GlobalSat TR-206 / TR-206 GLONASS

Персональный GSM/GPRS/SMS трекер

ОПИСАНИЕ ПРОТОКОЛА ОБМЕНА ДАННЫМИ

Версия документации: 1.2

Оглавление

1 Introduction

TR-206 is a tracker that could 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.

The key functions of TR-206 are listed as below.

- **Two-way voice communication**
- **Friendly LCD display**
- **Report by TCP/ UDP/ SMS**
- **Configurable report format and content**
- **Configurable event triggered action**
- **SOS emergency function**
- **Geo-fence function**
- **Motion detection**
- **4 timers**
- **Alarm clock**
- **Phone book**
- **Buffer storage (Up to 1400 pieces of data)**
- **GPS Data logger function**

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.

2 Protocol Summary

2.1 General Format

GSx,IMEI,[T,S,]Field1,Field2,……,FieldN*Checksum!		
Format	**Description**	**Note**
GSx	”GSS” :Write setting ”GSs” :Report setting ”GSG” :Write Geo-fence parameter ”GSg” :Report Geo-fence parameter ”GSC” :Action command ”GSr” :Position and status report (format 0) ”GSh” :Position and status report (format 1) ”GSd” :Cell ID and status report (format 2)	Command head
IMEI	(The IMEI number)	GSM device ID
T	‘0’ : Middle of message ‘1’ : Start of message ‘2’ : End of message ‘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, separated by ‘,’, contain command or/and configuration parameters	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 Format of Configuration Message

2.2.1 Server -> Device

This message is used to configure TR-206 device. Each message contains as many parameters as desired. If the message to be sent is too long, it is separated to several packets in sequence. The maximum length of each packet is 250 bytes.

The format is
GSS,IMEI,T,S,x1=y1,x2=y2,x3=y3,……*Check Sum!
Where T field is message packet sequence control flag.
S field is message packet sequence number.
x1,x2,x3… are code words for configuration parameters.
y1,y2,y3… are their respective settings.

For example:
GSS,123456789012345,1,0,A0=1,C0=0,C1=90,C2=20*51!
GSS,123456789012345,0,1,D1=internet,E0=123.234.168.1,E1=5000*04!
GSS,123456789012345,2,2,O3= SORPZAB27GHKLMN*U!*01!

2.2.2 Device -> Server

The message is generated by the TR-206 in accordance with a reading configuration command. If the message is too long, it will be separated into several packets in sequence.

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

For example:
GSs,123456789012345,1,0,O5=test,O7=F-0TR-206STD-10021421.1.0.1.1*40!
GSs,123456789012345,2,1,OD=02,OS=120*5e!

2.3 Format of Geo-fence Message

2.3.1 Server -> Device

This message is used to configure geo-fence setting. Each message contains as many parameters as desired. If the message to be sent is too long, it is separated to several packets in sequence. The maximum length of each packet is 250 bytes.

The format is
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!
Where T field is message packet sequence control flag.
S field is message packet sequence number.
1,2,3,… are geo-fence area ID.
Setting of each area is enclosed by (…). Please refer to 2.3.3 & 7.3 for detail.

2.3.2 Device -> Server

The message is generated by TR-206 in accordance with a reading geo-fence setting command. If the message is too long, it will be separated into several packets in sequence.

The format is
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

Each geo-fence area is a rectangle represented by the following parameters.
(type,upper_left_Lon,upper_left_Lat,right_bottom_Lon,right_bottom_Lat[,startTime,endTime,weekday])

type	1=get in area 2=get out of area 3=cross over the boundary 4=stay in area 5=stay out of area
upper_left_Lon upper_left_Lat	The upper left coordinate of specified area.
right_bottom_Lon right_bottom_Lat	The right-bottom coordinate of specified area.
startTime endTime weekday	Optional field for specifying 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 Format of Command Message

A command message is used to set the working mode or control the device activity. A command codeword can combine with configuration setting for best transmission efficiency.

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

Where
c1,c2…are codewords of command.
option1, option2… are configuration parameters and setting. Please refer to section 2.7 for detail.

For example:
GSC,123456789012345,Na,M2(P0=30)*44!

2.5 Format of Report Message

Report message is generated by the TR-206 to inform the application server of its location and status. There are three types of GPRS report message format, "format 0", "format 1" and "format 2".

Report format 0 (GSr,…) & format 1 (GSh,…) are configurable reports. They are composed of report prefix and report parameters which are described in section 2.6.

Report format 2 contains cell ID and status information. It is used as a replacement of format 0 when GPS fix is not available. The format of report format 2 is not configurable.

Please refer to "Chapter 12. Report" for detailed definitions.

For example:

TR-206 -> Server (format 0)

If configuration parameter O3= SORPZAB27GHKLMN*U!, then the report is 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)

If configuration parameter ON= SPAN*U!, then the report is GSh,IMEI,Alarm_Status,GPS_Fix,Battery_capacity*checksum!

TR-206 -> Server (format 2)

GSd,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!

2.6 Parameters of Report Messages

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

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

		b=Power on report (battery) c=Power on report (temperature) d=Power on report (OTA complete) e=Power on report (reboot) f=OTA download fail g= Power off report (manual) h=Power off report (battery) i= Power off report (temperature) j=request EPO download
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.
s	IMSI	
#		
*		
?		
!	!	Message delimiter

2.7 Codeword of 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_DEV".**
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 3=On-line 4=Motion 7=Standby Default=7
		B2	IMEI code	char(16)	Read only
	SIM	B0	PIN code	char(7)	
		B1	Phone number of SIM card	char(20)	
		B3	IMSI number	char(16)	Read only
	Vibrator	I2	Enable/ disable TR-206 to vibrate after pressing SOS key	1/0	0=disable 1=enable

	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 bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 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 1=enable
	Data logger	O2	Data logger interval	u16, in seconds	1 ~ 65535 Default=60
		OH	Data logger distance	u32, in meters	0 ~ 4 Giga 0=disable
	Other setting	O1	Motion sensor sensitivity	u16	0 ~ 100 Default=5
		O3	Report format 0	char(32)	Default=SORPZAB27GHKLMN*U!
		ON	Report format 1	char(32)	Default=SPAN*U!
		OG	Enable/ disable data buffer function	1/0	Default=1

		O8	Enable/ disable TR-206 to report “cell ID” if it does not get GPS fix	1/0	Default=0. 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 bit2=UDP bit5=USB
		OV	Send power on/off report	1/0	0=disable 1=enable Default =0
		OW	Report media of power on/off report	Media type	bit0=SMS bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
		OX	Enable/disable data logger function	1/0	0=disable 1=enable Default =0
GPS	GPS	C0	GPS always on	1/0	0=disable 1=enable 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 **Note: TR-206 will send out the report whether it gets GPS fix or not when C1 time ends.**
		C2	The time for starting to get GPS fix before the next report time if	u16, in seconds	10 ~ 120 **Note: TR-206 will send out the report whether it gets GPS fix or**

			TR-206 got GPS fix within 1 hour		not when C2 time ends.
		C3	GPS fix time before sending out the first report	u16, in seconds	0 ~ 600 If "C3"=0, disable first report message.
		C7	Choose to use C8 or C9+CA	1/0	0=use C8 1=use C9+CA Applicable for standby, periodic and on-line mode
		C8	Interval for starting to get GPS fix	u16, in seconds	0 ~ 65535 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 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 ~ 4 Giga Applicable if C7=1 and speed>=10 Km/H 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 04=UDP
		OR	Shortly click SOS key to make TR-206 connect to server	1/0	0=disable 1=enable
		E0	Host IP or domain name	char(32)	
		E1	Host Port number 1	u16	

