



GV50M Series @Track Air Interface Protocol

EGPRS/LTE Cat-M1/LTE Cat-NB1/GNSS Tracker

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0. Revision History

Version	Date	Author	Description of Change
16.01	2018-03-02	Parker Xu	Initial
16.02	2018-03-07	Parker Xu	1. AT+GTDIS Delete “no ignition” “debounce time” 2. Add The command AT+GTSDS,AT+GTSTP,AT+GTVMS,AT+GTVVS,AT+GTAVS,AT+GTEMR 3. Add messages +RESP:GTSRT, +RESP:GTDRV, +RESP:GTSSP, +RESP:GTTSP, +RESP:GTASP
16.03	2018-4-12	Parker Xu	1.Add “input trigger selection” in AT+GTDIS
16.04	2018-04-26	Parker Xu	1. Add “Network Mode” in AT+GTBSI 2. Delete “VIN” in report of GTVGN and GTVGF
16.05	2018-05-15	Parker Xu	1. Modify “Network Mode” in AT+GTBSI, delete two “Reserved” in GTFRI report,
16.06	2018-05-23	Parker Xu	1. Add “ignition off debounce” and “Smart voltage adjust” in AT+GTVVS. Add “LTE Mode” in AT+GTBSI. 2. Delete “Duration of Ignition On or Ignition Off” in GTCRA hex report.
16.07	2018-06-25	Parker Xu	1.Modify “Network Mode” in AT+GTBSI 2.Modify AT+GTVMS\AT+GTVVS
17.01	2018-07-23	Parker Xu	1. Add “AGPS mode” in AT+GTCFG.
17.02	2018-08-22	Parker Xu	1. Modify the range of threshold in GTCFG and GTRMD etc.
17.03	2018-08-27	Parker Xu	1. Delete “Input trigger selection” in AT+GTDIS
17.04	2018-10-24	Parker Xu	1. Add “Manual_Netreg” in AT+GTBSI 2. Modify AT+GTPDS
17.05	2018-11-28	Kerwin Shen	1. Modify AT+GTDOG command
17.06	2018-12-20	Kerwin Shen	1. Modify the range of <Hour Offset> in AT+GTTMA command. 2. Delete “MPN/MPF validity time” in AT+GTEPS
17.07	2019-02-18	Kerwin Shen	1. Added ‘+RESP:GTLGN/+LGN’ report. 2. Modify AT+GTCFG,AT+GTRMD,AT+GTHRM and AT+GTRTO
17.08	2018-04-24	Parker Xu	1. Add “ICCID” in GTINF report.
17.09	2019-06-14	Beck Wan	1. Modify APN in AT+GTBSI. 2. Modify APN in AT+GTQSS.
17.0A	2019-10-14	Beck Wan	1. Add “Hysteresis Error” in AT+GTEPS. 2. Modify System Architecture picture. 3. Renew report examples. 4. Modify some functional descriptions.
17.0B	2019-11-15	Beck Wan	1. Add AT+GTGAM Command.

			2. Add "Position type" in AT+GTDIS. 3. Add "Time unit" in AT+GTSSR. 4. Add sub command "OE" in AT+GTRTO. 5. Modify "Frame Number" range in +CRD.
17.0C	2019-12-25	Beck Wan	1. Add +RESP:GTGSV HEX report. 2. Modify +RESP:GTCRD report example. 3. Add "Expand INF Mask" in INF hex report. 4. Modify "Satellites" in location hex report. 5. Modify <Main Server IP> description in AT+GTSRI. 6. Modify +INF report description.
17.0D	2020-02-20	Beck Wan	1. Add "APN Authentication Methods" in AT+ GTBSI.
17.0E	2020-07-21	Beck Wan	1. Add "Sub Command Parameter" in AT+GTRTO. 2. Modify "Mode" description in AT+GTFRI. 3. Add "GPS Fix Failure Timeout" in AT+GTGAM. 4. Modify "Ignition Time" in AT+GTEMR. 5. Modify AT+GTOUT description.
17.0F	2020-09-27	Beck Wan	1. Modify "IGN/IGF Interval" length in +INF report. 2. Add <Clear FPLMN Interval>/GNSS Global Fix Timeout in AT+GTCFG. 3. Add <RTL GNSS Fix Timeout>/<Delay Reboot> in AT+GTRTO. 4. Add <QCSQ Sysmode>/<GSM/LTE RSSI>/<LTE RSRP LTE SINR>/<LTE RSRQ> in +RESP:GTINF report. 5. Modify APN maximum length 40 bytes in AT+GTBSI/QSS. 6. Modify "Reserved" length is zero. 7. Add "+ACK:GTEMR/+ACK:GTGAM /+ACK:GTASC /+ACK:GTSTP/+ACK:GTSDS" . 8. Modify <Configurations> in +RESP:GTALM.
17.10	2020-12-16	Beck Wan	1. Modify "Motion Threshold" in AT+GTTOW. 2. Modify "Fake Tow Delay" default value in AT+GTTOW. 3. Modify "Tow Detection Time/Fake Tow Delay" description in AT+GTTOW. 4. Modify "Idling Detection Time" description in AT+GTIDL.
17.11	2021-01-28	Beck Wan	1. Added "Cat-NB1 first/Cat-NB1 only" in AT+GTBSI. 2. Modified "GEO ID" max value to 9 in AT+GTPEO.
	2021-03-29	Beck Wan	1. Modified AT+GTPEO descriptions.
17.12	2021-04-09	Beck Wan	1. Modified AT+GTCRA descriptions. 2. Modified "GEO ID" max value to 19 in AT+GTPEO.
	2021-04-16	Beck Wan	1. Added +LGN buffer report descriptions.

1. Overview

1.1. Scope of This Document

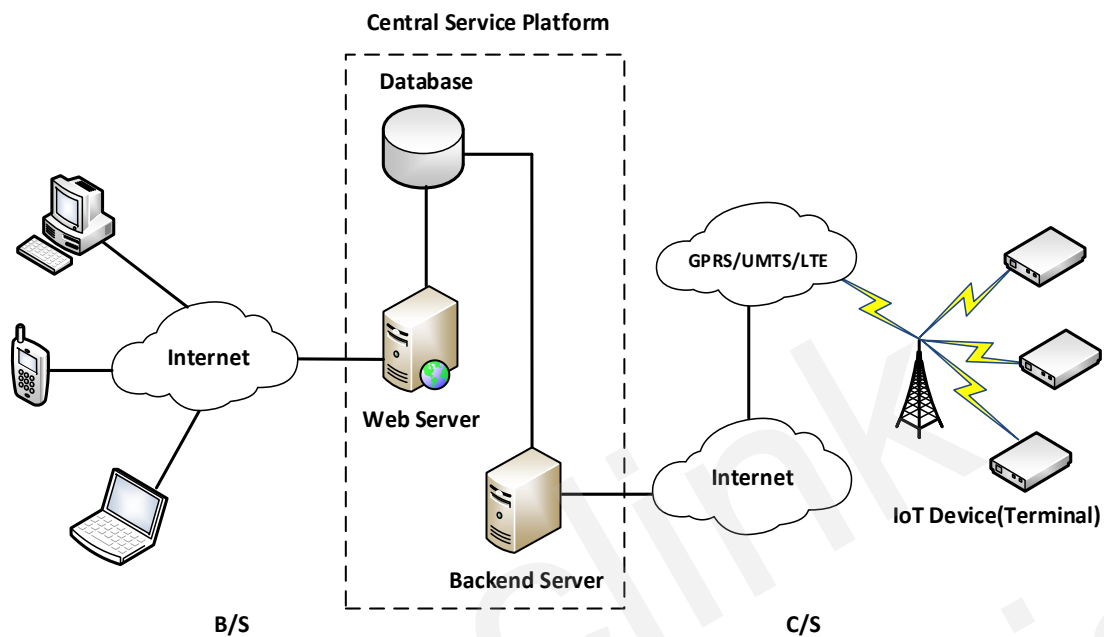
The @Track Air Interface Protocol, a digital communication interface based on printable ASCII characters over SMS or wireless network, is used for all communication between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms with an acknowledgement message. The terminal also sends messages to the backend server if necessary.

The purpose of this document is to describe how to build up the backend server based on the @Track Air Interface Protocol.

1.2. Terms and Abbreviations

Abbreviation	Description
ASCII	American National Standard Code for Information Interchange
LTE	Long Term Evolution
HDOP	Horizontal Dilution of Precision
IP	Internet Protocol
SMS	Short Message Service
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
UTC	Coordinated Universal Time
IMEI	International Mobile Equipment Identity
RSSI	Received Signal Strength Indication

2. System Architecture



The backend server can be accessed by multiple terminals and it should have the following abilities:

- ✧ The backend server should be able to access the internet and monitor the connection originating from the terminal.
- ✧ The backend server should be able to support TCP or UDP connection with the terminal. It should be able to receive data from the terminal and send data to the terminal.
- ✧ The backend server should be able to receive and send SMS.

3. Message Description

3.1. Message Format

All the @Track Air Interface Protocol messages are composed of printable ASCII characters. Each message has the following format:

Message format	Message type
AT+GTXXX=<parameter1>,<parameter2>,...\$	Command
+ACK:GTXXX,<parameter1>,<parameter2>,...\$	Acknowledgement
+RESP:GTXXX,<parameter1>,<parameter2>,...\$	Report

The entire message string ends with character '\$'.

The characters 'XXX' identify the transmitted message.

The "<parameter1>,<parameter2>,..." carries the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighboring parameter characters. The parameter string may contain the ASCII characters: '0'-'9','a'-'z','A'-'Z'.

Detailed descriptions of each message format are located in the specific message sections.

The backend server can either configure and query the parameters of the terminal or control the terminal to perform specific actions by sending Commands to the device. When the terminal receives Commands over the air, it will reply with a corresponding acknowledgement message.

The device can send other Reports to the server by configuring related parameters. Please see the following figure:

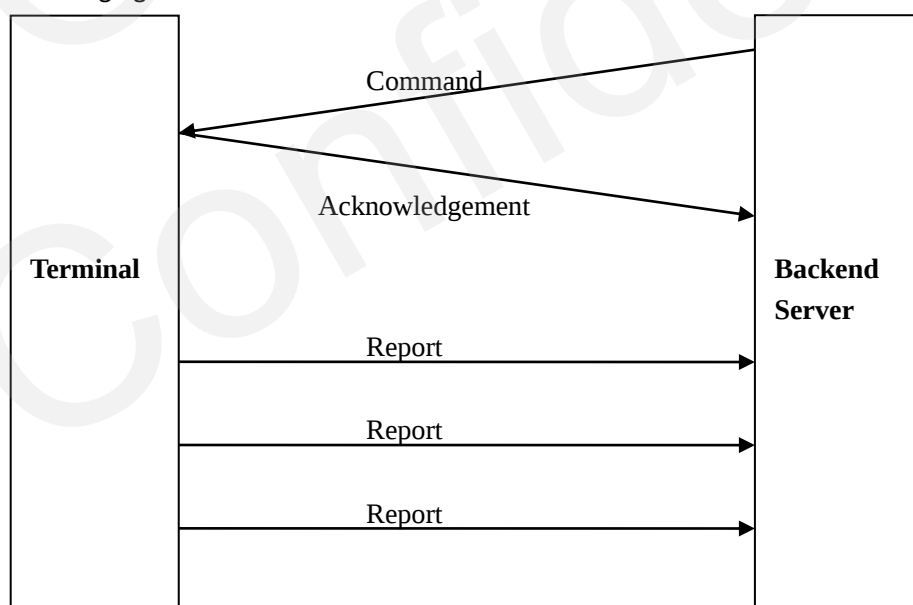


Figure 1: @Tracker Protocol messages flow

3.2. Command and Acknowledgement

3.2.1. Server Connection

3.2.1.1. Bearer Setting Information

The command **AT+GTBSI** is used to configure the parameters for network data connection.

➤ **AT+GTBSI=**

Example: AT+GTBSI=gv50m,,ctnet@mynet.cn,vnet.mobi,,,,,0000\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	LTE APN	<=40		
3	LTE APN User Name	<=30		
4	LTE APN Password	<=30		
5	GPRS APN	<=40		
6	GPRS APN User Name	<=30		
7	GPRS APN Password	<=30		
8	Network Mode/APN Authentication Methods	2	00-33	00
9	LTE Mode	1	0-5	2
10	Manual Netreg	1	0-1	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Password>: The valid characters of password include '0'–'9', 'a'–'z', 'A'–'Z'. The default value is "gv50m".
- ✧ <LTE APN>: Access point name (APN).
- ✧ <LTE APN User Name>: The APN user name. If the parameter field is empty, the current value of this parameter will be cleared.
- ✧ <LTE APN Password>: The APN Password. If the parameter field is empty, the current value of this parameter will be cleared.
- ✧ <GPRS APN>: GPRS access point name (APN). If the <LTE APN> does not work, the <GPRS APN> will be used.
- ✧ <GPRS APN User Name>: The GPRS APN user name. If the parameter field is empty, the current value of this parameter will be cleared.
- ✧ <GPRS APN Password>: The GPRS APN Password. If the parameter field is empty, the current value of this parameter will be cleared.

Note:

If there is only one APN, please use it as LTE APN.

- ✧ <Network Mode/APN Authentication Methods>: This field is in hex format. 4 high bits mean APN authentication methods and 4 low bits mean network mode.

Mobile network modes of the device:

- 0: Auto. (LTE & GSM)
- 1: GSM only.
- 2: LTE only.
- 3: GSM First. (LTE & GSM)

Mobile APN authentication methods of the device:

- 0: No authentication.
- 1: PAP authentication.
- 2: CHAP authentication.
- 3: PAP or CHAP authentication.

- ✧ <LTE Mode>: Select Cat-M1 and Cat-NB1 work mode.

- 0: Cat-M1 & Cat-NB1 (Cat-M1 first)
- 1: Cat-NB1 & Cat-M1 (Cat-NB1 first)
- 2: Cat-M1.
- 3: Cat-NB1.
- 4: Cat-NB1 first (network search sequence: NB1, 2G, M1). It is valid when <Network Mode> is set to 0: Auto. (LTE & GSM).
- 5: Cat-NB1 only (network search sequence: NB1, 2G). It is valid when <Network Mode> is set to 0: Auto. (LTE & GSM).

Note: When "Network Mode" is 0/2/3, "LTE Mode" is valid.

Network Mode		LTE Mode		Search Order		
Mode	Detail	Mode	Detail	1	2	3
0	Auto	0	Cat-M1&Cat-NB1 (Cat-M1 first)	M1	2G	NB1
		1	Cat-M1&Cat-NB1 (Cat-NB1 first)	2G	NB1	M1
		2	Cat-M1	M1	2G	N/A
		3	Cat-NB1	2G	NB1	N/A
		4	Cat-NB1 First	NB1	2G	M1
		5	Cat-NB1 Only	NB1	2G	N/A
1	GSM Only	N/A	N/A	2G	N/A	N/A
2	LTE Only	0	Cat-M1&Cat-NB1 (Cat-M1 first)	M1	NB1	N/A
		1	Cat-M1&Cat-NB1 (Cat-NB1 first)	NB1	M1	N/A
		2	Cat-M1	M1	N/A	N/A
		3	Cat-NB1	NB1	N/A	N/A
3	GSM First	0	Cat-M1&Cat-NB1 (Cat-M1 first)	2G	M1	NB1
		1	Cat-M1&Cat-NB1 (Cat-NB1 first)	2G	NB1	M1
		2	Cat-M1	2G	M1	N/A
		3	Cat-NB1	2G	NB1	N/A

- ✧ <Manual Netreg>: Manually register the network selection.

- 0: Disable manually register the network.
- 1: Enable manually register the network.

- ✧ <Serial Number>: The serial number of the command. It will be included in the ACK message

of the command.

- ✧ **<Tail Character>**: A character to indicate the end of the command. And it must be “\$”.

The acknowledgment message of **AT+GTBSI** command:

➤ **+ACK:GTBSI,**

Example: +ACK:GTBSI,FE110A,862170019025640,,0000,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ **<Protocol Version>**: The protocol version that the terminal conforms to. The first two characters point out the device type. As in the example, “**FE**” means GV50M. The middle two characters point out the major version number of the protocol and the last two characters point out the minor version number of the protocol. And all the version numbers are hex digits. For example, “1001” means version 10.01.
- ✧ **<Unique ID>**: The IMEI of the terminal.
- ✧ **<Device Name>**: The specified name of the device.
- ✧ **<Serial Number>**: A serial number which is included in the corresponding command to distinguish which command the ACK message is for.
- ✧ **<Send Time>**: The local time to send the ACK message.
- ✧ **<Count Number>**: A self-increasing count number in each acknowledgment message and other messages. It counts from 0000 and increases by 1 for each message. And it rolls back after “FFFF”.
- ✧ **<Tail Character>**: A character to indicate the end of the command. And it must be “\$”.

Note:

Only after both the command **AT+GTBSI** and **AT+GTSRI** are properly set can the ACK messages and other messages be sent to the backend server.

3.2.1.2. Backend Server Register Information

The command **AT+GTSRI** is used to configure where and how to report all the messages, including the server information and the communication method between the backend server and the

terminal.

