State Means**

Constant Lighting no SIM card or not GSM net

flashlight once interval 8s GSM receiver work well and standby

flash quickly voice calls or in GSM connection

Red LED---indicate charge state

### **State Means**

constant Lighting charging

No light charging was completed

Green LED--- indicate the GPS signal state

### **State Means**

No Lighting Working, but no location

Flashing Working and has located

## **3. Get Started**

### **3.1 Products**

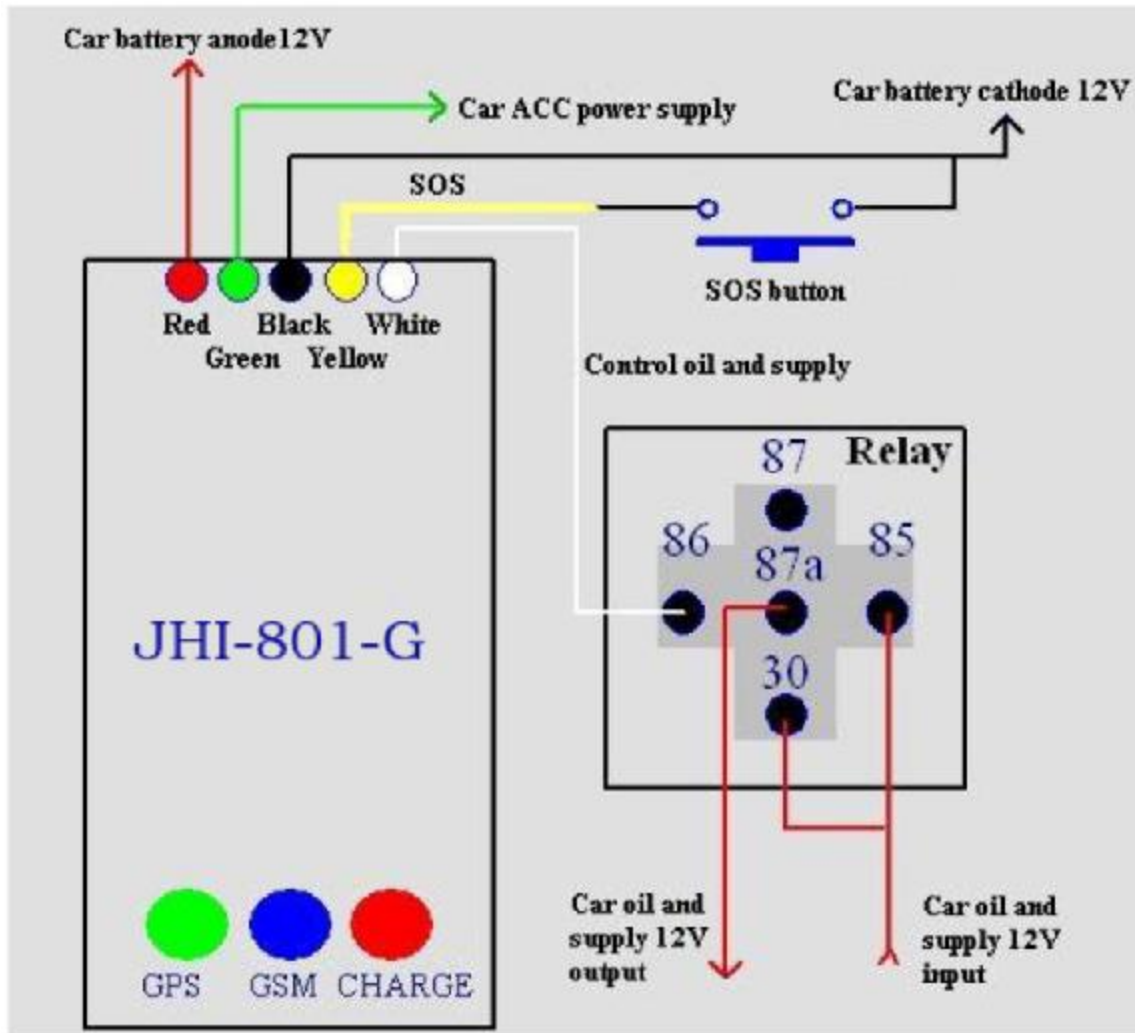
1) MC-602 GPS/GSM Vehicle Tracker

2) Power cable

3) Battery

### **State Means**

### 3.3 Wiring diagram:



The external 5 wires of MC-602 GPS/GSM tracker are as follows. Red for the 12V car power wire, connect to the car battery anode; Black for the earth GND, connect to the car battery cathode; Yellow for the SOS for help Control wire, connect external SOS switch button to car battery cathode; Green wire connect ACC car power supply, that is, with the car CD, radio, and other automotive electrical appliances in parallel. When the vehicle key puts in the ACC gear, the green line will examine the 12v voltage, the terminal will open the charge function automatically. White for cut-off oil and power control wire, connect to the relay coil 6, i.e. one end. Relay 85, i.e. another and connects to oil and power supply 12V. 30, 87a are normal closed-end, series in the oil and power supply circuit. Please note that if the installation of lead wire is right, if errors installation led to the equipment damage, At Own Risk, the company is not responsible for it.

### **3.4 Reset:**

3.5 special statement 1. terminal only respond to the instructions send by the users' restored phone number. so the first step operation, the user must be stored telephone number. 2, the terminal can operate in SMS and GPRS modes, in this two modes, respectively have their own instruction set, SMS mode, the terminal only to respond to SMS mode instruction set; GPRS mode, the terminal only to respond to GPS mode instruction set. During operation, please note that the current mode of the terminal to send instructions and pre-match.

## **4 Functions & Operation**

### **4.1 Position service based on SMS operation**

In this mode, MC-602 can be stored three preset telephone numbers (1, 2, and 3) and a 4-digit user password. The related configuration content that users set by SMS order is non-volatile. After the success, the state has not affect by switching power, until once again receives the relevant instructions or reset operation to change.