	SMS	F0	SMS return phone number	char(20)	
		F2	SMS format	1/0	0= Same as GPRS format 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 1=enable Confirmation message="ACK\r"
		A1	Wait confirmation from server after sending message to server	1/0	0=disable 1=enable Confirmation message="ACK\r"
		A2	Timeout of waiting confirmation from server	u8	0~255
		A3	Device Ack with ID string	1/0	0=disable 1=enable
		A4	ID string is IMEI or device ID	1/0	0=Device ID 1=IMEI 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 1=24 hour
		F6	Daylight saving	1/0	1=enable 0=disable
		F7	Auto key lock	1/0	1=enable 0=disable
		F8	Vibrator/beep type	u8	0=vibrator + beep 1=beep 2=vibrator 3=off
		FB	Volume level of ring tone	u8	0=minimum 1=medium 2=maximum 3=progressive Default=1
		FC	Volume level of alarm clock	u8	0=minimum 1=medium 2=maximum 3=progressive Default=1
		FD	Volume level of phone call (headset)	u8	0~6 Default=6
		FE	Melody of ring tone	u8	Default=2
		FF	Power-on melody	u8	Default=1
Security	SOS	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 bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
		H1	Number of SMS report	u16	1 ~ 65535
		H2	report interval	u16, in seconds	0 ~ 65535 Default=30
		H3	Number of GPRS report	u8	0 =continue sending SOS alarm report till receive stop command
		OI	Upper limit of speed alarm	u8, in Km/h	0 ~ 255 0=disable
		OJ	Lower limit of speed alarm	u8, in Km/h u8, in Km/h	0 ~ 255 0=disable 0 ~ 255
		OP	Hysteresis for speed alarm		
		OL	Report Media for speed alarm	Media type	bit0=SMS bit1=TCP
					bit2=UDP bit5=USB
					bit6=Action[0]

					bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
	Geo-fence	K0	Geo-fence enable	1/0	0=disable 1=enable
		K3	Geo-fence alarm report Media	Media type	bit0=SMS bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
		K4	Report media for reading Geo-fence data	Media type	bit1=TCP bit2=UDP bit5=USB
Tracking	Ping	OD	Report media for ping	Media type	bit0=SMS bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 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
	Periodi	P0	Report interval	u32, in seconds	0 ~ 4 Giga
		P2	Report Media	Media	bit0=SMS

				type	bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
		P3	Traveled distance for sending report	u32, in meters	0 ~4 Giga 0=disable
		Q0	Report interval	u32, in seconds	0 ~ 4 Giga
		Q2	Report Media	Media type	bit0=SMS bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
		Q3	Traveled distance for sending report	u32, in meters	0 ~ 4 Giga 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	1/0	0=disable 1=enable Available when E5 is not 0

			connection is re-built.		
	Motion	R0	Report interval in static state	u32, in seconds	0 ~ 4 Giga
		R1	Report interval in motion state	u32, in seconds	0 ~ 4 Giga
		R2	Report Media	Media type	bit0=SMS bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
		R3	Traveled distance for sending report	u32, in meters	0 ~ 4 Giga 0=disable
		R7	Automatic change from motion mode to on-line mode	1/0	0=disable 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 1=enable
		RC	Keep GPRS on-line in moving state	1/0	0=disable 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 online. If GPRS connection is cut, TR-206 will try to	u16, in seconds	0=disable

			one time.		
		E6	Enable/disable TR-206 to send “OK” to server after GPRS connection is re-built.	1/0	0=disable 1=enable 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 1=enable
		RH	GPS always on in moving state	1/0	0=disable 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 ~ 86399
		W1	End time	u32, in seconds	1 ~ 86400
		W2	Report interval	u16, in seconds	0 ~ 65535
		W3	Weekday mask	u8, xx(hex digits)	00 ~ 7f 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 bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
	Timer 1	X0	Start time	u32, in seconds	0 ~ 86399
		X1	End time	u32, in seconds	1 ~86400
		X2	Report interval	u16, in seconds	0 ~ 65535
		X3	Weekday mask	u8, xx(hex digits)	00 ~ 7f 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 bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on

	Timer 2	Y0	Start time	u32, in seconds	0 ~ 86399
		Y1	End time	u32, in seconds	1 ~ 86400
		Y2	Report interval	u16, in seconds	0 ~ 65535
		Y3	Weekday mask	u8, xx(hex digits)	00 ~ 7f 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 bit1=TCP bit2=UDP bit5=USB bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 Action=10: GPS on
	Timer 3	Z0	Start time	u32, in seconds	0 ~ 86399
		Z1	End time	u32, in seconds	1 ~ 86400
		Z2	Report interval	u16, in seconds	0 ~ 65535
		Z3	Weekday mask	u8, xx(hex digits)	00 ~ 7f 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 bit1=TCP bit2=UDP bit5=USB

					bit6=Action[0] bit7=Action[1] Action=00: report format 0 Action=01: report format 1 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	u8	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 00 ~ 7f 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	u8	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 ZC=3 00 ~ 7f 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	u8	0=disable 1=once 2=daily 3=weekly (ZD must be set)
		ZD	Weekday mask of alarm clock 3	u8, xx(hex digits)	Available when ZC=3 00 ~ 7f 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 Book		VA~VT	Phone number of phone book	Char(20)	
		Va~Vt	Contacts of phone book	Char(24)	

2.8 Codeword of Command

Commands are used to control the device activity. A command message is composed of one or several command codeword. Each command codeword can incorporate configuration parameter setting. Please refer to section 2.4 for message format. Command message could be sent by SMS or TCP or UDP.

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	
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. 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	No argument: Restore all parameters to default setting (W): for saving current configuration as default setting.
LC	Clear data logger	
LH	Re-Set device	
LJ	Send SMS message	(phone number, "00SMS message") SMS message are enclosed by quotation marks. (“00” should be added prior to the SMS message.)

Example: Ask TR-206 to send configuration parameters.
GSC,123456789012345,L1(R0,R1,RE,RF)*35!

Example: Ask TR-206 to restore default configuration.
GSC,123456789012345,LA*6a!

Example: Ask TR-206 to send SMS message to 0918518518.
GSC,123456789012345,LJ(0918518518,”00Please call service center ASAP.”)*3b!

Example: Ask TR-206 to switch to motion mode.
GSC,123456789012345,M4(R0=3600,R1=60)*31!

Example: Ask TR-206 to connect to server immediately.
GSC,123456789012345,L4*1f!

2.9 Report Media

Report media is the method that TR-206 sends report. No matter how you send the command by SMS or TCP or UDP, TR-206 will send the report according to the appropriate report media setting.

A report media byte contains 8 flag bits and it is represented by 2 hex digits. Unused bits must be set to 0.

Bit 0: 1=send by SMS, 0=disable SMS report
Bit 1: 1=send by TCP, 0=disable TCP report
Bit 2: 1=send by UDP, 0=disable UDP report
Bit 7 & bit 6: action type

Bit 7	Bit 6	Action
0	0	Send report by format 0
0	1	Send report by format 1
1	0	Turn on GPS without sending report

bit	7=	6=	5	4	3	2=UDP	1=TCP	0=SMS
TCP by format 0	0	0	0	0	0	0	1	0
UDP by format 1	0	1	0	0	0	1	0	0
Turn on GPS	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 213.219.245.116, the server port number 20100.
The setup command is
GSS,011412000011274,3,1,D1=internet,D2=,D3=,D8=02,E0=213.219.245.116,E1=20100*QQ!

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

TR-206 has a very flexible platform. Its behavior is totally configurable. Please refer to section 2.7 for the list of configuration parameters.

3.1 Read parameters of configuration

The PC tool "TR-206 Config Tool_DEV.exe" is used to configure the device by RS-232 interface. You could also send L1 command to remotely read back the setting by TCP or UDP protocol.
Please note TR-206 could NOT send back the configuration parameter by SMS.

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 is (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 parameters(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!

3.2 Set parameters of configuration

The setting of configuration parameters could be changed by the following methods.

- **Connect TR-206 to personal computer via USB cable and then set the configuration parameters by "TR-206 Config Tool_DEV.exe".**
- **Send the "GSS,….!" setting with the configuration parameters to TR-206**
- **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.

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	213.219.245.116
E1	Host Port number 1	20100

GSS,138785469589531,3,0,D1=internet,E0=213.219.245.116,E1=20100*01!

Example 2:
Ping TR-206 and 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 to Friday (X3=3E)

GSC,011412000012789,N1(X0=32400,X1=64800,X2=3600,X3=3E)*4b!

4 GSM & GPRS

4.1GPRS 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 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,011412000010789,3,0,D1=internet,D2=,D3=,D8=02,E0=220.128.207.75,E1=5000 *5f!

4.2 Acknowledgement

Acknowledgement is the acknowledge receipt used to confirm if server or device receive the command or report from each other.

Code word	Parameters	Value	Description
A0	Send confirmation to server after receiving command from server	1/0	1=Enable 0=Disable
A1	Wait confirmation from server after sending message to server	1/0	1=Enable 0=Disable Confirmation message="ACK\r"
A2	Timeout of waiting confirmation from server	u8	0~255 Default=5
A3	Device Ack with ID string	1/0	
A4	ID string is IMEI or device ID	1/0	1=IMEI, 0=Device ID Available when A3=1

The confirmation message from the device is defined in the table below.

A0	A3	A4	Confirmation message
0	x	x	No confirmation required
1	0	x	“ACK\r”
1	1	0	”Device ID, ACK\r”
1	1	1	”IMEI, ACK\r”

Note: “Device ID” is defined by O5.