➤ **AT+GTSRI=**

Example:

AT+GTSRI=gv50m,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001\$

AT+GTSRI=gv50m,3,,1,some.host.name,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001\$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Report Mode	1	0 – 7	0
3	Reserved	0		
4	Buffer Mode	1	0 1 2	1
5	Main Server IP/ Domain Name	<=60		
6	Main Server Port	<=5	0 – 65535	
7	Backup Server IP/ Domain Name	<=60		
8	Backup Server Port	<=5	0 – 65535	
9	SMS Gateway	<=20		
10	Heartbeat Interval	<=3	0 5 – 360min	0
11	SACK Enable	1	0 1 2	0
12	Protocol Format	1	0 1	0
13	SMS ACK Enable	1	0 1	0
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ **<Report Mode>**: This defines the communication method between the backend server and the terminal. Supported report modes as following:

- 0: Stop Reporting.
- 1: TCP Short-Connection Preferred Mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will cut off the connection when the terminal finishes sending data. And if it fails to establish TCP connection to the backend server (both Main Server and Backup

- Server), it will try to send data via SMS to the SMS gateway.
- 2: TCP Short-Connection Forced Mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will cut off the connection when the terminal finishes sending data. And if it fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the buffer if buffer report function is enabled. Otherwise the data is dropped.
 - 3: TCP Long-Connection Mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection by using the heartbeat data. The backend server should respond to the heartbeat data from the terminals.
 - 4: UDP Mode. The terminal will send data to the backend server by UDP protocol. Receiving protocol commands via UDP is supported if the network allows it. It is recommended to enable heartbeat sending when UDP receiving is the case.
 - 5: Force on SMS. Only use the SMS for data transmitting.
 - 6: UDP with fixed local port. Like the UDP mode, the terminal will send data by using UDP protocol. The difference is the terminal will use a fixed local port rather than a random port to communicate with the server in this mode. Thus, the backend server could use the identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the primary server.
 - 7: TCP Long-Connection Mode with the backup server. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection by using the heartbeat data. The backend server should respond to the heartbeat data from the terminals. If the main server is lost, it will try to connect the backup server. And if the backup server is also lost, it will try to connect the main server again.
- ✧ <Buffer Mode>: The working mode of the buffer report function. When buffer report function is enabled, if the device goes into areas without network covering, it will store all reports locally. When the device goes back to areas with network covering, it will then send all the buffered reports to the backend server.
- 0: Disable the buffer report function.
 - 1: Low priority. The buffer report function is enabled. Under this working mode, the device will send the buffered messages after sending the normal messages.
 - 2: High priority. The buffer report function is enabled. Under this working mode, the device will send all the buffered messages before sending any normal message except the SOS message (+RESP:GTSOS).
- ✧ <Main Server IP/Domain Name>: The IP address or the domain name of the primary server.
- ✧ <Main Server Port>: The port of the primary server.
- ✧ <Backup Server IP/Domain Name>: The IP address or the domain name of the backup server.
- ✧ <Backup Server Port>: The port of the backup server.
- ✧ <SMS Gateway>: Maximum 20 characters (including the optional national code starting with "+"). Short code (for example: 10086) is also supported.
- ✧ <Heartbeat Interval>: The interval of sending heartbeat package message (+ACK:GTHBD)

when report mode is TCP Long-Connection Mode or UDP Mode. If it is set to 0, there is no heartbeat package message sending.

- ✧ <SACK Enable>: This defines whether the backend server should respond to the terminal with SACK messages when receiving messages from the terminal.
 - 0: The backend server does not reply a SACK message after receiving a message from the terminal.
 - 1: The backend server replies a SACK message when receiving a message from the terminal.
 - 2: The backend server replies a SACK message when receiving a message form the terminal, but the terminal does not check the serial number of the SACK message.
- ✧ <Protocol Format>: This defines the format of the message sent from the device to the backend server. 0 means using the ASCII format, 1 means the HEX format.
- ✧ <SMS ACK Enable>: This defines whether the ACK confirmation should be responded by SMS when the command is sent by SMS.
 - 0: The device will send the ACK confirmation according to the configuration of <Report Mode>.
 - 1: The device will send the ACK confirmation by SMS to the phone which sends the command by SMS.

The acknowledgment message of **AT+GTSRI** command:

➤ **+ACK:GTSRI,**

Example: +ACK:GTSRI,FE110A,862170019025640,,0001,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

Note:

Only after both the command **AT+GTBSI** and **AT+GTSRI** are properly set can the ACK messages and other messages be sent to the backend server.

3.2.1.3. Quick Start Setting

The command **AT+GTQSS** is used to configure the parameters for network data connection and backend server information in one command.

➤ **AT+GTQSS=****Example:**
AT+GTQSS=gv50m,,,,,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,0002\$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	LTE APN	<=40		
3	LTE APN User Name	<=30		
4	LTE APN User Password	<=30		
5	Report Mode	1	0 – 7	0
6	Reserved	0		
7	Buffer Mode	1	0 1 2	1
8	Main Server IP/Domain Name	<=60		
9	Main Server Port	<=5	0 – 65535	
10	Backup Server IP	<=15		
11	Backup Server Port	<=5	0 – 65535	
12	SMS Gateway	<=20		
13	Heartbeat Interval	<=3	0 5 – 360min	0
14	SACK Enable	1	0 1 2	0
15	Protocol Format	1	0 1	0
16	SMS ACK Enable	1	0 1	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

The acknowledgment message of **AT+GTQSS** command:➤ **+ACK:GTQSS,****Example:**
+ACK:GTQSS,FE110A,862170019025640,,0002,20140511093254,11F0\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2. Device Configuration

3.2.2.1. Global Configuration

The **AT+GTCFG** command is used to configure the global parameters.

➤ AT+GTCFG=

Example:

AT+GTCFG=gv50m,123456,gv50m,,,,,,,,,,,,,,,,,,,,,0003\$

AT+GTCFG=gv50m,,,1,123.4,0,,0,1,,2FF,0,1,1,300,0,1,1,,,0,0003\$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	New Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	
3	Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	gv50m
4	ODO Enable	1	0 1	0
5	ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
6	Reserved	0		
7	Reserved	0	0	0
8	Report Item Mask	4	0000 – 007F	003F
9	Power Saving Mode	1	0 – 2	1
10	Reserved	0		
11	Event Mask	4	0000 – 3FFF	3BFF
12	IO Mode	1	0-1	0
13	LED On	1	0 1	0
14	Info Report Enable	1	0 1	0
15	Info Report Interval	<=5	30 – 86400sec	300
16	Location Request Mask	2	00 10 20	0

17	Reserved			
18	Backup Battery Charge Mode	1	0 1	0
19	AGPS mode	1	0 1	0
20	Reserved			
21	GPS Lost Time	2	0 – 30min	0
22	Clear FPLMN Interval	<=2	0 10--30 day	0
23	GNSS Global Fix Timeout	<=3	60--180 sec	150
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
32	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <New Password>: Change the current password with a new one.
- ✧ <Device Name>: An ASCII string to represent the name of the device.
- ✧ <ODO Enable>: Enable/disable the odograph function to calculate the total mileage. The current mileage is included in every position message.
- ✧ <ODO Initial Mileage>: The initial value for calculating the total mileage.
- ✧ <Report Item Mask>: Bitwise report mask to configure the composition of message, especially the GPS message composition.
 - Bit 0 for <Speed>
 - Bit 1 for <Azimuth>
 - Bit 2 for <Altitude>
 - Bit 3 for <Cell info network data>, including <MCC>, <MNC>, <LAC>, <Cell ID> and the <Reserved> parameter "00"
 - Bit 4 for <Mileage>
 - Bit 5 for <Send Time>
 - Bit 6 for <Device Name>

For each bit, set it to 1 to enable corresponding component in the report and 0 to disable.

This mask is effective to all ASCII messages.

- ✧ **<Power Saving Mode>**: Set the mode of power saving function. If the mode of power saving function is set to 0, the fixed report will follow **<IGF Report Interval>** when the engine is off. If the mode of power saving function is set to 1, the fixed report, geo-fence and speed alarm report function is suspended when the device is standstill or the engine is off. If the mode of power saving function is set to 2, it is like mode 1 with the difference that the fixed report will not be suspended and the fix and sending interval will follow **<IGF Report Interval>** in **AT+GTFRI** when the engine is off.

- 0: Disable power saving function
- 1: GPS deep saving mode
- 2: GPS low saving mode

- ✧ **<Event Mask>**: Bitwise mask to configure which event report should be sent to the backend server.

- Bit 0 for **+RESP:GTPNA**
- Bit 1 for **+RESP:GTPFA**
- Bit 2 for **+RESP:GTMPN**
- Bit 3 for **+RESP:GTMPF**
- Bit 4 is reserved
- Bit 5 for **+RESP:GTBPL**
- Bit 6 for **+RESP:GTBTC**
- Bit 7 for **+RESP:GTSTC**
- Bit 8 for **+RESP:GTSTT**
- Bit 9 is reserved
- Bit 10 for **+RESP:GTPDP**
- Bit 11 for **+RESP:GTPNL**
- Bit 12 for the ignition report **+RESP:GTIGN/VGN** and **+RESP:GTIGF/VGF**
- Bit 13 for location report **+RESP:GTIGL** when ignition on or ignition off
- Bit 14 for **+RESP:GTLGN**
- Bit 15 is reserved

For each bit, set it to 1 to enable corresponding event report and 0 to disable.

- ✧ **<IO Mode>**: Configure the working mode of OUT1/IN1 on the connector. 0 means input, and 1 means output.

- ✧ **<LED On>**: Configure the working mode of GPS LED.

- 0: Each time the device powers on, both LEDs will work for 30 minutes and then are turned off.
- 1: Turn on GPS LED if necessary.

- ✧ **<Info Report Enable>**: Enable/Disable the device information report function (**+RESP:GTINF**). The device information includes state of the device, received signal strength, voltage of external power supply, battery voltage, charging status, Power and GPS LEDs working mode, the last known time of GPS fix, analog input voltage, all digit inputs and outputs status.

- 0: Disable the device information report function.
- 1: Enable the device information report function.

- ✧ **<Info Report Interval>**: The interval of reporting the device information.

- ✧ **<Location Request Mask>**: Bitwise mask for SMS request position. 4 high bits for SMS

request and 4 low bits for reserved. Each bit of bit 4 to bit 7, represents one kind of reports. Set to 1 to enable and 0 to disable corresponding report.

- Bit 4: Report the current position (+RESP:GTLBC) when the device receives SMS position request message via SMS.
 - Bit 5: Report the current position with Google Map link through SMS to the original number when the device receives **SMS Request Position** message via SMS.
- ✧ <Backup Battery Charge Mode>: Control the charge mode of the backup battery.
- 0: When the main power supply is connected, charge the backup battery on need.
 - 1: When the main power supply is connected, the backup battery will be charged only when ignition on is detected. The charge process will begin 3 minutes after the ignition on. The charge process is stopped when ignition off.
- ✧ <AGPS Mode>: A numeric to indicate the AGPS mode. AGPS is helpful to improve the chance to get GPS position successfully and reduces the time to get GPS position.
- 0: Disable the AGPS function.
 - 1: AGPS Offline mode.
- Note:** The “AGPS Mode” function is useful with GV50M_1713_R20.
- ✧ <GPS Lost Time>: A time parameter to monitor the GPS signal. If the device stays <GPS Lost Time> consecutively without GPS signal or without successful GPS fix, it will send the event report **+RESP: GTGSS** to indicate the GPS signal is lost. When the GPS signal is recovered or a successful fix is obtained again, the device will send the event report **+RESP:GTGSS** to indicate the recovery. 0 means to disable this function.
- ✧ <Clear FPLMN Interval>: The interval to clear the FPLMN in the SIM, 0 means to disable this function.
- ✧ <GNSS Global Fix Timeout>: If the time to get GPS fix is more than <GNSS Global Fix Timeout>, getting GPS location timeout happens.

The acknowledgment message of **AT+GTCFG** command:

➤ **+ACK:GTCFG,**

Example: +ACK:GTCFG,FE110A,862170019025640,,0003,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.2. Configure SIM Card

The **AT+GTPIN** command is used to unlock the SIM automatically.

➤ AT+GTPIN=

Example: AT+ GTPIN=gv50m,1,1234,,,,,0011\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Auto Unlock PIN	1	0 1	0
3	PIN	4-8	'0'-'9'	
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Auto Unlock PIN>: A numeric to indicate whether to unlock the USIM-PIN for the device.
 - 0: Do not unlock USIM-PIN automatically.
 - 1: Each time the device powers on, it will detect whether the SIM card is locked with a PIN. If it is locked, the device will unlock the PIN automatically.
- ✧ <PIN>: The PIN code which is used to unlock the SIM automatically. If it is empty, the PIN code saved in the device will be cleared.

The acknowledgment message of **AT+ GTPIN** command:

➤ +ACK: GTPIN,

Example: +ACK: GTPIN,FE110A,862170019025640,,0011,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.3. Protocol Watchdog

The **AT+GTDG** command is used to reboot the device or network module in a time based manner or upon ignition. This helps the device avoid working in abnormal status for a long time. Besides these two automatic reboot methods, the device also supports using the digital input to trigger the reboot manually.

➤ AT+GTDG=

Example: AT+GTDG=gv50m,1,,1,0130,,1,1,,60,,,0011\$ AT+GTDG=gv50m,2,30,,,,1,2,,60,,,0011\$ AT+GTDG=gv50m,0,60,25,,,1,0,1,60,60,60,0011\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1 2	1
3	Ignition Frequency	<=3	10 – 120 min	60
4	Reboot Interval	<=2	1 – 30 day/hour	7
5	Reboot Time	4	HHMM	0200
6	Reserved	0		
7	Report Before Reboot	1	0 1	1
8	Input ID	1	0 1	0
9	Unit	1	0 1	0
10	No Network Interval	<=4	0 5-1440 min	480
11	No Activation Interval	<=4	0 5-1440 min	480
12	Send Failure Timeout	<=4	0 5-1440 min	480
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Mode>: Working Mode.

- 0: Disable this function
- 1: Reboot periodically according to the <Reboot Interval> and <Reboot Time> setting.
- 2: Reboot when ignition on.

- ✧ *<Ignition Frequency>*: When the working mode is 2, if the time interval between two ignitions is greater than the value set in Ignition Frequency, the device will automatically reboot upon ignition on. But please note that if the function is enabled for the first time, the device will reboot at next ignition even if the interval is less than the value set in Ignition Frequency.
- ✧ *<Reboot Interval>*: The interval to reboot the device per days or hours.
- ✧ *<Reboot Time>*: Only when the *<Unit>* is day, the device performs the reboot operation at *<Reboot time>* when *<Reboot Interval>* is met.
- ✧ *<Report Before Reboot>*: Whether to report the **+RESP:GTDG** message before reboot. 0 is not to report and 1 to report. If this is enabled, the device will obtain a real-time location and send it to the server.
- ✧ *<Input ID>*: ID of the digital input port which is used to trigger the manual reboot. 0 means no manual reboot. Digital input port 1 is supported.
- ✧ *<Unit>*: Unit
 - 0: Unit is day.
 - 1: Unit is hour.
- ✧ *<No Network Interval>*: The interval to reboot the device when it is in no network signal situation. 0 means no rebooting the device.
- ✧ *<No Activation Interval>*: The interval to reboot the device when PDP unable to register or message interaction failed (such as no TCP Ack or Sever Ack). 0 means no rebooting the device.
- ✧ *<Send Failure Timeout>*: The device will reboot automatically if report sending time is greater than *<Send Failure Timeout>*. 0 means "Do not reboot the device"

The acknowledgment message of AT+GTDG command:

➤ **+ACK:GTDG,**

Example:

+ACK:GTDG,FE110A,862170019025640,,0011,20140511093254,11F0\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.4. Time Adjustment

The **AT+ GTTMA** command is used to adjust local time.

➤ AT+ GTTMA =

Example: AT+ GTTMA=gv50m,-,3,30,0,20090917203500,,,,,0006\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Sign	1	+ -	+
3	Hour Offset	<=2	0-12	00
4	Minute Offset	<=2	0-59	00
5	Daylight Saving	1	0 1	0
6	UTC Time	14	YYYYMMDDHHMMSS	
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Sign>: Indicate the positive or negative of the local time offset to UTC
- ✧ <Hour Offset>: UTC offset in hours
- ✧ <Minute Offset>: UTC offset in minutes
- ✧ <Daylight Saving>: Enable/Disable daylight saving time.
 - 0: Disable daylight saving
 - 1: Enable daylight saving
- ✧ <UTC time>: The UTC time.

The acknowledgment message of **AT+ GTTMA** command:

➤ +ACK:GTTMA,

Example: +ACK: GTTMA,FE110A,862170019025640,,0011,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z', '0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.5. Outside Working Hours

To protect the privacy of the drivers when they are off duty, the device could be configured to report empty location information during the outside working hours. The command **AT+GTOWH** is used to define the working hours and the working mode. When this function is enabled, the device will report empty latitude, empty longitude, empty MCC, empty MNC, empty LAC and empty Cell ID in all the messages except **+RESP:GTSOS**.

➤ AT+GTOWH=

Example: AT+GTOWH=gv50m,1,1F,0900,1200,1300,1730,,,3,1,1,0,0,,,,0010\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1 2 3	0
3	Day of Work	<=2	0 – 7F	1F
4	Working Hours Start1	4	HHMM	0900
5	Working Hours End1	4	HHMM	1200
6	Working Hours Start2	4	HHMM	1300
7	Working Hours End2	4	HHMM	1800
8	Reserved	0		
9	Reserved	0		
10	Digital Input ID	1	0 – 1	0
11	Output ID	1	0 – 2	0
12	Output Status	1	0 1	
13	Duration	<=3	0 – 255(×100ms)	0
14	Toggle Times	<=3	0 – 255	0
15	Reserved	0		

16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ **<Mode>**: Working Mode.

- 0: Disable this function.
- 1: Manual Mode. In this mode, location information will be hidden under two conditions: the device works at outside the working hours and digital input is triggered.
- 2: Full Manual Mode. In this mode, location information will be hidden under the following condition: the digital input is triggered.
- 3: Automatic Mode. In this mode, location information will be hidden under the following condition: the device works at outside the working hours.

✧ **<Day of Work>**: Specify the working days in a week in a bitwise manner.

- Bit 0 for Monday
- Bit 1 for Tuesday
- Bit 2 for Wednesday
- Bit 3 for Thursday
- Bit 4 for Friday
- Bit 5 for Saturday
- Bit 6 for Sunday

For each bit, 0 means off duty day and 1 means working day.

✧ **<Working Hours Start1>, <Working Hours End1>**: The first period of the working hours in a day.

✧ **<Working Hours Start2>, <Working Hours End2>**: The second period of the working hours in a day.

✧ **<Digital Input ID>**: The input ID used to trigger this function when **<Mode>** is 1. The working parameters of the input must be set by **AT+GTDIS** first. If interruptible digital input is used, please connect slide button instead of tact button to the input.

