Smart GPS Tracker Communication Protocol

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COMMUNICATION PROTOCOL

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Release Approval Process

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# 1 Terms, Definitions and abbreviations

## 1.1 Terms

|  |  |
| --- | --- |
| **Terms** | **Description** |
| Abnormal data communication link | Wireless communication link interrupt, or temporarily suspended(such as during a call) |
| register | Terminal sends messages to inform the platform that the terminal has been installed in a particular object(as vehicle or boat) |
| unregister | Terminal sends messages to inform the platform that the terminal has been removed from the object. |
| authentication | Terminal sends messages to the platform to inform the platform to verify the identity. |
| Location reporting strategy | Reporting as time, distance or a combination of these. |
| Location reporting program | the internal of periodic reporting rules as the relevant conditions |
| Additional points report while turning | Terminal sends the location data while vehicle turning. Sampling frequency is not less than 1 Hz, vehicle azimuth rate not less than 15 degree per second and last for more than 3 seconds. |

## 1.2 Abbreviations

|  |  |
| --- | --- |
| **abbr** | **Description** |
| APN | access point name |
| GZIP | GNUzip |
| LCD | liquid crystal display |
| RSA | a asymmetric cryptographic algorithms(developed by RonRivest, AdiShamirh, LenAdleman) |
| SMS | short message service |
| TCP | transmission control protocol |
| TTS | text to speech |
| UDP | user datagram protocol |
| VSS | vehicle speed sensor |

# Base protocol format

## 2.1 Communication mode

The protocol type is TCP or UDP. The platform is server, the terminal is client. The terminal can transmit the data by SMS when the data communication link is abnormal.

## Data type

Table 1: data types in the protocol messages

Table 1: Data types

|  |  |
| --- | --- |
| Data type | Description |
| BYTE | Unsigned single-byte integer type(byte,8 bits) |
| WORD | Unsigned double-byte integer type(word,16 bits) |
| DWORD | 4 bytes unsigned integer type(double word,32 bits) |
| BYTE[n] | N bytes |
| BCD[n] | 8421 code, n bytes |
| STRING | GBK code, if no data ,leave blank |
| INT8 | Signed single-byte integer(byte,8 bits) --(supported by LT-160) |
| INT16 | Signed double-byte integer(16 bits) --(supported by LT-160) |
| INT32 | 1. bytes signed integer(32 bits) --(supported by LT-160)
 |

## 2.3 Transmission rule

This protocol uses big-endian mode to transfer work and double words. Agreed as follow:

——BYTE transfer agreement: transfer as the byte streams

——Word transfer agreement: transmit high 8 bits, and then transmit low 8 bits.

——DWORD transfer agreement: transmit the highest 8 bits(b31,b24),then higher 8 bits(b23,b16),then the lower 8 bits(b15,b8), then the lowest 8 bits(b7,b0).

## Protocol message format

### 2.4.1 Message format

The message is consisted of flag, message header, and message body and checksum code. Its structure is shown as the below figure 1:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Flag |  Message header | Message body | Checksum | flag |

Figure 1 Message format

### 2.4.2 Flag

Adopt 0x7e, if there exists 0x7e in the checksum, message header or message body, need transferred meaning process, the transferred meaning rules is shown as the below:

0x7e<————>0x7d followed with 0x02

0x7d<————>0x7d followed with 0x01

Transferred meaning process is described as following：

Sending message: pack message ——>calculate and fill the checksum ——>transferred meaning

Receiving message: transferred meaning restore——>verify checksum code——>parse the message

Example：

Send packet as 0x300x7e0x080x7d0x55,

After packing, the packet should be: 0x7e0x30 0x7d0x020x080x7d0x010x550x7e.

### 2.4.3 Message header

See table 2 for detailed message header

Table 2 Message header

|  |  |  |  |
| --- | --- | --- | --- |
| The starting byte | field | data type | description |
| 0 | Message ID | WORD |  |
| 2 | Properties of message body | WORD | The properties format, refer to the below figure 2. |
| 4 | Terminal phone number  | BCD[6] | Please transform according to the phone number of inserted SIM card. If the length of digits is less than 12, please add the “0” before the phone number.  |
| 10 | Message sequence number | WORD | Cycle accumulation from 0 as the sending sequence. |
| 12 | Message packing item |  | If need sub-package process according to the related flag of the message body properties, there is information in this field. Otherwise ignore the field. |

The properties format, refer to the below figure 2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Reserved | sub-package | Data encryption mode-- (LT-162) | Length of message body |

Figure 2: Properties format of message body

Data encryption mode (Supported by LT-162):

--bit10-bit12 means data encryption flag

-- When all three bits are 0, it means the message body is not encrypted

-- When all three bits are 0, the message body is not encrypted

-- When the tenth bits are 1, it means the message body is encrypted by the RSA algorithm

--others are reserved

Sub-package:

If the bit13 of the properties of message body is“1”, need sub-package process. The detailed strategy is determined by message packing item. If the bit13 is“0”, there is no message packing item field in the message header.