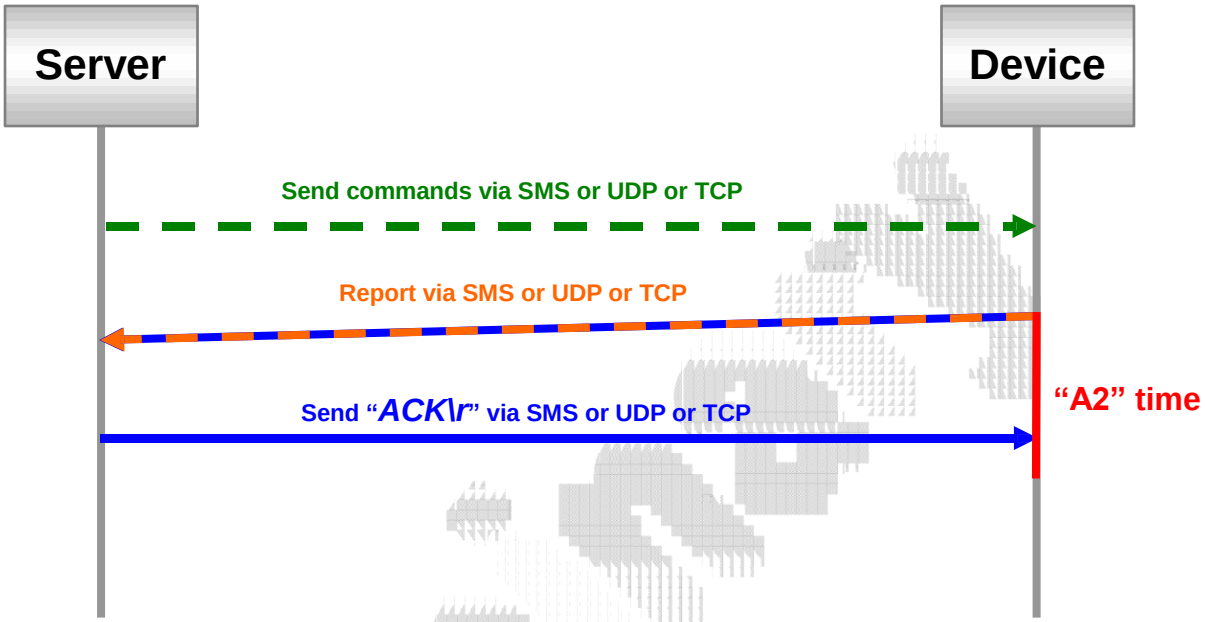
For example, set A0=1, A1=1, A3=1, A4=1, server sends command to TR-206 whose IMEI is 011412000010789. After receiving the command, TR-206 will send acknowledgement receipt as “011412000010789,ACK\r”

For example, set A0=1, A1=1, A3=1, A4=0 and O5=Globalsat. After receiving command, TR-206 will send acknowledgement receipt as “Globalsat,ACK\r”

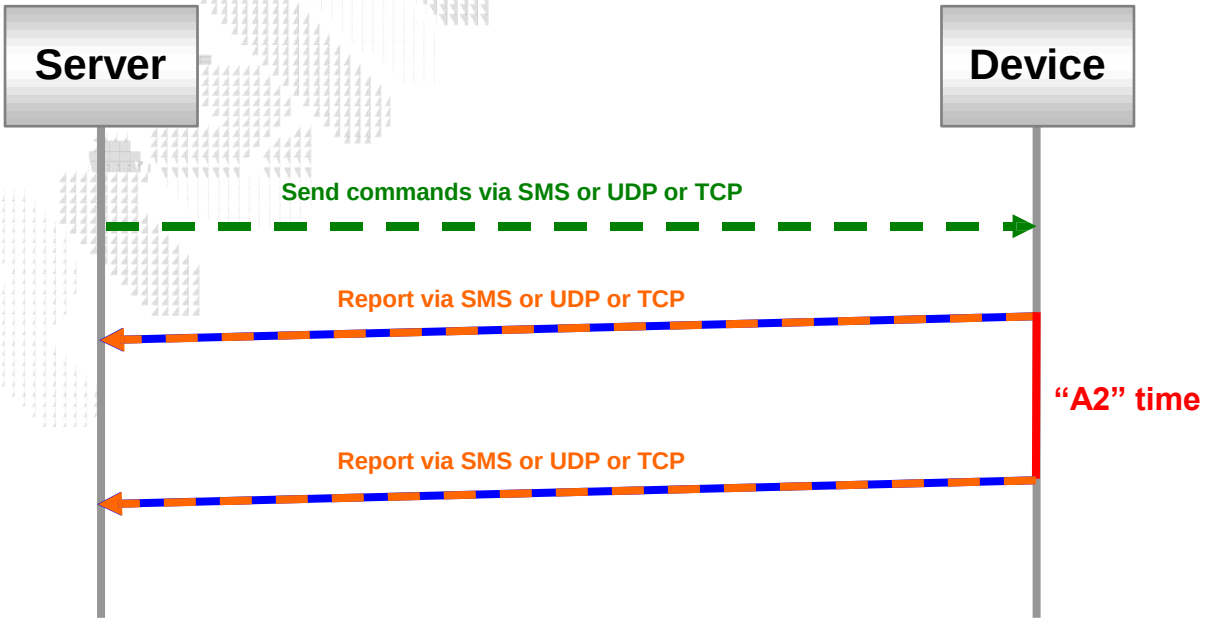
For example, set A0=1, A1=1, A3=0. After receiving the command, TR-206 will send acknowledgement receipt as “ACK\r”

4.2.1 Receive Acknowledgement from Server

Receive ACK from server during "A2" time:

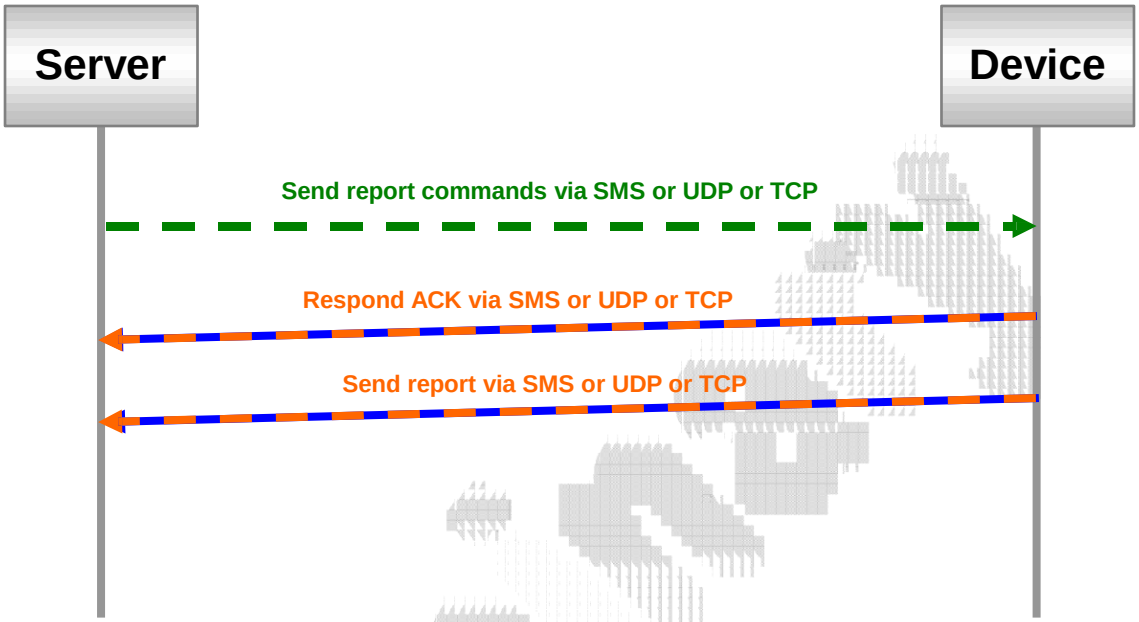


Didn't receive ACK from server during "A2" time:

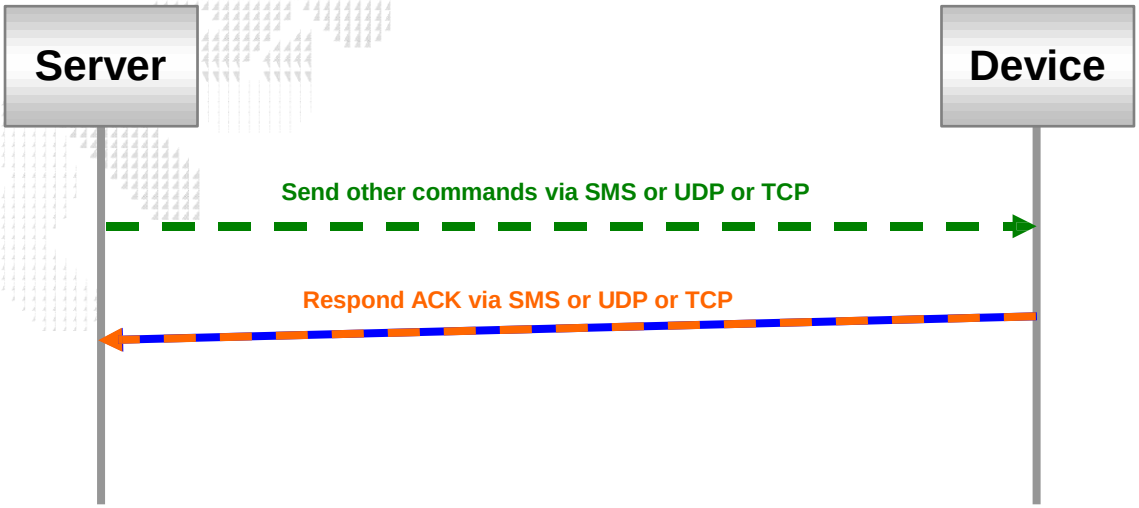


4.2.2 Respond Acknowledgement to Server

Receive report commands from server:



Receive other commands from server:



4.3 GPRS connection

Normally TR-206 will setup GPRS connection before sending report and disconnect after sending report. But TR-206 will try to keep GPRS always on-line in one of the following conditions.