✧ **<Output ID>, <Output Status>, <Duration> and <Toggle Times>**: When this function is enabled and it is off duty time, the specified waveform will be output to the specified output.

The acknowledgment message of **AT+GTOWH** command:

➤ **+ACK:GTOWH,**

Example: +ACK:GTOWH,FE110A,862170019025640,,0010,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {‘A’ –	

		'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.6. Preserve Device Special Logical State

The command **AT+GTPDS** is used to preserve device special logical state for the terminal. According to the working mode, the function is enabled or disabled. According to the value of the MASK, specified logical state(s) will be saved.

➤ AT+GTPDS=

Example: AT+GTPDS=gv50m,1,0,,,,,,001A\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1 2	1
3	Mask	<=4	0-7FF	7FF
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Mode>:

- 0: Disable this function
- 1: Preserve device special logical state according to the value of the <Mask>

- 2: Reset all the special device logical states listed in the <Mask> after receiving the command, and then preserve device special logical state according to the value of the <Mask>
- ✧ <Mask>: Bitwise mask to configure which device states will be preserved. Each bit represents a state.
- Bit 0: States of GEO
 - Bit 1: Reserved bit
 - Bit 2: Reserved bit
 - Bit 3: Information of last known position
 - Bit 4: State of ignition
 - Bit 5: State of waveform 1
 - Bit 6: State of digital input
 - Bit 7: State of SPD
 - Bit 8: State of SSR
 - Bit 9: State of main power
 - Bit 10: States of PEO

The acknowledgment message of AT+GTPDS command:

➤ **+ACK:GTPDS,**

Example: +ACK:GTPDS,FE110A,862170019025640,,001A,20140511093254,FFFF\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.7. PPP Connection Setting

The command **AT+GTPCS** is used to set the PPP connection behavior.

➤ **AT+ GTPCS=**

Example: AT+GTPCS=gv50m,1,900,,,,,,,,,000A\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv50lta

2	Enable PPP Deactivation	1	0 1	1
3	Time to Deactivate	<=5	0 60-65535s	900
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Enable PPP Deactivation>: Enable or disable PPP deactivation function.
- ✧ <Time to Deactivate>: The time to cut off PPP connection after all messages has been sent. 0 means “Deactivate PPP connection immediately when no more messages will be sent.”

The acknowledgment message of **AT+ GTPCS** command

+ACK:GTPCS,

Example: +ACK:GTPCS,FE110A,862170019025640,,0010,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.3. Position Related Report

3.2.3.1. Fixed Report Information

The command **AT+GTFRI** is used to configure the parameters of scheduled report (**+RESP:GTFRI**).

➤ **AT+GTFRI=**

Example:

AT+GTFRI=gv50m,0,,,,,,,,,,,,,0009\$ AT+GTFRI=gv50m,1,1,,1,1000,2300,,30,,,,,600,,,,,0009\$ AT+GTFRI=gv50m,2,1,,1,1000,2300,,,500,,,,,,0009\$ AT+GTFRI=gv50m,3,1,,1,1000,2300,,,1000,,,,,,0009\$ AT+GTFRI=gv50m,4,1,,1,1000,2300,,60,,300,,,,,,0009\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 – 5	0
3	Discard No Fix	<=2	0 1	1
4	Reserved	0		
5	Period Enable	1	0 1	1
6	Start Time	4	HHMM	0000
7	End Time	4	HHMM	0000
8	Reserved	0		
9	Send Interval	<=5	5 – 86400sec	30
10	Distance	<=5	50 – 65535m	1000
11	Mileage	<=5	50 – 65535m	1000
12	Reserved	0		
13	Corner Report	<=3	0 – 180	0
14	IGF Report Interval	<=5	0 5-86400sec	600
15	Auto Report Interval	<=5	0 5-90000	0
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Mode>: The working Mode of the fixed report.

- 0: Disable this function.
- 1: Fixed Timing Report. The position message is sent to the backend server periodically according to the parameter <Send Interval>.
- 2: Fixed Distance Report. The position message is sent to the backend server when the straight-line distance between the current GPS position and the last sent GPS position is greater than or equal to the distance specified by parameter <Distance>.

It requires connecting vehicle ignition signal to the specified digital input of the device or enabling virtual ignition via AT+GTVMS to use this function.

- 3: Fixed Mileage Report. The position message is sent to the backend server when the path length between the current GPS position and the last sent GPS position is greater than or equal to the mileage specified by parameter *<Mileage>*. It requires connecting vehicle ignition signal to the specified digital input of the device or enabling virtual ignition via AT+GTVMS to use this function.
- 4: Optimum Report. Optimum Report mode combines the Fixed Timing Report and Fixed Mileage Report. Only when the report time interval is greater than or equal to the *<Send Interval>* and the cumulative mileage is greater than or equal to the *<Mileage>* will the Optimum Report be sent to the server. It requires connecting vehicle ignition signal to the specified digital input of the device or enabling virtual ignition via AT+GTVMS to use this function.
- 5: Fixed Time or Mileage Report. Fixed Time or Mileage Report mode combines the Fixed Timing Report and Fixed Mileage Report. The device will detect *<Send Interval>* and the *<Mileage>* at the same time. As long as one of them meets the conditions, the report will be sent to the server. It requires connecting vehicle ignition signal to the specified digital input of the device or enabling virtual ignition via AT+GTVMS to use this function.

Note: If the engine is off, the position message is sent to the backend server periodically according to the parameter *<IGF Report Interval>*.

- ✧ *<Discard No Fix>*: Disable/Enable reporting when there is no GPS fixing
 - 0: Enable reporting
 - 1: Disable reporting
- ✧ *<Period Enable>*: Disable/Enable the time range specified by *<Start time>* and *<End time>*. If the time range is enabled, the position reporting is limited within the time range.
- ✧ *<Start Time>*: The start time of the scheduled fixed report. The valid format is "HHMM". The value range of "HH" is "00"–"23". The value range of "MM" is "00"–"59".
- ✧ *<End Time>*: The end time of the scheduled fixed report. The valid format and range are as same as *<Start Time>*.
- ✧ *<Send Interval>*: Period to send the position information. The value range is 5 – 86400 and the unit is second. If *<Report Mode>* in **AT+GTSRI** is set to Force on SMS, this should be greater than 15 seconds, otherwise it will send via TCP short connect.
- ✧ *<Distance>*: The specified distance to send the position information when *<Mode>* is 2. Unit: meter.
- ✧ *<Mileage>*: The specified length to send the position information when *<Mode>* is 3 and 4. Unit: meter.
- ✧ *<Corner Report>*: The threshold to determine whether the device is turning around a corner. 0 is to disable the corner report. For other values, the device will compare the current azimuth with the last known corner, if the difference is greater than or equal to this value, the device will send the corner report with **+RESP:GTFRI**.
- ✧ *<IGF Report Interval>*: If vehicle ignition is off, no matter which report mode it is, even if Power Saving Mode is set to "GPS low saving mode" in Global Configuration, the position report is sent to the server as the time interval of *<IGF Report Interval>*. Its value range is

0|5 – 86400 and the unit is second.

- ✧ *<Auto Report Interval>*: The time interval for sending the auto report **+RESP:GTFRI**. Its value range is 0|5 – 90000 and the unit is second. 0 means “Do not send auto report **+RESP:GTFRI**”. The auto report is uncontrolled by other parameter.

The acknowledgment message of **AT+GTFRI** command:

➤ **+ACK:GTFRI**,

Example:

+ACK:GTFRI,FE110A,862170019025640,,0009,20140511093254,11F0\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.3.2. Frequency Change of Fixed Report Information

The command **AT+GTFRC** is used to change the parameters of fixed report when certain event occurs to match the requirements of different report interval according to the need. When the event disappears, the device will resume its previous settings.

The device supports up to 5 sets of parameter for different events. Priority is assigned among these events. Only the set of parameters with the highest priority will be executed if more than one event occurs at the same time.

➤ **AT+GTFRC=**

Example:

AT+GTFRC=gv50m,0,1,0,30,500,500,300,,,,,0016\$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Priority	1	0-4	0
3	Mode	1	0-3	0
4	FRI Mode	1	0-5	0
5	FRI IGN Report Interval	<=5	5-86400s	30

6	FRI Report Distance	<=5	50-65535m	500
7	FRI Report Mileage	<=5	50-65535m	500
8	FRI IGF Report Interval	<=5	0 5-86400s	300
9	Reserved	0		
10	Corner Report	<=3	0 – 180	0
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Priority>: Priority of the event which triggers the parameter change for fixed report. 0 has the highest priority.
- ✧ <Mode>: Specify the trigger event to change the fixed report parameters.
 - 0: Disable the parameters in the specified priority.
 - 1: Change the fixed report parameter when the device enters into any of the defined Geo-Fence.
 - 2: Change the fixed report parameter when the device enters into known roaming state.
 - 3: Change the fixed report parameter when the device enters into unknown roaming state.
- ✧ <FRI Mode>: When the specified event occurs, the working mode of the fixed report will be changed according to this parameter.
 - 0: Do not change the working mode
 - 1: Change the working mode to 'Timing Report'.
 - 2: Change the working mode to 'Distance Report'.
 - 3: Change the working mode to 'Mileage Report'.
 - 4: Change the working mode to 'Optimum Report'.
 - 5: Change the working mode to 'Fixed Time or Mileage Report'.
- ✧ <FRI IGN Report Interval>: Period to send the position information when ignition is on. The value range is 5 – 86400 and the unit is second.
- ✧ <FRI Report Distance>: The specified distance to send the position information when it is changed to fixed distance report. Unit: meter.
- ✧ <FRI Report Mileage>: The specified path length to send the position information when it is changed to fixed mileage report or optimum report. Unit: meter.
- ✧ <FRI IGF Report Interval>: Period to fix and send the position information when ignition is off if <Power Saving Mode> in **AT+GTCFG** is set to 2 and <FRI Mode> in this command is set to 1 (Fixed Timing Report). The value range is 0|5 – 86400 and the unit is second.
- ✧ <Corner Report>: The threshold to determine whether the device is turning around a corner. 0 means "Disable the corner report". For other values, the device will compare the current azimuth with that of the last known corner. If the difference is greater than or equal to this

value, the device will send the corner report with **+RESP:GTFRI**.

The acknowledgment message of **AT+GTFFC** command:

➤ **+ACK:GTFFC,**

Example: +ACK:GTFFC,FE110A,862170019025640,,0016,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4. Alarm Settings

3.2.4.1. Circular Geo-Fence Information

The command **AT+GTGEO** is used to configure the parameters of Circular Geo-Fence (Geo-Fence is a virtual perimeter on a geographic area using a location-based service. When the terminal enters or exits the area, a notification is generated. The notification contains information about the location of the terminal and can be sent to the backend server).

➤ **AT+GTGEO=**

Example: AT+GTGEO=gv50m,0,3,121.412248,31.187891,1000,600,1,1,0,0,0,,000A\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	GEO ID	<=2	0 – 19	
3	Mode	1	0 – 3	0
4	Longitude	<=11	(-)xxx.xxxxxx	
5	Latitude	<=10	(-)xx.xxxxxx	
6	Radius	<=7	50 – 6000000m	50
7	Check Interval	<=5	0 5 – 86400sec	0

8	Output ID	1	0-2	0
9	Output Status	1	0 1	
10	Duration	<=3	0-255(×100ms)	0
11	Toggle Times	<=3	0-255	0
12	Trigger Mode	<=2	0 21 22	0
13	Trigger Report	1	0 1	0
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000-FFFF	
	Tail Character	1	\$	\$

- ✧ <GEO ID>: ID of the circular Geo-Fence. Total 20 zones, 0 to 19, are supported.
- ✧ <Mode>: The working mode of the circular Geo-Fence to report **+RESP:GTGIN** or **+RESP:GTGOT** to the backend server.
 - 0: Disable the Geo-Fence function.
 - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
 - 2: Exiting the zone. The report will be generated only when the terminal exits the Geo-Fence.
 - 3: Both entering and exiting.
- ✧ <Longitude>: The longitude of a point which is defined as the center of the circular Geo-Fence region. The format is “(-) xxx.xxxxxx” and the value range is from “-180.000000” to “180.000000”. The unit is degree. West longitude is defined as negative starting with “-” and east longitude is defined as positive without “+”.
- ✧ <Latitude>: The latitude of a point which is defined as the center of the circular Geo-Fence region. The format is “(-) xx.xxxxxx” and the value range is from “-90.000000” to “90.000000”. The unit is degree. South Latitude is defined as negative starting with “-” and north Latitude is defined as positive without “+”.
- ✧ <Radius>: The radius of the circular Geo-Fence region. The value range is (50 – 6000000) and the unit is meter.
- ✧ <Check Interval>: The checking interval for the circular Geo-Fence alarm.
- ✧ <Trigger Mode>:
 - 0: Disable auto trigger mode
 - 21: Automatically set circular Geo Fence after ignition off. In this mode, the device will automatically set a circular Geo-Fence with the current location as the center point of the Geo-Fence when ignition is off. This circular Geo-Fence will only report exiting alarm. The circular Geo-Fence will be cancelled after exiting
 - 22: Manually enable circular Geo-Fence after ignition off. In this mode, the device will automatically set a circular Geo-Fence with the current location as the center point of the Geo-Fence when ignition is off. This circular Geo-Fence will only report

exiting alarm. When the device exits this circular Geo-Fence, it will cancel this circular Geo-Fence and disable the trigger mode at the same time. The driver has to manually set it again if he/she wants to use this trigger mode next time.

✧ **<Trigger Report>**: Whether to report **+RESP:GTGES** when specified trigger mode is triggered and when the Geo-Fence is cancelled.

- 0: Disable report **+RESP: GTGES**.
- 1: Enable report **+RESP: GTGES**.

The acknowledgment message of **AT+GTGEO** command:

➤ **+ACK:GTGEO,**

Example:			
+ACK:GTGEO,FE110A,862170019025640,,0,000A,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	≤20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GEO ID	≤2	0 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.2. Polygon Geo-Fence

The command **AT+GTPEO** is used to configure the parameters of Polygon Geo-Fence (Geo-Fence is a virtual perimeter on a geographic area using a location-based service. When the terminal enters or exits the area, a notification is generated. The notification contains information about the location of the terminal and can be sent to the backend server).

➤ **AT+GTPEO=**

Example:				
AT+GTPEO=gv50m,0,0,1,3,121.412240,31.187801,121.412248,31.187891,121.412258,31.187991,600,1,1,0,0,,,,,0039\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	GEO ID	≤2	0 – 19	0
3	Mode	1	0 – 3	0

4	Start Point	1	1-8	1
5	End Point	<=2	3-10	3
5+2N-1	Longitude	<=11	(-)xxx.xxxxxx	
5+2N	Latitude	<=10	(-)xx.xxxxxx	
6+2N	Check Interval	<=5	0 5 – 86400sec	0
7+2N	Output ID	1	0 – 2	0
8+2N	Output Status	1	0 1	
9+2N	Duration	<=3	0 – 255(×100ms)	0
10+2N	Toggle Times	<=3	0 – 255	0
11+2N	Reserved	0		
12+2N	Reserved	0		
13+2N	Reserved	0		
14+2N	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <GEO ID>: ID of the polygon Geo-Fence. Total twenty zones, 0 to 19, are supported.

Note: If the number of configured (used) <GEO ID> is greater than 9, **AT+GTCRA** function is forced to be disabled.

✧ <Mode>: The working mode of the polygon Geo-Fence to report **+RESP:GTGIN** or **+RESP:GTGOT** to the backend server.

- 0: Disable the Geo-Fence function.
- 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
- 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
- 3: Both entering and exiting.

✧ <Start Point>: The start point of the polygon GEO-Fence of a set of points.

✧ <End Point>: The end point of the polygon GEO-Fence of a set of points.

✧ <Longitude>: The longitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The format is “(-)xxx.xxxxxx” and the value range is from “-180.000000” to “180.000000”. The unit is degree. West longitude is defined as negative starting with “-” and east longitude is defined as positive without “+”.

✧ <Latitude>: The latitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The format is “(-)xx.xxxxxx” and the value range is from “-90.000000” to “90.000000”. The unit is degree. South Latitude is defined as negative starting with “-” and north Latitude is defined as positive without “+”.

Note: If more groups of <longitude> and <latitude> are needed, please use <start point> and <end

point> to adjust. Marked <longitude> and <latitude> means to repeat.

✧ <Check Interval>: The checking interval for the Geo-Fence alarm.

The acknowledgment message of **AT+GTPEO** command:

➤ **+ACK:GTPEO,**

Example: +ACK:GTPEO,FE110A,862170019025640,,0,000B,20140221113250,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GEO ID	1	0 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.3. Tow Alarm

The **AT+GTTOW** command is used to configure the motion sensor and the parameters for tow alarm.

➤ **AT+GTTOW=**

Example: AT+GTTOW=gv50m,0,120,120,,0,0,0,0,,,,,,,,,000D\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50
2	Tow Enable	1	0 1	0
3	Tow Detection Time	<=2	5 – 15 min	10
4	Fake Tow Delay	<=2	0 – 10 min	3
5	Tow Interval	<=5	30 – 86400 sec	300
6	Tow Output ID	1	0 – 2	
7	Tow Output Status	1	0 1	
8	Tow Output Duration	<=3	0 – 255 (×100ms)	0

9	Tow Output Toggle Times	≤ 3	0 – 255	0
10	Rest Duration	≤ 3	1 – 255 (×15sec)	2
11	Motion Duration	≤ 2	1 – 10 (×100ms)	3
12	Motion Threshold	1	2 – 6	3
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ *<Tow Enable>*: Enable or disable tow alarm (**+RESP:GTTOW**).
 - 0: Disable the tow alarm
 - 1: Enable the tow alarm
- ✧ *<Tow Detection Time>*: A time parameter to judge whether the device is considered being towed after engine off. If the motion sensor doesn't detect stillness within the specified time after engine off and moving distance greater than 600 meters, the device is being towed.
- ✧ *<Fake Tow Delay>*: After engine off and stillness is detected, if the motion sensor detects moving again, the device turns into a state called fake tow. If the device keeps in the fake tow state beyond the time defined by the parameter *<Fake Tow Delay>* and moving distance greater than 600 meters, it is considered being towed.
- ✧ *<Tow Interval>*: The period to send tow alarm message.
- ✧ *<Tow Output ID>*: The ID of the output port to output the specified waveform when tow event is detected.
- ✧ *<Tow Output Status>*: Please refer to the parameter *<Output1–2 Status>* in chapter 3.2.5.1.
- ✧ *<Tow Output Duration>*: Please refer to the parameter *<Duration>* in chapter 3.2.5.1.
- ✧ *<Tow Output Toggle Times>*: Please refer to the parameter *<Toggle Times>* in chapter 3.2.5.1.