#### **4.1.1 Power on**

Put on the batteries, connect with the power, product will automatically open.

#### **4.1.2 Switch the mode instruction**

Explanation: When MC-602 tracker receives the SMS and confirms the user password correctly, it switches to the SMS application mode. After the success, it will send the confirmation messages (SET MODE OK, CURRENT MODE: SMS P2P) to the sender.

#### **4.1.3 Set up the user password instruction**

Explanation: When MC-602 tracker receives the SMS and confirm the user password correctly; changes the new user password to the old password. After set successfully, it will send the confirmation messages (SET USER PASSWORD OK) to the sender.

#### **4.1.4 Change the telephone number in advance instructions**

Explanation: You can store 3 telephone numbers at most in advance. When MC-602 tracker receives the instruction and confirms the user password correctly, substitutes the new number for the existing number. After success, it will send the confirmation messages (SET USER NUMBER (1-3) OK) to the sender.

#### **4.1.5 GPS state setting instruction**

GPS will enable on the on / off / adaptive three work states by send text messages command. GPS state is open after factory settings or reset.

##### **4.1.5.1 Open the GPS instruction**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, opens the GPS power. After the success, it will send the confirmation messages (GPS ON OK) to the sender.

##### **4.1.5.2 Close GPS instruction**

Explanation: When MC-602 tracker receives the instruction and confirms the user password MC-602 correctly, close the GPS. After the success, it will send the confirmation messages (GPS OFF OK) to the sender.

##### **4.1.5.3 Adaptive GPS instruction (Power-saving Function)**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, it will close the GPS immediately, and send the confirmation messages (VIBRATION SENSOR ON OK) to the sender. The tracker built in vibration sensor, once monitors the track movement for change to open the GPS. If in 5 minutes, with not monitors the track changed in the movement to close GPS.

#### **4.1.6 Single localization request instruction**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, reads the GPS information. No matter whether effective, the information with the replying base station which is the set of the original software will be sent to the sender.