- **In on-line mode**
- **In motion mode / static state and 'RB' is set.**
- **In motion mode / moving state and 'RC' is set.**

In such condition, the device will check the connection periodically. The period is defined by 'E5'. If the connection is lost, the device will try to connect again. If 'E6' is set, device will send "OK" message when connection is recovered.

If the connection is kept for a long time without sending any message, GSM carrier may terminate the connection intentionally. In some worst conditions, the carrier may even reject further request for connection. Setting of 'E4' is used to overcome this issue. TR-206 will disconnect and then re-connect after it has been on-line for the time defined by 'E4'.

In certain circumstances, the server may want the device to setup GPRS connection for receiving command or configuration messages. 'L4' command is used to achieve the purpose. TR-206 will connect to server immediately when getting L4 command. After the connection is established, TR-206 will keep on-line for an interval defined by E7. Server can send commands or configure the device during the interval. If there's no message received during the interval, the connection will be terminated. If there is a message received in the interval, the connection will be extended for another E7 time. Server can send L5 command to terminate the connection immediately.

The related configuration parameters are listed in the table below.

Code word	Parameters	Value	Description
D8	Report Media for L4 command	02=TCP 04=UDP	Connection protocol for always on-line and "L4" command.

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 1=enable Available when E5 is not 0**
E7	**Timeout of L4 connection**	**u16, in seconds**	**>=2, default=30**
RB	**Keep GPRS on-line in static state of motion mode**	**0/1**	**0=disable 1=enable**
RC	**Keep GPRS on-line in moving state of motion mode**	**0/1**	**0=disable 1=enable**

Command format:

GSC,IMEI,L4*Checksum!

Command Codeword	Parameters
L4	Connect to server

Example: Ask TR-206 to connect to server by TCP.

GSC,123456789012345,L4(D8=02)*5d!

5 GPS

In the general tracking modes, TR-206 will turn on GPS when it needs to generate a report. The pre-on time is controlled by C1 or C2, depending on last GPS fix is available or not. Since GPS is most power consuming module, the device will automatically turn off GPS when GPS information is not needed. You may set GPS always on if power consumption is not a critical issue.

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 extra GPS fix. Then TR-206 can speed up the time of getting GPS fix at the next report.

There are some functions that depend on GPS information to work, such as

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

For those functions to work properly, GPS has to be turned on intentionally. 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) and check location/distance/speed related functions. For the details of setting timer, please refer to chapter "9 Timer."

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.

Code word	Parameters	Value	Description
C0	GPS always on	1/0	0=disable 1=enable 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 **Note: TR-206 will send out the report whether it gets GPS fix or not when C1 time ends.**
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 **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 If "C3"=0, disable first report message.
C7	Choose to use C8 or C9+CA	1/0	0=use C8 1=use C9+CA Applicable for standby, periodic and on-line mode
C8	Interval for starting to get GPS fix	u16, in seconds	0 ~ 65535 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 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 ~ 4 Giga Applicable if C7=1 and speed>=10 Km/H 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 1=enable

C1 example, the next report time is 10:00:00 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 9:57:00 AM and send out report at 10:00:00

C2 example, the next report time is 10:00:00 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 10:00:00

C3 example, C3=10 seconds, TR-206 is in the static state of motion mode. When TR-206 is moved, it will switch to moving state and try to get GPS fix for 10 seconds. Then it sends motion moving report to notify the motion event.

6 Tracking

6.1 Ping

Ping function is for getting the present location and status of TR-206. The command is N1. Please set the tolerance time for TR-206 to get fixed before sending out the report by the parameter OS. TR-206 will turn on GPS once N1 command is received. If TR-206 gets GPS fix within OS time, it will send ping report as soon as it gets GPS fix. If it can not get GPS fix within the allowed time, it will send out the report at the end of OS time.

Code word	Parameters	Value	Description
OD	Report media for ping (N1)	Media type	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

Commands format:

GSC,IMEI,N1*Checksum!

Command Codeword	Parameters
N1	Ping device

Example 1: Ping device location and ask it to report via SMS no later than 20 seconds.

GSC,135785412249986,N1(OD=01,OS=20)*23!

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.

You can also set a traveled distance, and then TR-206 will report by the combination of report interval and traveled distance, depending on which criterion is reached first. If checking traveled distance is needed, you have to extra make GPS on. Please refer to "Chapter 4 GPS."

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.

Code word	Parameter	Value	Description
P0	Report interval	1~4 Giga seconds	
P2	Report Media	Media type	Please refer to 2.9 Report media
P3	Traveled distance for sending report	1~4 Giga Unit: meter	0=disable checking distance

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 works in the same way as that of periodic mode except it will keep GPRS connection after sending report. 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 at next report time.

Please refer to section "4.3 GPRS connection" for GPRS on-line operation.
The parameters of On-Line mode are listed below.

Code word	Parameters	Value	Description
Q0	Report interval	1~4 Giga seconds	
Q2	Report Media	Media type	Please refer to 2.9 Report media
Q3	Traveled distance for sending out report	0=disable 1~4Giga 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,M3*Checksum!

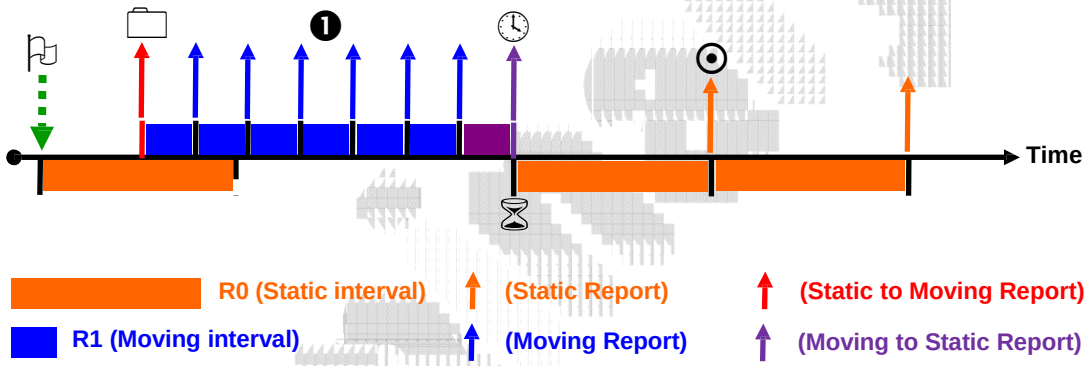
Command Codeword	Parameters
M3	On-line mode

Example 1:
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

TR-206 has built in a motion sensor to detect the movement or vibration. Using this feature, the device can work in moving state or static state. Each state has independent parameters to control the behavior.

Basically, TR-206 will send report periodically according to the interval defined for the working state. You may set a short interval for moving state and a long interval for static state to save transmission fee.



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

In moving state, GPS can be configured to be always on for GPS related function to work properly. The device will terminate GPRS connection after sending reports. But you may set GPRS to be always on-line so that server can send message to device at any time. Please refer to section “4.3 GPRS connection” for the usage of always on-line connection.

In moving state, the traveled distance can be considered to generate report as well as report interval, whatever criterion is matched first. Then the report is sent and the device re-starts to check distance and interval. You may need to keep GPS on for this function to work by setting RH=1.

If the motion sensor is triggered by a short vibration pulse in static state, you may configure the device to watch for further vibration before switching to moving state. An intermediate state called validation state is used to confirm the movement. If the moving distance exceeds the threshold (R9) within allowable time window (RD), the device will switch to moving state. Otherwise it will return to static state. Validation state can be disabled by setting R9=0.

Traveled distance can be used as a motion syndrome in moving state. If the traveled distance exceeds the threshold (RE) within specified time (RF), the device will keep in moving state. Setting RE=0 will disable the distance check.