The acknowledgment message of **AT+GTTOW** command:

➤ **+ACK:GTTOW,**

Example:

+ACK:GTTOW,FE110A,862170019025640,,000B,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.4. Speed Alarm

This command is used to set speed-alarm range for the terminal. According to the working mode, the terminal will send message **+RESP:GTSPD** to the backend server when its moving speed is outside or inside the range.

➤ AT+GTSPD=

Example:				
AT+GTSPD=gv50m,1,80,120,60,300,1,1,0,0,,,,,,,,,000C\$				
AT+GTSPD=gv50m,2,80,120,60,300,1,1,0,0,,,,,,,,,000C\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1 2 3 4	0
3	Min Speed	<=3	0 – 400km/h	0
4	Max Speed	<=3	0 – 400km/h	0
5	Valid Time	<=4	0 – 3600sec	60
6	Send Interval	<=4	30 – 3600sec	300
7	Output ID	1	0 – 2	0
8	Output Status	1	0 1	
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Reserved	0		
12	Reserved	0		

13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ **<Mode>**: The working mode of the speed alarm.
 - 0: Disable speed alarm.
 - 1: Report speed alarm if the current speed is within the speed range defined by **<Min Speed>** and **<Max Speed>**.
 - 2: Report speed alarm if the current speed is outside the speed range defined by **<Min Speed>** and **<Max Speed>**.
 - 3: Report speed alarm only once if the current speed is within or outside the speed range defined by **<Min Speed>** and **<Max Speed>**. In this mode, **<Send Interval>** will be ignored.
 - 4: Report speed alarm if the speed changes from inside to outside or from outside to inside of the speed range. But the backend server will never receive **+RESP:GTSPD** for speed changes from inside to outside unless **+RESP:GTSPD** for speed changes from outside to inside is received first. In this mode, **<Send Interval>** will be ignored.
- ✧ **<Min Speed>**: The lower limit speed.
- ✧ **<Max Speed>**: The upper limit speed.
- ✧ **<Valid Time>**: If the speed meets the alarm condition and maintains the period of time defined by **<Valid Time>**, the speed alarm will be triggered.
- ✧ **<Send Interval>**: The interval time of sending speed alarm message.

The acknowledgment message of **AT+GTSPD** command:

➤ **+ACK:GTSPD,**

Example: +ACK:GTSPD,FE110A,862170019025640,,000C,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.5. SOS Function

This command is used to configure the specified input port for emergency. When an emergency occurs, the end user can use this input port to trigger reporting position message **+RESP:GTSOS** to the backend server or to the SOS number by SMS. A specified output waveform can be configured on specified output port.

➤ AT+GTSOS=

Example:

AT+GTSOS=gv50m,1,1,,1,1,0,0,,,,,000D\$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 – 2	0
3	Digital Input ID	1	0 1	0
4	Reserved	0		
5	Output ID	1	0 2	
6	Output Status	1	0 1	
7	Duration	<=3	0 – 255(×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Mode>: The working mode of SOS function.

- 0: Disable SOS function.

- 1: Send the current position **+RESP:GTSOS** to the backend server.
 - 2: Send the current position to the SMS gateway and Direct Number List (if enabled) via SMS and **+RESP:GTSOS** to backend server
- ✧ *<Digital Input ID>*: ID of the digital input port which triggers the SOS function. 0 means the SOS function is disabled. The corresponding digital input port should be configured by the command **AT+GTDIS** first. If SOS Alarm is configured, the **+RESP:GTDIS** report will be not generated when specified digital input was triggered.

The acknowledgment message of **AT+GTSOS** command:

➤ **+ACK:GTSOS,**

Example: +ACK:GTSOS,FE110A,862170019025640,,000D,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.6. Roaming Detection Configuration

The command **AT+GTRMD** is used to configure the parameters for GSM/LTE roaming alarm.

➤ **AT+GTRMD=**

Example: AT+GTRMD=gv50m,0,,,,,1,2,4600F,4602F,,,1,1,,,,,2,2,,,,,1f,,,1f,,,,,0,0,0,0,,,0001\$ AT+GTRMD=gv50m,1,,,,,1,3,46000,46002,46003,,,2,2,46007,,,1,1,46001,,,3fff,,,2ff,,,,,0,0,0,0,,,0002\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		

6	Reserved	0		
7	Home Operator Start	<=2	1-10	1
8	Home Operator End	<=2	1-10	1
9	Home Operator List	<=6*10	'0' – '9' 'a' – 'f' 'A' – 'F'	
10	Reserved	0		
11	Reserved	0		
12	Roaming Operator Start	<=3	1-100	1
13	Roaming Operator End	<=3	1-100	1
14	Roaming Operator List	<=6*100	'0' – '9' 'a' – 'f' 'A' – 'F'	
15	Reserved	0		
16	Reserved	0		
17	Black Operator Start	<=2	1-20	1
18	Black Operator End	<=2	1-20	1
19	Black Operator List	<=6*20	'0' – '9' 'a' – 'f' 'A' – 'F'	
20	Reserved	0		
21	Reserved	0		
22	Known Roaming Event Mask	<=4	0000 – 7FFF	7FFF
23	Reserved	0		
24	Reserved	0		
25	Unknown Roaming Event Mask	<=4	0000 – 7FFF	7FFF
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Output ID	1	0 – 2	0
31	Output Status	1	0 1	
32	Duration	<=3	0~255(×100ms)	0
33	Toggle Times	<=3	0 – 255	0
34	Reserved	0		
35	Reserved	0		
	Serial Number	4	0000 – FFFF	

	Tail Character	1	\$	\$
--	----------------	---	----	----

- ✧ **<Mode>**: Working mode of the roaming detection function.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ **<Operator Start>**: A numeral which indicates the first index of the white operator numbers to be input. For example, if the value is 1, it will update the white operator list from the 1st one. If the parameter is empty, there should be no white number list following the empty value.
- ✧ **<Operator End>**: A numeral which indicates the last index of the white operator number to be input. For example, if the value is 2, it will update the white operator list until the 2nd one. If the parameter is empty, there should be no white number list following the empty value.
- ✧ **<Home Operator List>**: A white number list of PLMN operators. The numbers are comprised of MCC and MNC, both of which consist of 3 digits. The operators in this list will be considered as in "Home" state. And two adjacent operator numbers are separated with ','. The number of the operators in the list depends on the parameters **<Operator Start>** and **<Operator End>**. For example, if **<Operator Start>** is 1 and **<Operator End>** is 2, the operator list should include 2 operator numbers (empty value acceptable) and the two numbers are separated by with ','. 'MCCFF' type code is used to identify operators across a whole country. For example, '460FF' covers the mobile network operators all across China.
- ✧ **<Roaming Operator List>**: It is like the **<Home Operator List>** with the difference that the operators in this list will be considered as in "Known Roaming" state.
- ✧ **<Black Operator List>**: It is like the **<Home Operator List>** with the difference that the operators in this list will be considered as in "Blocking Report" state. In this state, all reports will be buffered instead of being sent.
Operators that are not in **<Home Operator List>**, **<Roaming Operator List>** and **<Black Operator List>** will be considered as in "Unknown Roaming" state.
- ✧ **<Known Roaming Event Mask>**: Bitwise mask to configure which event report should be sent to the backend server when GSM/LTE roaming state is detected. If the roaming state is a "Known Roaming", the **<Known Roaming Event Mask>** will be valid; otherwise the **<Unknown Roaming Event Mask>** will be valid.
 - Bit 0 for **+RESP:GTPNA**
 - Bit 1 for **+RESP:GTPFA**
 - Bit 2 for **+RESP:GTMPN**
 - Bit 3 for **+RESP:GTMPF**
 - Bit 4 is reserved
 - Bit 5 for **+RESP:GTBPL**
 - Bit 6 for **+RESP:GTBTC**
 - Bit 7 for **+RESP:GTSTC**
 - Bit 8 for **+RESP:GTSTT**
 - Bit 9 is reserved
 - Bit 10 for **+RESP:GTPDP**
 - Bit 11 for **+RESP:GTPNL**

- Bit 12 for the ignition report **+RESP:GTIGN/GTVGN** and **+RESP:GTIGFGTVGF**
- Bit 13 for the ignition on location report **+RESP:GTIGL**
- Bit 14 for **+RESP:GTLGN**
- Reserved
- Others are Reserved

For each bit, set it to 1 to enable corresponding event report and 0 to disable.

- ✧ **<Unknown Roaming Event Mask>**: It works as the **<Known Roaming Event Mask>**.
- ✧ **<Output ID>**, **<Output Status>**, **<Duration>** and **<Toggle Times>**: When this function is enabled and roaming state is detected, the specified waveform will be sent to the specified output.

The acknowledgment message of the **AT+GTRMD** command:

➤ **+ACK:GTRMD,**

Example:			
+ACK:GTRMD,FE110A,135790246811220,,0000,20090214093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	≤20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

Note:

The length of AT Command cannot exceed 180 bytes when it is sent via Manage Tool. Make sure the command length is not more than 180 bytes through proper **<Start Index>** and **<End Index>** settings. A yellow prompt will appear on the Command Text Box if the length is over 180 bytes.

3.2.4.7. Buzzer Alarm

This command is used to set the buzzer alarm. There are four kinds of alarms. Each kind outputs a different sound. Before using those alarms, configure the output ID connected to the buzzer and enable it. The following event, over speed, can trigger the buzzer alarm defined by this command. Please refer to the command **AT+GTSPA** for details.

➤ **AT+GTBZA=**

Example:	
AT+GTBZA=gv50m,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,,0000\$	

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Output ID	1	0 - 2	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Alarm 1 Output Status	1	0 1	
7	Duration	<=3	0 – 255 (×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Alarm 2 Output Status	1	0 1	
12	Duration	<=3	0 – 255 (×100ms)	0
13	Toggle Times	<=3	0 – 255	0
14	Reserved	0		
15	Reserved	0		
16	Alarm 3 Output Status	1	0 1	
17	Duration	<=3	0 – 255 (×100ms)	0
18	Toggle Times	<=3	0 – 255	0
19	Reserved	0		
20	Reserved	0		
21	Alarm 4 Output Status	1	0 1	
22	Duration	<=3	0 – 255 (×100ms)	0
23	Toggle Times	<=3	0 – 255	0
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		

31	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Output ID>: The output port which connects to the buzzer.

The acknowledgment message of the **AT+GTBZA** command:

➤ **+ACK:GTBZA,**

Example: +ACK:GTBZA,FE110A,862170019025640,,000D,20090214093254,FFFF\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.8. Overspeed Alarm

This command is used to set the speed thresholds and bind one alarm type with each speed threshold for the buzzer alarm. If the current speed meets one of the thresholds, the buzzer will make a sound corresponding to the alarm type.

➤ **AT+GTSPA**

Example: AT+GTSPA=gv50m,2,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,,0000\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1 2	0
3	Speed Threshold 1	<=3	0 – 400km/h	50
4	Reserved	0		
5	Validity	<=4	0 – 3600sec	60

6	Alarm Type	1	0 1 – 4	0
7	Reserved	0		
8	Reserved	0		
9	Speed Threshold 2	<=3	0 – 400km/h	70
10	Reserved	0		
11	Validity	<=4	0 – 3600sec	60
12	Alarm Type	1	0 1 – 4	0
13	Reserved	0		
14	Reserved	0		
15	Speed Threshold 3	<=3	0 – 400km/h	90
16	Reserved	0		
17	Validity	<=4	0 – 3600sec	60
18	Alarm Type	1	0 1 – 4	0
19	Reserved	0		
20	Reserved	0		
21	Speed Threshold 4	<=3	0 – 400km/h	110
22	Reserved	0		
23	Validity	<=4	0 – 3600sec	60
24	Alarm Type	1	0 1 – 4	0
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
32	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Mode>: The working mode of overspeed alarm.

- 0: Disable this function.

- 1: Strict Standard Mode. This mode will check the speed and trigger the buzzer alarm during speedup or slowdown.
- 2: Warning Mode. This mode will only check the speed and trigger the buzzer alarm during speedup.
- ✧ <Speed Threshold>: The minimum speed to trigger the buzzer alarm.
- ✧ <Validity>: If the speed meets the alarm condition and is maintained for a period longer than the time specified by <Validity>, the buzzer alarm will be triggered.
- ✧ <Alarm Type>: The alarm type for each speed threshold. 0 means “No buzzer alarm”.

The acknowledgment message of the **AT+GTSPA** command:

➤ **+ACK:GTSPA,**

Example: +ACK:GTSPA,FE110A,862170019025640,,000D,20090214093254,FFFF\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.9. Excessive Idling Detection

The command **AT+GTIDL** is used to detect excessive engine idling (stationary while ignition on). To use this command, the ignition signal must be connected to the device. When the device detects that the vehicle is entering into idle status, it will send event message **+RESP:GTIDN** to the backend server. When the vehicle exits the idle status, the device will send event message **+RESP:GTIDF** to the backend server.

➤ **AT+GTIDL=**

Example: AT+GTIDL=gv50m,1,2,1,,,,,1,1,0,,,,,000E\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1	0
3	Idling Detection Time	<=2	1 – 30 min	2

4	Idling End Time	1	1 – 5 min	1
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Output ID	1	0 – 2	0
10	Output Status	1	0 1	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Debounce Option	1	0-1	0
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ **<Mode>**: Working Mode.
 - 0: Disable this function
 - 1: Enable this function.
- ✧ **<Idling Detection Time>**: If the vehicle is detected to be stationary (no speed detected by GPS) with ignition on for this time long, it is considered to be in idling status.
- ✧ **<Idling End Time>**: After the vehicle enters into idling status, if it moves again or ignition is off and keeps in that status for the time specified by **<Idling End Time>**, the vehicle is considered to exit idling status.
- ✧ **<Output ID>**: Specify the ID of the output port (1) to output specified waveform when the vehicle enters into idling status. If it is set to 0, there is no output waveform.
- ✧ **<Debounce Option>**: Specify required debouncing time to exit idle state after ignition off. 0 means needing no debouncing. 1 means needing to debounce **<Idling End Time>**.

The acknowledgment message of **AT+GTIDL** command:

➤ **+ACK:GTIDL,**

Example: +ACK:GTIDL,FE110A,862170019025640,,000E,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.10. Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh behavior of the driver with GPS and motion sensor. Two harsh behaviors will be monitored, the harsh braking and the harsh acceleration. The method to monitor the harsh behavior is by motion sensor. The function works when the engine is on and the vehicle is moving.

➤ AT+GTHBM=

Example: AT+GTHBM=gv50m,1,,,100,21,6,,,60,21,6,,,21,15,,1,1,8,3,,,,,000F\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 -1	0
3	Acceleration Threshold 1	<=3	10-999(cm/s/s)	150
4	Acceleration Threshold 2	<=3	10-999(cm/s/s)	200
5	Acceleration Threshold 3	<=3	10-999(cm/s/s)	250
6	Acceleration Threshold 4	<=3	10-999(cm/s/s)	300
7	Harsh Acceleration Duration	<=2	10-50(*10ms)	50
8	Braking Threshold 1	<=3	10-999(cm/s/s)	150
9	Braking Threshold 2	<=3	10-999(cm/s/s)	200
10	Braking Threshold 3	<=3	10-999(cm/s/s)	250
11	Braking Threshold 4	<=3	10-999(cm/s/s)	300
12	Harsh Braking	<=2	10-50(*10ms)	50

	Duration			
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Output ID	1	0 – 2	0
18	Output Status	1	0 1	
19	Duration	<=3	0 – 255(×100ms)	0
20	Toggle Times	<=3	0 – 255	0
21	Reserved	0		
22	Reserved	0		
23	Reserved	0		
24	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Mode>: Working mode.
 - 0: Disable this function
 - 1: Enable this function.
- ✧ <Braking Threshold>: The threshold for harsh braking. The deceleration is greater than or equal to this value and the duration is greater than or equal to <Harsh Braking Duration>, a harsh braking is detected.
- ✧ <Acceleration Threshold>: The threshold for harsh acceleration. The acceleration is greater than or equal to this value and the duration is greater than or equal to <Harsh Acceleration Duration>, a harsh acceleration is detected.
- ✧ <Harsh Acceleration Duration>: Please refer to <Acceleration Threshold>.
- ✧ <Harsh Braking Duration>: Please refer to <Braking Threshold>.
- ✧ <Count Number>: A self-increasing count number in each acknowledgment message and message. It counts from 0000 and increases by 1 for each message. And it rolls back to "0000" "after "FFFF".
- ✧ <Tail character>: A character to indicate the end of the command. It must be "\$".

NOTE: The <Acceleration Threshold 1> to <Acceleration Threshold 4> should meet the following condition:

Acceleration Threshold 1 <= Acceleration Threshold 2 <= Acceleration Threshold 3 <= Acceleration Threshold 4

The <Braking Threshold 1> to <Braking Threshold 4> should meet the following condition:

Braking Threshold 1 <= Braking Threshold 2 <= Braking Threshold 3 <= Braking Threshold 4

NOTE: If device detected 2 or more than 2 times of the same driving behavior (harsh acceleration or harsh braking) within 10 seconds, it will report **+RESP:GTHBM** only one time.

The acknowledgment message of **AT+GTHBM** command:

➤ **+ACK:GTHBM,**

Example: +ACK:GTHBM,FE110A,862170019025640,,000F,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	154	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.11. Crash Alarm

The command **AT+GTCRA** is used to configure the parameter for crash alarm. When the detection condition is matched, the device will report **+RESP:GTCRA** event message and data packets **+RESP:GTCRD** to the backend server. If it is configured to report GPS information to the backend server, the device will report **+RESP:GTCRG** with GPS information most 10s before crash and 10s after crash.