 Message packing item. Refer to table 3 for message packing item

Table 3 Message packing item

|  |  |  |  |
| --- | --- | --- | --- |
| starting byte | field | Data type | description |
| 0 | the total number of the message packages | WORD | the total number of the packages after sub-package |
| 2 | Package no. | WORD | starting from“1” |

### 2.4.4 Checksum

Checksum is calculated via XOR from the starting of message header to the last byte before checksum. The Checksum occupies 1 byte.

# 3 Communication connection

## 3.1 Establishment of the connection

The connection way is TCP or UDP between the terminal and the platform, the terminal should establish the connection with the platform ASAP after reset, send the authentication messages to login (verify) in the platform.

## Maintaining of the connection

The terminal should periodically send the heartbeat package to the platform when there is no other data packet sent to the platform. The platform should give the general response for the heartbeat package. The heartbeat interval can be specified by the terminal parameters.

## Disconnect the connection

Platform and terminal can actively disconnect the connection according to TCP protocol, both of them should actively check whether the connection is disconnected.

The way the platform check whether the TCP connection is disconnected

——detect the terminal actively disconnect the connection according to TCP protocol.

——there is a new connection with same terminal ID; means the original connection had been disconnected.

——the platform cannot receive any messages from the terminal within a certain time, such as the heartbeat package.

The way the terminal check whether the TCP connection is disconnected

——detect the platform actively disconnect the connection according to TCP protocol.

——data communication link disconnected

——data communication link is normal, but does not receive the response after up to the resending times

# 4 Message processing

## 4.1 TCP and UDP messages processing

### 4.1.1 Active message from the platform

The terminal must give response for all messages from the platform; the terminal should give general or special response according to the detailed protocol commands. If the platform does not receive the response, the platform will resend the data in a certain time. The timeout of response and the times of resending are specified by the platform parameters. The computational formula of the timeout time after re-upload each time refer to (1)

TN+1=TN ×（N+1） …………(1)

Note:

TN+1——the timeout time after re-uploading each time

TN——Previous response timeout

N-—Retransmission times

### 4.1.2 Active message from the terminal

#### 4.1.2.1 Normal data communication link

The platform must give the response for all active messages from the terminal; the platform should give general or special response according to the detailed protocol commands. If the platform does not receive the response, the platform will resend the data in a certain time. The timeout of response and the times of resending are specified by the terminal parameters. For the special alarms messages, if sending unsuccessfully, the terminal should store them. After the communication link is normal again, the terminal should priority send the stored alarm messages.

#### Abnormal data communication link

The terminal should store the location report messages when abnormal data communication link. Immediately send the stored messages after the communication link restores to be normal.

# Protocol types

## Overview

The following description is classified by the functions. The default communication way is TCP if no specified. The communication protocol of vehicle terminal and external device refer to appendix A, the message name and message ID in the protocol refer to appendix B.

## Terminal management protocol

### 5.2.1 Register and unregister of the terminal

When no register, the terminal should register firstly. It will obtain and save the authentication code for login after registering successfully. The terminal should perform unregister operation to cancel the relation between vehicle and terminal when it is removed or replaced.

### 5.2.2 Login and authentication of the terminal

After register, the terminal should login or authenticate immediately every time it establishes connection with platform. And the other message will be forbidden before login or authenticating successfully.

The terminal sends authentication command to the platform and the platform should respond with general response message.

### 5.2.3 Set and inquire terminal parameters

The platform will set the parameters into terminal by sending parameters setting message. The terminal should respond with general response message after receiving parameters setting message. The platform sends parameters inquiry message to terminal. The terminal will reply parameter inquiry response message. The terminal will support some special parameters according to different network type.

### 5.2.4 Terminal control

The platform sends the control commands to the terminal, the terminal should give the general response message after receiving the commands.

## Location and alarm protocol

### 5.3.1 Location report

The terminal will upload periodically the location report based on the preset interval. And the terminal can upload the location when it detects the vehicle turning.

### 5.3.2 Query Location

The terminal should report the location inquiry response message after receiving the location inquiry message from the platform.

### 5.3.3 Temporary location track control

The terminal will reply general response message and report location message according to the specified interval after receiving temporary location track control message from platform. But during reporting temporary location message, all other periodical location reports need to be stopped.

### 5.3.4 Terminal alarm

The terminal should report location message when the alarm is triggered, the alarm flag in the message should indicate the alarm status until the alarm goes off. The platform can deal with the alarm by sending general response message.

Please refer to the location report message about the alarm types. The terminal should report the location message after the alarm goes off, and clear the corresponding alarm flag.

## Vehicle control protocol

The terminal should reply the general response message immediately after receiving the vehicle control commands from the platform, then control the vehicle, the terminal will send the control response message based on results.