You may configure parameters to send report by specific media for state transition.

If report interval is set to 0, TR-206 will not send report in respective state.

Parameter 'O1' is used to control the sensitivity of motion sensor. The larger the value is, the less sensitive the sensor is.

The related parameters are listed below.

Code word	Parameters	Value	Description
R0	Report interval in static state	1~4 Giga seconds	
R1	Report interval in moving state	1~4 Giga seconds	
R2	Report Media	Media type	Please refer to 2.9 Report media
R3	Traveled distance for sending report	0=disable 1~4Giga 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, Unit: meter	0 ~ 65535
RB	Keep GPRS on-line in static state	1/0	0=disable 1=enable
RC	Keep GPRS on-line in moving state	1/0	0=disable 1=enable
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 1=enable
RH	GPS always on in moving state	1/0	0=disable 1=enable
RI	Report Media for switching from static state to moving	Media type	Please refer to 2.9 Report media
RJ	Report Media for switching from moving state to static	Media type	Please refer to 2.9 Report media

Commands format:

GSC,IMEI,M4*Checksum!

Commands Codeword	Parameters
M4	Set motion mode

Example:

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 hold and pressed over 2 seconds, The SOS alarm flag will be raised and TR-206 will start to send emergency reports by SMS and/or TCP/UDP with the interval defined by 'H2'.

The SMS reports can be configured to send to maximum 6 sets of phone numbers. The number of reports is defined by 'H1'. If you'd like to stop SOS report, please send "Na" command to TR-206.

Emergency report can also be sent to server by TCP or UDP. The number of report is defined by 'H3'. If H3 is set to zero, then the report will be sent continuously until the SOS flag is dismissed by server.

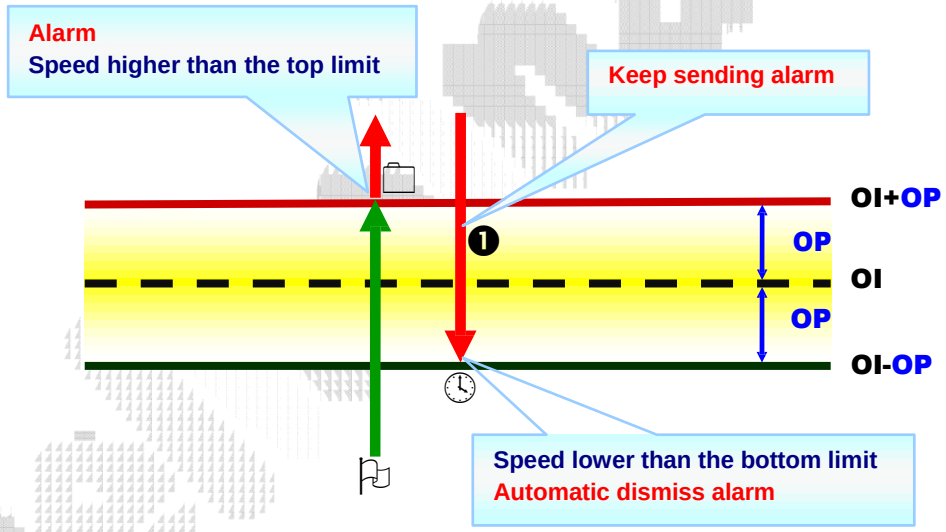
The related parameters are listed in the following table:

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	Media type	Please refer to 2.9 Report media
H1	Number of SMS Report	u16	1 ~ 65535
H2	report interval	u16	3 ~ 65535
H3	Number of GPRS Report	u8	0=continue sending SOS alarm report till receive stop command

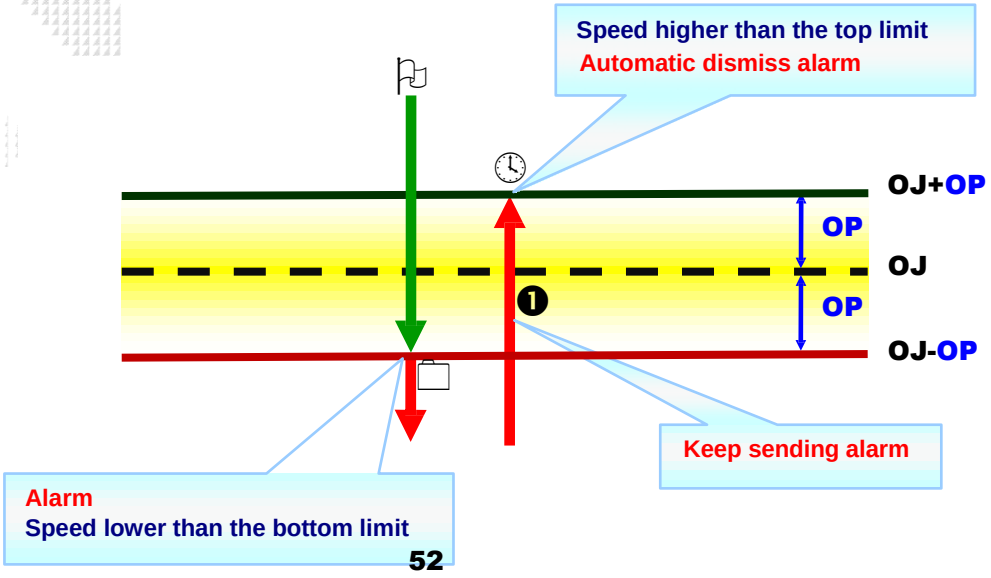
7.2 Speed Limits

TR-206 implements high speed alarm and low speed alarm. There're two parameters for the function to work. One is the speed limit (OI / OJ). The other one is the hysteresis range (OP). Once the speed alarm is detected, the alarm flag of alarm status is set and a report is sent. The alarm flag will be automatically dismissed if the alarm condition is disappeared. Speed alarm detection requires GPS information so the GPS should be turned on. Please refer to chapter "5. GPS" for the setting. Please refer to the illustrations below for the detection behavior.

High Speed Limit



Low Speed Limit



The parameters of speed alarm are listed below.

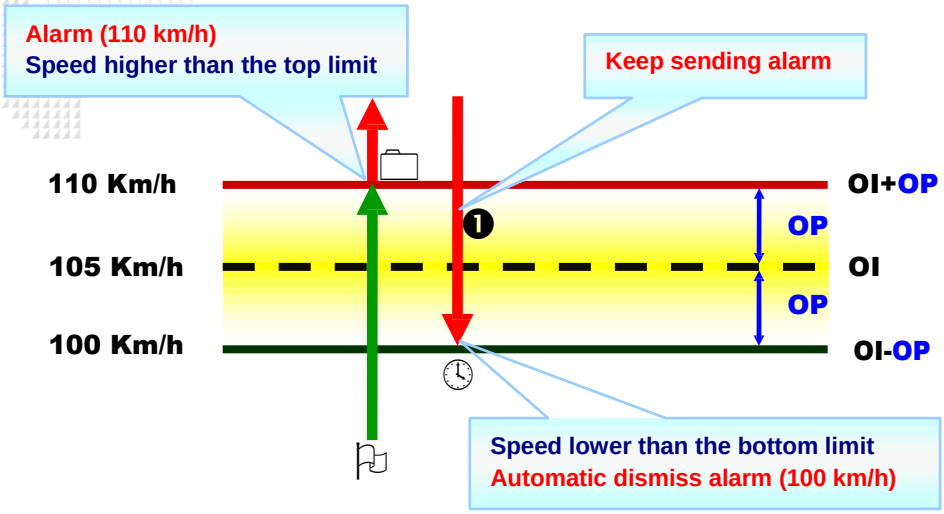
Code word	Parameters	Value
OI	Upper limit of speed alarm	u8, in Km/H 0 ~ 255 Km/H 0=disable
OJ	Lower limit of speed alarm	u8, in Km/H 0 ~ 255 Km/H 0=disable
OL	Report media for speed alarm	Please refer to 2.9 Report media
OP	Hysteresis of speed alarm	u8, in Km/H 0 ~ 255 Km/H

7.2.1 Enable Speed Limit Alert

Example 1:
Set upper limit of speed alert

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

The behavior mode is as following:

