# TR-206
# Development Document
## Version 0.4_100326



Globalsat Technology Corporation
16F., No. 186, Jian-Yi Road, Chung-Ho City, Taipei Hsien 235, Taiwan
Tel: 886-2-8226-3799/ Fax: 886-2-8226-3899
E-mail: service@globalsat.com.tw
Website: www.globalsat.com.tw

| Version | Description |
| --- | --- |
| 0.1 | Document creation |
| 0.2 | 1. Delete: parking mode, sleeping mode, simple command<br>2. Add: 12.3 SMS format 1<br>3. Move “8. emergency” to 7.1 |
| | |

# CONTENT

# 1 Introduction

**TR-206 is a tracker that can track the location of the elderly, children, pets, and vehicles.**
**It can apply for fleet management, looking for lost children, elderly care, and lost pets.**

**This document describes the communication protocol between TR-206 tracker and server, the built-in behavior modes of TR-206, and the function of each parameter.**

**It helps system integration developer to develop back-end system in the shortest time.**

# 2 Protocol Summary

## 2.1 General Format

| GSx,IMEI,[T,S,]Field1,Field2,……,FieldN*Checksum! | | |
|---|---|---|
| **Format** | **Description** | **Note** |
| GSx | “GSS” :Write setting to device<br>“GSs” :Report setting from device<br>“GSG” :Write Geo-fence parameter to device<br>“GSg” :Report Geo-fence parameter from device<br>“GSC” :Action command<br>“GSr” :Position and status report (format 0)<br>“GSh” :Position and status report (format 1)<br>“GSd”: Cell ID and status report (format 2) | Command head |
| IMEI | (The IMEI number) | GSM device ID |
| T | ‘0’ : Middle of message<br>‘1’ : Start of message<br>‘2’ : End of message<br>‘3’ : Start and End of message, i.e., only one packet for message | Message packet control |
| S | ‘0’,’1’,’2’,’3’,…,’9’,’10’,’11’,…,’99’ | Sequence number |
| Field | Field 1 ~ Field N | Refer to “TR-206 configure parameters” for details |
| * | * | End of field |
| Checksum | The checksum value is derived by the same method of NMEA standard. It is calculated by ‘exclusive OR’ the 8 data bits of each character before “*” in the sentence, but excluding “*”. The hexadecimal value of the most significant and least significant 4 bits of the result are converted to two ASCII characters (0-9, A-F) for transmission. The most significant character is transmitted first. | |

| | | |
|---|---|---|
| ! | ! | Message delimiter |

# 2.2 Setup Format

## 2.2.1 Server -> Device

**GSS,IMEI,T,S,x1=y1,x2=y2,x3=y3,……*Check Sum!**

**x1,x2,x3… are code words for configuration parameters.**
**y1,y2,y3… are their respective settings.**

## 2.2.2 Device -> Server

**GSs,IMEI,T,S,x1=y1,x2=y2,x3=y3,……*Check Sum!**

# 2.3 Geo-fence Format

## 2.3.1 Server -> Device

**GSG,IMEI,T,S,1=(type,upper_left_Lon,upper_left_Lat,right_bottom_Lon,right_bottom_Lat[,startTime,endTime,weekday]),2=(…),3=(…),…*Check sum!**

## 2.3.2 Device -> Server

**GSg,IMEI,T,S,1=(type,upper_left_Lon,upper_left_Lat,right_bottom_Lon,right_bottom_Lat[,startTime,endTime,weekday]),2=(…),3=(…),…*Check sum!**

### 2.3.3 Geo-fence area definition format

***(type,upper_left_Lon,upper_left_Lat,right_bottom_Lon,right_bottom_Lat[,gxxx][,startTime,endTime,weekday])***

| | |
|---|---|
| **type** | **0=disable the area**<br>**1=get in area**<br>**2=get out of area**<br>**3=cross over the boundary**<br>**4=stay in area**<br>**5=stay out of area** |
| **upper_left_Lon,upper_left_Lat,right_bottom_Lon,right_bottom_Lat** | **Coordinate of specified area** |
| **startTime,endTime,weekday** | **Optional field which specify the effective time frame of this geo-fence area. Start Time and end Time are in seconds. Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc.** |

# 2.4 Command Format

**GSC,IMEI,c1(option1),c2(option2),…….*checksum!**

**c1,c2…are code words of commands.**

**option1, option2… are their respective parameters. Please refer to 2.7.**

# 2.5 Report Messages Format

**There are two types of report message format, “format 0” and “format 1”. (Refer to “12. Report” for detail definition)**

**Example:**

**TR-206 -> Server (format 0)**

**GSr,IMEI,Device_Mode,Report_Type,Alarm_Status,Geofence_status,GPS_Fix,UTC_Date,UTC_Time,Longitude,Latitude,Altitude,Speed,Heading,Number_of_Satellites,HDOP,Battery_capacity*checksum!**

**TR-206 -> Server (format 1)**

**GSh, IMEI,Alarm_Status,GPS_Fix,Battery_capacity*checksum!**

# 2.6 Parameters of Report Messages

| Parameters of Report Message | | |
|---|---|---|
| **Codeword** | **Parameters** | **Description** |
| A | GPS fixing status | 1=not fix<br>2=2D fix<br>3=3D fix |
| B | UTC Date, Time | ddmmyy,hhmmss |
| C | Local Date, Time | ddmmyy,hhmmss |
| 1 | Longitude | (E or W)ddd.dddddd |
| 2 | Longitude | (E or W)dddmm.mmmm |
| 3 | Longitude | (+ or -)ddddddddd<br>unit: 0.000001 degree |
| 6 | Latitude | (N or S)dd.dddddd |
| 7 | Latitude | (N or S)ddmm.mmmm |
| 8 | Latitude | (+ or -)ddddddddd<br>unit: 0.000001 degree |
| G | Altitude | xxxxx.x<br>Unit: meter |
| H | Speed | xxx.xx<br>unit: knots (1.852km/hr) |
| I | Speed | xxx<br>unit: km/hr |
| J | Speed | xxx<br>unit: mile/hr |
| K | Heading | xxx<br>unit: degree |
| L | Number of satellite in use | xx |
| M | HDOP | xx.x |
| N | Battery capacity | xx<br>unit: percent capacity |
| O | Operation mode | 2=Periodic<br>3=On-line<br>4=Motion<br>7=Standby |

| | | |
|---|---|---|
| | | 8=Off |
| P | Alarm status | xx(hex digits)<br><br>bit0=SOS alarm<br>bit4=Geo-fence alarm<br>bit5=Speed alarm<br>bit7=Battery low alarm |
| Z | Geo-fence status | Empty field: no geo-fence alarm<br>Ixxx: get in area xxx<br>Oxxx: get out area xxx |
| Q | Report Media | xx(hex digits)<br><br>bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Acton[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| R | Report type | 1=Ping report<br>2=Periodic mode report<br>3=On-line mode report<br>4=Motion mode static report<br>5=Motion mode moving report<br>6=Motion mode static to moving report<br>7=Motion mode moving to static report<br>G=Geo-fence alarm report<br>I=SOS alarm report<br>J=Low battery alarm report<br>K=Speed alarm report<br>L=Timer 0 report<br>M=Timer 1 report<br>N=Timer 2 report<br>O=Timer 3 report<br>P=L4 report<br>Q= Power on report |

| | | |
|---|---|---|
| | | R= Power off report |
| S | IMEI | |
| T | Device ID | |
| U | Checksum | The checksum value is derived by the same method of NMEA standard. It is calculated by 'exclusive OR' the 8 data bits of each character before "*" in the sentence, but excluding "*". The hexadecimal value of the most significant and least significant 4 bits of the result are converted to two ASCII characters (0-9, A-F) for transmission. The most significant character is transmitted first. |
| # | | |
| * | | |
| ? | | |
| ! | ! | Message delimiter |

# 2.7 Configuration Parameters

**Most behaviors of TR-206 could be changed by Configuration Parameters. You could change the setting of configuration parameters by the following methods.**

1. **Connect TR-206 to personal computer via USB cable and then set the configuration parameters by "TR206 Config Tool."**
2. **Send the "GSS,….!" setting with the configuration parameters to TR-206**
3. **Send the "GSC,….!" command with the configuration parameters to TR-206**

**All the settings or commands could be sent by SMS or TCP or UDP.**
**You could also send L1 command to read the present setting of TR-206.**

| Configure Parameters | | | | | |
|---|---|---|---|---|---|
| | | Code words | Parameters | Type | Description |
| Main | Device | O5 | Device ID | char(16) | |
| | | O7 | Firmware Version | char(28) | Read only |
| | | O6 | Time Zone Offset | s32, in seconds | -43200 ~ 46800 |
| | | O4 | Power on operating mode | u8 | 2=Periodic<br>3=On-line<br>4=Motion<br>7=Standby<br>Default=7 |
| | | B2 | IMEI code | char(16) | Read only |
| | | | | | |
| | SIM | B0 | PIN code | char(4) | |
| | | B1 | Phone number of SIM card | char(20) | |
| | | | | | |
| | Vibrator | I2 | Enable/ disable TR-206 to vibrate after pressing SOS key | 1/0 | 0=disable<br>1=enable |
| | | | | | |

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|---|---|---|---|---|---|
| | Battery | J0 | The power capacity for sending out battery low alarm report | u8, percent | 15 ~ 100 |
| | | J1 | The power capacity for power off TR-206 | u8, percent | 10 ~ 100 |
| | | J6 | Battery low alarm report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | J7 | The power capacity for clear battery low alarm flag | u8, percent | 10 ~ 100 |
| | | J8 | Enable/disable TR-206 to automatically power on when power capacity is charged to the capacity of J1 | 1/0 | 0=disable<br>1=enable |
| | | | | | |
| | Data logger | O2 | Data logger interval | u16, in seconds | 1 ~ 65535<br>Default=60 |
| | | OH | Data logger distance | u32, in meters | 0 ~ 86400<br>0=disable |
| | | | | | |
| | Other setting | O1 | Motion sensor sensitivity | u16 | 0 ~ 100<br>Default=5 |
| | | O3 | Report format 0 | char(32) | Default=SORPZAB27GHKLMN*U! |
| | | ON | Report format 1 | char(32) | Default=SARN*U! |
| | | OG | Enable/ disable data buffer function | 1/0 | Default=1 |
| | | O8 | Enable/ disable | 1/0 | Default=0. |

| | | | | | |
|---|---|---|---|---|---|
| | | | TR-206 to report “cell ID” if it does not get GPS fix | | The report format will automatically switch from format 0 to format 2 when TR-206 does not get GPS fix. |
| | | OO | Report media for reading configuration | Media type | bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | OV | Send power on/off report | 1/0 | 0=disable<br>1=enable<br>Default =0 |
| | | OW | Report media of power on/off report | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | OX | Enable/disable data logger function | 1/0 | 0=disable<br>1=enable<br>Default =0 |
| | | | | | |
| GPS | GPS | C0 | GPS always on | 1/0 | 0=disable<br>1=enable<br>Applicable to all modes except Off mode |
| | | C1 | The time for starting to get GPS fix before the next report time if TR-206 does not get GPS fix in last report, or got GPS fix for 1 hour ago | u16, in seconds | 60 ~ 600<br>**Note: TR-206 will send out the report whether it gets GPS fix or not when C1 time ends.** |
| | | C2 | The time for starting | u16, in | 10 ~ 120 |

| | | | | | |
|---|---|---|---|---|---|
| | | | to get GPS fix before the next report time if TR-206 got GPS fix within 1 hour | seconds | **Note: TR-206 will send out the report whether it gets GPS fix or not when C2 time ends.** |
| | | C3 | GPS fix time before sending out the first report | u16, in seconds | 0 ~ 600<br>If "C3"=0, disable first report message. |
| | | C7 | Choose to use C8 or C9+CA | 1/0 | 0=use C8<br>1=use C9+CA<br>Applicable for standby, periodic and on-line mode |
| | | C8 | Interval for starting to get GPS fix | u16, in seconds | 0 ~ 65535<br>Applicable if C7=0 |
| | | C9 | Interval for starting to get GPS fix when speed is lower than 10 KM/H | u16, in seconds | 0 ~ 65535<br>Applicable if C7=1 and speed<10 Km/H |
| | | CA | Interval for starting to get GPS fix when speed is higher than 10 KM/H | u32 | 0 ~ 86400<br>Applicable if C7=1 and speed>=10 Km/H<br>You have to take the value to divide the speed to get the interval. For example, if you set the value as 54000 and the speed is 60 KM/H. The interval will be 54000/60=900 seconds |
| | | | | | |
| **Communication** | **GPRS** | D1 | APN | char(32) | |
| | | D2 | User Name | char(32) | |
| | | D3 | Password | char(32) | |
| | | D4 | DNS 1 | char(32) | |
| | | D5 | DNS 2 | char(32) | |
| | | D8 | GPRS mode for L4 command | Media type | 02=TCP<br>04=UDP |
| | | OR | Shortly click SOS key to make TR-206 connect to server | 1/0 | 0=disable<br>1=enable |
| | | E0 | Host IP or domain | char(32) | |