# 6 Data Format

## 6.1 Terminal general response

Message ID: 0x0001.Terminal general response data format, refer to Table 4

Table 4 Terminal general response data format

|  |  |  |  |
| --- | --- | --- | --- |
| The starting byte | field | Data type | description |
| 0 | Response sequence number  | WORD | should be same with the platform message sequence number |
| 2 | Response ID | WORD | The corresponding platform message ID |
| 4 | result | BYTE | 0: succeed/confirm 1: fail 2: wrong message 3: unsupported |

## 6.2 Platform general response

Message ID: 0x8001.Platform general response data format, refer to Table 5

Table 5 Terminal general response data format

|  |  |  |  |
| --- | --- | --- | --- |
| The starting byte | field | Data type | description |
| 0 | Response sequence number  | WORD | should be same with the terminal message sequence number |
| 2 | Response ID | WORD | The corresponding terminal message ID |
| 4 | result | BYTE | 0：succeed/confirm 1: fail 2: wrong message 3: unsupported 4: alarm confirmation  |

## 6.3 Terminal heartbeat

Message ID: 0x0002.The message body of the terminal heartbeat is empty.

## 6.4 Terminal register

Message ID: 0x0100 Terminal register message data format, shown as Table 7

Table 7 Terminal register message data format

|  |  |  |  |
| --- | --- | --- | --- |
| the starting byte | field | data type | Description |
| 0 | provincial area ID | WORD | Label the terminal installed vehicle provincial area,“0”is reserved。Defined by platform. |
| 2 | District ID | WORD | Label the terminal installed vehicle district,“0”is reserved。Defined by platform. |
| 4 | Manufacturer ID | BYTE[5] | 5 bytes ,terminal manufacturers code |
| 9 | terminal model | BYTE[20] | 20 bytes, defined by the manufacturers, filled with the “0x00”at the end till its length is 20 bytes. |
| 29 | Terminal ID | BYTE[7] | 7 bytes, composed of capital letters and digits, filled with the “0x00”at the end till its length is 7 bytes. |
| 36 | license plate color | BYTE | License plate color, the value is 0 without registration |
| 37 | Vehicle logo | STRING | use the VIN when plate color is 0;otherwise use the vehicle plate number |

## 6.5 Terminal register response

Message ID: 0x8100 Terminal register response message data format, shown as Table 8

Table 8 terminal register response message data format

|  |  |  |  |
| --- | --- | --- | --- |
| the starting byte | field | data type | description |
| 0 | response sequence number | WORD | should be same with the terminal register message sequence numberCorresponding terminal register message sequence number |
| 2 | result | BYTE | 0: success 1: the vehicle has been registered 2: no the vehicle in database 3: the terminal has been registered 4: no the terminal in database |
| 3 | authentication code | STRING | have this field only after the result is successful |

## 6.6 Terminal unregister

Message ID: 0x0003 the terminal unregisters message body is empty

## 6.7 Terminal authentication

Message ID: 0x0102 Terminal authentication message data format, shown as Table 9

Table 9 Terminal authentication message data format

|  |  |  |  |
| --- | --- | --- | --- |
| the starting byte | field | data type | description |
| 0 | authentication code | STRING | terminal needs to report the authentication code after reconnection |

## 6.8 Set the terminal parameters

Message ID: 0x8103 set the terminal parameters message data format, shown as Table 10.

Table 10 set the terminal parameters message data format

|  |  |  |  |
| --- | --- | --- | --- |
| the starting byte | field | data type | description |
| 0 | total number of parameters | BYTE |  |
| 1 | parameter list |  | Shown as Table 11. |

Table 11 terminal parameters item data format

|  |  |  |
| --- | --- | --- |
| field | data type | description |
| Parameter ID | DWORD | the parameter ID definition & description ,shown as Table 12 |
| Parameter length | BYTE |  |
| Parameter value |  | the message will use multi-parameters of the same ID for the multi value parameters , such as the control center phone number |