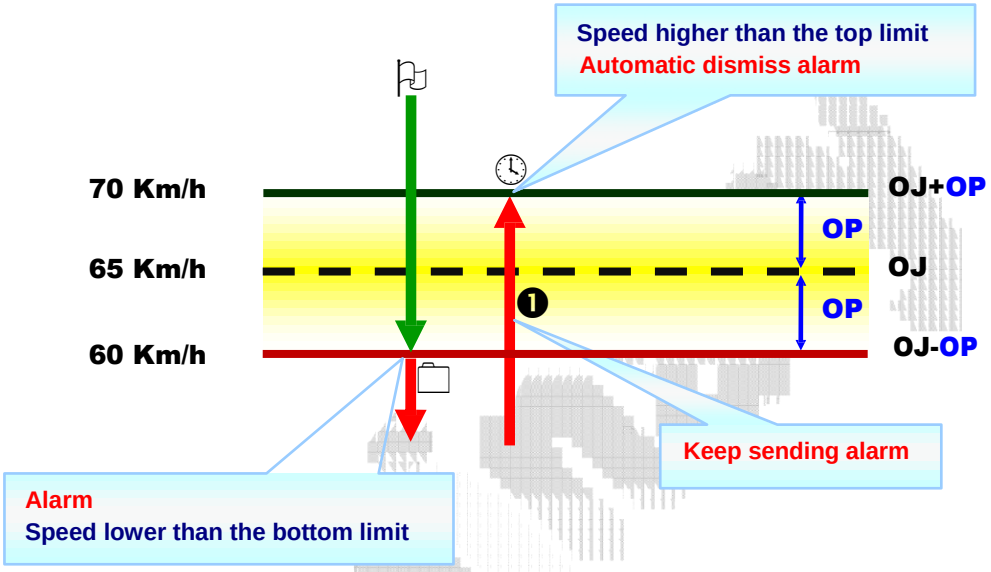


Example 2:

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!

The behavior mode is as following:



7.2.2 Disable Speed Limit Alert

Example 1:

Disable upper limit of speed alert

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

Example 2:

Disable lower limit of speed alert

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

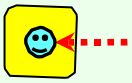
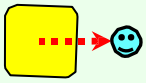
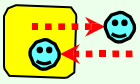
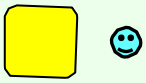
7.3 Geo-fence

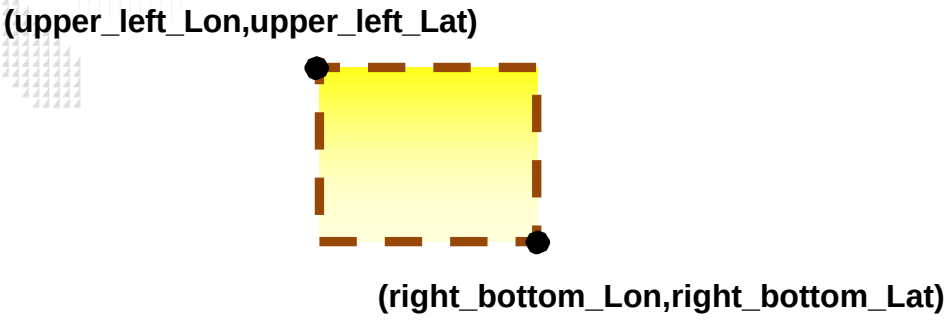
Geo-fence is for setting a rectangular area as permissible area or restricted area. When TR-206 gets out of the permissible area or goes in to the restricted area, TR-206 will send a report to notify the alarm condition.

Geo-fence function needs the information of GPS to check with the settings. Please refer to chapter "5. GPS" for the setting.

TR-206 supports up to 64 sets of geo-fence areas. Each area could be configured and re-configured For example, after you set 10 sets of geo-fence areas. You could change the 7th geo-fence area setting independently.

Geo-fence area with type=0 is disabled. 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 alert types of geo-fence are illustrated below.

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
				



7.3.1 Setup Geo-fence

A Geo-fence area is defined by several parameters.

- **Area ID**

- **Left (west) longitude, Top (north) latitude**
- **Right (east) longitude, Bottom (south) latitude**
- **Type**
- **Optional effective time window (start time, end time, weekday mask)**

Message format for configuring Geo-fence area:

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

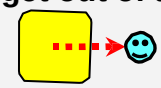
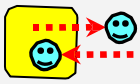
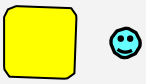
A complete geo-fence configuration message may be composed of several packets in sequence. All the area IDs in the message must be in ascending order.

'T' field in the message denotes the sequence control flag. Bit 0~2 represents start of message, end of message & erase setting respectively. For example:
'1': Start of message
'2': End of message
'3' : Start and End of message, i.e., only one packet for message
'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 packet)
'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 packet)

Longitude & latitude are in the unit of 0.000001 degree. East longitude & north latitude are represented by positive numbers and the prefix '+' can be omitted. West longitude & south latitude are represented by negative numbers and the prefix '-' should be added.

Effective time window is an optional field. It specifies the effective time in a day and applicable day in a week. Start time & end time are in seconds counted from 12:00:00AM. Weekday mask is expressed by 2 hex digits with bit 0~6 represent Sunday ~Saturday respectively.

Format	Value	Note
GSG	"GSG" : Write geo-fence parameter command	Command head
IMEI	(The IMEI number)	GSM device ID

T	Bit 0 : Start of message Bit 1 : End of message Bit 2 : Erase all of previous setting	Message packet control
S	‘0’,’1’,’2’,’3’,…,’9’,’10’,’11’,…,’63’	Sequence number
id	‘1’ ~ ‘64’	Area ID
type	0=disable the area 1=get in area  2=get out of area  3=cross over the boundary  4=stay in area  5=stay out of area 	Alert type of Geo-fence area
upper_left_Lon, upper_left_Lat	upper_left_Lon =Lon upper_left_Lat =Lat Lon: (+ or -)ddddddddd unit: 0.000001 degree Lat: (+ or -)ddddddddd unit: 0.000001 degree	The top left coordinates of specified area
right_bottom_Lon, right_bottom_Lat	right_bottom_Lon =Lon right_bottom_Lat =Lat Lon: (+ or -)ddddddddd unit: 0.000001 degree Lat: (+ or -)ddddddddd unit: 0.000001 degree Example: 12129141	The right bottom coordinates of specified area

	12129141x0.000001=12.129141degree	
Start Time	**0~86400 sec** **Example:** **00:00:01 = 1** **23:59:59 = 86399**	
End Time	**0~86400 sec** **Example:** **00:00:01 = 1** **23:59:59 = 86399**	
weekday	**bit0=Sunday** **bit1=Monday** **bit2=Tuesday** **bit3=Wednesday** **bit4=Thursday** **bit5=Friday** **bit6=Saturday**	
*****	*****	**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**

Example 1.1:

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!

Example 1.2:
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
!

Example 1.3.1:
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!

Example 1.3.2:
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 2.1:
Set up 1st ~10th sets of Geo-fence areas
GSG,132763902812736,1,0,1=(1,121305521,24999088,121308246,24997649,00,8
6400,7f),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!

Example 2.2:
change the 7th set of geo-fence area
GSG,132763902812736,3,0,7=(1,123479371,28016629,123148068,28015657)*5C!

7.3.2 Reading Geo-fence setting

Command of reading geo-fence data is 'L3' and the report media is defined by 'K4'.

Command Codeword	Parameters
L3	(id1,id2~id3,id4)

Example 1:
Read 1st ~10th Geo-fence areas GSC,132763902812736,L3(1-10)*04!

Example 2:
Read Geo-fence area 1,2,5~8 & 10.
GSC,132763902812736,L3(1,2,5~8,10)*44!

Message format for reading Geo-fence area:
GSg,IMEI,T,S,id1=(type,upper_left_Lon,upper_left_Lat,right_bottom_Lon,right_bottom_Lat[,StartTime,EndTime,weekday]),id2=(…),id3=(…),…*Checksum!

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

Example 1:
Report 1~5 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,132763902812736,2,2,5=(1,12146435,25009979,121466711,25008423,00,86400,02)*5f!

7.3.3 Enable Geo-fence Alert

Geo-fence is independent from other functions. It needs the information of GPS to check with the settings. So the GPS should be additionally turned on regardless of other reports. Please refer to chapter "5. GPS" for the setting.

After configuring the geo-fence areas, there must be an additional command 'N6' to turn on the function. It can be turned off by 'N7' command or by setting K0=0.

Codeword	Parameters	Value	Description
K0	Enable geo-fence	1/0	1=enable 0=disable (default)
K3	Report media of geo-fence alarm	Media type	Please refer to 2.9 report media.
K4	Report media of reading geo-fence area	Media type	Please refer to 2.9 report media.

Command's format for enable/disable Geo-fence:

GSC,N6*Checksum!

Command Codeword	Function
N6	Enable Geo-fence
N7	Disable 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!

Example 3:

Disable geo-fence function

GSC,135097652783615,N7*18!

7.3.4 Dismiss Geo-fence Alarm

TR-206 would send out only one geo-fence alarm report when it violates the geo-fence rule. The user should dismiss the alarm flag by "Ne" command and the monitoring of geo-fence will re-start. If geo-fence function is disabled by "N7" command, the alarm flag will also be cleared.