| | | | | | |
|---|---|---|---|---|---|
| | | | name | | |
| | | E1 | Host Port number 1 | u16 | |
| | | | | | |
| | SMS | F0 | SMS return phone number | char(20) | |
| | | F2 | SMS format | 1/0 | 0= Same as GPRS format<br>1= Text format |
| | | Fa | SMS format 1 report string for ping | char(96) | |
| | | Fb | SMS format 1 report string for SOS alarm | char(96) | |
| | | Fc | SMS format 1 report string for main battery low | char(96) | |
| | | Fd | SMS format 1 report string for geo-fence alarm | char(96) | |
| | | Fe | SMS format 1 report string for periodic mode | char(96) | |
| | | Ff | SMS format 1 report string for online mode | char(96) | |
| | | Fg | SMS format 1 report string for static state of motion mode | char(96) | |
| | | Fh | SMS format 1 report string for moving state of motion mode | char(96) | |
| | | Fi | SMS format 1 report string for changing from static to moving state | char(96) | |
| | | Fj | SMS format 1 report string for changing from moving to static state | char(96) | |

| | | | | | |
|---|---|---|---|---|---|
| | | Fk | SMS format 1 report string for high speed alarm | char(96) | |
| | | Fl | SMS format 1 report string for low speed alarm | char(96) | |
| | | Fm | SMS format 1 report string for timer 0 | char(96) | |
| | | Fn | SMS format 1 report string for timer 1 | char(96) | |
| | | Fo | SMS format 1 report string for timer 2 | char(96) | |
| | | Fp | SMS format 1 report string for timer 3 | char(96) | |
| | | Fq | SMS format 1 report string for power on | char(96) | |
| | | Fr | SMS format 1 report string for power off | char(96) | |
| | | | | | |
| | | A0 | Send confirmation to server after receiving command from server | 1/0 | 0=disable<br>1=enable<br>Confirmation message="ACK\r\n" |
| | | A1 | Wait confirmation from server after sending message to server | 1/0 | 0=disable<br>1=enable<br>Confirmation message="ACK\r" |
| | | A2 | Timeout of waiting confirmation from server | u8 | 0~255 |
| | | A3 | Device Ack with ID string | 1/0 | 0=disable<br>1=enable |
| | | A4 | ID string is IMEI or device ID | 1/0 | 0=Device ID<br>1=IMEI<br>Available when A3=1 |
| | | A5 | Enable Simple | 1/0 | 0=disable |

| | | | | | |
|---|---|---|---|---|---|
| | | | Command | | 1=enable |
| | | | | | |
| Function | | F4 | Date format (LCD) | u8 | dd/mm/yy or mm:dd:yy |
| | | F5 | Time format (LCD) | u8 | 0=12 hour<br>1=24 hour |
| | | F6 | Daylight saving | 1/0 | 1=enable<br>0=disable |
| | | F7 | Auto key lock | 1/0 | 1=enable<br>0=disable |
| | | F8 | Vibrator/beep type | u8 | 0=vibrator + beep<br>1=beep<br>2=vibrator<br>3=off |
| | | FB | Volume level of ring tone | u8 | 0=minimum 1=medium<br>2=maximum 3=progressive<br>Default=1 |
| | | FC | Volume level of alarm clock | u8 | 0=minimum 1=medium<br>2=maximum 3=progressive<br>Default=1 |
| | | FD | Volume level of phone call (headset) | u8 | 0~6<br>Default=6 |
| | | FE | Melody of ring tone | u8 | Default=2 |
| | | FF | Power-on melody | u8 | Default=1 |
| | | OU | Password of simple command and PC utility | Char(16) | |
| | | | | | |
| S | S | G0 | SMS Phone number 1 | char(20) | |

| | | | | | |
|---|---|---|---|---|---|
| | | G1 | SMS Phone number 2 | char(20) | |
| | | G2 | SMS Phone number 3 | char(20) | |
| | | G3 | SMS Phone number 4 | char(20) | |
| | | G4 | SMS Phone number 5 | char(20) | |
| | | G5 | SMS Phone number 6 | char(20) | |
| | | H0 | Report media | Media Type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | H1 | Number of SMS report | u16 | 1 ~ 65535 |
| | | H2 | report interval | u16, in seconds | 0 ~ 65535<br>Default=30 |
| | | H3 | Number of GPRS report | u8 | 0 =continue sending SOS alarm report till receive stop command |
| | | | | | |
| | Voice monitor | V4 | Voice Monitor call in phone number for voice monitor command | char(20) | G0~G5 are also call in phone number for voice monitor command |
| | | V5 | Allowed interval for call in TR-206 after receiving voice monitor command | u16, in seconds | 0 ~ 65535 |
| | | | | | |
| | Speed Limit | OI | Upper limit of speed alarm | u8, in Km/h | 0 ~ 255<br>0=disable |
| | | OJ | Lower limit of speed alarm | u8, in Km/h | 0 ~ 255<br>0=disable |
| | | OP | Hysteresis for speed alarm | u8, in Km/h | 0 ~ 255 |
| | | OL | Report Media for speed alarm | Media type | bit0=SMS<br>bit1=TCP |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | | | | |
| | Geo-fence | K0 | Geo-fence enable | 1/0 | 0=disable<br>1=enable |
| | | K3 | Geo-fence alarm report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | K4 | Report media for reading Geo-fence data | Media type | bit1=TCP<br>bit2=UDP |
| | | | | | |
| Tracking | Ping | OD | Report media for ping | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | OS | GPS fix time between receiving ping command and sending out ping report | u16, in seconds | For N1 command. If OS=0, GPS fix time=C3 |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Periodic | P0 | Report interval | u32, in seconds | 0 ~ 86400 |
| | | P2 | Report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | P3 | Traveled distance for sending report | u32, in meters | 0 ~86400<br>0=disable |
| | | | | | |
| | On-line | Q0 | Report interval | u32, in seconds | 0 ~ 86400 |
| | | Q2 | Report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | Q3 | Traveled distance for sending report | u32, in meters | 0 ~ 86400<br>0=disable |
| | | E4 | Interval in on-line state for disconnecting and then re-connecting | u16, in seconds | 0=disable |
| | | E5 | Interval for checking if GPRS connection is on-line. If GPRS connection is cut, TR-206 will try to connect to server for one time. | u16, in seconds | 0=disable |

| | | | | | |
|---|---|---|---|---|---|
| | | E6 | Enable/disable TR-206 to send “OK” to server after GPRS connection is re-built. | 1/0 | 0=disable<br>1=enable<br>Available when E5 is not 0 |
| | | | | | |
| | Motion | R0 | Report interval in static state | u32, in seconds | 0 ~ 86400 |
| | | R1 | Report interval in motion state | u32, in seconds | 0 ~ 86400 |
| | | R2 | Report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | R3 | Traveled distance for sending report | u32, in meters | 0 ~ 86400<br>0=disable |
| | | R7 | Automatic change from motion mode to on-line mode | 1/0 | 0=disable<br>1=enable |
| | | R9 | Minimum distance to be judged as moving state | u16, in meters | 0 ~ 65535 |
| | | RB | Keep GPRS on-line in static state | 1/0 | 0=disable<br>1=enable |
| | | RC | Keep GPRS on-line in moving state | 1/0 | 0=disable<br>1=enable |
| | | E4 | Interval in on-line state for disconnecting and then re-connecting | u16, in seconds | 0=disable |
| | | E5 | Interval for checking if GPRS connection is on-line. If GPRS | u16, in seconds | 0=disable |

| | | | | | |
|---|---|---|---|---|---|
| | | | connection is cut, TR-206 will try to connect to server for one time. | | |
| | | E6 | Enable/disable TR-206 to send “OK” to server after GPRS connection is re-built. | 1/0 | 0=disable<br>1=enable<br>Available when E5 is not 0 |
| | | RD | Interval for switching from validation to static state if no motion detected | u16, in seconds | 0=Interval is the same with R1 |
| | | RE | Traveled distance to be judged as keep in moving state | u16, Unit: meter | |
| | | RF | Interval for switching from moving to static state if no motion detected | u16, in seconds | 0=Interval is the same with R1 |
| | | RG | Check GPS off time setting (C7, C8, C9, CA | 1/0 | 0=disable<br>1=enable |
| | | RH | GPS always on in moving state | 1/0 | 0=disable<br>1=enable |
| | | RI | Report Media for changing from static to moving | Media type | |
| | | RJ | Report Media for changing from moving to static | Media type | |
| | | | | | |
| Timer | Timer 0 | W0 | Start time | u32, in seconds | 0 ~ 86400 |
| | | W1 | End time | u32, in seconds | 0 ~ 86400 |
| | | W2 | Report interval | u16, in seconds | 0 ~ 65535 |

| | | | | | |
|---|---|---|---|---|---|
| | | W3 | Weekday mask | u8, xx(hex digits) | 00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| | | W4 | Report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | | | | |
| | Timer 1 | X0 | Start time | u32, in seconds | 0 ~ 86400 |
| | | X1 | End time | u32, in seconds | 0 ~86400 |
| | | X2 | Report interval | u16, in seconds | 0 ~ 65535 |
| | | X3 | Weekday mask | u8, xx(hex digits) | 00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| | | X4 | Report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Timer 2 | Y0 | Start time | u32, in seconds | 0 ~ 86400 |
| | | Y1 | End time | u32, in seconds | 0 ~ 86400 |
| | | Y2 | Report interval | u16, in seconds | 0 ~ 65535 |
| | | Y3 | Weekday mask | u8, xx(hex digits) | 00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| | | Y4 | Report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0]<br>bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | | | | |
| | Timer 3 | Z0 | Start time | u32, in seconds | 0 ~ 86400 |
| | | Z1 | End time | u32, in seconds | 0 ~ 86400 |
| | | Z2 | Report interval | u16, in seconds | 0 ~ 65535 |
| | | Z3 | Weekday mask | u8, xx(hex digits) | 00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| | | Z4 | Report Media | Media type | bit0=SMS<br>bit1=TCP<br>bit2=UDP<br>bit6=Action[0] |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | bit7=Action[1]<br><br>Action=00: report format 0<br>Action=01: report format 1<br>Action=10: GPS on |
| | | | | | |
| Alarm Clock | Alarm Clock 1 | XA | Melody of alarm clock 1 | u8 | |
| | | XB | Alarm time of alarm clock 1 | u32, in seconds | 0 ~ 86400 |
| | | XC | Type of alarm clock 1 | | 0=disable<br>1=once<br>2=daily<br>3=weekly (XD must be set) |
| | | XD | Weekday mask of alarm clock 1 | u8, xx(hex digits) | Available when XC=3<br>00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| | | XE | Prompt message of alarm clock 1 | Char(16) | |
| | | | | | |
| | Alarm Clock 2 | YA | Melody of alarm clock 2 | u8 | |
| | | YB | Alarm time of alarm clock 2 | u32, in seconds | 0 ~ 86400 |
| | | YC | Type of alarm clock 2 | | 0=disable<br>1=once<br>2=daily<br>3=weekly (YD must be set) |

| | | | | | |
|---|---|---|---|---|---|
| | | YD | Weekday mask of alarm clock 2 | u8, xx(hex digits) | Available when ZC=3<br>00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| | | YE | Prompt message of alarm clock 2 | Char(16) | |
| | | | | | |
| | Alarm Clock 3 | ZA | Melody of alarm clock 3 | u8 | |
| | | ZB | Alarm time of alarm clock 3 | u32, in seconds | 0 ~ 86400 |
| | | ZC | Type of alarm clock 3 | | 0=disable<br>1=once<br>2=daily<br>3=weekly (ZD must be set) |
| | | ZD | Weekday mask of alarm clock 3 | u8, xx(hex digits) | Available when ZC=3<br>00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| | | ZE | Prompt message of alarm clock 3 | Char(16) | |
| | | | | | |
| Phone | | VA~VT | Phone number of phone book | Char(20) | |

| | | | | | |
|---|---|---|---|---|---|
| | | Va~Vt | Contacts of phone book | Char(24) | |

# 2.8 Command's Codeword

| Command's Codeword | | |
|---|---|---|
| **Codeword** | **Parameters** | **Description** |
| M7 | Set Standby Mode | |
| M2 | Set Periodic Mode | |
| M3 | Set On-Line mode | |
| M4 | Set Motion mode | |
| M8 | Set Off mode | |
| N0 | Set Timer | |
| N1 | Ping device | |
| | | |
| N2 | Trigger vibration | |
| N4 | Enable Voice Monitor | |
| N6 | Enable Geo-fence | |
| N7 | Disable Geo-fence | |
| N8 | Enable Data logger | |
| N9 | Disable Data logger | |
| Na | Dismiss SOS alarm | |
| Ne | Dismiss Geo-fence alarm | |
| Nh | Dismiss low battery alarm | |
| Ni | Dismiss All alarm | |
| | | |
| L1 | Read Configuration | Adding up to 1-5 parameters.<br>If parameter=(ALL), then all user configuration data will be reported. |
| L3 | Read Geo-fence | |
| L4 | Make TR-206 connect to Server | |
| L5 | Disconnect from Server | |
| LA | Restore default configuration | Restore all parameters to factory value<br>(W) for writing current configuration to default setting. |

| | | |
|---|---|---|
| **LC** | **Clear data logger** | |
| **LH** | **Re-Set device** | |