Table 12 the parameter ID definition & description

|  |  |  |
| --- | --- | --- |
| parameter ID | Data type | Description |
| 0x00000010 | STRING | Main server APN, or PPP dial number for the CDMA. |
| 0x00000011 (LT-160) | STRING | Main serve user name of APN |
| 0x00000012 (LT-160) | STRING | Main server password of APN  |
| 0x00000013 | STRING | Main server IP or domain address |
| 0x00000017 | STRING | Backup server IP or domain address |
| 0x00000018 | DWORD | Server TCP port |
| 0x00000019 | DWORD | Server UDP port |
| 0x00000027 (LT-162) | DWORD | Sleeping uploading time interval, the unit is second (s),>0  |
| 0x00000029 | DWORD | Default report interval, unit: second. |
| 0x00000030 (LT-162) | DWORD | The angle of turning compensatory, <180 degree |
| 0x00000055 (LT-162) | DWORD | Maximal speed, the unit is KM/H  |
| 0x00000056 (LT-162) | DWORD | Over speed duration, the unit is second (s) |
| 0x00000081 | WORD | The provincial ID where the vehicle located  |
| 0x00000082 | WORD | They city ID where the vehicle located |
| 0x00000083 | STRING | Vehicle license plate issued by the public security traffic administration department |
| 0x00000084 | BYTE | Vehicle plate color, follow 5.4.12 of JT/T415-2006 |
| 0XFFFF0000 (LT-162) | BYTE | The time of the vehicle go into sleeping model when it’s parked, the unit is second (s)  |
| 0xFFFF0002 | N WORD | Set multipoint uploading parameters for one day, n means the uploading points, 0<=n<=4 n=0 means delete multipoint uploading parameters. W1 Bit15-Bit8 the hour of the first uploading time point <=23Bit7-Bit0 the minute of the first uploading time point <=59……Wn Bit15-Bit8 the hour of the Nth uploading time point <=23Bit7-Bit0 the minute of the Nth uploading time point <=597E81030008013000225251000301FFFF0002020819897E //set one time point as 8:25//7E8103000A013000225251000301FFFF000204090A0F23A97E //set two time points as 09:10 15:35//7E8103000C013000225251000301FFFF00020608000A0010008A7E //set three time points as 08:00 10:00 16:00//7E8103000E013000225251000301FFFF00020809000C000F0012008C7E //set four time points as 9:00 12:00 15:00 18:00// |
| 0xFFFF0004 (LT-160) | BYTE | Positioning mode 0: LBS+GPS 1: LBS 2: Disable positioning switch |
| 0xFFFF0017 (LT-160) | BYTE | LED indicator switch 1: work normally 0: led doesn’t work |
| 0xFFFF0019 (LT-160) | BYTE | Anti disassemble alarm1: disable 0: enable 2: use trimming alarm bit  |
| 0xFFFF001A (LT-160) | BYTE | AGPS Switch 1: enable 0: disable  |
| 0xFFFF001C (LT-162) | WORD |  Voltage critical value detected by ACC, the unit is 0.1V |
| 0xFFFF001D (LT-160) | BYTE |  Hidden model setting 1: hidden model 0: real-time positioning model |

## 6.9 Query the terminal parameters

Message ID: 0x8104 Query the terminal parameters message body is empty.

## 6.10 Query terminal parameter response

Message ID: 0x0104 Query terminal parameter response message data format, shown as Table 16.

Table 16 Query terminal parameter response message data format

|  |  |  |  |
| --- | --- | --- | --- |
| **the starting byte** | **field** | **data type** | **description** |
| 0 | Response sequence number  | WORD | Should be same with the sequence number of query terminal parameter message. |
| 2 | The number of response parameters | BYTE |  |
| 3 | Parameters item list |  | Please refer to table 10 for parameter item format |

## 6.11 Terminal control

Message ID: 0x8105 Terminal control message data format, shown as Table 17

Table 17 Terminal control message data format

|  |  |  |  |
| --- | --- | --- | --- |
| **The starting byte** | **field** | **data type** | **description** |
| 0 | command word | BYTE | terminal control command word description ,shown as Table 18 |
| 1 | Command parameters | STRING | Shown as the below table, each field is separated by symbol ‘;’each STRING field adopts GBK code. |

Table 18 terminal control command word description

|  |  |  |
| --- | --- | --- |
| **Command word** | **command parameter** | **Description**  |
| 4 | null  | terminal reset |
| 5 | null  | Restore factory settings  |
| 0XF0 | NULL (LT-162) | Lock, engine cut |
| 0Xf1 | NULL (LT-162) | Unlock, engine cut recover |
| 0xF3 | Control Items IP address, port and firmware version  | Remote upgrading, connect the specified server to upgrade the specified firmware version, refer to below:Upgrading control C: 1byte, C=1 start upgrading C=0 stop upgradingIP address and port: 6bytes, 119.145.40.64:7771 hexadecimal is 0x779128401E5BFirmware version nbytes, e.g.: T1S-2.0 hexadecimal is 0x5431532D322E30 |

## 6.12 Location information report

Message ID: 0x0200. Location information report message body is made up with location basic information and location additional information item list. Message structure is shown as figure 3.

|  |  |
| --- | --- |
| **location basic information** | **location additional information item list** |

Figure 3 Message structure

Location additional information item list can include all kinds of location additional information items or not. - It is determined by the length of message header field in detail.