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-206 still stay in the geo-fence area or stay out of the area. After dismissing the geo-fence alarm, if TR-206 still stays in the geo-fence area or stay out of the area, TR-206 will send a new report.

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

GSC,Ne*Checksum!

Command Codeword	Function
Ne	Dismiss Geo-fence Alarm

Example 1:

Dismiss TR-206 geo-fence alarm status

GSC,135097652783615,Ne*6A!

8 Timer

Timer can be used to send report or turn on GPS. There are four periodic timers for setting specified time report. The timers are effective during the time frame from start time to end time and the weekday defined by weekday mask. When start time is reached, the device enables the periodic timer with defined interval.

Start time and end time are counted in seconds from 12:00:00 AM. Weekday mask is used to define the effective days in a week. Bit 0 ~ bit 6 are used to activate the time on Sunday ~ Saturday respectively. If the bit is set, the timer is enabled on that appropriate day. Weekday mask is represented by 2 hex digits.

Timer 0 operates differently from other timers. When there is a new event (report), it will re-start to count down the report interval again.
Timer 1 ~ 3 will not re-start counting down the report interval when there is a new event.

8.1 Timer 0

The configuration parameters of timer 0 are listed below.

Code word	Parameters	Value	Description
W0	Start time	u32	0~86399
W1	End time	u32	1~86400
W2	Report interval	U16	1~65535
W3	Weekday mask	00~7f	u8, xx(hex digits)
W4	Report Media	Media type	Please refer to 2.9 Report media

8.2 Timer 1~3

The configuration parameters of timer 1~3 are listed below.
(“X”: Timer 1, “Y”: Timer 2, “Z”: Timer 3,)

Code word	Parameters	Value	Description
X0	Start time	u32	0~86399
X1	End time	u32	1~86400
X2	Report interval	U16	1~65535
X3	Weekday mask	00~7f	u8, xx(hex digits)
X4	Report Media	Media type	Please refer to 2.9 Report media
Y0	Start time	u32	0~86399
Y1	End time	u32	1~86400
Y2	Report interval	U16	1~65535
Y3	Weekday mask	00~7f	u8, xx(hex digits)
Y4	Report Media	Media type	Please refer to 2.9 Report media
Z0	Start time	u32	0~86399
Z1	End time	u32	1~86400
Z2	Report interval	U16	1~65535
Z3	Weekday mask	00~7f	u8, xx(hex digits)
Z4	Report Media	Media type	Please refer to 2.9 Report media

Example 1:

Make timer 3 to work from 8:00AM to 6:PM on Monday to Friday with interval=30 minutes.

GSS,123456789012345,3,0,Z0=28800,Z1=64800,Z2=1800,Z3=3e,Z4=02,Z5=00*0c!

9 Alarm Clock

TR-206 has built in 3 alarm clocks. Each alarm clock has 5 setting parameters – alarm melody, alarm time, type, weekday mask & prompt message. Alarm clock type specifies the clock is effective for once, daily or recurrently. If the type is recurrent, the alarm clock is effective on the day(s) defined by weekday mask. Please refer to chapter "9. Timer" for the setting of weekday mask.

The configuration parameters of alarm clock are listed below.
("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	u8	0=disable, 1=once, 2=daily 3=recurrently (XD must be set)
XD	Weekday mask of alarm clock 1	u8, xx(hex digits)	Available when XC=3 00 ~ 7f 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	u8	0=disable, 1=once, 2=daily 3= recurrently (YD must be set)

YD	Weekday mask of alarm clock 2	u8, xx(hex digits)	Available when YC=3 00 ~ 7f 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	u8	0=disable, 1=once, 2=daily 3= recurrently (ZD must be set)
ZD	Weekday mask of alarm clock 3	u8, xx(hex digits)	Available when XC=3 00 ~ 7f 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 recurrently (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!

10 User interface

There’re parameters that control the behavior of user interface. They are summarized in the following table.

Code word	Parameters	Value	Description
F4	Date format (LCD)	Char(16)	See note below
F5	Time format (LCD)	1/0	0=12 hour 1=24 hour
F6	Daylight saving	1/0	1=enable 0=disable
F7	Auto key lock	1/0	1=enable 0=disable
F8	Vibrator/beep type	u8	0=vibrator + beep 1=beep 2=vibrator 3=off
FB	Volume level of ring tone	u8	0=minimum 1=medium 2=maximum 3=progressive Default=1
FC	Volume level of alarm clock	u8	0=minimum 1=medium 2=maximum 3=progressive Default=1
FD	Volume level of headset	u8	0~6. Default=6
FE	Melody of ring tone	u8	Default=2
FF	Power-on melody	u8	Default=1

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 if there's no key pressed for 30 seconds.**

11 Report Messages

A report is generated by a specific event, such as ping, SOS alarm, battery low, etc. Each event has a corresponding report type and report media. Please refer to section 2.6 for the mapping of report type. The report media defines the report channel (TCP/UDP/SMS) and report format.

There are three types of GPRS report format, "format 0", "format 1" and "format 2". Typically format 0 is used for normal report which contains as many information as possible, and format 1 is used for heart beat report which contains necessary information to notify the server that the device is working properly.

Selection of report format 0/1 is defined in the report media setting for respective report condition. Please refer to section "2.9 Report media" for detail.

If GPS signal is blocked and the device can not get GPS fix when sending report format 0, format 2 is an alternative which contains GSM base station identifiers called "CELL ID". Because the location of each GSM base station is fixed and known, "CELL ID" information can be used to calculate the approximate location of the device.

Format 0 and format 1 are configurable by setting O3 & ON respectively. But the format of format 2 is fixed.

There are two types of SMS messages. The first type is the same as GPRS report which is efficient in length but it is not friendly for reading. In order to overcome this drawback, the second type of SMS report is added for easy reading. The sentence and information of second type are all configurable.

11.1 Format 0 of Report Messages

Format 0 report is prefixed by "GSr". Its content is configurable by setting parameter "O3". Please refer to section 2.6 for the available report parameters and the respective code words. Please collect the required code words and put them together to form a string and set to "O3". Then TR-206 will generate report according to the codeword sequence and translate to corresponding information.

Parameter's Codeword	Description
O3	Report format 0

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

Example 1:
Set report format 0 by configuration message.
GSS,135785412249986,3,0,O3=SORPZAB27GHKLMN*U!*20!

Then format 0 report will be in the following format.
GSr,IMEI,Operation_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!
For example:
GSr,135785412249986,4,6,00,,3,230410,153318,E12129.2839,N2459.8570,0,1.17,212,8,1.0,53*57!

Example 2:
Ask TR-206 report "format of format 0"
GSC,136647890362718,3,0,L1(O3)*6D!

TR-206 receives the command and reports the following message.
GSs,136647890362718,3,0,O3=SORPZAB27GHKLMN*U!*0b!

11.2 Format 1 of Report Messages

Format 1 report is prefixed by "GSh". Its content is configurable by setting parameter "ON". Please refer to section 2.6 for the available report parameter and the respective codeword. Please collect the required codeword and put

them together to form a string and set to "ON". Then TR-206 will generate report according to the codeword sequence and translate to corresponding information.

Parameter's Codeword	Description
ON	Report format 1

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

Example 1:
Set TR-206 format of report message for format 1
GSS,131826789036289,3,0,ON=SPAN*U!*15!

Then format 1 report will be in the following format.
GSh,IMEI,Alarm_Status,GPS_Fix,Battery_capacity*checksum!

Example 2:
Ask TR-206 report "format of format 1"
GSC,131826789036289,3,0,L1(ON)*36!

TR-206 receives the command and report the following message GSs,131826789036289,3,0,ON=SPAN*U!*66!

11.3 Format 2 of Report Messages

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 information. Then the report format of TR-206 will automatically switch from format 0 to format 2 when TR-206 does not get GPS fix.

The parameter of enabling TR-206 to report the Cell ID is O8. Please note that report format 1 is not affected regardless of the setting of O8.

Code word	Parameters	Value	Description
O8	Enable/ disable TR-206 to	1/0	0=disable
	report “cell ID” if it does not get GPS fix		1=enable

The report format (format 2) of cell ID is

GSd,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.

For example:
GSd,131826789036289,4,5,00,260110,103255,"466,92,0A8D,08C6,13,14","466,92,0A8D,2FD6,15,14","466,92,0A8D,466E,13,12","466,92,0A8D,6D7E,14,11","466,92

,0A8C,E726,11,11"*01!

11.4 SMS Report

If the SMS flag of the report media is enabled when TR-206 is generating report, a SMS report will be sent to the phone number defined by F0. There're two types of SMS message. The first one is the same as GPRS messages described in the above sections. The second type is a configurable text which is designed for easy reading. Parameter 'F2' is used to control SMS message type.