# 2.9 Report Media

**Report media is the method that TR-206 sends report. No matter you send the command by SMS or TCP or UDP, TR-206 will send the report via the report media.**

| | | |
|---|---|---|
| **Report Media** | **Media type** | **bit0=SMS**<br>**bit1=TCP**<br>**bit2=UDP**<br>**bit6=Action[0]**<br>**bit7=Action[1]**<br>**Action=00: report format 0**<br>**Action=01: report format 1**<br>**Action=10: GPS on** |

| | **Action** | | **Media Type** | | | | | |
|---|---|---|---|---|---|---|---|---|
| **bit** | **7** | **6** | **5** | **4** | **3** | **2=UDP** | **1=TCP** | **0=SMS** |
| **Ex 1: TCP** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** |
| **Ex 2: UDP** | **0** | **1** | **0** | **0** | **0** | **1** | **0** | **0** |
| **Ex 3: GPS on** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**Example 1: Ask TR-206 to send on-line report with report interval of 5 minutes (Q0=300) and report format 0 to TCP server (Q2=02).**
**GSC,011412000010789,M3(Q0=300,Q2=02)*07!**

**Example 2: Ask TR-206 to enter motion mode with static report interval of 7 minutes (R0=420) and moving report interval of 40 seconds (R1=40), report format 1 to UDP server (R2=44).**
**GSC,011412000010789,M4(R0=420,R1=40,R2=44)*71!**

**Example 3: Set Timer 1 to turn on GPS without sending report (X4=80), Start time: 09:00 AM (X0=32400), End time: 06:00 PM (X1=64800), Report interval: 1 hour (X2=3600), Report day: from Monday ~Friday (X3=3E)**
**GSS,011412000012789,3,0,X0=32400,X1=64800,X2=3600,X3=3E,X4=80*53!**

# 2.10 Checksum

**The checksum value is derived by the same method of NMEA standard. It is calculated by 'exclusive OR' the 8 data bits of each character before "*" in the sentence, but excluding "*". The hexadecimal value of the most significant and least significant 4 bits of the result are converted to two ASCII characters (0-9, A-F) for transmission. The most significant character is transmitted first.**

**Example1:** set the device whose IMEI is 011412000011274, the APN is internet, the user name and password are not necessary, the server type is TCP, the server IP is 220.128.207.75, the server port number 3000.
The setup command is
**GSS,011412000011274,3,1,D1=internet,D2=,D3=,D8=02,E0=220.128.207.75,E1=3000*5E!**
**The checksum is 5E.**

**Example2:** Set TR-206 periodic report and ask it to report based on traveled distance (P3) of 500 meters
The setup command is
**GSC,011412000010789,M2(P3=500)*72!**
**The checksum is 72.**

# 3 Configuration

**You could read or set TR-206 configuration parameters by USB, SMS, TCP, UDP communication protocol.**

## 3.1 Read parameters of configuration

**Command's format:**

**GSC,IMEI,L1(x1,x2,x3,x4,x5)*Checksum!**
**GSC,IMEI,L1(ALL)*Checksum!**

**Add up to 1-5 parameters.**
**If parameter =(ALL), then all user configuration data will be generated.**

**Report format:**

**GSs,IMEI,T,S,x1=y1,x2=y2,x3=y3,……*Checksum!**

**x1,x2,x3… are code words for configuration parameters.**
**y1,y2,y3… are their respective settings.**

**Example 1:**

**Ask TR-206 report parameters of Motion mode(R0,R1,R2,R3)**
**GSC,136489586301578,L1(R0,R1,R2,R3)*35!**

**Report parameters R0,R1,R2 and R3 form TR-206**
**GSs,136489586301578,3,0,R0=3600,R1=30,R2=02,R3=0*4E!**

**Example 2:**

**Ask TR-206 report all parameters**
**GSC,135485956301257,L1(ALL)*5C!**

**Report all parameters from TR-206**

**GSs,135485956301257,1,0,O5=TR206,O7=F-ORT-206-08120421.0.0.0.0,O6=28800,O4=7,B0=,B1=,B2=,I2=1,J0=20,J1=15,J6=02*02!**

**GSs,135485956301257,0,1,O1=5,O3=STRPAB27GHKLMN*U!,ON=SPAN*!,OO=02,C0=0,C1=300,C2=30,C3=10*18!**

**GSs,135485956301257,0,2,D1=,D2=,D3=,D4=,D5=,D6=1,E0=,E1=5000,F0=,F1=5,A0=1,A1=0,A2=5,A3=0,A4=1*02!**

**GSs,135485956301257,0,3,G0=,G1=,G2=,G3=,G4=,G5=,H0=02,H1=3,H2=30,V1=600,V0=1,V4=,V5=300*13!**

**GSs,135485956301257,0,4,T0=3600,T1=30,T2=02,T3=0,U0=3600,U1=30,U3=02,OI=100,OJ=60,OL=02,OP=5,OQ=30*2C!**

**GSs,135485956301257,0,5,K3=02,K4=02,K5=30,OD=02,P0=60,P2=02,P3=0,Q0=60,Q2=02,Q3=0*0A!**

**GSs,135485956301257,0,6,R0=3600,R1=180,R2=02,R3=0,W0=0,W1=86400,W2=60,W3=40,W4=02*0D!**

**GSs,135485956301257,2,7,Y0=,Y1=,Y2=3600,Y3=,Y4=02,Z0=,Z1=,Z2=30,Z3=,Z4=02,X4=02,Z0=,Z1=,Z2=30,Z3=,Z4*43!**

# 3.2 Set parameters of configuration

**Commands format:**

**GSS,IMEI,T,S,x1=y1,x2=y2,x3=y3,……,*Checksum!**

**x1,x2,x3… are code words for configuration parameters.**
**y1,y2,y3… are their respective settings.**
**Example 1:**

**Set parameters of GPRS setting (D1,E0,E1)**

| Codeword | Parameters | Value |
|---|---|---|
| D1 | APN | Internet |
| E0 | Host IP 1 | 201.89.56.207 |
| E1 | Host Port number 1 | 5000 |

**GSS,138785469589531,3,0,D1=internet,E0=201.89.56.207,E1=5000*01!**

**Example 2:**

**Set parameters of Timer 1: Start time: 09:00 AM (X0=32400), End time: 06:00 PM (X1=64800), Report interval: 1 hour (X2=3600), Report day: from Monday ~Friday (X3=3E)**

**GSS,011412000012789,3,0,X0=32400,X1=64800,X2=3600,X3=3E*26!**

# 4 GSM & GPRS

## 4.1 GPRS Setting

In order to activate the communication between server and device, the GPRS parameter is necessary to set at the beginning. The GPRS parameters are included as the table below. Please contact with your telecom operator for the APN, user name, and password. Please contact your ISP provider for DNS1 and DNS2.

| | | | | |
|---|---|---|---|---|
| GPRS | D1 | APN | char(32) | |
| | D2 | User Name | char(32) | |
| | D3 | Password | char(32) | |
| | D4 | DNS 1 | char(32) | |
| | D5 | DNS 2 | char(32) | |
| | D8 | GPRS mode for L4 command | Server type | 02=TCP<br>04=UDP |
| | E0 | Host IP 1 or domain name | char(32) | |
| | E1 | Host Port number 1 | u16 | |

***Note:***

1. If user name and password are not necessary for your telecom operator, please keep D2 and D3 blank.
2. If the value of E0 is IP, you do not have to set D4 and D5. Please skip the fields.

The setup format of GPRS setting is "**GSS,IMEI,T,S,D1=y1,D2=y2,D3=y3,D4=y4, D5=y5, D8=y6,E0=y7,E1=y8,*Checksum!"**

For example, set the device whose IMEI is 011412000010789, the APN is internet, the user name and password are not necessary, the server type is TCP, the server IP is 220.128.207.75, the server port number 5000.
The setup command is
**GSS,011412000010789,3,1,D1=internet,D2=,D3=,D8=02,E0=220.128.207.75,E1=5000 *78!**

# 4.2 Acknowledgement

**Acknowledgement is the acknowledge receipt used to confirm if server or device receive the command or report from each other.**
**The following parameters must be set for configuration or sending those parameters by other action command for enable/disable acknowledgement.**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| A0 | Send confirmation to server after receiving command from server | 1/0 | Confirmation message="ACK\r\n" when A3=0<br>When A3=1, A4=1, confirmation message="IMEI, ACK\r\n"<br>When A3=1,A4=0, confirmation message="Device ID, ACK\r\n" |
| A1 | Wait confirmation from server after sending message to server | 1/0 | Confirmation message="ACK\r" |
| A2 | Timeout of waiting confirmation from server | u8 | 0~255 |
| A3 | Device Ack with ID string | 1/0 | |
| A4 | ID string is IMEI or device ID | 1/0 | 1=IMEI, 0=Device ID<br>Available when A3=1 |

**For example, set A0=1, A1=1, A3=1, A4=1, server sends command to TR-206 whose IMEI is 011412000010789.**
**After receiving the command, TR-206 will send acknowledgement receipt as "011412000010789,ACK\r\n"**

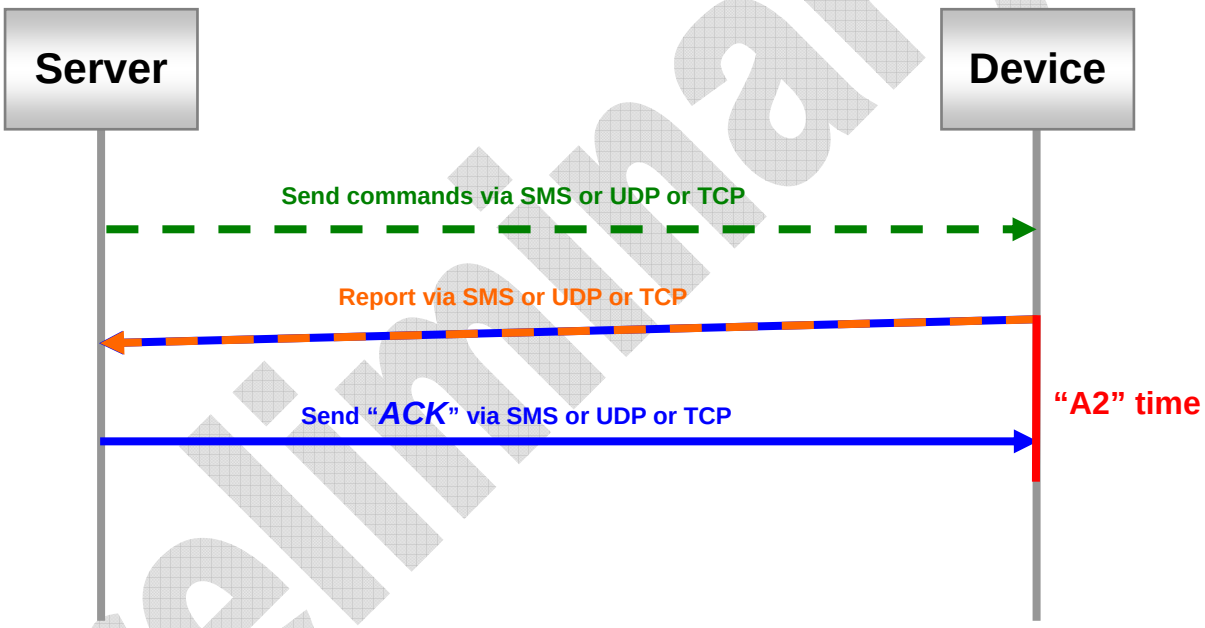
**For example, set A0=1, A1=1, A3=1, A4=0, TR-206 whose device ID is Globalsat, sends report to server.**