➤ **AT+GTCRA=**

Example: AT+GTCRA=gv50m,1,7,3,3,1,,10,10,,0,0,0,0,,001D\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0-1	0
3	G-Sensor Sensitivity	2	1-99(0.1g)	7
4	Gsensor Data Pre-Crash	1	1-5	3
5	Gsensor Data Post-Crash	1	1-5	3
6	Gsensor Sample	1	0 -1	1

	Frequency			
7	Reserved	0		
8	GPS Data Pre-Crash	<=2	0-10(s)	10
9	GPS Data Post-Crash	<=2	0-10(s)	10
10	Reserved	0		
11	Output ID	1	0 – 2	0
12	Output Status	1	0 1	
13	Duration	<=3	0~255(×100ms)	0
14	Toggle Times	<=3	0 – 255	0
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Mode>: Working Mode.

- 0: Disable this function.
- 1: Enable this function.

Note: If **AT+GTCRA** is enabled, the function of <GEO ID> greater than 9 in **AT+GTPEO** will be forced to be disabled.

- ✧ <G-Sensor Sensitivity>: Sensitivity of the crash alarm. The smaller the number is, the more sensitive this function would be.
- ✧ <Gsensor Data Pre-Crash>: The acceleration sample duration of record XYZ-axis data for Pre-Crash. The unit is second.
- ✧ <Gsensor Data Post-Crash>: The acceleration sample duration of record XYZ-axis data for Post-Crash. The unit is second.
- ✧ <Gsensor Sample Frequency>: The mode for sample frequency. This parameter defines the resample frequency of the data in the message **+RESP:GTCRD**. The original frequency of sample data from sensor is always 200Hz.

Sampling Frequency	Frequency (Hz)
0	100
1	200

- ✧ <GPS Data Pre-Crash>: The duration of the GPS data before crash. The unit is second.
- ✧ <GPS Data Post-Crash>: The duration of the GPS data after crash. The unit is second.

The acknowledgment message of **AT+GTCRA** command:

➤ **+ACK:GTCRA,**

Example:

+ACK:GTCRA,FE110A,862170019025640,,001D,20140511093254,11F0\$

Parameter	Length (Byte)	Range/Format	Default
-----------	---------------	--------------	---------

Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.12. Start/Stop Report

The command **AT+GTSSR** is used to detect the status of vehicle (Start or Stop status). When the device detects that the vehicle is entering into start status, it will report event message **+RESP:GTSTR** to the backend server. When the vehicle exits the start status and enters into stop status, it will report event message **+RESP:GTSTP** to the backend server.

➤ AT+GTSSR=

Example:				
AT+GTSSR=gv50m,1,2,1,5,2,,,,,0017\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1	0
3	Stop Detection Time	<=2	1 – 30	2
4	Motion Detection Time	1	1 – 5	1
5	Start Speed	<=2	1 – 10 Km/h	5
6	Long Stop Detection Time	<=5	0 – 43200 min	0
7	Time Unit	1	0 1	0
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Mode>: Working Mode.

- 0: Disable this function
 - 1: Enable this function
- ✧ <Stop Detection Time>: After entering into start status, the vehicle stops again and keeps in stop status for the time specified by <Stop Detection Time>, the vehicle is considered to exit start status.
- ✧ <Motion Detection Time>: If the vehicle is detected to be moving with ignition on for this time long, it is considered to be in start status.
- ✧ <Start Speed>: The speed threshold to determine whether the vehicle is in start status or not. When the device is detected to be moving with ignition on by the built-in motion sensor, it will then check the speed from GPS. If the device speed stays greater than <Start Speed> and the duration is longer than <Motion Detection Time>, the vehicle is regarded to be in start status. The event report **+RESP:GTSTR** will be reported. If the device speed stays less than or equal to <Start Speed> and the duration is longer than <Stop Detection Time>, the vehicle is regarded to exit start status. The event report **+RESP:GTSTP** will be reported. If GPS fix abnormality lasts more than 1 minute, the built-in motion sensor will only check the start/stop status but not the speed.
- ✧ <Long Stop Detection Time>: After the vehicle enters into stop status and stays stop for this time long, the **+RESP:GTLSP** will be sent. 0 means to disable this function.
- ✧ <Time Unit>: It controls the unit of <Stop Detection Time> and <Motion Detection Time>.
- 0: The unit is minute.
 - 1: The unit is second.

The acknowledgment message of **AT+GTSSR** command:

➤ **+ACK:GTSSR,**

Example: +ACK:GTSSR,FE110A,862170019025640,,0017,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.13. Start and Drive Report

The command **AT+GTSDS** is used to configure the parameters for Start and Drive report.

➤ **AT+ GTSDS =**

Example: AT+GTSDS=gv50m,1,2,5,50,50,0,,,,,,,,,000F\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Start Report Mode	1	0-2	0
3	Drive Report Mode	1	0-3	0
4	Drive Report Interval	<=5	0 5 – 86400 sec	0
5	Drive Report Distance	<=5	0 50 – 65535m	0
6	Drive Report Mileage	<=5	0 50 – 65535m	0
7	Max. Report Number	<=4	0-9999	0
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Start Report Mode>: The working mode of the start report.

- 0: Disable the start report.
- 1: Enable the start report. The device will send message **+RESP:GTSRT** when it detects Start event.
- 2: Enable the Start report regardless of Start event. The device will keep sending **+RESP:GTDRV** to the backend server according to <Drive Report Mode> until the total number of **+RESP:GTDRV** events reaches the value specified by <Max Report Number>.

✧ <Drive Report Mode>: The working mode of the drive report.

- 0: Disable the drive report.
- 1: Fixed Time Drive Report. The message **+RESP:GTDRV** is sent to the backend server periodically according to the parameter <Drive Report Interval>.
- 2: Fixed Distance Drive Report. The message **+RESP:GTDRV** is sent to the backend server when the straight-line distance between the current GPS position and the last sent GPS position is greater than or equal to the distance specified by the parameter <Drive Report Distance>.
- 3: Fixed Mileage Drive Report. The message **+RESP:GTDRV** is sent to the backend server when the path length between the current GPS position and the last sent GPS position is greater than or equal to the mileage specified by the parameter <Drive

Report Mileage>.

- ✧ <Drive Report Interval>: The time interval for sending the message **+RESP:GTDRV** when <Drive Report Mode> is 1. Unit: second.
- ✧ <Drive Report Distance>: The specified distance interval for sending the message **+RESP:GTDRV** when <Drive Report Mode> is 2. Unit: meter.
- ✧ <Drive Report Mileage>: The specified length for sending the message **+RESP:GTDRV** when <Drive Report Mode> is 3. Unit: meter.
- ✧ <Max. Report Number>: The maximum number of Drive messages. If the total number of these messages reaches the value specified by this parameter, 0 means "Do not stop reporting any messages".

The acknowledgment message of **AT+ GTSDS** command:

➤ **+ACK:GTSDS,**

Example: +ACK:GTSDS,FE170F,862170019025640,,0015,20200927093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.14. Stop Event Report

The command **AT+ GTSTP** is used to configure the parameters for the Stop Event report.

➤ **AT+ GTSTP =**

Example: AT+GTSTP=gv50m,1,10,240,1,,,,,,,,,000F\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1	0
3	Time to Standard Stop	<=3	0 10 – 240 min	0
4	Time to Stipulation Stop	<=4	0 240 – 1440 min	0

5	Time to Abandonment Stop	<=2	0 1 – 30 day	0
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Mode>: Working mode of the Stop Event Report function.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ <Time to Standard Stop>: If it is detected that the vehicle stops for the time specified by this parameter, the device will send message **+RESP:GTSSP**. 0 means “Do not report the message”.
- ✧ <Time to Stipulation Stop>: If it is detected that the vehicle stops for the time specified by this parameter, the device will send message **+RESP:GTTSP**. 0 means “Do not report the message”.
- ✧ <Time to Abandonment Stop>: If it is detected that the vehicle stops for the time specified by this parameter, the device will send message **+RESP:GTASP**. 0 means “Do not report the message”.

The acknowledgment message of **AT+ GTSTP** command:

➤ **+ACK:GTSTP,**

Example: +ACK:GTSTP,FE170F,862170019025640,,0015,20200927093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	\$	\$
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3.2.5. IO Application

3.2.5.1. Digital Output

The **AT+GTOUT** command is used to set specified output waveform from the digital output ports. Total four waveforms are supported as below. If it is set to waveform 1, the device will maintain this waveform at the specified output port after power on reset.

The output port will output square wave if it is set to waveform 4. The waveform will be output only when the main power supply is connected. The waveform will still be output even if the device is rebooted.

Waveform 1:

✓ <Duration> = 0ms, <Toggle Times> = 0



Figure 2: Waveform 1

Waveform 2:

✓ <Duration> = 500ms, <Toggle Times> = 1

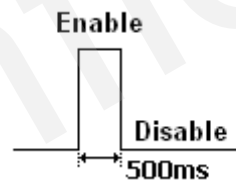


Figure 3: Waveform 2

Waveform 3:

✓ <Duration> = 800ms, <Toggle Times> = 3

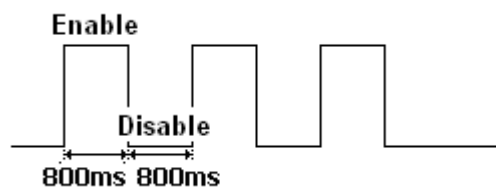


Figure 4: Waveform 3

Waveform 4:

✓ <Duration> = 800ms, <Toggle Times> = 0

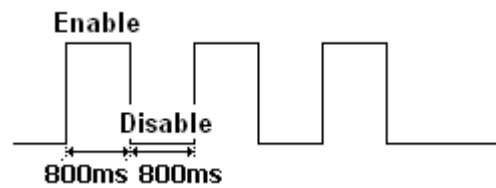


Figure 5: Waveform 4

➤ AT+GTOUT=**Example:****AT+GTOUT=gv50m,1,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0004\$**

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Output1 Status	1	0 1	0
3	Duration	<=3	0 – 255(×100ms)	0
4	Toggle Times	<=3	0 – 255	0
5	Output2 Status	1	0 1	0
6	Duration	<=3	0 – 255(×100ms)	0
7	Toggle Times	<=3	0 – 255	0
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	DOS Report	1	0-3	0
18	Long Operation1	<=3	0 – 120min	0
19	Long Operation2	<=3	0 – 120min	0
20	Reserved	0		

21	Reserved	0		
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ **<Output1–2 Status>**: Used only for the waveform 1 as shown in **Figure 2** to set the final status of the output port.

- 0: Disable status.
- 1: Enable status.

✧ **<Duration>**: Please refer to **Figure 2**, **Figure 3** and **Figure 4**. Unit is 100ms.

✧ **<Toggle Times>**: Please refer to **Figure 2**, **Figure 3** and **Figure 4**.

When the **<Duration>** is set to 0, the **<Toggle Times>** must be set to 0. Otherwise the command may be invalid.

✧ **<DOS Report>**: Output status changes with waveform 1, whether to report **+RESP: GTDOS** or not.

- Bit 0: for output 1 report +RESP:GTDOS
- Bit 1: for output 2 report +RESP:GTDOS

For each bit, set it to 1 to enable and 0 to disable.

✧ **<Long Operation1>** and **<Long Operation2>**: The long operation time for output 1 to output 2. After the long operation time, the output waveform will reset to the initial status at the specified output port. These two parameters are effective only when the output waveform is 1 or 4.

The acknowledgment message of **AT+GTOUT** command:

➤ **+ACK:GTOUT,**

Example:

+ACK:GTOUT,FE110A,862170019025640,,0004,20140511093254,11F0\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5.2. External Power Supply Monitoring

The command **AT+GTEPS** is used to configure the parameters of external power supply monitoring. The device will measure and monitor the voltage of the external power supply. If the voltage of the external power supply meets the predefined alarm condition, the device will send an alarm message **+RESP:GTEPS** to the backend server to notify the status of the external power supply.

To make sure this function works in all situations, please switch on the internal backup battery in case the voltage of the external power supply drops too low.

➤ AT+GTEPS=

Example: AT+GTEPS=gv50m,2,250,12000,3,2,1,1,0,0,1,,,,,0007\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0-3	0
3	Min Threshold	<=5	250 – 32000 mV	250
4	Max Threshold	<=5	450 – 32000 mV	450
5	Reserved	0		
6	Debounce Time	<=3	0 – 255 (×10s)	0
7	Output ID	1	0 – 2	
8	Output Status	1	0 1	
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Sync with FRI	1	0 1	0
12	Hysteresis Error	<=4	0 – 2000 mV	200
13	Reserved	0		
14	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Mode>: Working mode of the external power supply monitoring.

- 0: Disable the external power supply monitoring.
- 1: Enable the external power supply monitoring. If the current voltage is within the range of (<Min Threshold>, <Max Threshold>), the **+RESP:GTEPS** alarm will be triggered.

- 2: Enable the external power supply monitoring. If the current voltage is outside the range of (<Min Threshold>, <Max Threshold>), the **+RESP:GTEPS** alarm will be triggered.
- 3: Enable the external power supply monitoring. If the current voltage is within or outside the range of (<Min Threshold>, <Max Threshold>), the **+RESP:GTEPS** alarm will be triggered once when the state changes.
- ✧ <Min Threshold>: The lower limit of the voltage of the external power supply to trigger the alarm.
- ✧ <Max Threshold>: The upper limit of the voltage of the external power supply to trigger the alarm.
- ✧ <Debounce Time>: The time for debouncing to avoid abnormal voltage drop of the external power supply.
- ✧ <Output ID>: Specify the ID of the output port (1) to output specified waveform when the **+RESP:GTEPS** alarm is triggered. If it is set to 0, there is no output wave.
- ✧ <Sync with FRI>: Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the fixed message.
 - 0: Do not report external power supply voltage with fixed message.
 - 1: Report external power supply voltage with fixed message.
- ✧ <Hysteresis Error>: It is an offset to the <Min Threshold> and <Max Threshold>. It can be used to suppress the bouncing of external power supply voltage detection. If this parameter is set, the limit to trigger the alarm is calculated as following:
 - Outside the range: detected voltage is greater than <Max Threshold> + <Hysteresis Error> or less than <Min Threshold>.
 - Inside the range: detected voltage is higher than <Min Threshold> + <Hysteresis Error> or less than <Max Threshold>.

The acknowledgment message of **AT+GTEPS** command:

➤ **+ACK:GTEPS,**

Example: +ACK:GTEPS,FE110A,862170019025640,,0007,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	≤20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5.3. Digital Input Port Setting

The command **AT+GTDIS** is used to configure the parameters of the digital input port. If the logical status of the digital input port is changed, the device will send message **+RESP:GTDIS** to the backend server.

Before using digital input 1, <IO Mode> in **AT+GTCFG** command must be set to 0 on the corresponding bit.

➤ AT+GTDIS=

Example:				
AT+GTDIS=gv50m,0,1,,0,1,1,4,,2,1,2,,3,3,,,,,,0005\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Ignition Detection Port ID	1	0	0
3	Position Type	1	0 1	0
4	Reserved	0		
5	Reserved	0		
6	Input ID 1	1	1	1
7	Enable	1	0 1	0
8	Reserved	0		
9	Validity Time	<=2	1 – 12(x2s)	1
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Reserved	0		
	Serial Number	4	0000 – FFFF	

	Tail Character	1	\$	\$
--	----------------	---	----	----

- ✧ <Ignition Detection Port ID>: ID of the ignition detection port.
- ✧ <Position Type>: This parameter indicates the type of position info included in +RESP:GTDIS report.
 - 0: Including real time position in the report.
 - 1: Including the last known position in the report.
- ✧ <Input ID 1>: The digital port ID.
- ✧ <Enable>: Enable or disable the interrupt input.
 - 0: Disable
 - 1: Enable
- ✧ <Validity Time>: The validity time of the input port.

The acknowledgment message of **AT+GTDIS** command:

➤ **+ACK:GTDIS,**

Example: +ACK:GTDIS,FE110A,862170019025640,,0005,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5.4. Input/Output Port Binding

This command is used to configure the user-defined output-port action triggered by input ports. After the IO binding is set and the corresponding condition occurs, the device will output specified waveform at the specified output port. Otherwise, the specified output port will restore to the initial status. And the device will send message **+RESP:GTIOB** to the backend server when the logical status of bound input ports changes.

➤ **AT+GTIOB=**

Example: AT+GTIOB=gv50m,1,F,A,3,1,0,8,3,,,,,0006\$				
SN	Parameter	Length (Byte)	Range/Format	Default

1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	IOB ID	1	0 – 3	
3	Input Mask	2	00 – 03	0
4	Trigger Mask	2	00 – 03	0
5	Input Sample Period	<=2	0 1 – 12(×2s)	0
6	Output ID	1	0-2	0
7	Output Status	1	0 1	0
8	Duration	<=3	0 – 255(×100ms)	0
9	Toggle Times	<=3	0 – 255	0
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <IOB ID>: ID of the user defined IO binding.
- ✧ <Input Mask>: Bitwise mask for input port composition. Each bit, from bit 0 to bit 1, represents one digital input port. Set it to 1 to enable and 0 to disable corresponding input port.
 - bit0: ignition detection
 - bit1: digital input 1
- ✧ <Trigger Mask>: Bitwise mask for trigger condition composition of the corresponding input ports. Each bit, from bit 0 to bit1, represents the logical status of the corresponding input port to trigger the IOB event. Set it to 1 to use enabled status as the trigger condition and 0 to use disabled status. Only when the logical status of all the input ports in the IO binding meets the trigger condition will the IOB event be triggered.
 - bit0: ignition detection
 - bit1: digital input 1
- ✧ <Input Sample Period>: The period to check the status of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use independent sample period to check the input port status even for the same input port.
- ✧ <Output ID>: ID of the output port to output specified wave when the trigger condition meets. 0 means no wave will be output.