#### **4.1.7 Send the positional information in fixed time instruction**

Explanation: x indicates one figure from 0 to 9, while " xx <60" , its unit is minute. while " xx >60" , its numerical value is " xx minus 60" and unit is hour, in other words, 61 is 1 hour, 62 is 2 hours, followed by analogy. When MC-602 tracker receives the instruction and confirms the user password correctly, it establishes the current time for initial timing time, xx is the gap time, and sends the confirmation SMS to the sender' s mobile phone (TIMER START, REPEAT INTERVAL :<X>MINUTES). Then start to time and send the format as 4.1.6 setting information when it arrives the gap time, the information state item automatically updates STATE: TIMER. When " xx=00" , cancels the positional information in fixed time instruction, and sends the confirmation SMS to the sender' s mobile phone " TIMER STOP" .

Attention : at present, this version only support at best 2 hours interval , if you want to add the time of interval, please contact us, we can do this for you specially.

#### **4.1.8 Calling switch instruction**

Explanation: When MC-602 tracker receives the instruction to close calling and confirms the user password correctly, close the calling function (including the SOS, alarm when across the fence, and alarm when cut off power), after successfully, sent the confirm information "SET VOICE CALL: OFF" to the sender. When MC-602 receives instruction to open calling and confirm the user password correctly, open the calling function (including the SOS, alarm when across the fence), after successfully, sent the confirm information "SET VOICE CALL: ON" to the sender.

#### **4.1.9 Telephone localization function**

Explanation: One of 3 telephone numbers stored in advance calls in, and hangs up after ringing 2-5 times, then the MC-602 will send the location information to this number such as 4.1.6 to this number, the information state item automatically updates STATE: CALL. But other incoming numbers will automatically hang up.

#### **4.1.10 Seeking help initiatively**

When press the key more than 3 seconds, it will send the location information such as 4.1.6 to 3 telephone numbers stored in advance, the information state item automatically updates STATE: SOS. At the same time, call the first user telephone number. If it is unsuccessful (closed or unable to connect or no response), starts calling the second and the third in turn.

Note: If the "Calling State" function is off, it will not call the user telephone number, and only send messages to the present number.

#### **4.1.11 Electronic fence function**

Electronic fence takes the set coordinates as the center, the set radius parameters to determine the scope of the fence. When open this feature, once the MC-602 beyond the scope of the set fence, it will send location information as to 4.1.6 to the 3 preset numbers. The information state item automatically updates STATE: OS. At the same time, call the first user telephone number. If it is unsuccessful (closed or unable to connect or no response), makes vibration and starts calling the second and the third in turn.



When the MC-602 re-enters the fenced area, it will immediately send location information format 4.1.6 to the three preset numbers. The information state item prompts STATE: RS. At the same time, call the first user telephone number. If it is unsuccessful (closed or unable to connect or no response), makes vibration and starts calling the second and the third in turn.

1) Set the scope of the fence

According to the input formats different of coordinates, user can choose the format as follows instructions to operate.

Explanation: E-- east longitude; W-- west longitude; N-- north latitude; S-- south latitude. In this example, uses E and N, please according to the actual geographical position choose corresponding coordinate form to set. In the demonstration, meanings of various parts are as follows:

When the tracker receives this instruction, judges to be authorized users and confirms the user password correctly, it will send the confirmation messages " SET GEO-FENCE OK" to the sender.

When the tracker receives this instruction, judges to be authorized users and confirms the user password correctly, it will send the confirmation messages " SET GEO-FENCE OK" to the sender.

Note:

1. Radius of the fence can not exceed the definition of its domain; the value of the decimal part for zero must input zero fill. For example: R=1, it is important to enter into 1.0.
2. If the calling state is off, it will not call the user telephone number, and only send messages to the present number.
3. Degree and minute is divided into sexagesimal system converter, that is, 1d = 60m

Note : When this unit receive this command and confirm the password is right. And read the Update gps data whether is available. If ok, take the lat/log to the coordination, and the R for The Radius, and also pen the Geofence at the same time. If the configuration is ok. The unit Will send "set geo fence ok " to the sender. If the update GPS Data void, the unit will give up and then red the next one, if the unit can't receive the data above 50sec, the unit will send A message to the sender which is "ERROR GPS DATA, TRY AGAIN LATER" After set ok, the unit will come back the original state.

2) open the electronic fence

After set successfully, it will send the confirmation messages " GEO-FENCE ON" to the sender.