**After receiving the command, TR-206 will send acknowledgement receipt as "Globalsat,ACK\r\n"**

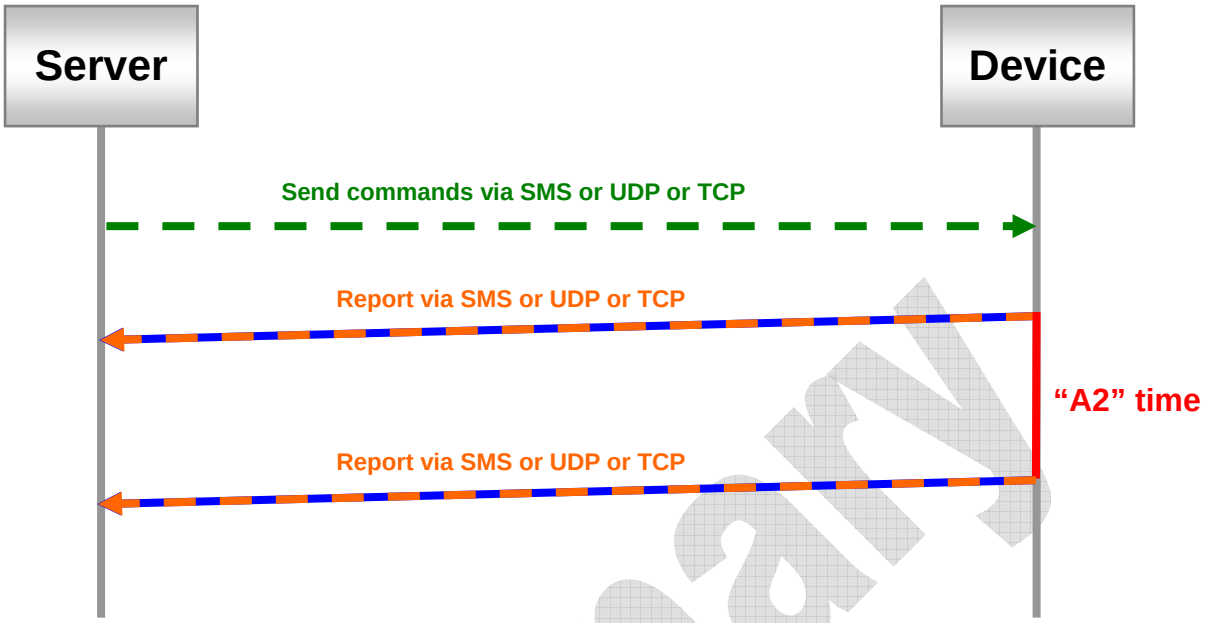
**<u>For example</u>, set A0=1, A1=1, A3=0, server sends command to TR-206**
**After receiving the command, TR-206 will send acknowledgement receipt as "ACK\r\n"**

### 4.2.1 Receive Acknowledgement from Server

**<u>Receive ACK from server during "A2" time</u>:**

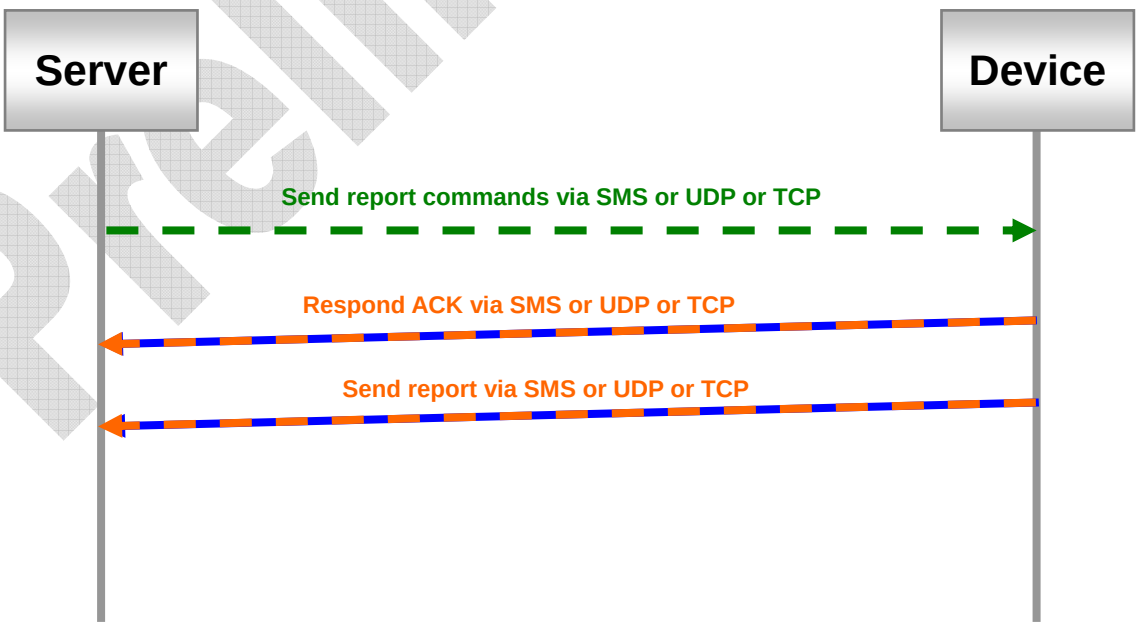


**Not receive ACK from server during "A2" time:**

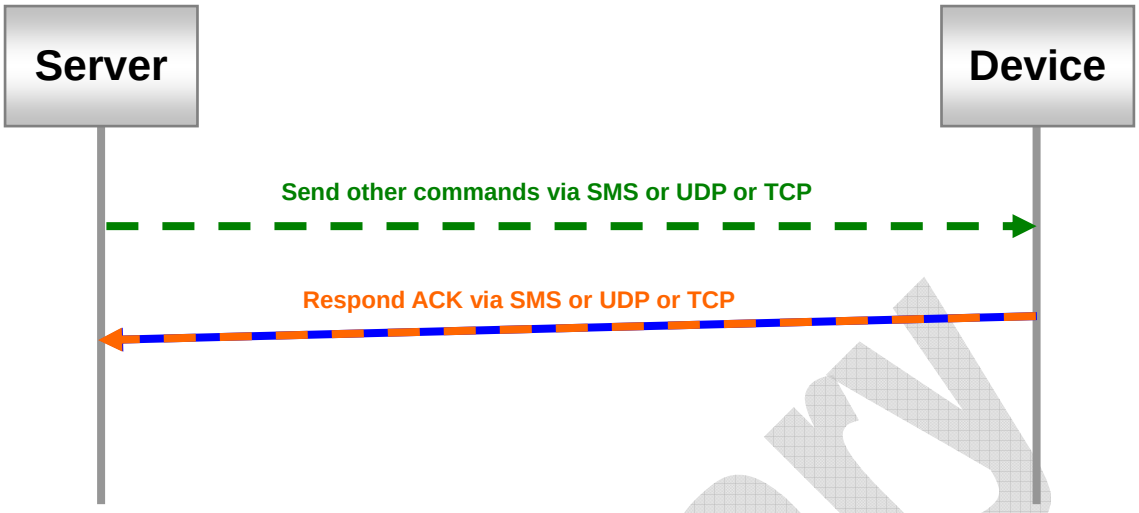



### 4.2.2 Respond Acknowledgement to Server

**Receive report commands from server:**



**Receive other commands from server:**



# 5 GPS

**In the general tracking modes, TR-206 will turn on GPS.**
**There are some conditions that you have to extra make GPS on.**

1. **Report based on traveled distance in the periodic mode, on-line mode, motion mode**
2. **Speed limit**
3. **Geo-fence mode**
4. **Data Logger**

**There are two ways for turning on GPS, one is to keep GPS always on by parameter C0, and the other is to use timer. Keep GPS always on will make the power run up within 10 hours.**
**The recommended method of making GPS on is to use timer.**
**While using timer, you could set the report media (X4 or Y4 or Z4) as 80, then TR-206 will turn on the GPS according to the report interval (X2 or Y2 or Z2)**

**Note:**
**Using timer to turn on GPS, TR-206 does not turn on GPS all the time during the period from Start Time (X0 or Y0 or Z0) to End Time (X1 or Y1 or Z1). GPS is turn on according to the report interval (X2 or Y2 or Z2) during the period from Start Time to End Time.**

**For the details of setting timer, please refer to chapter "10 Timer."**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| C0 | GPS always on | 1/0 | 0=disable<br>1=enable<br>Applicable to all modes except Off mode |
| C1 | The time for starting to get GPS fix before the next report time if TR-206 does not get GPS fix in last report, or got GPS fix | u16, in seconds | 60 ~ 600<br>**Note: TR-206 will send out the report whether it gets GPS fix or not when C1 time ends.** |

| | | | |
|---|---|---|---|
| | for 1 hour ago | | |
| C2 | The time for starting to get GPS fix before the next report time if TR-206 got GPS fix within 1 hour | u16, in seconds | 10 ~ 120<br>**Note: TR-206 will send out the report whether it gets GPS fix or not when C2 time ends.** |
| C3 | GPS fix time before sending out the first report | u16, in seconds | 0 ~ 600<br>If "C3"=0, disable first report message. |
| C7 | Choose to use C8 or C9+CA | 1/0 | 0=use C8<br>1=use C9+CA<br>Applicable for standby, periodic and on-line mode |
| C8 | Interval for starting to get GPS fix | u16, in seconds | 0 ~ 65535<br>Applicable if C7=0 |
| C9 | Interval for starting to get GPS fix when speed is lower than 10 KM/H | u16, in seconds | 0 ~ 65535<br>Applicable if C7=1 and speed<10 Km/H |
| CA | Interval for starting to get GPS fix when speed is higher than 10 KM/H | u32 | 0 ~ 86400<br>Applicable if C7=1 and speed>=10 Km/H<br>You have to take the value to divide the speed to get the interval. For example, if you set the value as 54000 and the speed is 60 KM/H. The interval will be 5400/60=900 seconds |
| RH | GPS always on in moving state | 1/0 | 0=disable<br>1=enable |

**C7, C8, C9, and CA is for speeding up the time of getting GPS fix if you set a long report interval in stand-by, periodic and on-line mode. Between the long report interval, C7, C8, C9, and CA will make TR-206 get GPS fix. Then TR-206 can speed up the time of getting GPS fix at the next report.**

**C1 example, the next report time is 10:00 AM and TR-206 does not get GPS fix in last report, C1 is 180 seconds. TR-206 will start to get GPS fix at 9:57 AM and send out report at 10:00**

**C2 example, the next report time is 10:00 AM and TR-206 got GPS fix within 1 hour, C2 is 20 seconds. TR-206 will start to get GPS fix at 9:59:40 AM and send out report at 10:00**

**C3 example, C3=120 seconds, TR-206 is in the motion mode. When TR-206 is moved, it will try to get GPS fix for 120 seconds before sending motion moving report.**

# 6 Tracking

## 6.1 Ping

**Ping is for getting the present location of TR-206 immediately. TR-206 will report its present location and concerning information when getting the ping command.**
**You can ping TR-206 by L4 command or by N1 command.**
**The parameters of ping:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| D8 | Report Media for L4 | 02=TCP<br>04=UDP | The connecting method for TR-206 to connect to server after receiving "L4" command. |
| OD | Report media for ping (N1) | | Please refer to 2.9 Report media |
| OS | GPS fix time between receiving ping command and sending out ping report | u16, in seconds | If OS=0, GPS fix time=C3 |
| C3 | GPS fix time before sending out the first report | u16, in seconds | 0 ~ 600<br>If "C3"=0, disable first report message. |

**Commands format:**
**GSC,IMEI,N1*Checksum!**

| Command Codeword | Parameters |
|---|---|
| N1 | Ping device |
| L4 | Connect to server |

**Example 1:**

**Ping TR-206 location and ask it to report via SMS (Send command via SMS or TCP or UDP)**

**GSC,135785412249986,N1(OD=01)*2C!**

# 6.2 Periodic Mode

**Periodic mode is for setting an interval for TR-206 to regularly report its location according to the interval. When it reaches the report time, TR-206 will turn on GPS and GPRS connection and report the location and concerning information to server. After sending the information, TR-206 will disconnect from server.**

**Note of Traveled Distance:**
You can also set a traveled distance, and then TR-206 will report by the combination of report interval and traveled distance.
For example, the report interval is 60 seconds, the traveled distance is 800 meters, TR-206 sends 1 report at 10:00:00, and then it detects the traveled distance is over 800 meters at 10:00:50, it will send out one report and re-start to count the report interval and the traveled distance. The next report will be sent out at 10:01:50 or when the traveled distance is over 800 meters.

**The parameters of periodic mode:**

| Code word | Parameter | Value | Description |
|---|---|---|---|
| P0 | Report interval | 1~86400 seconds | |
| P2 | Report Media | | Please refer to 2.9 Report media |
| P3 | Traveled distance for sending report | 0=disable<br>1~1000000<br>Unit: meter | If you want TR-206 to send reports according to traveled distance, you have to extra make GPS on. Please refer to “Chapter 4 GPS.” |

**Commands format:**
**GSC,IMEI,M2*Checksum!**

| Command Codeword | Parameter |
|---|---|
| M2 | Set periodic mode |

**Example 1:**

**Set TR-206 periodic report and ask it to report based on traveled distance (P3) of 500 meters (Send command via SMS or TCP or UDP), turn on GPS by timer 1: Start time:12:00 AM (X0=0), End time:12:00 AM (X1=86400), Report interval:30 seconds (X2=30), Report time: From Monday to Sunday (X3=7F), GPS on (X4=80)**

**GSC,011412000010789,M2(P3=500,X0=0,X1=86400,X2=30,X3=7F,X4=80)*7F!**
**Note: You have to turn GPS on. Please refer to chapter 5 GPS.**

**Example 2:**

**Set TR-206 periodic report and ask it to report based on report interval (P0) 0f 30 seconds**
**GSC,135785412249986,M2(P0=30)*45!**

# 6.3 On-Line Mode

**In On-Line mode, TR-206 will keep GPRS connection. If TR-206 detects the GPRS connection is cut, it will try to connect to server for one time. If it cannot connect to server, it will re-connect to server when the next report time.**

**Some telecom operator will kick off the continual GPRS connection. So you could make GPRS connection cut and then make the GPRS connection again according to a regular interval by parameter E4. If E4=0, TR-206 will not cut GPRS connection and then connect again. It will keep GPRS connection. You could also make TR-206 to check if GPRS connection is on-line according to a regular interval by parameter E5. If GPRS connection is cut, TR-206 will try to connect to server for one time.**

**Note of Traveled Distance:**
You can also set a traveled distance, and then TR-206 will report by the combination of report interval and traveled distance.
For example, the report interval is 60 seconds, the traveled distance is 800 meters, TR-206 sends 1 report at 10:00:00, and then it detects the traveled distance is over 800 meters at 10:00:50, it will send out one report and re-start to count the report interval and the traveled distance. The next report will be sent out at 10:01:50 or when the traveled distance is over 800 meters.