Codeword	Parameters	Value	Description
F0	SMS return phone number	char(20)	
F2	SMS format	1/0	0= Same as GPRS format 1= Text format

For type 2 SMS report, each report type has a corresponding setting that defined the content of the SMS text. The setting is a combination of text and report parameter. A report parameter is represented by a leading '$' and its codeword. For example, '$A' means GPS fix status. '$+' represents a carriage return character. TR-206 will replace it by its value/status.

Note:
The leading "00" is necessary for format control. Please don't change or delete it.

The following table lists the related parameters for SMS report format settings. Please refer to "2.6. Parameters of Report Messages" for the codeword.

Code word	Parameters	Value	Description
Fa	SMS format 1 report string for ping	char(96)	"00Ping!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"

Fb	**SMS format 1 report string for SOS alarm**	**char(96)**	**"00Emergency! $+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fc	**SMS format 1 report string for main battery low**	**char(96)**	**"00Power low!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fd	**SMS format 1 report string for geo-fence alarm**	**char(96)**	**"00Geofence alarm$+IMEI:$S$+Time:$C$+Area Z+$6,1+Speed:$I km/hr$+Power:$N%"**
Fe	**SMS format 1 report string for periodic mode**	**char(96)**	**"00Periodic report!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Ff	**SMS format 1 report string for on-line mode**	**char(96)**	**"00Online report!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fg	**SMS format 1 report string for static state of motion mode**	**char(96)**	**"00Static report!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fh	**SMS format 1 report string for moving state of motion mode**	**char(96)**	**"00Moving report!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fi	**SMS format 1 report string for changing from static to moving state**	**char(96)**	**"00Start moving!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**

Fj	**SMS format 1 report string for changing from moving to static state**	**char(96)**	**"00Stop moving!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fk	**SMS format 1 report string for high speed alarm**	**char(96)**	**"00Over speed!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fl	**SMS format 1 report string for low speed alarm**	**char(96)**	**"00Under speed!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fm	**SMS format 1 report string for timer 0**	**char(96)**	**"00Timer 0 alarm!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fn	**SMS format 1 report string for timer 1**	**char(96)**	**"00Timer 1 alarm!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fo	**SMS format 1 report string for timer 2**	**char(96)**	**"00Timer 2 alarm!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fp	**SMS format 1 report string for timer 3**	**char(96)**	**"00Timer 3 alarm!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fq	**SMS format 1 report string for power on**	**char(96)**	**"00Device power on$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**
Fr	**SMS format 1 report string for power off**	**char(96)**	**"00Device power down$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"**

Example:

Ping: "00Ping!$+IMEI:$S$+Time:$C$+GPS A+$6,1+Speed:$I km/hr$+Power:$N%"

S=IMEI

C=Local date, time

A=GPS fix status

6=latitude

1=longitude

I=speed (km/hr)

N=battery capacity

The received SMS is displayed as

Ping!
IMEI:12345678901234
Time:2009/11/17 04:43:20,
GPS:3D fix
N21.924598,E100.314536
Speed:18km/hr
Power:70%

12 Data Log

The function of Data Log is used to record the GPS location information in TR-206. The recording criteria may based on time interval or/and traveled distance. If traveled distance criterion is selected, GPS must be turned on to calculate the moving distance. If both criteria are applied, then the device will save one record if any one of the criteria is matched and resets the counting.

If you want TR-206 to store position according to traveled distance, you have to extra make GPS on. Please refer to "Chapter 5 GPS."

The recorded information can be uploaded to PC by USB interface or be transmitted to server by GPRS remotely.

To enable data log function, you should configure parameters 'O2' & 'OH' and send 'N8' command. Command 'N9' is used to disable the function. The related parameters are listed below.

Codeword	Parameters	Value	Description
O2	Data logger interval	u16, in seconds	0 ~ 65535 0=disable
OH	Data logger distance	u32, in meters	0 ~ 4 Giga 0=disable

Command Codeword	Parameters
N8	Enable Data logger
N9	Disable data logger

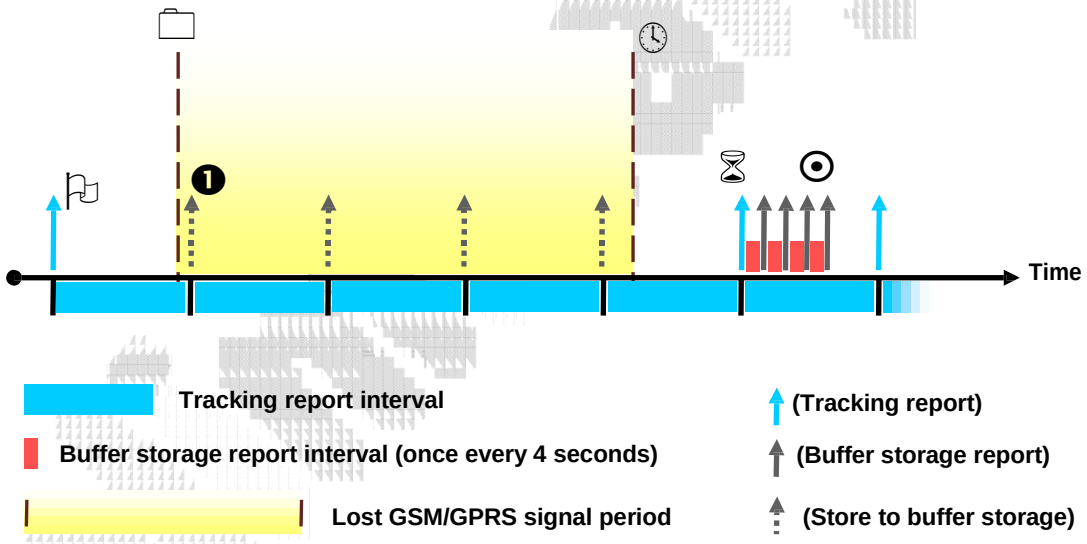
Example 1:
Enable data log function with 10 seconds interval.
GSC,123456789012345,N8(O2=10)*51!

Example 2:
Enable data log function with 2 minutes interval, maximum distance=100m & GPS always on.
GSC, 123456789012345,N8(O2=120,OH=100,C0=1)*37!

13 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 retrieve the reports in the buffer storage and send them to server. TR-206 could save up to 8000 pieces of location reports to buffer storage.

The behavior is illustrated as following.



	Tracking report
	Enter area without GSM/GPRS signal coverage.
1	Save location report to buffer storage
	Enter area with GSM/GPRS signal
	Send periodic report
	Send the location report in the buffer storage

The parameter of enable data buffer function is OG.

Code word	Parameters	Value	Description
OG	Enable/ disable data buffer function	1/0	0=disable 1=enable

14 Simple Command

Typical command of TR-206 is composed of command code words, parameters & checksum. The code words are hard to remember and you may need a tool to generate the checksum. The purpose of simple command is to simplify the command format and send command without checksum. You could send simple commands to TR-206 by mobile phone's SMS.

<u>The format of simple command sentence is:</u>
"password,simple command 1,simple command 2,simple command 3,……"

In order to protect the privacy, the sentence starts with a password field. The password is defined by configuration parameter 'OU'. If 'OU' is set as blank, then the password field is omitted. This password is also used as the password of PC utility.

A complete command sentence has one or multiple simple commands. Do not insert any space byte between commands. Each simple command is composed of a command codeword and an optional parameter. If there's no parameter for the command, TR-206 will refer to present setting for operation. The available commands are listed in the following table.

Command	Codeword	Optional Parameter
Ping report	PI	=tolerance time of GPS fix
Set Periodic mode	PR	=periodic report interval
Set On-line mode	OL	=on-line report interval
Set Motion moving report interval	MM	=moving report interval
Set Motion static report interval	MS	=static report interval.
Link to server	LI	
Reset device	RS	
Standby mode	SP	

Please note that the simple command is case sensitive. All simple commands are in capital. To enable the simple command, please set configuration parameter A5 to 1.

Code word	Parameters	Value	Description
A5	Enable simple command	1/0	0=disable 1=enable
OU	Password for simple command and PC utility	Char(16)	

Example 1, set the password to be "VICTORY" and enable simple command
The command is "GSS,011412000010789,3,1,OU=VICTORY,A5=1*7e!"

Example 2, cancel the password of TR-206.
The command is "GSS,011412000010789,3,1,OU=*5b!"

Example 3, ping TR-206 and set the tolerance time of GPS fix as 3 minutes. The password is 520JX
The command is "520JX,PI=180"

Example 4, switch TR-206 to motion mode and set the moving report interval as 30 seconds and static report interval as 30 minutes. The password is 7777.
The command is "7777,MM=30,MS=1800"

Example 6, make TR-206 link to server. And there is no password.
The command is "LI"

Example 7, switch TR-206 to standby mode. And there is no password.
The command is "SP"

Техническая поддержка

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