Location basic information data format is shown as table 23

Table 23 Location basic information data format

|  |  |  |  |
| --- | --- | --- | --- |
| **starting byte** | **field** | **data type** | **description** |
| 0 | alarm flag | DWORD | alarm flag definition is shown as Table 24 |
| 4 | Status | DWORD | the status bit definition is shown as table 25. |
| 8 | latitude | DWORD | latitude value \*106 ,unit: 0.000001 degree |
| 12 | longitude | DWORD | longitude value \*106 ,unit: 0.000001 degree |
| 16 | Altitude | WORD | altitude, unit: meter |
| 18 | speed | WORD | Unit: 0.1 km/h |
| 20 | direction | WORD | 0-359,north is 0,clockwise |
| 21 | time | BCD[6] | YY-MM-DD-hh-mm-ss (default is GMT+8 time zone) |

Table 24 alarm flag definition

|  |  |  |
| --- | --- | --- |
| **bit** | **definition** | **description** |
| 0 |  |  |
| 1 | 1. Over speed (LT-162)
 | Flag maintained until alarm condition is relieved |
| 2 |  |  |
| 3 |  |  |
| 4 | 1. GNSS module break down
 | Flag maintained until alarm condition is relieved |
| 5 | 1. GNSS antenna disconnected or sheared (LT-160)
 | Flag maintained until alarm condition is relieved |
| 6 | 1. GNSS antenna short circuit (LT-160)
 | Flag maintained until alarm condition is relieved |
| 7 | 1. Terminal Main power supply under voltage
 | Flag maintained until alarm condition is relieved |
| 8 | 1. Terminal main power off (LT-162)
 | Flag maintained until alarm condition is relieved |

Note: Immediately upload the location information when the alarm is triggered.

Table 25 status bit definition

|  |  |
| --- | --- |
| **Bit** | **status** |
| 0 | 0: ACC off; 1: ACC on |
| 1 | 0: no positioning; 1: positioning |
| 2 | 0: north latitude;1: south latitude |
| 3 | 0: east longitude; 1:west longitude |
| 4 |  |
| 5 (LT-160) | 0: latitude and longitude without security plug-in encryption1: latitude and longitude with security plug-in encryption |
| 6-9 |  |
| 10 | 0: vehicle oil channel is normal 1: vehicle oil channel is disconnected(LT-162) |
| 11-31 | reserved |

Note: immediately upload the location information after the terminal detects the status change.

**Location additional information item list is shown as Table 26.**

Table 26 location additional information item list

|  |  |  |
| --- | --- | --- |
| **field** | **data type** | **description** |
| Additional information ID | BYTE | 1-255 |
| Additional information length | BYTE |  |
| Additional information |  | Additional information definition ,shown as table 27 |

Table 27 additional information definition

|  |  |  |
| --- | --- | --- |
| **Additional information ID** | **Additional information length** | **Description** |
| 0x30 | 1 | BYTE The signal strength of wireless communication network  |
| 0x31 | 1 | BYTE GNSS positioning satellites number |
| **0xD0** | **4** | user-defined, additional information refer to 27-B |
| **0xD2** | **N** | Base station information, additional information refer to 27-C |
| **0xD3** | **2** | Main voltage value 1/10V |
| **0Xd4(LT-160)** | **1** | Percentage of battery power |
|  |  |  |
|  |  |  |
| **0xD6 (LT-162)** | **N** | The ICCID number of the SIM card or UIM card |

Table 27-B User-defined vehicle status

|  |  |
| --- | --- |
| Bit | Definition |
| bit1：bit0 | Occupied |
| **bit2** | Occupied |
| **bit3** | Occupied |
| Bit4 | Occupied |
| Bit5 | Occupied |
| Bit6 | Occupied |
| Bit7 | Occupied |
| Bit8 | Occupied |
| **Bit9** | **1: Blind data**  |
| **Bit10** | Disassemble state LT-160 |
| **Bit11** | RTC Failure LT160 |
| **Bit12** | Tracking model LT-160 |
| **Bit13** | Button is open LT160 |
| Bit14 | 1: G-sensor failure LT-162 |
| Bit15 | 1: Positioning interfering LT-162 |
| Bit16 | 1: communication interfering LT-162 |
| **Bit17** | 1: LBS  |
| Bit18 | Occupied |
| Bit19 | Occupied |
| Bit20-28 | Reserved  |
| Bit29 | Occupied |
| Bit30 | Occupied |
| Bit31 | Occupied |

Table 27-C Base station additional information

|  |  |  |  |
| --- | --- | --- | --- |
| Start byte | Field | Data type | Description and Requirements |
| 0 | base station **number** | BYTE |  |
| 1 | mobile country code | WORD | 460: China |
| 3 | mobile network code | BYTE | 00:China Mobile，01: China Unicom,02:China mobile,03: China Telecommunications,04: China Satellite Communications,05:China Telecommunications (CDMA2000)06:China Unicom (UMTS 2100),07:Chian mobile (TD-SCDMA),20: China Railcom |
| 4 | Position code of base station 1 | WORD |  |
| 6 | Cell Code of base station 1 | WORD |  |
| 8 | Signal strength of base station 1 | BYTE | The range of the signal strength of base station (-113dbm,-51dbm), add 113 then the range changed to [0,62]  |
| …… | …… | …… | …… |
| 5\*n + 4 | Position code of base station n  | WORD |  |
|  | Cell Code of base station n | WORD |  |
|  | Signal strength of base station n | BYTE | The range of the signal strength of base station (-113dbm,-51dbm), add 113 then the range changed to [0,62] |