**You can also set a traveled distance, and then TR-206 will report by the combination of report interval and traveled distance.**

**You could define the content of report and the report interval of on-line mode.**

**The parameters of On-Line mode:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| Q0 | Report interval | 1~86400 seconds | |
| Q2 | Report Media | | Please refer to 2.9 |

| | | | |
|---|---|---|---|
| | | | Report media |
| Q3 | Traveled distance for sending out report | 0=disable<br>1~1000000<br>Unit: meter | If you want TR-206 to send reports according to traveled distance, you have to extra make GPS on. Please refer to “Chapter 4 GPS.” |
| E4 | Interval in on-line state for disconnecting and then re-connecting | u16, in seconds | |
| E5 | Interval for checking if GPRS connection is on-line. If GPRS connection is cut, TR-206 will try to connect to server for one time. | u16, in seconds | 0=disable |
| E6 | Enable/disable TR-206 to send “OK” to server after GPRS connection is re-built. | 1/0 | 0=disable<br>1=enable<br>Available when E5 is not 0 |

**Commands format:**

**GSC,IMEI,M3*Checksum!**

| Command Codeword | Parameters |
|---|---|
| M3 | On-line mode |

**Example 1:**

**Ask TR-206 on-line report (Send command via SMS or TCP or UDP)**

**GSC,130158974523157,M3*1A!**

**Example 2:**

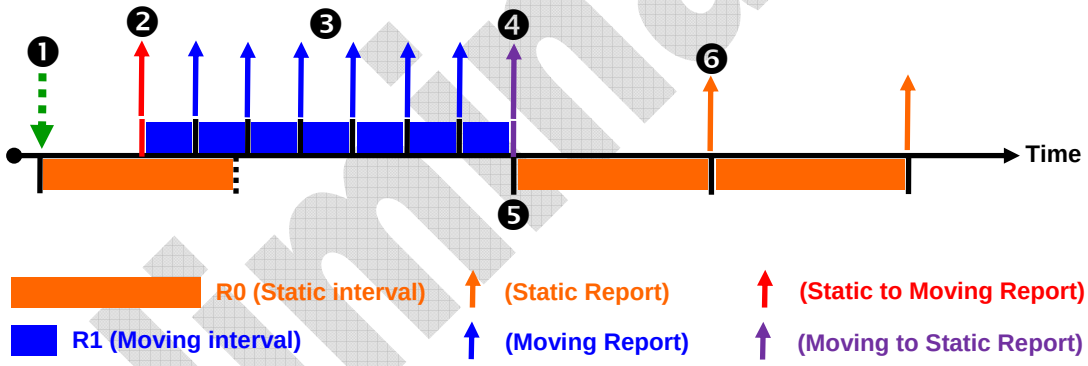
**Ask TR-206 set on-line report with interval of 60 seconds and report by UDP**

**GSC,011412000010789,M3(Q0=60,Q2=04)*34!**

# 6.4 Motion Mode

**Motion mode is an economic report mode. Under motion mode, TR-206 will report its location with high frequency when TR-206 detects motion (moving state). When TR-206 is static, it will report its location with low frequency (static state). It can save the report-transmission fee. Between the moving state and static state, there is a validation state for TR-206 not to jump to static state as soon as it does not detect motion. You could set TR-206 keep in moving state by setting a traveled distance (RE) within a defined interval (RF).**

**There are 2 report frequency of motion mode, one is when TR-206 detects motion, and the other is when TR-206 is static. The behavior is as following:**




| | |
|---|---|
| ❶ | Receive command and then enter motion static mode. |
| ❷ | When TR-206 detects motion, it will enter motion moving mode and send “static to moving” report. |
| ❸ | Motion Moving Report. |
| ❹ | When TR-206 is static, it will send “moving to static” report and then return to the motion static mode. |
| ❺ | Re-start timer for motion static interval. |
| ❻ | Motion Static Report. |

**Note of Traveled Distance:**
You can also set a traveled distance, and then TR-206 will report by the combination of report interval and traveled distance.
For example, the report interval is 60 seconds, the traveled distance is 800 meters, TR-206 sends 1 report at 10:00:00, and then it detects the traveled distance is over 800 meters at 10:00:50, it will send out one report and re-start to count the report interval and the traveled distance. The next report will be sent out at 10:01:50 or when the traveled distance is over 800 meters.

**You could define the content of report and the report interval of motion mode.**
**If you want to save the battery power, you could turn off GSM module in static state by making parameter RA=1.**
**In motion mode, TR-206 will make GPRS connection while sending static or moving report. After sending report, it will cut the GPRS connection. If you want to keep GPRS on-line, you could set RB=1 to keep GPRS on-line in static interval and set RC=1 to keep GPRS on-line in moving interval. Some telecom operator will kick off the continual GPRS connection. So you could make GPRS connection cut and then make the GPRS connection again according to a regular interval by parameter E4. You could also make TR-206 to check if GPRS connection is on-line according to a regular interval by parameter E5. If GPRS connection is cut, TR-206 will try to connect to server for one time.**
**In order to avoid TR-206 jump to static state as soon as it does not detect motion, you could set TR-206 keep in moving state by setting a traveled distance (RE) within a defined interval (RF).**

**The parameters of motion mode:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| R0 | Report interval in static state | 1~86400 seconds | |
| R1 | Report interval in moving state | 1~86400 seconds | |
| R2 | Report Media | | Please refer to 2.9 Report media |
| R3 | Traveled distance for sending report | 0=disable<br>1~1000000<br>Unit: meter | If you want TR-206 to send reports according to traveled distance, you have to extra make GPS on. Please refer to “Chapter 4 GPS.” |
| R7 | Automatic change from | 1/0 | 0=disable |

| | | | |
|---|---|---|---|
| | motion mode to on-line mode when TR-206 does not detect motion | | 1=enable |
| R9 | Minimum distance to be judged as moving state | u16,<br>Unit: meter | 0 ~ 65535 |
| RB | Keep GPRS on-line in static state | 1/0 | 0=disable<br>1=enable |
| RC | Keep GPRS on-line in moving state | 1/0 | 0=disable<br>1=enable |
| E4 | Interval in on-line state for disconnecting and then re-connecting | u16, in seconds | 0=disable |
| E5 | Interval for checking if GPRS connection is on-line. If GPRS connection is cut, TR-206 will try to connect to server for one time. | u16, in seconds | 0=disable |
| E6 | Enable/disable TR-206 to send “OK” to server after GPRS connection is re-built. | 1/0 | 0=disable<br>1=enable<br>Available when E5 is not 0 |
| RD | Interval for switching from validation to static state if no motion detected | u16, in seconds | 0=Interval is the same with R1 |
| RE | Traveled distance to be judged as keep in moving state | u16,<br>Unit: meter | |
| RF | Interval for switching from moving to static state if no motion detected | u16, in seconds | 0=Interval is the same with R1 |
| RG | Check GPS off time setting (C7, C8, C9, CA) | 1/0 | 0=disable<br>1=enable |
| RH | GPS always on in moving state | 1/0 | 0=disable<br>1=enable |

**Commands format:**

**GSC,IMEI,M4*Checksum!**

| Commands Codeword | Parameters |
|---|---|

| M4 | Set motion mode |
|---|---|

**Example 1:**

**Ask TR-206 set motion report (Send command via SMS or TCP or UDP)**

**GSC,136639674520921,M4*1E!**

**Example 2:**

**Set TR-206 motion mode with report interval of 3600 seconds for static state (R0), report interval of 30 for moving state (R1) and report media (R2) TCP**

**GSC,130158974523157,M4(R0=3600,R1=30,R2=02)*44!**

# 7. Alert

## 7.1 Emergency

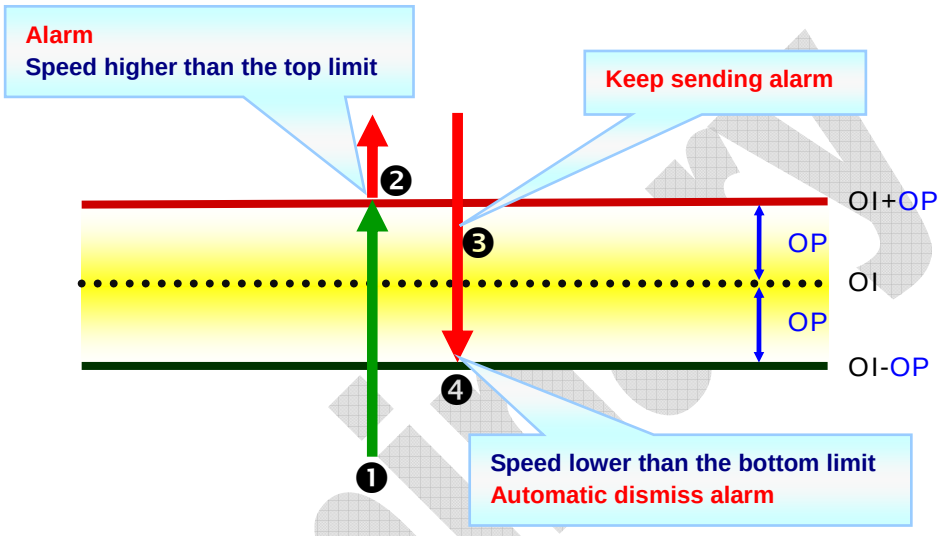
**When SOS (Emergency) button is long pressed, TR-206 will send its location information to 6 sets of phone numbers by SMS or send its location information to server via TCP or UDP.**

**The parameters emergency:**

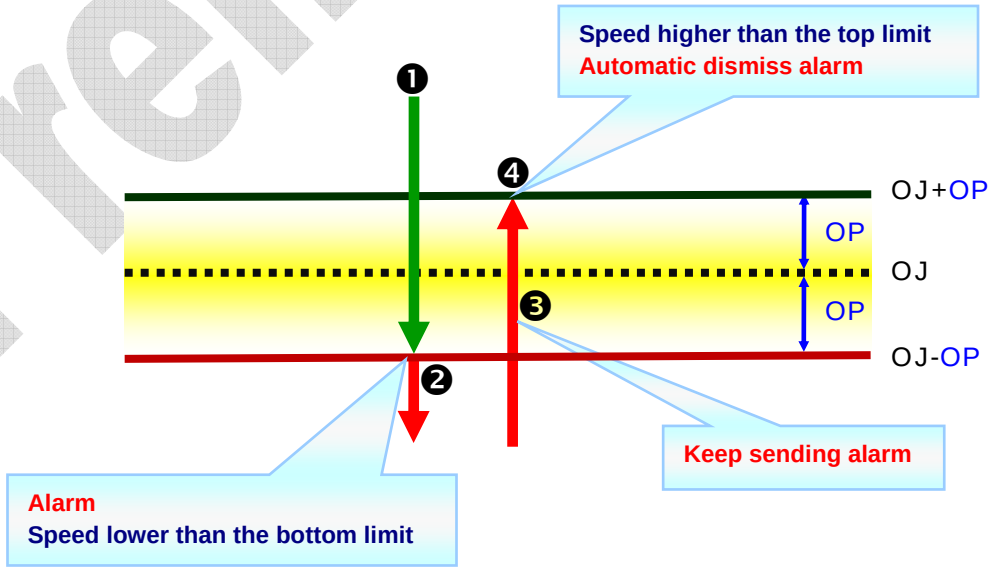
| Code word | Parameters | Value | Description |
|---|---|---|---|
| G0 | SMS Phone number 1 | char(20) | |
| G1 | SMS Phone number 2 | char(20) | |
| G2 | SMS Phone number 3 | char(20) | |
| G3 | SMS Phone number 4 | char(20) | |
| G4 | SMS Phone number 5 | char(20) | |
| G5 | SMS Phone number 6 | char(20) | |
| H0 | Report media | | Please refer to 2.9 Report media<br>Default: report to GS-TRAQ website and SMS |
| H1 | Number of SMS Report | u16 | 1 ~ 65535 |
| H2 | report interval | 0~3600 seconds | |
| H3 | Number of GPRS Report | u8 | 0=continue sending SOS alarm report till receive stop command |