3) close the electronic fence "ERROR GPS DATA, TRY AGAIN LATER"

After set successfully, it will send the confirmation messages " GEO-FENCE OFF" to the sender.

#### **4.1.12 Cut-off electricity and oil function**

1. Open the cut-off electricity and oil function

Description: Due to the command with a certain degree of risk, so needs to do a more confirmation operation. When the user need to cut-off electricity and oil, using a mobile phone to send format a command, the device will return to: "Confirm Power OFF?" after it receives the order and confirm the user password correct. If it receives the user sending format b command in ten minutes and confirms password correct, white wire will output low level in order to control the outside relay to cut off oil and electricity. After completion, send confirmation message "POWER OFF OK" to the user.

2. Cut-off electricity and oil function to recovery command

Description: When the device receives the cut-off electricity and oil function to recovery command by the preset user numbers and confirms the password correct, will send the confirm information "Confirm Power ON?" to the sender, and then prepares to receive the confirm command. If within 10 minutes the device receives the users confirm command, white wire will output high level in order to control the outside relay to recovery oil and electricity. After completion, send confirmation message "POWER ON OK" to the user.

#### **4.1.13 Alarm when cut off power function**

Description: When the MC-602 receive the armament command from the preset number and verifies the user password correct, after success, it will respond to confirm the information "DEFENCE ON" , into the armament state after 10 seconds. When the main external power supply was illegally cut off, the MC-602 will automatically send the current location information format as 4.1.6 to the 3 preset numbers, STATE items for: DEF. At the same time, call the first user telephone number. If it is unsuccessful (closed or unable to connect or no response), starts calling the second and the third in turn. When the MC-602 receives the disarmament command from the preset number and verifies the user password correct, after success, it will respond to confirm the

information "DEFENCE OFF" , repeal disarmament. MC-602 is no longer monitor the illegal cutting external power supply case.

Note:

1. After leave factory or reset, it is the disarmament state. It does not effect by boot until receives the command or reset.
2. If the calling state is off, it will not call the user telephone number, and only send messages to the preset number.

#### **4.1.14 ACC detect charge function**

Description: MC-602 using ACC detect line achieve car battery charge the MC-602 built-in battery when driving, stop charging when parking.

#### **4.1.15 Low voltage warning**

When the MC-602 ' s working voltage lower than the set, to read the GPS information, whether or not effective, immediately send the format as 4.1.6 location information to the three stored numbers, the information state item automatically updates STATE: LP. Send a total of three times, each time one minute interval.

#### **4.1.16 Upload the history data**

Record the history data: If you want to use this function in SMS Mode, you need to change the mode in GPRS and set the IP, APN, the detail way you can see the manual.

When the unit receive this command and confirm the password is right.

And set the history frequency is X. When the X=0, that's close the function. If X=30, that's mean that the unit will save the data every 30se, if the command is ok, then send "SET SAMPLEING OK" to the unit.

1, the memory of every data is 100B

2, the memory of the unit for the history is 864KB. For example, if you set the X=30, it's about can save the data of three days . If X=300, it's about can save the data of thirty days. When the data is above 864KB, the next new data will cover the oldest data.

3, if the air sensor is open and also the unit is not move for a long time, the history record will close and the unit will open once the unit is moving again.

2, Upload the history data

A: upload the history data of 24h

When the unit receive this command and confirm the password is correct, then send "START UPLOAD ALL HISTORY RECORD" and then send all of the data to the server. The format is like 4.1.16 .the state is "STORAGE"

#### **4.2.16 Overspeed Alarm Function**

Note : X is mean reference value, and the unit is mail/hours(KM/H), the area is (0,999), when the unit receive this command and confirm the password is correct, Then implement this command. X=250 is mean that when the speed of the car is Above 250KM/H, the unit will send a message to the threes users ,the format is like 4.1.6 and the state is "OVER SPEED". At this time, if the speed of the car is lower as 250KM/H, then the unit will send a message to the send which the state is "SAFE SPEED" When you set the X==0, and at this time, the unit will close this function, when you set the X≠0, open this function, and then send a message to the sender which is "SET RATE LIMIT:X"

#### **4.2 The operation based on the GPRS application**

In this mode, MC-602 can be stored three preset telephone numbers (1, 2, and 3), a 4-digit user password, a group of TCP / IP server IP address and port number, 4-digit GPS password and access point name of GPRS. The related configuration content that users set by SMS order is non-volatile. After the success, the state has not affect by switching power, until once again receives the relevant instructions or reset operation to change.