## 6.13 Temporary location tracking control

Message ID: 0x8202

Temporary location tracking control used for tracking model, the structure format of control message refer to table 34

Table 34 the structure format of control message

|  |  |  |  |
| --- | --- | --- | --- |
| **Starting byte** | **field** | **Data type** | **Description** |
| 0 | Time interval | WORD | The unit is second (s), 0 means stop tracking, Stop tracking does not need to be followed by subsequent fields **LT160 is used for setting the uploading time interval in the tracking model,0 means exiting tracking** |
| 2 | Temporary tracking validity | DWORD | The unit is second (s) ,the location will be uploaded by the fixed time interval before the expiration date after the tracking control message received by the terminal. **LT160 is used for setting the duration in the tracking model, the tracking model will be exit automatically when the time is up.**  |

# 7. SMS Message List

## 7.1 LT-162 SMS Message List

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Description** | **Example** | **SMS** |
| WY,<A>[,R,M]# | Displacement alarm settingA: displacement switch, 1: enable 0:disableR: displacement radius, unit: meter, default as 300 meters, the parameter is optional M=0:only GPRS,M=1:SMS+GPRS | WY,1,500,1# enable displacement alarm, the radius is 500 meters. Notification model : GPRS+SMSWY,1# enable displacement, the radius and notification model is invariant WY,0# disable displacement alarm | ▲ |
| ZD,<A>[,M]# | Vibration alarm settingA=1: enable A=0:disableM: notification model, the parameter is optional M=0: only GPRS,M=1:SMS+GPRS | ZD,1,1#, enable vibration, notification model: GPRS+SMS ZD,0# disable vibration | ▲ |
| ZDT,<AT>,<DT># | Vibration time setting AT: the delay time of vibration alarm, unit is minute DT: the fortification time of vibration alarm, unit is minute  | ZDT,2,5#The delay time: 2 minutesThe fortification time: 5 minutes | ▲ |
| LEVEL,<S># | Set vibration sensitiveness S: sensitiveness 1/2/3/4/5 means highest/high/middle/low/lowestThe sensitivity can be set as high When the device is installed in a better position in seismic performance, in order to update the position normally | LEVEL,1# set the vibration sensitiveness as highest | ▲ |
| HC,<T1>,<T2># | Set the uploading time intervalT1: set the starting uploading time interval, the range is 5-300 seconds. T2: set the uploading time interval when the ignition off, the range is 0, 5-300 seconds. If it’s 0, the uploading time interval is invalid when ignition off  | HC,30,120# set the starting uploading time interval as 30 seconds, the uploading time interval as 120 seconds when the ignition is off HC,20,0# Set the starting uploading time interval as 20 seconds, the uploading time interval as 0 when ignition off  | ▲ |
|  |  |
| \*02\*NNF# | Set SMS alarm switch NN alarm type  The range 01-32, about the detail definition, refer to appendix B F alarm switch F | \*02\*001# enable power off alarm SMS notification, default as enable \*02\*000# disable power off alarm SMS notification \*02\*011# enable SOS alarm SMS notification default as enable\*02\*010# disable SOS alarm SMS notification\*02\*# query the alarm switchAbout the detail definition of alarm type, refer to appendix B | ▲ |
| \*03\*CCC# | set the angle of turning compensation | \*03\*60# set the turning compensation angle as 60 degree\*03\*100# set the turning compensation angle as 100 degree\*03\*# query the turning compensation angle | ▲ |
|  |
| \*11\*1# | Query the center number, SMS notification number, listening number  |  | ● |