# 7.2 Speed Limits

## High Speed Limit




## Low Speed Limit



**The parameters of speed alarm:**

| Code word | Parameters | Value |
|---|---|---|
| OI | Upper limit of speed alarm | u8, in Km/H<br>0 ~ 255 Km/H<br>0=disable |
| OJ | Lower limit of speed alarm | u8, in Km/H<br>0 ~ 255 Km/H<br>0=disable |
| OL | Report media for speed alarm | Please refer to 2.9 Report media |
| OP | Hysteresis of speed alarm | u8, in Km/H<br>0 ~ 255 Km/H |

## 7.2.1 Enable Speed Limit Alert

**Example 1:**

**Set upper limit of speed alert (Send command via SMS or TCP or UDP)**

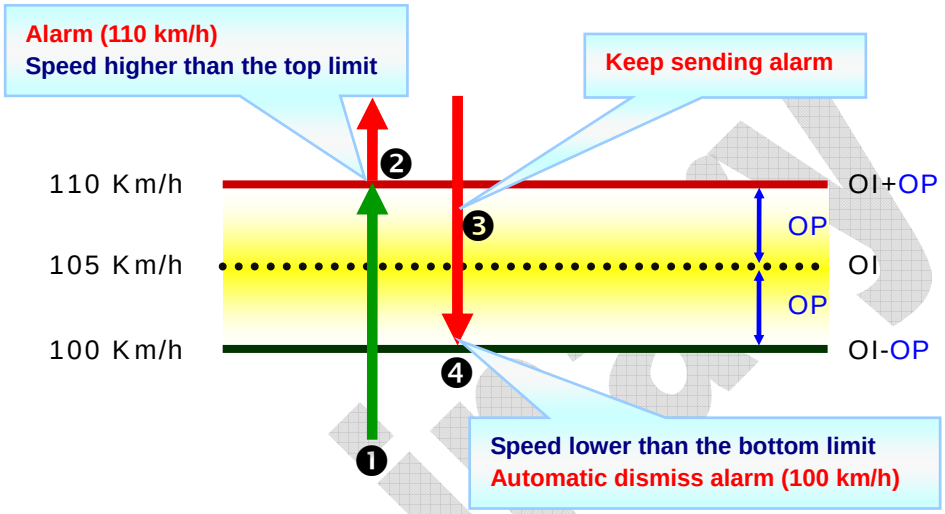
**GSS,10339376540375,3,0,OI=105,OP=5,OL=02*6A!**

| Command Type | Description |
|---|---|
| GSS | Write setting to device |

| Code word | Parameters | Value | Description |
|---|---|---|---|
| OI | Upper limit of speed alarm | 105 | Set upper limit: 105 Km/h |
| OL | Report media for speed alarm | 02 | Report alarm messages via TCP. Alarm messages |

| | | | |
|---|---|---|---|
| | | | format: Format 0 |
| OP | Hysteresis of speed alarm | 5 | |

The behavior mode is as following:




**Example 2:**

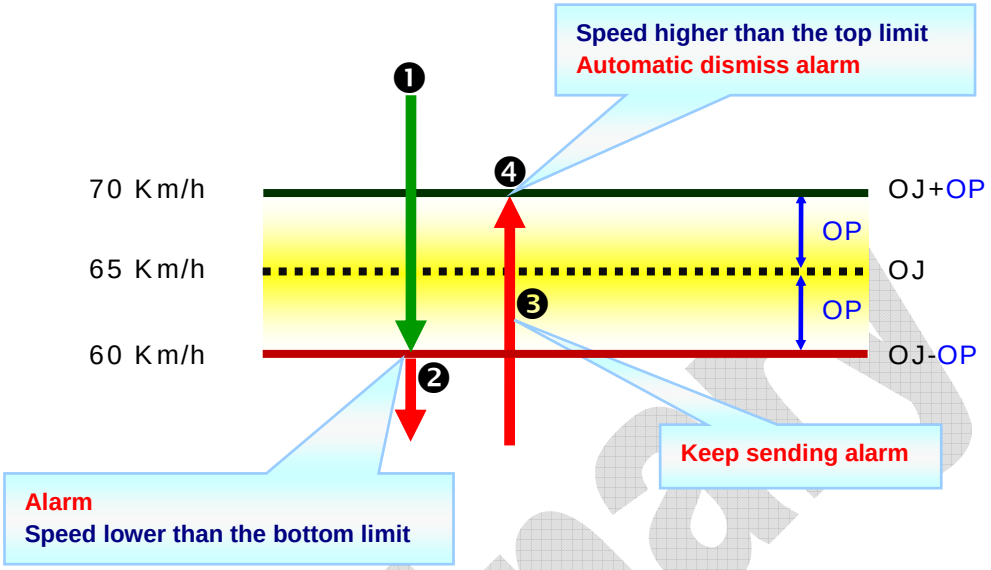
**Set lower limit of speed alert (Send command via SMS or TCP or UDP)**

**GSS,10339376540375,3,0,OJ=65,OP=5,OL=02,*5E!**

| Command Type | Description |
|---|---|
| GSS | Write setting to device |

| Code word | Parameters | Value | Description |
|---|---|---|---|
| OJ | Upper limit of speed alarm | 65 | Set lower limit: 65 Km/h |
| OL | Report media for speed alarm | 02 | Report alarm messages via TCP. Alarm messages format: Format 0 |
| OP | Hysteresis of speed alarm | 5 | |

**The behavior mode is as following:**




## 7.2.2 Disable Speed Limit Alert

**Example 1:**

**Disable upper limit of speed alert (Send command via SMS or TCP or UDP)**

**GSS,10339376540375,3,0,OI=0*45!**

| Command Type | Description |
|---|---|
| GSS | Write setting to device |

| Code word | Parameters | Value | Description |
|---|---|---|---|
| OI | Upper limit of speed alarm | 0 | 0=disable |

**Example 2:**

**Disable lower limit of speed alert (Send command via SMS or TCP or UDP)**

**GSS,10339376540375,3,0,OJ=0*46!**

| Command Type | Description |
|---|---|
| GSS | Write setting to device |

| Code word | Parameters | Value | Description |
|---|---|---|---|
| OI | Lower limit of speed alarm | 0 | 0=disable |

# 7.3 Geo-fence

**Geo-fence is for setting a rectangular area as permissible area or restricted area. When TR-206 gets out of the permissible area or goes in to the restricted area, TR-206 will send its location to the preset mobile phone number via SMS or to server via TCP or UDP.**

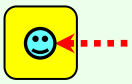
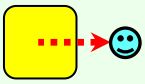
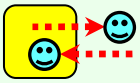
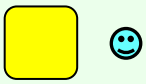
**You can set up to 64 sets of geo-fence areas.**

**After setting all sets of geo-fence areas, you could change one or several of the geo-fence area setting. You do not have to set all the geo-fence areas again. For example, after you set 10 sets of geo-fence areas. You could change the 7$^{th}$ geo-fence area setting independently.**

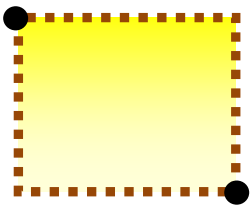
**You could disable any one of the previously set geo-fence area by setting it again and change the alert type to be 0.**

**The behavior is as following:**

**The behavior is as following:**

| Alert type of Geo-fence | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| Get in area | Get out of area | Cross over the boundary | Stay in area | Stay out of area |
|  |  |  |  |  |

**(upper_left_Lon,upper_left_Lat)**



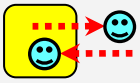
**(right_bottom_Lon,right_bottom_Lat)**

## 7.3.1 Setup Geo-fence

**Command's format for set Geo-fence:**

**GSG,IMEI,T,S,1=(type,upper_left_Lon,upper_left_Lat,right_bottom_Lon,right_bottom_Lat[,StartTime,EndTime,weekday]),2=(…),3=(…),…*Checksum!**

| Format | Value | Note |
|---|---|---|
| GSG | "GSG" : Write geo-fence parameter command | Command head |
| IMEI | (The IMEI number) | GSM device ID |
| T | '0' : Middle of message<br>'1' : Start of message<br>'2' : End of message<br>'3' : Start and End of message, i.e., only one packet for message<br>'5' : Erase all of the previously set geo-fence areas + start of message (when you need to set new geo-fence areas by more than 1 message)<br>'7' : Erase all of the previously set geo-fence areas + start and end of message (when you need to set new geo-fence areas by only 1 message) | Message packet control |
| S | '0','1','2','3',…,'9','10','11',…,'63' | Sequence number |
| type | 0=disable that area<br>1=get in area<br>  <br>2=get out of area<br>  | Alert type of Geo-fence |

| | | |
|---|---|---|
| | 3=cross over the boundary  <br>4=stay in area  <br>5=stay out of area  | |
| upper_left_Lon, upper_left_Lat | upper_left_Lon =Lon<br>upper_left_Lat =Lat<br><br>Lon: (+ or -)ddddddddd<br>unit: 0.000001 degree<br>Lat: (+ or -)ddddddddd<br>unit: 0.000001 degree | The top left coordinates of specified area |
| right_bottom_Lon, right_bottom_Lat | right_bottom_Lon =Lon<br>right_bottom_Lat =Lat<br><br>Lon: (+ or -)ddddddddd<br>unit: 0.000001 degree<br>Lat: (+ or -)ddddddddd<br>unit: 0.000001 degree<br><br>Example: 12129141<br>12129141 x0.000001<br>=12.129141degree | The right bottom coordinates of specified area |
| Start Time | 0~86400 sec<br><br>Example:<br>00:00:01 = 1<br>23:59:59 = 86399 | Optional field for specifying time frame of this geo-fence area. Start Time and end Time are in seconds. |

| | | |
|---|---|---|
| **End Time** | **0~86400 sec**<br><br>**Example:**<br>**00:00:01 = 1**<br>**23:59:59 = 86399** | **Optional field for specifying the frame of this geo-fence area. Start Time and end Time are in seconds.** |
| **weekday** | **bit0=Sunday**<br>**bit1=Monday**<br>**bit2=Tuesday**<br>**bit3=Wednesday**<br>**bit4=Thursday**<br>**bit5=Friday**<br>**bit6=Saturday** | **Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc.** |
| ***** | ***** | **End of field** |
| **Checksum** | **The checksum value is derived by the same method of NMEA standard. It is calculated by 'exclusive OR' the 8 data bits of each character before "*" in the sentence, but excluding "*". The hexadecimal value of the most significant and least significant 4 bits of the result are converted to two ASCII characters (0-9, A-F) for transmission. The most** | |

| | | |
|---|---|---|
| | **significant character is transmitted first.** | |
| **!** | **!** | **Message delimiter** |

**You can set up to 64 sets of geo-fence areas.**

**Example 1:**

**Set up 52nd ~57th sets of geo-fence areas**

**GSG,130738902846156,1,0,52=(2,121752441,24756536,121752924,24755863),53=(2,121743236,24748254,12174845,24744844)*78!**

**GSG,130738902846156,0,1,54=(1,121758267,24786053,121760745,24784397),55=(3,160053272,24144678,160056791,2414037)*73!**

**GSG,130738902846156,2,2,56=(1,160080072,24161526,160080866,24160439),57=(2,160075888,2410602,120722923,2406402)*47!**

**Disable the 56th set of geo-fence (by setting the alert type to be 0)**

**GSG,130738902846156,3,0,56=(0,160080072,24161526,160080866,24160439)*61!**

**Erase 52nd ~57th sets of geo-fence areas and set 2 geo-fence areas**
**GSG,130738902846156,7,0,1=(1,12146435,25009979,121466711,25008423),2=(1,121471624,25012487,121474736,25010756)*7C!**

**Erase 52nd ~57th sets of geo-fence areas and set 3 geo-fence areas**
**GSG,130738902846156,5,0,1=(1,12146435,25009979,121466711,25008423),2=(1,121471624,25012487,121474736,25010756)*7E!**

**GSG,130738902846156,2,1,3=(1,123479371,28016629,123148068,28015657)*55!**

**Example 2:**

**Set up 1st ~10th sets of Geo-fence areas**

**GSG,132763902812736,1,0,1=(1,121305521,24999088,121308246,24997649,00,86400,7f),2=(1,121302452,25004397,121305285,25002842)*0A!**

**GSG,132763902812736,0,1,3=(1,121299427,25014101,121302345,25012545),4=(1,121301723,25022909,121305306,25021101)*4F!**

**GSG,132763902812736,0,2,5=(1,12146435,25009979,121466711,25008423),6=(1,121471624,25012487,121474736,25010756) *54!**

**GSG,132763902812736,0,3,7=(1,121479371,25016629,12148068,25015657),8=(1,121547295,25043931,121548105,25043547)*7C!**

**GSG,132763902812736,2,4,9=(1,121536984,25049913,121538894,25048514),10=(1,121539195,25055901,121540675,25054773)*78!**

**change the 7th set of geo-fence area**

**GSG,132763902812736,3,0,7=(1,123479371,28016629,123148068,28015657)*5C!**

**Command's format for read Geo-fence:**

**GSC,L3(1~64)*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| L3 | Read Geo-fence |

**Example 1:**

**Ask TR-206 report the parameters of 1st ~10th Geo-fence area**

**The method of marking 1st ~10th geo-fence areas is to write 1~10 in the braces after L3, like L3 (1-10)**

**GSC,132763902812736,L3(1-10)*04!**

**Report format for read Geo-fence:**

**GSg,IMEI,T,S,1=(type,upper_left_Lon,upper_left_Lat,right_bottom_Lon,right_bottom_Lat[,StartTime,EndTime,weekday]),2=(…),3=(…),…*Checksum!**