The acknowledgment message of **AT+GTIOB** command:

➤ **+ACK:GTIOB,**

Example: +ACK:GTIOB,FE110A,862170019025640,,1,0006,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
IOB ID	1	0 – 3	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.6. Ignition Detection Settings

3.2.6.1. Virtual Ignition Mode Selection

The command **AT+GTVMS** is used to configure the virtual ignition mode if the hard-wired ignition wire is not connected. When the virtual ignition event was triggered, it will send **+RESP: GTVGN** or **+RESP: GTVGF** to backend server.

➤ **AT+GTVMS=**

Example: AT+GTVMS=GV50M,1,,,,,000B\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	GV50M
2	Virtual Ignition Mode	1	0 2	2
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ *<Virtual Ignition Mode>*: A numeric to define the working mode for detecting ignition state virtually.

- 0: Disable the function, check ignition state by hardware wire.

- 2: Check virtual ignition state by accelerometer.

The acknowledgment message of **AT+GTVMS** command:

➤ **+ACK:GTVMS,**

Example: +ACK:GTVMS,F70101,862170019025640,,000B,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.6.2. Real Wire Ignition Settings

The command **AT+GTVVS** is used to configure parameters for ignition debounce by real wire.

➤ **AT+GTVVS=**

Example: AT+GTVVS=GV50M,13000,500,10,,,000B\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	GV50M
2	Reserved	0		
3	Reserved	0		
4	Reserved	0		
5	IGN Debounce	<=3	1-255(s)	1
6	IGF Debounce	<=3	1 -255 (s)	1
7	Reserved	0		
8	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ *<IGN Debounce>*: The debounce time of ignition wire detection before updating ignition state from OFF to ON.

- ✧ *<IGF Debounce>*: The debounce time of ignition wire detection before updating ignition state from ON to OFF.

The acknowledgment message of **AT+GTVVS** command:

➤ **+ACK:GTVVS,**

Example: +ACK:GTVVS,F70101,862170019025640,,000B,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.6.3. Accelerometer Virtual Ignition Setting

The command **AT+GTAVS** is used to configure parameters for checking ignition state by accelerometer. It will work when hard-wired ignition wire is not connected and Accelerometer Virtual Ignition mode is enabled by **AT+GTVMS**.

➤ **AT+GTAVS=**

Example: AT+GTAVS=GV50M,13000,500,10,,,000B\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	GV50M
2	Sensor Rest Duration	<=3	1 – 255 sec	120
3	Sensor Motion Validity	<=3	1 – 255 sec	10
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ *<Sensor Rest Duration>*: A time parameter to determine whether the device enters virtual ignition off state. The device will be considered in virtual ignition off state after the motion

sensor detects resting and the resting state is maintained for the period of time specified by the parameter <Sensor Rest Duration>.

- ✧ <Sensor Motion Validity>: A time parameter to determine whether the device enters virtual ignition on state. The device will be considered in virtual ignition on state after the motion sensor detects moving and the moving state is maintained for the period of time specified by the parameter <Sensor Motion Validity>.

The acknowledgment message of **AT+GTAVS** command:

➤ **+ACK:GTAVS,**

Example: +ACK:GTAVS,F70101,862170019025640,,000B,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7. Other Settings

3.2.7.1. Real Time Operation

The command **AT+GTRTO** is used to retrieve information from the terminal or control the terminal to execute certain actions.

➤ **AT+GTRTO=**

Example: AT+GTRTO=gv50m,A,,,,,,,,,0012\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Sub Command	<=2	0 – F 10-15	
3	AT Command Configuration Mask Configuration String	3 16 0-250	"SRI" 0000000000000000 – FFFFFFFFFFFFFFFF '0' – '9' 'a' – 'z' 'A' – 'Z'	
4	Output direction	1	0-3	

5	Reserved	0		
6	Reserved	0		
7	Sub Command Parameter RTL GNSS Fix Timeout Delay Reboot	<=3	RTL: 30-180sec REBOOT: 5--60sec RESET: 0--1	RTL: 150 REBOOT: 10 RESET: 0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Sub Command>:

- 0: **GPS**. Get the GPS related information via message **+RESP: GTGPS**.
- 1: **RTL**. Request the terminal to report its current position immediately via message **+RESP: GTRTL**.
- 2: **READ**. Get the current configuration of the terminal via message **+RESP: GTALM** or **+RESP: GTALS** or **+RESP: GTALC**.
- 3: **REBOOT**. Reboot the terminal.
- 4: **RESET**. Reset all parameters to factory setting. Parameters configured by **AT+GTBSI**, **AT+GTSRI**, **AT+GTCFG**, **AT+GTPIN** and **AT+GTTMA** will not be reset.
- 5: **PWROFF**. Power off the device.
- 6: **CID**. Get the ICCID of the SIM card which is being used by the terminal via message **+RESP: GTCID**.
- 7: **CSQ**. Get the current received signal strength of the terminal via message **+RESP: GTCSQ**.
- 8: **VER**. Get the version information of the device via message **+RESP: GTVER**.
- 9: **BAT**. Get the battery percentage and adapter status of the terminal via message **+RESP: GTBAT**.
- A: **IOS**. Get status of all the IO ports via message **+RESP: GTIOS**.
- B: **TMZ**. Get the time zone settings via message **+RESP: GTTMZ**.
- E: **GSV**. Request the device to report the GPS fix level.
- F: **INF**. Read the device information report function. The corresponding information will be reported via the message **+RESP: GTINF**.
- 13: **CLASC**. Clear calibration data.
- 14: **DELBUF**. Delete all the buffered reports.
- 15: **LGNMSG**. It is used to store configuration string in the device. The configuration string is a summary of the current device configuration.

✧ <AT Command/Configuration Mask/Configuration String>:

- <AT Command>: To get a single AT command's configuration when <Sub Command> is set to 2, follow the format in the following example. For example, to get the configuration of AT+GTFRI, please set AT+GTRTO= GV50M,2,FRI,,,,,0015\$, and get it via **+RESP: GTALS**.
- <Configuration Mask>: If <Sub Command> is set to 2, the configuration information of the specified <Configuration Mask> can be obtained via the message **+RESP: GTALC**.

The Configuration Mask must be 16 bytes. If it's less than 16 bytes, '0' will be added in the high bytes of the Configuration Mask.

- <Configuration String>: If <Sub Command> is set to 15, this field is configuration string. The configuration string is a summary of the current device configuration. For example, if the configuration string contains "S1", it means it is using the ignition input, and "S2" means using the simulated ignition. It consists of a string with up to 250 characters.

✧ <Sub Command Parameter / RTL GNSS Fix Timeout / Delay Reboot>: This parameter is used for part of the sub commands. This field cannot be empty for the sub-commands listed below.

For the sub command **RTL** (1):

- <RTL GNSS Fix Timeout>: If the GNSS chip fails to get a position within this time, it will be shut down and the device will send the last known location.

For the sub command **REBOOT** (3):

- <Delay Reboot>: Time delay for real-time reboot.

For the sub command **RESET** (4):

- 0: Light. Reset all configuration parameters, except:
 - (1) Reserved.
 - (2) Network-related configuration (AT+GTBSI/AT+GTSRI).
 - (3) Device password (AT+GTCFG).
 - (4) Time Zone (AT+GTTMA).
- 1: Heavy. Reset all configuration parameters.

Note: AT+GTPIN will not be reset.

Configuration Mask Table:

Bit	Item to Mask
Bit 63	Reserved
Bit 62	Reserved
Bit 61	Reserved
Bit 60	Reserved
Bit 59	GAM
Bit 58	GLM
Bit 57	Reserved
Bit 56	UPC
Bit 51	Reserved
Bit 50	EMR
Bit 49	STP
Bit 48	SDS

Bit 47	PCS
Bit 46	ASC
Bit 45	Reserved
Bit 44	PEO
Bit 43	RMD
Bit 42	Reserved
Bit 41	Reserved
Bit 40	Reserved
Bit 39	Reserved
Bit 38	AVS
Bit 37	SPA
Bit 36	BZA
Bit 35	VVS
Bit 34	VMS
Bit 33	PDS
Bit 32	Reserved
Bit 31	Reserved
Bit 30	Reserved
Bit 29	SSR
Bit 28	Reserved
Bit 27	FFC
Bit 26	CRA
Bit 25	HRM
Bit 24	WLT
Bit 23	Reserved
Bit 22	Reserved
Bit 21	HBM
Bit 20	HMC
Bit 19	IDL
Bit 18	Reserved

Bit 17	DOG
Bit 16	OWH
Bit 15	PIN
Bit 14	Reserved
Bit 13	SOS
Bit 12	SPD
Bit 11	GEO
Bit 10	FRI
Bit 9	TMA
Bit 8	IOB
Bit 7	OUT
Bit 6	DIS
Bit 5	EPS
Bit 4	TOW
Bit 3	CFG
Bit 2	Reserved
Bit 1	SRI
Bit 0	BSI

✧ **<Output Direction>**: This parameter determines the destination the response message of the RTO command will be reported to. This field is invalid for **<Sub Command>** 2(READ, except +RESP:GTALS), 3(REBOOT), 4(RESET) and 5(PWROFF).

- 0: The message will be output to the backend server.
- 1: The message will be output to the main serial port.
- 2: Reserved.
- 3: If the command is received via SMS, the message will be output to the original SMS number. Otherwise the message will be output to the backend server.

The acknowledgment message of **AT+GTRTO** command:

➤ **+ACK:GTRTO,**

Example: +ACK:GTRTO,FE110A,862170019025640,,IOS,0012,20140511093254,11F1\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub Command	<=6	Sub Command String	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Sub Command>: A string to indicate the sub command of **AT+GTRTO**.

3.2.7.2. White Number List Configuration

The AT+GTWLT command is used to set white number list table.

➤ AT+GTWLT=

Example: AT+GTWLT=gv50m,1,1,2,1381388888,1391399999,,,,,000C\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Number Filter	1	0 1 2	1
3	Phone Number Start	<=2	1-10	1
4	Phone Number End	<=2	1-10	1
5	White Number List	<=20*10		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ <Number Filter>: A numeric to indicate whether to filter the original number according to <White Number List> and <Direct Number List> before it tries to send Google link SMS to the original number.

- 0: Do not return SMS to original number, ignore the Request Position message received

and no matter whether the original number is in the *<White Number List>* or *<Direct Number List>* or not.

- 1: Do not filter the original number. It will return SMS to the original number as long as it receives Request Position message via SMS
- 2: Filter the original number. If the original number isn't in *<White Number List>* or *<Direct Number List>*, it won't return an SMS to the incoming number even if the device receives Request Position message via SMS
- ✧ *<Phone Number Start>*: A numeric to indicate the first index of the white number to be input. For example, if it is 1, it will update the white Number list from the 1st one. If it is empty, it should not include the number of *<White Number List>*.
- ✧ *<Phone Number End>*: A numeric to indicate the last index of the white number to input. For example, if it is 2, it will update the white Number list until the 2nd one. If it is empty, it should not include the number of *<White Number List>*.
- ✧ *<White Number List>*: A phone number list. It could include several phone numbers. And two neighboring phone numbers are separated with ",". The number of the phone number in the list depends on the parameters *<Phone Number Start>* and *<Phone Number End>*. For example, if *<Phone Number Start>* is 1 and *<Phone Number End>* is 2, the *<White Number List>* should include 2 phone numbers and the two numbers are separated with ",".

The acknowledgment message of **AT+GTWLT** command:

➤ **+ACK:GTWLT,**

Example: +ACK:GTWLT,FE110A,862170019025640,,0015,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.3. User Defined Function

The **AT+GTUDF** command is used to bind input events and the stored commands. The input events will trigger the corresponding stored commands.

➤ **AT+GTUDF=**

Example:

AT+GTUDF=gv50m,1,1,2,1381388888,1391399999,,,,,000C\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0-2	0
3	Group ID	<=2	0 – 31	
4	Input ID Mask	<=9	0- FFFFFFFF	
5	Debounce Time	<=5	0-86400(s)	0
6	Inzizo Mask	<=5	00000-FFFFF	0
7	Outzizo Mask	<=5	00000-FFFFF	0
8	Stocmd ID Mask	<=8	0-FFFFFFFF	
9	Stocmd Ack	1	0 1	0
10	Inpeo Mask	<=5	00000-FFFFF	0
11	Outpeo Mask	<=5	00000-FFFFF	0
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Mode>: The working mode of the user defined function.
 - 0: Disable the group.
 - 1: Enable the group.
 - 2: Delete the group.
- ✧ <Group ID>: A numeral to identify the group of input events and stored commands to be executed.
- ✧ <Input ID Mask>: The bitwise mask to indicate the input events included in the group.
 Bit 0 (00000001): Select ID1

ID	Bit	Item to Mask
1	Bit 0	Power on finished
2	Bit 1	Ignition on
3	Bit 2	Ignition off
4	Bit 3	The GPRS/LTE network is attached
5	Bit 4	The GPRS/LTE network is not attached
6	Bit 5	The GSM/LTE network registered
7	Bit 6	The GSM/LTE network not registered
8	Bit 7	Network roaming

9	Bit 8	Network non roaming
10	Bit 9	SIM card is locked
11	Bit 10	GPS is turned on
12	Bit 11	GPS is turned off
13	Bit 12	The device is stationary
14	Bit 13	The device is moving
15	Bit 14	External charge inserted
16	Bit 15	No external charge
17	Bit 16	The device is charging
18	Bit 17	The device is not charging
19	Bit 18	Reserved
20	Bit 19	Reserved
21	Bit 20	Digital input 1 is low
22	Bit 21	Digital input 1 is high
23	Bit 22	SIM card is inserted
24	Bit 23	SIM card is not inserted
25	Bit 24	Reserved
26	Bit 25	Reserved
27	Bit 26	Inside the speed range
28	Bit 27	Outside the speed range
29	Bit 28	Messages need to be sent
30	Bit 29	No messages need to be sent
31	Bit 30	Reserved
32	Bit 31	Reserved
33	Bit 32	Backup battery inserted
34	Bit 33	Reserved
35	Bit 34	No change of SIM card
36	Bit 35	Reserved

✧ <Debounce Time>: The debounce time for input events before executing the specified stored commands.

✧ <Inzizo Mask>: The bitwise mask to indicate the input events within the circular Geo-Fence.

ID	Bit	Item to Mask
1	Bit 0	Inside the Geo 0
2	Bit 1	Inside the Geo 1
3	Bit 2	Inside the Geo 2
4	Bit 3	Inside the Geo 3
5	Bit 4	Inside the Geo 4
6	Bit 5	Inside the Geo 5
7	Bit 6	Inside the Geo 6
8	Bit 7	Inside the Geo 7
9	Bit 8	Inside the Geo 8
10	Bit 9	Inside the Geo 9

11	Bit 10	Inside the Geo 10
12	Bit 11	Inside the Geo 11
13	Bit 12	Inside the Geo 12
14	Bit 13	Inside the Geo 13
15	Bit 14	Inside the Geo 14
16	Bit 15	Inside the Geo 15
17	Bit 16	Inside the Geo 16
18	Bit 17	Inside the Geo 17
19	Bit 18	Inside the Geo 18
20	Bit 19	Inside the Geo 19

- ✧ <Outzido Mask>: The bitwise mask to indicate the input events outside the circular Geo-Fence.

ID	Bit	Item to Mask
1	Bit 0	Outside the Geo 0
2	Bit 1	Outside the Geo 1
3	Bit 2	Outside the Geo 2
4	Bit 3	Outside the Geo 3
5	Bit 4	Outside the Geo 4
6	Bit 5	Outside the Geo 5
7	Bit 6	Outside the Geo 6
8	Bit 7	Outside the Geo 7
9	Bit 8	Outside the Geo 8
10	Bit 9	Outside the Geo 9
11	Bit 10	Outside the Geo 10
12	Bit 11	Outside the Geo 11
13	Bit 12	Outside the Geo 12
14	Bit 13	Outside the Geo 13
15	Bit 14	Outside the Geo 14
16	Bit 15	Outside the Geo 15
17	Bit 16	Outside the Geo 16
18	Bit 17	Outside the Geo 17
19	Bit 18	Outside the Geo 18
20	Bit 19	Outside the Geo 19

- ✧ <Stocmd ID Mask>: The bitwise masks of the stored commands which will be executed after the state of the group becomes TRUE (i.e. all the included input events occur.).
- ✧ <Stocmd Ack>: A numeral to indicate whether to send acknowledgement message when the stored commands are executed.
- 0: Do not send acknowledgement message when the stored command is executed.
 - 1: Send acknowledgement message when the stored command is executed.
- ✧ <Inpeo Mask>: The bitwise mask to indicate the input events within the polygon Geo-Fence.

ID	Bit	Item to Mask
1	Bit 0	Inside the Peo 0

2	Bit 1	Inside the Peo 1
3	Bit 2	Inside the Peo 2
4	Bit 3	Inside the Peo 3
5	Bit 4	Inside the Peo 4
6	Bit 5	Inside the Peo 5
7	Bit 6	Inside the Peo 6
8	Bit 7	Inside the Peo 7
9	Bit 8	Inside the Peo 8
10	Bit 9	Inside the Peo 9
11	Bit 10	Inside the Peo 10
12	Bit 11	Inside the Peo 11
13	Bit 12	Inside the Peo 12
14	Bit 13	Inside the Peo 13
15	Bit 14	Inside the Peo 14
16	Bit 15	Inside the Peo 15
17	Bit 16	Inside the Peo 16
18	Bit 17	Inside the Peo 17
19	Bit 18	Inside the Peo 18
20	Bit 19	Inside the Peo 19

✧ <Outpeo Mask>: The bitwise mask to indicate the input events outside the polygon Geo-Fence.

ID	Bit	Item to Mask
1	Bit 0	Outside the Peo 0
2	Bit 1	Outside the Peo 1
3	Bit 2	Outside the Peo 2
4	Bit 3	Outside the Peo 3
5	Bit 4	Outside the Peo 4
6	Bit 5	Outside the Peo 5
7	Bit 6	Outside the Peo 6
8	Bit 7	Outside the Peo 7
9	Bit 8	Outside the Peo 8
10	Bit 9	Outside the Peo 9
11	Bit 10	Outside the Peo 10
12	Bit 11	Outside the Peo 11
13	Bit 12	Outside the Peo 12
14	Bit 13	Outside the Peo 13
15	Bit 14	Outside the Peo 14
16	Bit 15	Outside the Peo 15
17	Bit 16	Outside the Peo 16
18	Bit 17	Outside the Peo 17
19	Bit 18	Outside the Peo 18
20	Bit 19	Outside the Peo 19

Note:

Maximum 5 stored commands in a group will be executed.