| \*11\*3# | Query longitude and latitude | Response Google link, speed, mileage, date, time, LBS information, voltage, GPS satellite number, GSM signal strength.， | ● |
| \*11\*4# | Query the terminal communication way | Online means the terminal onlineOffline means the terminal offlineLink means connecting the server Status follows IP, port, APN, and local number, or terminal ID | ● |
|  |
| \*22\*01# | Wake up the terminal |  | ▲ |
| \*22\*1# | restore to factory setting |  | ▲ |
| \*22\*100# | Delete all blind area data |  | ▲ |
| \*22\*2# | Engine cut off |  | ▲ |
| \*22\*3# | Recover engine cut  |  | ▲ |
| \*22\*4# | Restart the terminal |  | ▲ |
|  |  |  |  |
| \*25\*# | query OTA upgrading status | Query results: the server IP, port, upgrading firmware version, upgrading status192.168.1.1:8000,T;T8G-1.5;Wireless upgrade request succeed ,downloading data now! | ● |
| \*26\*IP\*Port\*Version# | OTA, connect the specified server to upgrade the specified firmware versionIP and port are of the specified serverVersion: upgrading firmware version | \*26\*192168001001\*8000\*LT162-1.24#Specified server IP: 192.168.1.1 port: 8000 fill 0 front if the IP less than 3 digits. Specified firmware versionLT162-1.24 | ▲ |
| \*27\*# | Terminate the wireless upgrade, if the upgrade data download has been completed, then continue to upgrade; otherwise terminate the upgrade. |  | ▲ |
|  |  |
| \*33\*7# | Query over speed early warning threshold value, over speed threshold value, low speed threshold value, low speed duration | Query results: 50km/h, 60km/h, 10km/h,30sOver speed early warning threshold value: 50km/hOver speed threshold value: 60km/hLow speed threshold value: 10km/hLow speed duration: 30s | ● |
|  |
| \*44\*1vvv# | set over speed threshold value | \*44\*160# set the over speed threshold value as 60km/h | ▲ |
| \*44\*6DDDDD# | Set the initial mileage, unit is KM, the range 0-99999KM | \*44\*61000#, set the initial mileage as 1000Km | ▲ |
| \*44\*7TTTTT# | Set sleeping time, unit is second  | \*44\*7900# , set the sleeping time as 900seconds, it will go into sleeping model after 15 minutes when ignition off.  | ▲ |
|  |  |  |  |
| \*77\*0number# | 1set the center number 1 | \*77\*0123456# center number1: 123456 | ▲ |
| \*77\*1number# | Set local SIM number | \*77\*115988886666# local SIM card number: 15988886666 | ▲ |
| \*77\*2number# | 2set the center number 2 | \*77\*2123456# center number2: 123456 | ▲ |
| \*77\*4number＃ | Set SMS notification mobile number 1 | \*77\*415988886666# SMS notification number 1:15988886666 | ▲ |
| \*77\*5number＃ | Set SMS notification mobile number 2 | \*77\*515988886666# SMS notification number 2:15988886666 | ▲ |
|  |  |
| \*88\*1IP\*port\*A# | Set host server IP, port and communication wayA means communication way 1:TCP 0: UDP | \*88\*1192168001001\*8881\*1#IP: 192.168.1.1 port: 8881  fill 0 front if the IP less than 3 digits. Communication way: TCP | ▲ |
| \*88\*2APN# | GPRS device specific，Set APN | \*88\*2CMNET#APN: CMNET | ▲ |
| \*88\*3IP\*port\*A# | Set back-up server IP, port and communication way A means communication way 1:TCP 0: UDP | \*88\*3192168001002\*8882\*1#IP: 192.168.1.2 port: 8882 Communication way: tcp | ▲ |
| \*88\*4domain\*port\*A# | Set host server domain, port A means communication way 1:TCP 0: UDP | \*88\*4www.vodofo.com\*8881\*1#Domain: www.vodofo.com port: 8882 communication way: tcp | ▲ |
| \*88\*5domain\*port\*A# | Set the back-up server domain, port A means the communication way 1:TCP 0: UDP | \*88\*5www.vodofo.com\*8881\*1#Domain: www.vodofo.com port: 8882 communication way: tcp | ▲ |