##### **4.2.1 Switch the mode instruction**

Explanation: When MC-602 tracker receives the SMS and confirms the user password correctly, it switches to the GPRS application mode. After the success, it will send the confirmation messages (SET MODE OK, CURRENT MODE: GPRS) to the sender.

##### **4.2.2 Set up the user password instruction**

Explanation: Confirm the user password correctly; changes the new user password to the old password. After set successfully, it will send the confirmation messages (SET USER PASSWORD OK) to the sender.

##### **4.2.3 Change the telephone number in advance instructions**

Explanation: You can store 3 telephone numbers at most in advance. When MC-602 tracker receives the instruction and confirms the user password correctly, substitutes the new number for the existing number. After success, it will send the confirmation messages (SET USER NUMBER (1-3) OK) to the sender.

#### **4.2.4 GPS state setting instruction**

GPS will enable on the on / off / adaptive three work states by send text messages command. GPS state is open after factory settings or reset.

##### **4.2.4.1 Open the GPS instruction**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, opens the GPS power. After the success, it will send the confirmation messages (GPS ON OK) to the sender.

##### **4.2.4.2 Close GPS instruction**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, close the GPS. After the success, it will send the confirmation messages (GPS OFF OK) to the sender.

##### **4.2.4.3 Adaptive GPS instruction (Power-saving Function)**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, it will close the GPS immediately, and send the confirmation messages (VIBRATION SENSOR ON OK) to the sender. The tracker built in vibration sensor, once monitors the track movement for change to open the GPS. If in 5 minutes, with not monitors the track changed in the movement to close GPS.

#### **4.2.5 Single localization request instruction**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, reads the GPS information. No matter whether effective, the information with the replying base station which is the set of the original software will be sent to the sender.

#### **Data format:**

Lat: Latitude Direction (+/-) Latitude Value (Accuracy for 5 after the decimal point)

Long: Longitude Direction (+/-) Longitude Value (Accuracy for 5 after the decimal point)

Speed: Speed KM/H (Accuracy for 2 after the decimal point)

Direction: Direction (Accuracy for 2 after the decimal point)

Date: Date YYYY-MM-DD

Time: Time HH: MM: SS (GMT)

BS: Base Station information

Fix: Location state (A/V)

ID: IMEI

STATE: Message state

**Effective data format:**

Lat: +22.50500

Long: +114.01000

Speed: 0.00KM/H

Direction: 315.00

Date: 2008-04-25

Time: 16:39:45

BS: 25ee0dff

Fix: A

ID: 353686009002030

STATE: SMS

**4.2.6 Change the user name**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, changes the user name to the new user name. After the success, it will send the confirmation messages to the sender. The content is "CHANGE USERNAME OK".

**4.2.7 Change the service password**

Explanation: When MC-602 tracker receives the instruction, confirms the user password and old service password correctly, changes the service password to the new service password. After the success, it will send the confirmation messages to the sender. The content is "CHANGE PASSWORD OK"

**4.2.8 Set up the access point name of GPRS**

Explanation1: Different GSM / GPRS service associations provide different APN, please according to local service providers to provide the APN to choose format 1 or 2 to use set. Explanation2: When MC-602 tracker receives the instruction and confirms the user password correctly, updates the access point name to the new access point name. After the success, it will send the confirmation messages to the sender. If sent the format 1, the content is "SET GPRS APN OK"; if it is format 2, the content is "SET GPRS ACCOUNT OK". Note: APN is CMNET after factory set or reset. APN is characters composed of 3 to 35 letters, numbers, dots (.) underscore (\_) and connectors (-). APN user name and user password are respectively characters composed of from 3 to 20 the numbers and letters.