The acknowledgement message of **AT+GTUDF** command:

➤ **+ACK:GTUDF**

Example: +ACK:GTUDF,FE110A,862170019025640,,0015,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.4. Command String Storage

The **AT+GTCMD** command is used to store the commands used by the command **AT+GTUDF**.

➤ **AT+GTCMD=**

Example: AT+GTCMD=gv50m,1,1,2,13813888888,13913999999,,,,,000C\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0-1	0
3	Stored cmd ID	<=2	0 – 31	
4	Command String	200	AT command	
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
	Serial Number	4	0000 – FFFF	

	Tail Character	1	\$	\$
--	----------------	---	----	----

- ✧ <Mode>: The working mode for storing command string.
 - 0: Delete the stored command.
 - 1: Add the stored command.
- ✧ <Stored cmd ID>: A numeral to identify the stored command.
- ✧ <Command String>: The whole content of the stored command.

The acknowledgement message of **AT+GTCMD** command:

➤ **+ACK:GTCMD**

Example: +ACK:GTCMD,FE110A,862170019025640,,0015,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.5. Accelerometer Self Calibration

The command **AT+GTASC** is used to define the conditions for calibrating the directions of accelerometer. When the conditions are met and the accelerometer is calibrated successfully, the device will report event message **+RESP: GTASC** with the calibration result to backend server. It is recommend to clear calibration data with subcommand 13 of **AT+GTRTO** after installing the device.

➤ **AT+GTASC=**

Example: AT+GTASC=gv50m,50,10,5,,,,,,,,,FFFF\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 -20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Brake Speed Threshold	<=3	18 -250 km/h	50
3	Delta Speed Threshold	<=2	3 -46 km/h	10

4	Delta Heading Threshold	1	0-5	5
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Output ID	1	0 – 2	0
10	Output Status	1	0 1	
11	Duration	<=3	0~255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
	Serial Number	4	0000 -FFFF	
	Tail Character	1	\$	\$

- ✧ <Password>: The password of the device, the default value is "gv50m", it can be changed by **AT+GTCFG** command.
- ✧ <Brake Speed Threshold>: The lower speed threshold before braking. If the speed is higher than the threshold before braking, the braking event could be used to calibrate the directions of the accelerometer.
- ✧ <Delta Speed Threshold>: The lower threshold of the delta speed in one second during braking. If the delta speed is higher than the threshold, the braking event could be used to calibrate the directions of the accelerometer.
- ✧ <Delta Heading Threshold>: The upper threshold of the delta heading during braking. If the delta heading is smaller than the threshold, the directions of the accelerometer could be calibrated based on the braking event.
- ✧ <Count Number>: A self-increasing count number in each acknowledgment message and message. It counts from 0000 and increases by 1 for each message. And it rolls back to "0000" after "FFFF".
- ✧ <Tail Character>: A character to indicate the end of the command. It must be "\$".

The acknowledgment message of **AT+GTASC** command:

➤ **+ACK:GTASC,**

Example: +ACK:GTASC,FE170F,862170019025640,,0015,20200927093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.6. Google Link SMS Configuration

The **AT+GTGLM** command is used to configure whether to send SMS with Google link for SOS and GEO events.

➤ AT+GTGLM=

Example: AT+GTGLM=gv50m,1,1,2,13813888888,13913999999,,,,,000D\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Google Mode	1	0 1 2 3	0
3	Phone Number Start	1	1-3	1
4	Phone Number End	1	1-3	1
5	Direct Number List	<=20*3		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

✧ **<Google Mode>**: A numeric to indicate whether to send an SMS with Google link to the number in **<Direct Number List>** for SOS and GEO events.

- 0: Do not send an SMS with Google link to the number in the **<Direct Number List>** for SOS and GEO events and PEO events.
- 1: Send an SMS with Google link to the number in the **<Direct Number List>** for SOS event in the Google hyperlink.
- 2: Send an SMS with Google link to the number in the **<Direct Number List>** for GEO event and PEO events in the Google hyperlink.

- 3: Send an SMS with Google link to the number in the *<Direct Number List>* for SOS and GEO event and PEO events in the Google hyperlink.
- ✧ *<Phone Number Start>*: A numeric to indicate the first index of the white number list to be input. For example, if it is 1, it will update the white Number list from the 1st one. If it is empty, it should not include the number of *<Direct Number List>*.
- ✧ *<Phone Number End>*: A numeric to indicate the last index of the white number to input. For example, if it is 2, it will update the white Number list until the 2nd one. If it is empty, it should not include the number of *<Direct Number List>*.
- ✧ *<Direct Number List>*: A phone number list. It could include several phone numbers. And two neighboring phone numbers are separated with ",". The number of the phone number in the list depends on the parameters *<Phone Number Start>* and *<Phone Number End>*. For example, if *<Phone Number Start>* is 1 and *<Phone Number End>* is 2, the *<White Number List>* should include 2 phone numbers and the two numbers are separated with ",".

The acknowledgment message of **AT+ GTGLM** command:

➤ **+ACK: GTGLM,**

Example: +ACK:GTGLM,FE110A,862170019025640,,0015,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.7. Hour Meter Counter

The command **AT+GTHMC** is used to calculate accumulative ignition time. To use this command, the ignition signal must be connected to the device. *<Hour Meter Counter>* will be included **+RESP:GTFRI**, **+RESP:GTIGN/VGN** or **+RESP:GTIGF/VGF** messages.

➤ **AT+GTHMC=**

Example: AT+GTHMC=gv50m,1,12345:12:34,,,,,,,,,0015\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m

2	Hour Meter Enable	1	0 1	0
3	Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ **<Hour Meter Enable>**: Enable or disable hour meter counter function. If hour meter counter function is enabled, hour meter count will be increased when the device is in ignition on status.
- 0: Disable hour meter counter function
 - 1: Enable hour meter counter function
- ✧ **<Initial Hour Meter Count>**: Initial value of hour meter. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00– 99999:00:00. The <Hour Meter Count> in **+RESP:GTFRI**, **+RESP:GTIGN/+RESP:GTVGN** or **+RESP:GTIGF/+RESP:GTVGF** will be increased based on the value of first-time ignition on.

The acknowledgment message of **AT+GTHMC** command:

➤ **+ACK:GTHMC**,

Example: +ACK:GTHMC,FE110A,862170019025640,,0015,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	\$	\$
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3.2.7.8. GPS-Assisted Motion Measurement

The command **AT+GTGAM** is used for assisting in measuring motion with GPS if the sensor detects motionless state while the vehicle is ignition on.

➤ **AT+GTGAM=**

Example: AT+GTGAM=gv600mg,1,1,25,10,60,,,,,FFFF\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Mode	1	0 1	1
3	Speed Mode	1	0 1	1
4	Motion Speed Threshold	<=2	5-50km/h	25
5	Motion Cumulative Time	<=3	10-100s	10
6	Motionless Cumulative Time	<=3	10-250s	60
7	GPS Fix Failure Timeout	<=4	5-1800	60
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ **<Mode>**: The working mode of the GPS-assisted motion measurement function.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ **<Speed Mode>**: It combines with GPS speed to measure the status of movement.
 - 0: Disable the function.
 - 1: Enable the function.
- ✧ **<Motion Speed Threshold>**: The speed threshold combined with GPS speed to measure the status of movement.
- ✧ **<Motion Cumulative Time>**: If the average speed in <Motion Cumulative Time> is higher than <Motion Speed Threshold>, the device is considered to be in motion status.
- ✧ **<Motionless Cumulative Time>**: If the average speed in <Motionless Cumulative Time> is

lower than <Motion Speed Threshold>, the device is considered to be in motionless status.

- ✧ <GPS Fix Failure Timeout>: If the time for GPS no fix is more than <GPS Fix Failure Timeout>, the device will update motion status by motion sensor again.

The acknowledgment message of **AT+ GTGAM** command:

➤ **+ACK:GTGAM,**

Example: +ACK:GTGAM,FE170F,862170019025640,,0015,20200927093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.9. Update Configuration Over The Air

The AT+GTUPC command is used to send control command.

➤ **AT+GTUPC=**

Example: AT+GTUPC=gv50m,0,10,0,0,168,http://www.queclink.com/configure.ini,,,,,0001\$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv50m
2	Max Download Retries	1	0 – 3	0
3	Download Timeout	<=2	5 – 30 min	10
4	Download Protocol	1	0	0
5	Report Enable	1	0 1	0
6	Update Interval	<=4	0 – 8760 hour	0
7	Download URL	<=100	URL	
8	Mode	1	0 1	0
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		

Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Password>: The valid characters of password include '0'-'9', 'a'-'z', 'A'-'Z'. The default value is "gv50m".
- ✧ <Max Download Retries>: Specifies the maximum time of retrying to download the configuration file upon downloading failure.
- ✧ <Download Timeout>: If downloading is not finished within this time, it will be regarded that the downloading failed.
- ✧ <Download Protocol>: The protocol used to download the file. Only HTTP is supported now. Set it to 0.
- ✧ <Report Enable>: A numeric to indicate whether to send the message **+RESP:GTUPC** to indicate the configuration was updated over the air.
 - 0: Do not report the message +RESP:GTUPC
 - 1: Report the message +RESP:GTUPC
- ✧ <Update Interval>: The time interval (hour) for updating the configuration over the air.
- ✧ <Download URL>: Specifies the URL to download the configuration file. If the URL ends with "/", it means this is a path without any file name. <imei>.ini will be added as the file name at the end of URL.
- ✧ <Mode>: A numeric to indicate the working mode of downloading configuration over the air
 - 0: Disable this function.
 - 1: Enable this function

The acknowledgement message of **AT+GTUPC** command is reported as location report.

Notice:

If the <download URL> ends with "/", it means the URL is a path without file name. <imei>.ini will be added as the file name at the end of URL. If it is larger than 100, an error will be reported.

The acknowledgment message of **AT+GTUPC** command:

➤ **+ACK:GTUPC,**

Example: +ACK:GTUPC,FE110A,862170019025640,,001D,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.10. Emergency Release

The command **AT+ GTEM**R is used to configure the parameters for emergency release.

Note:

This function works only when the ignition wire is connected.

➤ **AT+ GTEM**R =

Example: AT+GTEMR=gv50m,10,5,0,0,30,,,,,000F\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
2	Ignition Time	<=2	0 20-90s	0
3	Ignition Count	<=2	0 5-60	0
4	Emergency Release Time	<=2	0 1-24h	0
5	Network Release	1	0-1	0
6	Release Again Time	<=2	1-60 day	30
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

- ✧ <Ignition Time>: If the driver turns the ignition on more than <Ignition Count> within the time specified by this parameter, emergency release function will be triggered. Unit: second. 0 means to disable this function.
- ✧ <Ignition Count>: If the driver turns the ignition on more than the value specified in this field within <Ignition Time>, emergency release function will be triggered.
- ✧ <Emergency Release Time>: If the emergency release function is triggered, the driver can turn on the ignition within the time specified by this parameter. Unit: hour.
- ✧ <Network Release>: Enable/disable emergency release when there is network coverage.
 - 0: Disable emergency release when there is network coverage.
 - 1: Enable emergency release when there is network coverage.

Note: In case of no network coverage, the emergency release function will be enabled automatically when <Ignition Time> is set to a non-zero value.

- ✧ <Release Again Time>: When there is network coverage, the emergency release will only be

triggered once and won't be triggered again within the time specified by the parameter. Unit: day.

Note: This function releases the output IO used OUTPUT2.

The acknowledgment message of **AT+ GTEMR** command:

➤ **+ACK:GTEMR,**

Example: +ACK:GTEMR,FE170F,862170019025640,,0015,20200927093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.11. SMS Request Position

This command can only be sent via SMS. Device will send SMS message with Google maps hyperlink and the current position or send message **+RESP:GTLBC** immediately.

Command format	get position
Example	get position

Get Position: It's a command string to query current position.

3.3. Report

This section defines the formats of the messages. Due to the max length of SMS message is 160 bytes, it is recommended to set the *<Report Item Mask>* in **AT+GTCFG** properly to limit the length of the report. Otherwise the report will be truncated to fit the length of SMS message.

3.3.1. Position Related Report

➤ **+RESP:GTTOW,**

If the tow alarm is enabled by the command **AT+GTTOW**, the device will send the message **+RESP:GTTOW** to the backend server when the motion sensor detects towing.

➤ **+RESP:GTDIS,**

If the status of digital inputs changes, the device will send the message **+RESP:GTDIS** to the backend server.

➤ **+RESP:GTIOB,**

If the IO combination is set and the corresponding condition occurs, the device will send the message **+RESP:GTIOB** to the backend server.

➤ **+RESP:GTSPD,**

If the speed alarm is enabled, the device will send the message **+RESP:GTSPD** to the backend server when the speed of the device is within the alarm range.

➤ **+RESP:GTSOS,**

If the SOS function is enabled, the device will send the message **+RESP:GTSOS** to the backend server when corresponding digital input port triggers SOS.

➤ **+RESP:GTRTL,**

After the device receives the command **AT+GTRTO**, the GPS starts to get the current position and then send the message **+RESP:GTRTL** to the backend server.

➤ **+RESP:GTPNL,**

Power on location

➤ **+RESP:GTDOG,**

The watchdog rebooting message

➤ **+RESP:GTIGL,**

The location message for ignition on and ignition off

➤ **+RESP:GTHBM,**

If harsh behavior is detected, this message will be sent to the backend server.

➤ **+RESP:GTSRT,**

Enable the start report. The device will send the message to the backend server when it detects Start event.

➤ **+RESP:GTDRV,**

If drive report mode is detected, this message will be sent to the backend server.

➤ **+RESP:GTSSP,**

If stop event report is enabled, this message will be sent to the backend server.

➤ **+RESP:GTTSP,**

If stop event report is enabled, this message will be sent to the backend server.

Example:

```
+RESP:GTTOW,FE110A,868446032529642,,,00,1,1,0.0,55,190.9,114.015156,22.537352,20190925
071241,0460,0000,2493,1490,,,20190925071243,0017$
+RESP:GTDIS,FE110A,868446032529642,,,10,1,2,0.0,0,19.5,114.013199,22.536946,20190925070
818,0460,0000,2493,1767,,,20190925070820,0012$
+RESP:GTIOB,FE110A,868446032529642,,,01,1,1,0.0,0,145.7,114.015500,22.537171,201909250
71455,0460,0000,2493,1465,,,20190925071457,0023$
+RESP:GTSPD,FE110A,866425030925657,gv50m,,01,1,1,34.7,294,29.4,114.011488,22.539087,20
190923041129,0460,0000,27BD,134D,,13660.3,20190923121126,550F$
+RESP:GTSOS,FE110A,868446032529642,,,10,1,1,0.0,55,175.9,114.015230,22.537365,20190925
071328,0460,0000,2493,1490,,,20190925071330,001B$
+RESP:GTRTL,FE110A,868446032529642,gv50m,,00,1,2,0.0,0,138.2,114.015396,22.537385,2019
0927024149,0460,0000,2493,1505,,,20190927024151,0DF0$
+RESP:GTD OG,FE110A,868446032529642,,,13,1,2,0.0,0,19.5,114.013199,22.536946,2019092507
0815,0460,0000,2493,1767,,,20190925070816,0011$
+RESP:GTIGL,FE110A,866425030925657,gv50m,,00,1,1,17.7,98,14.0,113.950840,22.568487,201
90923043110,0460,0000,2495,116F,,13670.4,20190923123107,5568$
+RESP:GTHBM,FE110A,866425030925657,gv50m,,10,1,1,28.4,315,28.0,114.010721,22.539423,2
0190923041140,0460,0000,27BD,134D,,13660.4,20190923121137,5511$
```

➤ **+RESP:GTASP,**

If stop event report is enabled, this message will be sent to the backend server.

All of the above messages have the same format as shown below.

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Report ID/Report Type	2	X(0-4)X(0-6)	
Number	1	0 – 1	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ **<Report ID/Report Type>**: The report ID and the report type in hex format. 4 high bits mean report ID and 4 low bits means report type.

Report ID has different meanings in different messages as below.

- The ID of digital input port which triggers the message **+RESP:GTDIS** and **+RESP:GTSOS**. The range is 1.
- The ID of the bound IO which triggers the message **+RESP:GTIOB**. The range is 0 – 3.
- The ID of the digital input port which triggers the reboot message **+RESP:GTDG**. The valid value is 1.
- For **+RESP:GTHBM**

Report ID representing the level of driving behavior

0: reserved

1: level 1

2: level 2

3: level 3

4: level 4

- For **+RESP:GTDRV**

0: Fixed Time Report

1: Fixed Distance Report

2: Fixed Mileage Report

For the rest of the messages, it will always be 0.

Report type has different meanings in different messages as below.

- In the **+RESP:GTDIS** message generated by the digital input
 - 0: The current logical status of the input port is disabled status.
 - 1: The current logical status of the input is enabled status.
- In the **+RESP:GTIOB** message generated by bound IO
 - 0: The current logical status of the bound IO does not meet the alarm condition.
 - 1: The current logical status of the bound IO meets the alarm condition.
- In the message of speed alarm **+RESP:GTSPD**
 - 0: Outside the predefined speed range.
 - 1: Inside the predefined speed range.
- In the message of protocol watchdog reboot message **+RESP:GTDOG**
 - 1: Reboot message for time based working mode
 - 2: Reboot message for ignition on working mode
 - 3: Reboot message for input triggered reboot
 - 4: Reboot message for no network watchdog.
 - 5: Reboot message for no activation watchdog.
 - 6: Reboot message for sending failure timeout watchdog.
- In the message of ignition on and ignition off message **+RESP:GTIGL**
 - 0: The engine is ignition on.
 - 1: The engine is ignition off.
- In the message of *Start Report* message **+RESP:GTSRT**
 - 0: Ignition on
 - 2: Ignition on when virtual ignition is checked by accelerometer
- In the message of harsh behavior monitoring message **+RESP:GTHBM**
 - 0: Harsh braking behavior
 - 1: Harsh acceleration behavior
- In the message of *Drive Report* message **+RESP:GTDRV**
 - 0: Normal fixed report.