**Appendix A**

● means the SMS command is supported unlimited.

▲ means the SMS command is supported by the center number, all mobile number can be available if the center number isn’t set.

**Appendix B** (● means supported by LT162)

|  |  |  |  |
| --- | --- | --- | --- |
| Serial Number | Alarm Type | Default | Supported By LT162 |
| 0 | Power off | Enable | ● |
| 1 | SOS alarm | Enable | ● |
| 2 | Theft alarm | Enable |  |
| 3 | Displacement alarm | Enable | ● |
| 4 | Vibration alarm | Enable |  |
| 5 | Over speed alarm | Disable  | ● |
| 6 | Low speed alarm | Disable | ● |
| 7 | Low fuel level | Disable |  |
| 8 | Fuel increase abnormal | Disable |  |
| 9 | Fuel decline abnormal | Enable  |  |
| 10 | High temperature | Disable |  |
| 11 | Low temperature | Disable |  |
| 12 | Ignition on | Disable | ● |
| 13 | Ignition off | Disable | ● |
| 14 | Geo-fence enter | Disable |  |
| 15 | Geo-fence exit | Disable |  |
| 16 | Fatigue driving | Enable  | ● |

## 7.2 LT-160 SMS Message List

|  |  |  |
| --- | --- | --- |
| **Command** | **Description** | **Example** |
| ZZ,<A>[,T1,T2]# | Tracking modelA: A=1 enter tracking model, A=0 exit tracking modelT1: The uploading time interval after entering tracking model, unit: second, default T1=30, range [5,300]T2: The duration in the tracking model, unit: minute, default T2=300, range [5, 57600]  | ZZ,1,10,60＃, entering tracking model, the uploading time interval is 10 seconds, it will go into sleeping model after 60 minutes.ZZ,0＃, exiting tracking model |
| HX,<T># | Sleep uploading time interval , default as 1440 minutes T : wake up time, unit: minute Range: 30-2880 minutes | HX,120# set the sleep uploading time interval as 120minutes.  |
| WAKEUP,T1[,T2[,T3[,T4]]]#Supported by the firmware version above LT160-1.14  | Set sleep uploading time point, max support to set 4 time points  T1…T4: time point, e.g.: 0830 means 8:30 am | WAKEUP,0800,1000,1530,1900# set 4 sleep uploading time points as 08:00,10:00,15:30,19:00WAKEUP,0900,1900# set 2 sleep uploading time points as 09:00,19:00WAKEUP,# delete sleep uploading time point parameter WAKEUP# query sleep uploading time point parameter |
| LBS,A# | A=2 disable locate function A=1 LBSA=0 LBS, GPS, AGPS, default as A=0 | LBS,1#LBS located, switch off GPS module.  |
| RECORD,# | Query the system running recording, includes wakeup times, Precise positioning times, LBS positioning times, non-positioning times, blind area times, Blind area data is covered and the data missing times, tracking model time and the system total running time( not includes sleeping time)  |  |
| FALL,A# | A=3 enable Anti disassemble alarm, non-trackingA=2 enable Anti disassemble alarm, tracking duration 15 minutes by the time interval 300 A=1 disable anti disassemble alarmA=0 enable anti disassemble alarm, tracking duration 60 minutes by the time interval 60 seconds.  Default as A=0  | FALL,1# disable anti disassemble alarm FALL,0# enable disassemble alarm FALL,# query  |
| AGPS,A# | A=1 enable, default as enableA=0 disable | AGPS,0# AGPS switch can be disable if the SIM card can’t support AGPS.  |
| LBS,A# | A=1 enableA=0 disable, default as A=0  | LBS,1#The positioning model will be switched to LBS when it’s none positioning by GPS module.  |
| WAKEINT,A# | Intelligent wake-up switch, default as enableA=0 enable A=1 disable |  |
|  |
| \*11\*1# | Query center number | includes major and minor sorting center numbers |
| \*11\*3# | Query longitude and latitude | It response GPS=1;2232.7008N,11354.6638E(accurate positioning, Latitude 22 degrees 32.7008 minutes, 113 degrees east longitude 54.6638 minutes) if the terminal accurate positioningIt response GPS=0 if it’s imprecise positioning |
| \*11\*4# | query the terminal communication way | Online: means the terminal onlineOffline: means the terminal offlineLink: means connecting server, the status follow the IP, port, APN, terminal ID and firmware version  |
|  |
| \*22\*1# | restore to factory setting |  |
|  |
| \*25\*# | query OTA upgrading status | Query results: the server IP, port, upgrading firmware version, upgrading status192.168.1.1:8000,T;T8G-1.5;Wireless upgrade request succeed ,downloading data now! |
| \*26\*IP\*Port\*Version# | OTA, connect the specified server to upgrade the specified firmware versionIP and port are of the specified serverVersion: upgrading firmware version | \*26\*192168001001\*8000\*LT160-1.24#Specified server IP: 192.168.1.1 port: 8000 fill 0 front if the IP less than 3 digits. Specified firmware versionLT160-1.24 |
|  |
| \*77\*0number# | 1set the center number 1 | \*77\*0123456# center number1: 123456 |
| \*77\*2number# | 2set the center number 2 | \*77\*2123456# center number2: 123456 |
|  |
| \*80\*# | Special standard, query the vehicle registration information The results of the inquiry: vehicle plate, vehicle color, 6 digits of provinces and cities ID, 7 digits of the device serial number, registration results (it also comes with authentication code if the registration is successful, ), protocol version | \*82\*JingA12345\*blue\*110000\*1234567#Vehicle plate: JingA12345 color: blue Provinces and cities ID: 110000(BeiJing) Device serial number 1234567\*82\*JingA12345\*blue\*\*#Vehicle plate: JingA12345 Color: blue Provinces and cities ID and device serial number can’t be modified, keep the original value  |
| \*83\*# | Special standard, terminal logout | the terminal will re-register automatically after logout |
|  |
| \*88\*1IP\*port\*A# | Set host server IP, port and communication wayA means communication way 1:TCP 0: UDP | \*88\*1192168001001\*8881\*1#IP: 192.168.1.1 port: 8881 fill 0 front if the IP less than 3 digits. Communication way: TCP |
| \*88\*2APN# | GPRS device specific，Set APN | \*88\*2CMNET#APN: CMNET |
| \*88\*3IP\*port\*A# | Set back-up server IP, port and communication way A means communication way 1:TCP 0: UDP | \*88\*3192168001002\*8882\*1#IP: 192.168.1.2 port: 8882 Communication way: tcp |
| \*88\*4domain\*port\*A# | Set host server domain, port A means communication way 1:TCP 0: UDP | \*88\*4www.vodofo.com\*8881\*1#Domain: www.vodofo.com port: 8882 communication way: tcp |
| \*88\*5domain\*port\*A# | Set the back-up server domain, port A means the communication way 1:TCP 0: UDP | \*88\*5www.vodofo.com\*8881\*1#Domain: www.vodofo.com port: 8882 communication way: tcp |