**About the parameters of reading geo-fence, please refer to the parameters of setting geo-fence.**

**Example 1:**

**Report 1~10 coordinates of Geo-fence**

**GSg,132763902812736,1,0,1=(1,121305521,24999088,121308246,24997649,00,86400,7F),2=(1,121302452,25004397,121305285,25002842,00,86400,7F)*6D!**

**GSg,132763902812736,0,1,3=(1,121299427,25014101,121302345,25012545,00,86400,7F),4=(1,121301723,25022909,121305306,25021101,00,86400,7F)*6F!**

**GSg,132763902812736,0,2,5=(1,12146435,25009979,121466711,25008423,00,86400,02),6=(1,121471624,25012487,121474736,25010756,00,86400,02)*54!**

**GSg,132763902812736,0,3,7=(1,121479371,25016629,12148068,25015657,00,86400,02),8=(1,121547295,25043931,121548105,25043547,00,86400,02)*5C!**

**GSg,132763902812736,2,4,9=(1,121536984,25049913,121538894,25048514,00,86400,04),10=(1,121539195,25055901,121540675,25054773,00,86400,04)*58!**

## 7.3.2 Enter Geo-fence Alert

**Geo-fence is independent from the other general tracking modes. Sending geo-fence command to TR-206 will not stop the other general tracking modes. TR-206 could execute general tracking mode and geo-fence at the same time**
**In geo-fence mode, it requires extra to turn on GPS on.**
**There are two ways for turning on GPS, one is to keep GPS always on by parameter C0, and the other is to use timer. Keep GPS always on will make the power run up within 10 hours.**
**The recommended method of making GPS on is to use timer.**
**While using timer, you could set the report media (X4 or Y4 or Z4) as 80, then TR-206 will turn on the GPS.**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| C0 | GPS always on | 1/0 | Applicable to all modes except Off mode |
| X0 | Start time | u32, in seconds | |
| X1 | End time | u32, in seconds | |
| X2 | Report interval | u16, in seconds | |
| X3 | Weekday mask | u8, xx(hex digits) | |
| X4 | Report Media | | Please refer to 2.9 Report media |

**Command's format for enable Geo-fence:**

**GSC,N6*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| N6 | Enable Geo-fence |

**Example 1:**

**Asking TR-206 enter geo-fence alert state and make GPS always on (C0=1)**

**GSC, 135097652783615,N6(C0=1)*47!**

**Example 2:**

**Asking TR-206 enter geo-fence alert state and use timer 1: Start Time: 12:00AM (X0=0), End Time:11:59PM(X1=86399), Report Interval=0 (X2=0), Weekday: Sunday~ Saturday (X3=7f), Report Media: GPS ON(X4=80)**

**GSC,011412000010789,N6(X0=0,X1=86399,X2=0,X3=7f,X4=82)*29!**

### 7.3.3 Dismiss Geo-fence Alarm

**TR-206 would send out only one geo-fence alarm report when it violates the geo-fence rule. If you set the alert type of geo-fence as "stay in area" (type 4) or "stay out of area" (type 5), you could dismiss the geo-fence alarm to check if TR-600 still stay in the geo-fence area or stay out of the area. After dismissing the geo-fence alarm, if TR-206 still stay in the geo-fence area or stay out of the area, TR-206 would send out alarm report again.**

**Command's format for dismiss Geo-fence alarm status:**

**GSC,Ne*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| Ne | Dismiss Geo-fence Alarm |

**Example 1:**

**Dismiss TR-206 geo-fence alarm status**

**GSC,135097652783615,Ne*6A!**

## 7.3.4 Stop Geo-fence Alert

**Command's format for disable Geo-fence:**

**GSC,N7*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| N7 | Disable Geo-fence |

**Example 1:**

**Asking TR-206 disable geo-fence**

**GSC,135097652783615,N7*38!**

# 8 Voice Monitor

**The parameters of voice monitor:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| V4 | Call in phone number for voice monitor | char(20) | G0~G5 are also call in phone number for voice monitor command |
| V5 | Allowed interval for call in TR-206 after receiving voice monitor command | u16, in seconds | 0 ~ 65535 |

**Command format:**

**GSC,N4*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| N4 | Enable voice monitor |

**Example 1:**

**Make TR-206 wait the phone number +886920886555 (V4=+886920886555) or SOS phone number 1~6" phone number call in within 120 seconds (V5=120) when receive the enable voice monitor command (N4)**

**GSC,130789246109245,N4(V4=+886920886555,V5=120) *28!**

# 9 Timer

**There are four timers for setting specified time report.**

**For Timer 0, when there is a new event (report), it will re-start to count down the report interval again.**
**Timer 1 ~ 3 will not count down the report interval when there is a new event.**

# 9.1 Timer 0

**The following parameters must be set for configuration or sending those parameters by other action command:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| W0 | Start time | 0~86400 | |
| W1 | End time | 0~86400 | |
| W2 | Report interval | 1~3600 | |
| W3 | Weekday mask | 00~7f | u8, xx(hex digits) |
| W4 | Report Media | | Please refer to 2.9 Report media |

# 9.2 Timer 1~3

**The following parameters must be set for configuration or sending those parameters by other action command:**
**(“X”: Timer 1, “Y”: Timer 2, “Z”: Timer 3,)**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| X0 | Start time | 0~86400 | |
| X1 | End time | 0~86400 | |
| X2 | Report interval | 1~3600 | |
| X3 | Weekday mask | 00~7f | u8, xx(hex digits) |

| | | | |
|---|---|---|---|
| **X4** | **Report Media** | | **Please refer to 2.9 Report media** |
| **Y0** | **Start time** | **0~86400** | |
| **Y1** | **End time** | **0~86400** | |
| **Y2** | **Report interval** | **1~3600** | |
| **Y3** | **Weekday mask** | **00~7f** | **u8, xx(hex digits)** |
| **Y4** | **Report Media** | | **Please refer to 2.9 Report media** |
| **Z0** | **Start time** | **0~86400** | |
| **Z1** | **End time** | **0~86400** | |
| **Z2** | **Report interval** | **1~3600** | |
| **Z3** | **Weekday mask** | **00~7f** | **u8, xx(hex digits)** |
| **Z4** | **Report Media** | | **Please refer to 2.9 Report media** |

# 10 Alarm Clock

**There are 3 alarm clocks of TR-206.**
**(“X”: Alarm clock 1, “Y”: Alarm clock 2, “Z”: Alarm clock 3,)**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| XA | Selecting melody for alarm clock 1 | u8 | |
| XB | Alarm time of alarm clock 1 | u32, in seconds | 0 ~ 86400 |
| XC | Type of alarm clock 1 | | 0=disable, 1=once, 2=daily 3=weekly (XD must be set) |
| XD | Weekday mask of alarm clock 1 | u8, xx(hex digits) | Available when XC=3<br>00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| XE | Prompt message of alarm clock 1 | Char(16) | |
| YA | Selecting melody for alarm clock 2 | u8 | |
| YB | Alarm time of alarm clock 2 | u32, in seconds | 0 ~ 86400 |
| YC | Type of alarm clock 2 | | 0=disable, 1=once, 2=daily 3=weekly (YD must be set) |

| | | | |
|---|---|---|---|
| YD | Weekday mask of alarm clock 2 | u8, xx(hex digits) | Available when YC=3<br>00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| YE | Prompt message of alarm clock 2 | Char(16) | |
| ZA | Selecting melody for alarm clock 3 | u8 | |
| ZB | Alarm time of alarm clock 3 | u32, in seconds | 0 ~ 86400 |
| ZC | Type of alarm clock 3 | | 0=disable, 1=once, 2=daily<br>3=weekly (ZD must be set) |
| ZD | Weekday mask of alarm clock 3 | u8, xx(hex digits) | Available when XC=3<br>00 ~ 7f<br>Weekday is in hex-digit format which specifies applicable day in a week, where bit 0 represents Sunday, bit1 represents Monday, etc. |
| ZE | Prompt message of alarm clock 3 | Char(16) | |

**Note:**

1. XB, YB, ZB starts on A.M. 00:00:00 and ends on P.M. 23:59:59. It is represented in seconds. For example, AM 03:30:45 =12645 second
2. XC, YC, and ZC are the ringing frequencies of the alarm clock. You could de-activate the alarm clock by setting XC, YC, ZC to be 0. If you sets the frequency as weekly (XC or YC or ZC=3), you must also set the weekday mask of alarm clock.
3. XE, YE, ZE are for showing the message on TR-206 LCD when alarm clock rings.

**Example 1:**

**Make TR-206 ring on 04:00:30 (XB=14430) everyday (XC=2) with melody 2 (XA=2) and show message “Get up” (XE=Get up)**
**GSS,011412000010789,3,1,XA=2,XB=14430,XC=2,XE=Get up*1d!**

**Example 2:**
**Make TR-206 ring on 10:00 (YB=36000) from Monday to Friday (YC=3, YD=3e) with melody 1 (YA=1) and show message “Meeting” (YE=Meeting)**
**GSS, 011412000010789,3,1,YA=1,YB=36000,YC=3,YD=3e,YE=Meeting*48!**

# 11 Other Function

| Code word | Parameters | Value | Description |
|---|---|---|---|
| F4 | Date format (LCD) | u8 | |
| F5 | Time format (LCD) | u8 | 0=12 hour<br>1=24 hour |
| F6 | Daylight saving | 1/0 | 1=enable<br>0=disable |
| F7 | Auto key lock | 1/0 | 1=enable<br>0=disable |
| F8 | Vibrator/beep type | u8 | 0=vibrator + beep<br>1=beep<br>2=vibrator<br>3=off |
| FB | Volume level of ring tone | u8 | 0=minimum<br>1=medium<br>2=maximum<br>3=progressive<br>Default=1 |
| FC | Volume level of alarm clock | u8 | 0=minimum<br>1=medium<br>2=maximum<br>3=progressive<br>Default=1 |
| FD | Volume level of headset | u8 | 0~6<br>Default=6 |
| FE | Melody of ring tone | u8 | Default=2 |

| | | | |
|---|---|---|---|
| FF | Power-on melody | u8 | Default=1 |
| OU | Password of simple command and PC Utility | Char(16) | |

**Note:**

1. **F4 could be dd/mm/yy or mm/dd/yy or yy/mm/dd. The date, month and year could also be separated by:.**
2. **F7: Make F7 =1 will make TR-206 lock the keys 30 seconds after you do not press any keys.**

# 12 Report Messages

**There are two types of message's report format, "format 0" and "format 1". Defined as follows:**

# 12.1 Format 0 of Report Messages

**Command's format for set format 0 of report messages:**

**GSS,IMEI,T,S,O3=y1y2y3….yn,*Checksum!**

**y1,y2,y3… are their respective parameters of report messages. (Refer to "2.6. Parameters of Report Messages" for details of parameters' definition)**

| Parameter's Codeword | Description |
|---|---|
| O3 | Report format 0 |

**Example 1:**

**Set TR-206 format of report messages for format 0 (Send command via SMS or TCP or UDP)**

**GSS,135785412249986,3,0,O3=ORPZAB72GHLMN*U!*19!**

**(Refer to "2.6. Parameters of Report Messages" for details of parameters' definition)**

**Report format for format 0 of report messages (report messages via SMS or TCP or UDP)**

**GSr,IMEI,Device_Mode,Report_Type,Alarm_Status,Geofence_status,GPS_Fix,UTC_Date,UTC_Time,Longitude,Latitude,Altitude,Speed,Heading,Number_of_Satellites,HDOP,Battery_capacity*checksum!**