#### **4.2.9 Set up the TCP/IP server and IP's address and port number**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, updates the IP address and port number preserved in the module, After the success, it will send the confirmation messages to the sender. The content is " SET SERVER IP AND PORT OK"

#### **4.2.10 Upload the location instruction at once**

Explanation: When MC-602 tracker receives the instruction and confirms the user password correctly, sends the confirmation messages to the sender. The content is " START GPRS UPLOAD" . At the same time, send the data from the memory block to server.

#### **4.2.11 Upload data settings**

Explanation: The time T unit of the sampling is second, 5 seconds at least, 65535 seconds at most; The number of upload data each time is N, at least is 1, at most is 50. Sampling interval T and the number of upload data each time N product should meet greater-than-equal 60, that is  $T*N \geq 60$ . When setting parameters  $T * N < 60$ , the device will automatically correct sampling interval T to meet the uploading constraints. When MC-602 tracker receives the instruction and confirms the user password correctly, sends the confirmation messages to the sender. The content is " SET GPS SAMPLING TIME AND QUANTITY OK" . At the same time as specified in the instructions to the sampling interval time T, continuous read the GPS data and preserve to the memory block. When the memory block reaches to the " number of upload each time N" setting, it starts connecting to the GPRS servers to send out the format as 4.2.10 information, and the state item automatically updates STATE: AUTO. When " the number of upload each time N = 0" it will close the upload data setting and send the confirmation messages to the sender. The content is " GPRS TIMER STOP" .

#### **4.2.12 Overspeed Alarm Function**

Note : X is mean reference value, and the unit is mile/hours(KM/H), the area is (0,999), when the unit receive this command and confirm the password is correct, Then implement this command. X=250 is mean that when the speed of the car is Above 250KM/H, the unit will send a message to the threes users ,the format is like 4.2,10, and the state is "OVER SPEED". At this time, if the speed of the car is lower as 250KM/H, then the unit will send a message to the send which the state is "SAFE SPEED"

When you set the X=0, and at this time, the unit will close this function, when you set the X≠0, open this function, and then send a message to the sender which is "SET RATE LIMIT:X"

#### 4.2.13 upload the data regularly

There are 2 modes in this setting: 1. Track the vehicle in driving, 2. Save energy when vehicle stopped. This 2 modes will automatic switch-over according to the ACC state of vehicle. It is the first mode when ACC is on, it is the second mode when ACC is off. According the difference of GPS Sampling time and Upload the message. Uploading the data very dense when driving, so can describe the tracking very detailed. And uploading the data very sparse when the vehicle stopped, so can save the GPRS fee and also can see the tracking data. When change the mode in upload data in certain time function, the unit will upload data from memory area of the unit.

##### 1、upload data in certain time when driving

When the unit receive this command and confirm the password is correct, the unit will send message to the sender which is "SET GPS SAMPLING TIME AND QUANTITY OK ". And also the unit will read the GPRMC of the NEMA of the unit, and then save it in memory. When the data is ok, then will connect with the server and send it out. If the data can't send it because of the internet or other reasons, the data will save automatically, then send it out when the internet is ok. The format is like

4.2.10, the state is "AUTO". When set "the number of upload N" is 0, so it's will close this function then send message which is "GPRS TIMER STOP"

##### 2. Upload data in certain time when vehicle stopped

When the unit receive this command and confirm the password is correct, the unit will send message to the sender which is "GPRS REPORT SAMPLING 2 OK ". And also the unit will read the GPRMC of the NEMA of the unit, and then save it in memory. When the data is ok, then will connect with the server and send it out. If the data can't send it because of the internet or other reasons, the data will save automatically, then send it out when the internet is ok. The format is like

4.2.10, the state is "AUTOLOW". When set "the number of upload Y" is 0, so it's will close this function then send message which is "GPRS REPORT SAMPLING 2 STOP"

#### **4.2.14 Calling switch instruction**

Explanation: When MC-602 tracker receives the instruction to close calling and confirms the user password correctly, close the calling function (including the SOS, alarm when across the fence and alarm when cut off power), after successfully, sent the confirm information "SET VOICE CALL: OFF" to the sender. When MC-602 receives instruction to open calling and confirm the user password correctly, open the calling function (including the SOS, alarm when across the fence), after successfully, sent the confirm information "SET VOICE CALL: ON" to the sender.