**Command's format for read format of format 0:**

**GSC,IMEI,L1(O3)*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| L1 | Read Configure |

**Example 1:**

**Ask TR-206 report "format of format 0" (Send command via SMS or TCP or UDP)**

**GSC,136647890362718,3,0,L1(O3)*6D!**

**TR-206 received "GSC,IMEI,L1(O3)*Checksum!" and report as below (report via SMS or TCP or UDP)**

**GSs,136647890362718,3,0,O3=ORPZAB72GHLMN*U!*13!**

# 12.2 Format 1 of Report Messages

**Command's format for set format 1 of report messages:**

**GSS,IMEI,T,S,ON=y1y2y3….yn,*Checksum!**

**y1,y2,y3… are their respective parameters of report messages. (Refer to "2.6. Parameters of Report Messages" for details of parameters' definition)**

| Parameter's Codeword | Description |
|---|---|
| ON | Report format 1 |

**Example 1:**

**Set TR-206 format of report message for format 1 (Send command via SMS or TCP or UDP)**

**GSS,131826789036289,3,0,ON=PAN*U!*46!**

**(Refer to "2.6. Parameters of Report Messages" for details of parameters' definition)**

**Report format for format 0 of report messages (report messages via SMS or TCP or UDP)**

**GSh,IMEI,Alarm_Status,GPS_Fix,Battery_capacity*checksum!**

**Command's format for read format of format 1:**

**GSC,IMEI,L1(ON)*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| L1 | Read Configure |

**Example 2:**

**Ask TR-206 report “format of format 1” (Send command via SMS or TCP or UDP)**

**GSC,131826789036289,3,0,L1(ON)*36!**

**TR-206 receives “GSC,IMEI,L1(ON)*Checksum!” and report as below (report via SMS or TCP or UDP)**

**GSs,131826789036289,3,0,ON= PAN*U!*66!**

# 12.3 Format 1 of SMS

**You could set the content of SMS to be displayed as text by setting F2=1. You could also edit the content of each report by the following parameters.**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| F2 | SMS format | 1/0 | 0= Same as GPRS format<br>1= Text format |
| Fa | SMS format 1 report string for ping | char(96) | "00Ping!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fb | SMS format 1 report string for SOS alarm | char(96) | "00Emergency!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fc | SMS format 1 report string for main battery low | char(96) | "00Power low!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fd | SMS format 1 report string for geo-fence alarm | char(96) | "00Geofence alarm\r\nIMEI:$S\r\nTime:$C\r\nArea $Z\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fe | SMS format 1 report string for periodic mode | char(96) | "00Periodic report!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Ff | SMS format 1 report string for on-line mode | char(96) | "00Online report!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fg | SMS format 1 report string for static state of | char(96) | "00Static report!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |

| | | | |
|---|---|---|---|
| | motion mode | | |
| Fh | SMS format 1 report string for moving state of motion mode | char(96) | "00Moving report!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fi | SMS format 1 report string for changing from static to moving state | char(96) | "00Start moving!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fj | SMS format 1 report string for changing from moving to static state | char(96) | "00Stop moving!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fk | SMS format 1 report string for high speed alarm | char(96) | "00Over speed!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fl | SMS format 1 report string for low speed alarm | char(96) | "00Under speed!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fm | SMS format 1 report string for timer 0 | char(96) | "00Timer 0 alarm!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fn | SMS format 1 report string for timer 1 | char(96) | "00Timer 1 alarm!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fo | SMS format 1 report string for timer 2 | char(96) | "00Timer 2 alarm!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| Fp | SMS format 1 report string for timer 3 | char(96) | "00Timer 3 alarm!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |

| | | | |
|---|---|---|---|
| **Fq** | SMS format 1 report string for power on | char(96) | "00Device power on\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |
| **Fr** | SMS format 1 report string for power off | char(96) | "00Device power down\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%" |

**Example:**

**Ping: "00Ping!\r\nIMEI:$S\r\nTime:$C\r\nGPS $A\r\n$6,$1\r\nSpeed:$I km/hr\r\nPower:$N%"**

**S=IMEI**

**C=Local date, time**

**A=GPS fix status**

**6=latitude**

**1=longitude**

**I=speed (km/hr)**

**N=battery capacity**

**Note:**
**For details of each report parameter, please refer to 2.6 Parameters of Report Messages**

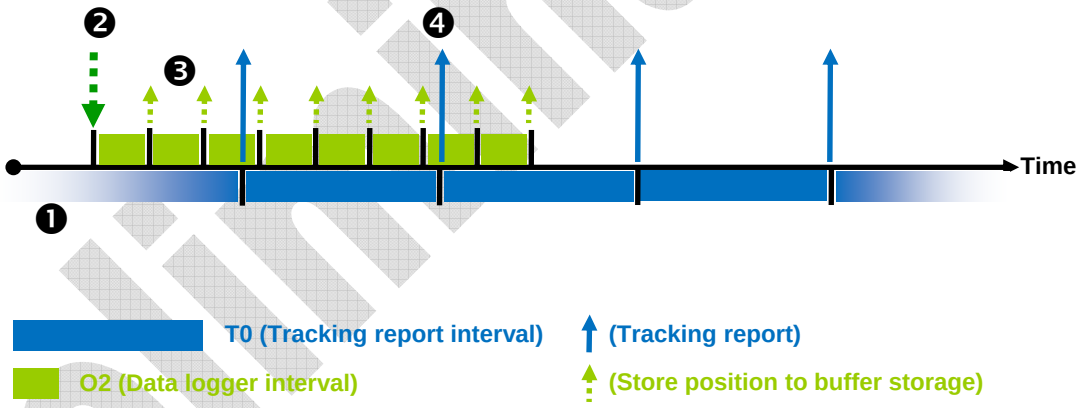
**The received SMS is displayed as**

**Ping!**
**IMEI:12345678901234**
**Time:2009/11/17 04:43:20,**
**GPS:2**
**100.314536;21.924598**
**Speed:18 km/hr**
**Power:70%**

# 13 Data Log

**The function of Data Log is for you to record the location information of TR-206 based on the time interval or traveled distance or the combination of time interval and distance. After recording the location information, you could connect TR-206 to PC by USB cable for downloading the data log.**

**If you want TR-206 to store position according to traveled distance, you have to extra make GPS on. Please refer to "Chapter 4 GPS."**




| | |
|---|---|
| ❶ | Under tracking report state |
| ❷ | When device receives "N8" command and then enable data logger function. |
| ❸ | Store position according to data logger interval. |
| ❹ | Tracking report. |

**The following parameters must be set for configuration or sending those parameters by other action command:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| O2 | Data logger interval | u16, in seconds | 0 ~ 65535<br>0=disable |
| OH | Data logger distance | u32, in meters | 0 ~ 86400<br>0=disable |

**Command's format for enable data logger:**

**GSC,IMEI,N8(O2)*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| N8 | Enable Data logger |

## Under standby mode to store position according to data logger interval


| | |
|---|---|
| ❶ | Under tracking report state |
| ❷ | When device received "N8" command and then enable data logger function. |
| ❸ | Store position in accordance with data logger interval. |

**The following parameters must be set for configuration or sending those parameters by other action command:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| O2 | Data logger interval | u16, in seconds | 0 ~ 65535<br>0=disable |

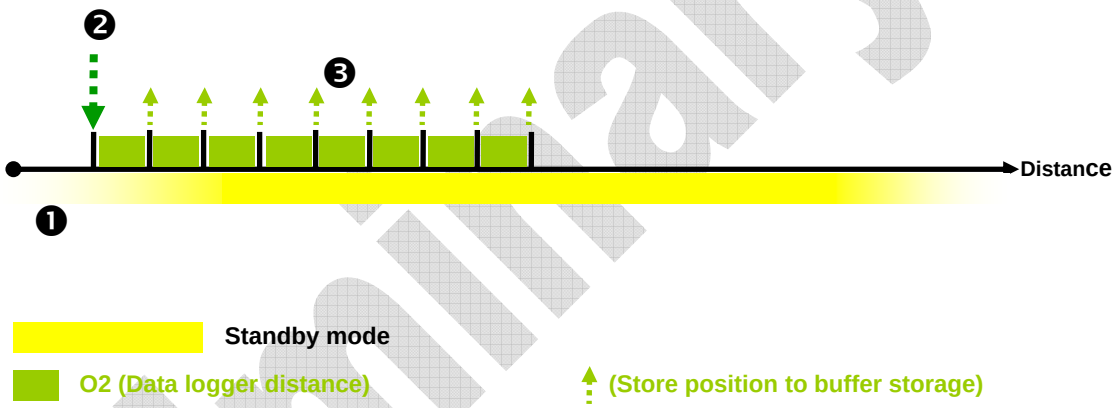
**Command's format for enable data logger:**

**GSC,IMEI,N8(O2)*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| N8 | Enable Data logger |

## Under standby mode to store position according to data logger distance

**If you want TR-206 to store position according to traveled distance, you have to extra make GPS on. Please refer to "Chapter 4 GPS."**




| | |
|---|---|
| ❶ | Under tracking report state |
| ❷ | When device received "N8" command and then enable data logger function. |
| ❸ | Store position in accordance with data logger distance. |

**The following parameters must be set for configuration or sending those parameters by other action command:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| OH | Data logger distance | u32, in meters | 0 ~ 86400<br>0=disable |

**Command's format for enable data logger:**

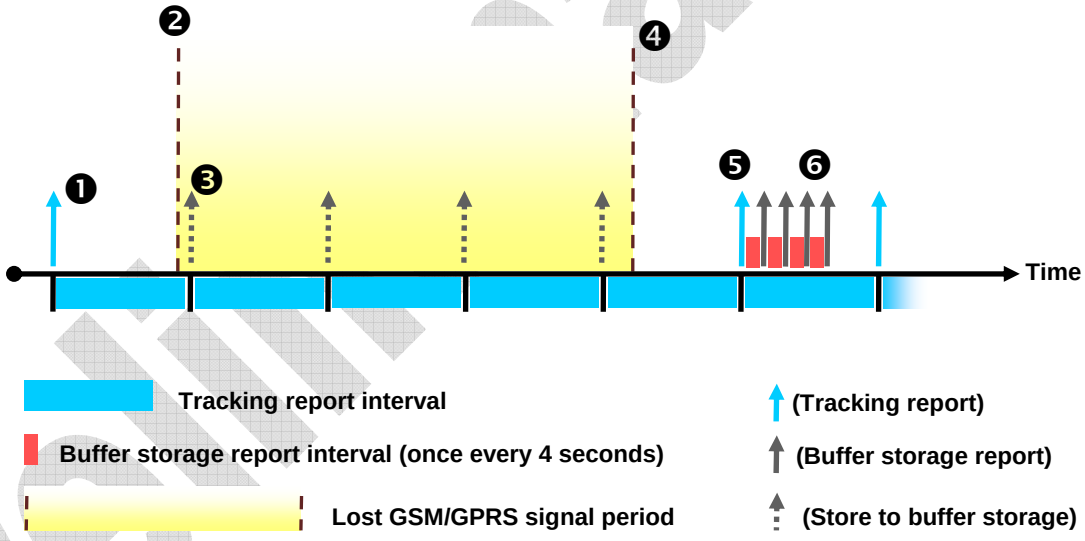
**GSC,IMEI,N8(OH)*Checksum!**

| Commands Codeword | Parameters |
|---|---|
| N8 | Enable Data logger |

# 14 Buffer Storage

**When TR-206 is carried to the areas without GSM/GPRS signal coverage, TR-206 could not send its location reports to server. In order not to lose the location report, TR-206 will save the location reports during the periods without GSM/GPRS signal to buffer storage. When TR-206 is carried to the areas with GSM/GPRS signal, it will send the location reports in the buffer storage to server. TR-206 could save up to 8000 pieces of location reports to buffer storage.**

**The behavior mode is as following:**




| | |
|---|---|
| ❶ | Tracking report |
| ❷ | Enter area without GSM/GPRS signal coverage. |
| ❸ | Save location report to buffer storage |
| ❹ | Enter area with GSM/GPRS signal |
| ❺ | Send periodic report |
| ❻ | Send the location report in the buffer storage |

**The parameter of enable data buffer function is OG.**
**You could set OG by configuration or sending OG by the other action commands:**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| OG | Enable/ disable data buffer function | 1/0 | 0=disable<br>1=enable |

# 15 Cell ID

**GSM Cell ID is assisted information to get device location. When TR-206 does not get GPS fix, you could enable TR-206 to report the Cell ID. Then the report format of TR-206 will automatically switch from format 0 to format 2 when TR-206 does not get GPS fix. Report format 1 is not affected.**

**The parameter of enabling TR-206 to report the Cell ID is O8.**

| Code word | Parameters | Value | Description |
|---|---|---|---|
| **O8** | **Enable/ disable TR-206 to report "cell ID" if it does not get GPS fix** | **1/0** | **0=disable**<br>**1=enable** |

## The report format (format 2) of cell ID is

GS**d**,IMEI,Device_Mode,Report_Type,Alarm_Status,Date,Time,Battery_capacity, "$MCC_1$,$MNC_1$,$LAC_1$,$CID_1$,$BSIC_1$,$RSSI_1$", "$MCC_2$,$MNC_2$,$LAC_2$,$CID_2$,$BSIC_2$,$RSSI_2$", "$MCC_3$,$MNC_3$,$LAC_3$,$CID_3$,$BSIC_3$,$RSSI_3$",…*checksum!

MCC=mobile country code, 3 digits
MNC=mobile network code, 2 or 3 digits
LAC=location area code, 4 hexadecimal digits.
CID=cell identifier, 4 hexadecimal digits.
BSIC=base station identity code, 1 digit or 2 digits.
RSSI=received signal strength indicator, 1 digit or 2 digits.

The number of set of cell information depends on GSM network environment. The maximum number is 5.