For the rest of the messages, it will always be 0.

- ✧ **<Number>**: The number of the GPS positions included in the message. Generally, it equals to 1.
- ✧ **<GPS Accuracy>**: The HDOP defined in NMEA0183 (The National Marine Electronics

Association (NMEA) is a non-profit association of manufacturers, distributors, dealers, educational institutions, and others interested in peripheral marine electronics occupations. The NMEA 0183 standard defines an electrical interface and data protocol for communications between marine instrumentation.). The range of the value is 0 – 50. Here 0 means no GPS fix.

- ✧ <Speed>: The current speed. Unit: km/h
- ✧ <Azimuth>: The azimuth of the GPS fix.
- ✧ <Altitude>: The height above the sea level.
- ✧ <Longitude>: The longitude of the current position.
- ✧ <Latitude>: The latitude of the current position.
- ✧ <GPS UTC Time>: The UTC time from the GPS chip.
- ✧ <MCC>: Mobile country code. It is 3-digit in length and ranges from 000 to 999. If bit 3 is not set to 1 in field <Report Item Mask> within **AT+GTCFG**, the length of this field is 0 in ASCII format message.
- ✧ <MNC>: Mobile network code. It is 3-digit in length and ranges from 000 to 999. If bit 3 is not set to 1 in field <Report Item Mask> within **AT+GTCFG**, the length of this field is 0 in ASCII format message.
- ✧ <LAC>: Location area code in hex format.
- ✧ <Cell ID>: Cell ID in hex format.
- ✧ <Mileage>: The current total mileage.

➤ **+RESP:GTFRI,**

If fixed report is enabled, the device will send the message **+RESP:GTFRI** to the backend server according to the working mode.

Example:

+RESP:GTFRI,FE110A,866425030925657,gv50m,13198,10,1,1,57.9,301,21.1,114.005392,22.543286,20190923041230,0460,0000,27BD,134D,,13661.1,00031:59:04,0,220100,,,20190923121228,5516\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power VCC	<=5	0 – 32000 mV	
Report ID/Report Type	2	X(1-6)X(0-7)	
Number	1	1	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	

Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Battery Percentage	<=3	0 – 100	
Device Status	6	000000 – FFFFFFFF	
Reserved	0		
Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <External Power VCC>: Use command **AT+GTEPS** to decide whether to send the external power supply voltage periodically with FRI report or not. If not, this field will be empty.
- ✧ <Report ID/Report Type>: Indicate the working mode of the fixed report and the type of the message.

Report ID has six meanings as below.

- 1: Fixed timing report.
- 2: Fixed distance report.
- 3: Fixed mileage report.
- 4: Fixed timing and mileage report.
- 5: Fixed timing or mileage report.
- 6: Auto fixed reporting.

Report type has six meanings as below.

- 0: The normal fixed report.
- 1: Corner report which indicates that the device just turns around a corner.
- 2: FRI report frequency change which indicates that the terminal enters into Geo-Fence status or known/unknown roaming status.

- 3: Corner report when FRI report frequency changed.
 - 4: Mileage report when fixed report is mode 5.
 - 5: Reserved.
 - 6: Mileage report when fixed report is mode 5 and FFC works.
- ✧ **<Number>**: The number of the GPS position included in the message. Generally, it equals to 1.
- ✧ **<Hour Meter Count>**: If hour meter counter function is enabled by the command **AT+GTHMC**, total hours will be counted when engine is on and will be reported in this field. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00 to 99999:00:00. If the function is disabled, this field will be empty.
- ✧ **<Backup Battery Percentage>**: The current volume of the backup battery in percentage.
- ✧ **<Device Status>**: The state of the device. The left two bits indicate the current motion state of the device, the middle two bits indicate the input ports status and the right two bits indicate the output ports status.

The current status of the device

- 16 (**Tow**): The device attached vehicle is ignition off and it is towed.
- 1A (**Fake Tow**): The device attached vehicle is ignition off and it might be towed.
- 11 (**Ignition Off Rest**): The device attached vehicle is ignition off and it is motionless.
- 12 (**Ignition Off Motion**): The device attached vehicle is ignition off and it has been moving before it is regarded as being towed.
- 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motionless.
- 22 (**Ignition On Motion**): The device attached vehicle is ignition on and it is moving.
- 41 (**Sensor Rest**): The device attached vehicle is motionless without ignition signal detected.
- 42 (**Sensor Motion**): The device attached vehicle is moving without ignition signal detected.

The input ports status: A bitwise hex integer to represent the logical status of the digital input. From the lowest bit to the highest bit, each bit represents ignition detection and one of the digital inputs respectively. For each bit, 0 means disable status, 1 means enable status.

The output ports status: A bitwise hex integer to represent the logical status of the digital output. From the lowest bit to the highest bit, each bit represents one of the digital outputs 1 – 2 respectively. For each bit, 0 means disable status, 1 means enable status.

➤ **+RESP:GTEPS,**

If the external power supply monitoring is enabled by the command **AT+GTEPS**, the device will send the message **+RESP:GTEPS** to the backend server when the voltage of the external power supply enters the alarm range.

Example:

```
+RESP:GTEPS,FE110A,866425030925657,gv50m,11985,11,1,1,0,0,0,133.9,113.827046,22.686177,20190923054415,0460,0000,2869,0F5D,,13694.8,20190923134416,5617$
```

Parameter	Length (Byte)	Range/Format	Default
-----------	---------------	--------------	---------

Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
External Power/Analog Input VCC	<=5	0 – 32000 mV	
Report ID/Report Type	2	X(1)X(1-4)	
Number	1	0 – 1	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <External Power/Analog Input VCC>: The value of the external power supply voltage or the analog input voltage. When the voltage of the analog input meets the alarm condition as set by command **AT+GTEPS**, the device will send the current analog input voltage along with **+RESP:GTEPS** message to the backend server
- ✧ <Report ID/Report Type>: The report ID and the type of the report type in hex format. 4 high bits mean report ID and 4 low bits means report type.
Report ID has different meanings in these two messages.
 - The ID of analog input port which triggers message +RESP:GTEPS. The value is 1.
 Report type has two meanings as below.

- 0: Outside of the predefined range.
- 1: Inside of the predefined range.

✧ <Number>: The number of the GPS positions included in the message. Generally, it equals to 1.

➤ **+RESP:GTGIN**

➤ **+RESP:GTGOT**

If Geo-Fence is configured and enabled, the device will send the message **+RESP:GTGIN** to the backend server according to the settings when the device enters the Geo-Fence and will send **RESP:GTGOT** when the device exits the Geo-Fence.

Example:

```
+RESP:GTGIN,FE110A,866425030925657,gv50m,,,0,F,,,,,1,1,98.5,131,10.9,113.847652,22.6304
07,20190923062204,0460,0000,286C,0F8E,,13705.9,20190923142205,5662$
+RESP:GTGOT,FE110A,866425030925657,gv50m,,,0,F,,,,,1,1,113.8,311,14.4,113.846625,22.63
1442,20190923044916,0460,0000,261A,0DF4,,13687.2,20190923124913,55C0$
```

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved	0		
Reserved	0		
Area Type	1	0-1	
GEO ID Group	<=5	20bit 1-FFFF (GEOID 0 – 19)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Number	1	1	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	

Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Area Type>: 0-Polygon GEO; 1-Circle GEO.
- ✧ <GEO ID Group>: The bitwise mask for trigger condition composition of the corresponding GEO ID. Each bit, from bit 0 to bit 19, represents the logical status of the corresponding GEO ID to trigger the entering or exiting event. 1 means that the event of the GEO ID set has been triggered and 0 means has not.

➤ **+RESP:GTGES**

Report **+RESP:GTGES** according to trigger mode and trigger report in **AT+GTGEO** after ignition off.

Example:

+RESP:GTGES,FE110A,868446032529642,gv50m,,0,1,21,50,5,1,2,0,0,0,138.2,114.015396,22.537385,20190927025006,0460,0000,2493,1505,,,20190927025008,0E26\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Trigger GEO ID	<=2	0-19	
Trigger GEO Enable	1	0 1	
Trigger Mode	<=3	0 21 22	
Radius	<=7	50 – 6000000m	

Check Interval	<=5	0 5 – 86400sec	
Number	1	1	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Trigger GEO ID>: The ID of Geo-Fence. The range is 0 – 19.
- ✧ <Trigger GEO Enable>: Current Parking-Fence is active or inactive.
 - 0 Current Parking -Fence is inactive.
 - 1 Current Parking -Fence is active.

➤ **+RESP:GTLBC,**

If the bit 4 or bit 5 of <location request mask> in command **AT+GTCFG** is set to 1, the device will get and send the current position to the backend server by the message **+RESP:GTLBC** when there is a location request.

Example: +RESP:GTLBC,FE110A,868446032529642,gv50m,18565723845,1,2,0.0,0,479.5,114.019486,22.537630,20190927032555,0460,0001,253D,AEC3,,20190927032557,0E9E\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
Original Number	<=20	phone number	
Number	1	1	1
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Original Number>: The phone number that triggers the message.

3.3.2. Device Information Report

If the device information report function is enabled by the command **AT+GTCFG**, the device will send the device information by the message **+RESP:GTINF** to the backend server periodically.

➤ **+RESP:GTINF,**

Example: +RESP:GTINF,FE110A,868446032529642,,41,898604411918C3691851,14,0,1,,,0.00,0,1,,,20190925070545,1,,,00,00,,,20190925070545,0009\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11 12 21 22 41 42 1A 16	
ICCID	20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
CSQ RSSI	<=2	0 – 31	
CSQ BER	<=2	0 – 7 99	
External Power Supply	1	0 1	
External Power VCC	<=5	0 – 32000mV	
Reserved	0		
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0 1	
LED On	1	0 1	
QCSQ Sysmode	1	0 – 3	
GSM/LTE RSSI	<=4	-120 – 0	
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
IO Mode	1	0-1	
LTE RSRP	<=3	-140 – -40 0	
LTE SINR	<=3	0 – 250	
Digital Input	2	00 – 03	
Digital Output	2	00 – 03	
LTE RSRQ	<=4	-20 – 3 dB	
Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <State>: The current motion state of the device.

- 16 (**Tow**): The device attached vehicle is ignition off and it is towed.
- 1A (**Fake Tow**): The device attached vehicle is ignition off and it might be towed.
- 11 (**Ignition Off Rest**): The device attached vehicle is ignition off and it is motionless.
- 12 (**Ignition Off Motion**): The device attached vehicle is ignition off and it has been moving before it is regarded as being towed.
- 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motionless.

- 22 (**Ignition On Motion**): The device attached vehicle is ignition on and it is moving.
- 41 (**Sensor Rest**): The device attached vehicle is motionless without ignition signal detected.
- 42 (**Sensor Motion**): The device attached vehicle is moving without ignition signal detected.

✧ <CSQ RSSI>: The signal strength level.

CSQ RSSI	Signal Strength (dBm)
0	<-133
1	-111
2 – 30	-109 – -53
31	>-51

- ✧ <CSQ BER>: The quality of the network signal. The range is 0-7 and 99 means unknown.
- ✧ <External Power Supply>: Whether the external power supply is connected.
- 0: External Power Supply not connected.
 - 1: External Power supply connected.
- ✧ <External Power Supply VCC>: The voltage of the external power supply.
- ✧ <Backup Battery VCC>: The voltage of the backup battery. The value of this field is only valid when the external power is not connected.
- ✧ <Charging>: Whether the backup battery is being charged when the main power supply is connected.
- 0: Not charging
 - 1: Charging
- ✧ <Last Fix UTC Time>: The UTC time of the latest successful GPS fixing.
- ✧ <Digital Input>: A bitwise hex integer to represent the logical status of the digital input. From the lowest bit to the highest bit, each bit represents ignition detection and one of the digital inputs respectively. For each bit, 0 means disable status, 1 means enable status.
- ✧ <Digital Output>: A bitwise hex integer to represent the logical status of the digital output. From the lowest bit to the highest bit, each bit represents one of the digital outputs 1 – 2 respectively. For each bit, 0 means disable status, 1 means enable status
- ✧ <QCSQ Sysmode>: A string type value indicating the service mode in which the MT will unsolicitedly report the signal strength.
- 0: NOSERVICE mode
 - 1: GSM/GPRS/EDGE mode
 - 2: LTE Cat M1 mode
 - 3: LTE Cat NB1 mode
- ✧ <GSM/LTE RSSI>: An integer indicating the received signal strength. These parameters are available for GSM and LTE mode respectively.
- ✧ <LTE RSRP>: An integer indicating the reference signal received power (RSRP). This parameter is available for LTE mode.
- ✧ <LTE SINR>: An integer indicating the signal to interference plus noise ratio (SINR). Logarithmic value of SINR. Values are in 1/5th of a dB. The range is 0-250, which translates to -20dB - +30dB.
- ✧ <LTE RSRQ>: An integer indicating the reference signal received quality (RSRQ) in dB.

3.3.3. Report of Real Time Querying

3.3.3.1. +RESP:GTGPS

After the device receives the command **AT+GTRTO** to read the GPS information, it will send the GPS information to the backend server by the message **+RESP:GTGPS**.

➤ **+RESP:GTGPS**,

Example:

+RESP:GTGPS,FE110A,868446032529642,gv50m,,,,006F,,,20190927033516,20190927033518,0EBE\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Reserved	0		
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Reserved	0		
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ *<Report Item Mask>*: Refer to *<Report Item Mask>* of **AT+GTCFG** command.

3.3.3.2. +RESP:GTALM

After the device receives the command **AT+GTRTO** to read all the configurations, it will send all configurations to the backend server by the message **+RESP:GTALM**. This message is only sent via GPRS/LTE even if the report mode is Force on SMS. If the message's length is too long, then it will be sub-packaged into several **+RESP:GTALM** messages. The **+RESP:GTALM** does not support HEX report.

➤ **+RESP:GTALM,****Example:**

```
+RESP:GTALM,FE110A,868446032529642,gv50m,10,1,BSI,10569.mcs,,,,,1,3,0,SRI,3,,1,218.17.4
6.11,68,,0,18571675609,0,0,0,0,,,CFG,,gv50m,0,0,0,,,006F,0,,3DEF,0,1,1,60,10,,0,0,,1,,,,,,TO
W,1,10,0,30,0,0,0,0,1,3,3,,,,,,EPS,0,250,450,,6,0,0,0,0,0,200,,,DIS,0,,,,1,1,,,,,,OUT,0,0,0,
,,,IOB,0,2,2,0,0,0,0,0,,,,,1,2,2,0,0,0,0,0,,,,,2,0,0,0,0,0,0,0,,,,,3,0,0,0,0,0,0,0,,,,,TMA,+,0,0,0,,,,,FRI,
1,0,,1,0000,0000,,30,1000,1000,,0,60,0,,,,,20190927034442,0EE1$
```

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Total Packets	2	10	
Current Packet	<=2	1 – 10	
Configurations	< 1500		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ **<Total Packets>**: The total number of **+RESP:GTALM**.
- ✧ **<Current Packet>**: The sequence number of current packet.
- ✧ **<Configurations>**: The current configuration of the device. The 1st message contains configuration for the commands from **BSI** to **FRI**, the 2nd is for the commands from **GEO** to **DOG**, the 3rd is for the commands from **IDL** to **FFC**, the 4th is for the commands from **PDS** to **AVS**, the 5th is for the commands from **RMD**, the 6th to 9th messages are for the command **PEO**, the 10th is for the commands from **ASC** to **GLM**.

Note: The length of every **+RESP:GTALM** message (including header and tail) should be no more than 1500 characters.

3.3.3.3. +RESP:GTALC

After the device receives the command **AT+GTRTO** to read the configurations, it will send corresponding configuration information to the backend server by the message **+RESP:GTALC** according to the configuration mask. This message is only sent via GPRS/LTE even if the report mode is Force on SMS. The **+RESP:GTALC** does not support HEX report.

➤ **+RESP:GTALC,****Example:**

```
+RESP:GTALC,FE110A,868446032529642,gv50m,FFFFFFFFFFFFFFFF,1,1,BSI,10569.mcs,,,,,1,3,0,
SRI,3,,1,218.17.46.11,68,,0,18571675609,0,0,0,0,,CFG,,gv50m,0,0,0,,006F,0,,3DEF,0,1,1,60,10,
,0,0,,1,,,,,,,,TOW,1,10,0,30,0,0,0,0,1,3,3,,,,,,,,EPS,0,250,450,,6,0,0,0,0,0,200,,DIS,0,,,,1,1,,1,,,
,,,,,,,,OUT,0,0,0,,,IOB,0,2,2,0,0,0,0,0,,,,,1,2,2,0,0,0,0,0,,,,,2,0,0,0,0,0,0,0,,,,,3,0,0,0,0,0,0,0,,,,TM
A,+,0,0,0,,,,FRI,1,0,,1,0000,0000,,30,1000,1000,,0,60,0,,,,GEO,0,0,114.015396,22.537385,50,5,
0,0,0,0,21,1,,1,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,2,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,
,3,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,4,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,5,0,0.000000
0,0.000000,50,0,0,0,0,0,0,0,,6,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,7,0,0.000000,0.000000,5
0,0,0,0,0,0,0,0,,8,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,9,0,0.000000,0.000000,50,0,0,0,0,0,0,
0,,10,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,11,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,12,0,0.
000000,0.000000,50,0,0,0,0,0,0,0,,13,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,14,0,0.000000,0.
000000,50,0,0,0,0,0,0,0,,15,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,16,0,0.000000,0.000000,50
,0,0,0,0,0,0,0,,17,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,18,0,0.000000,0.000000,50,0,0,0,0,0,
0,0,,19,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,SPD,0,0,0,60,300,0,0,0,0,,,,,,,,,SOS,1,1,,0,0,0,0
,,,,,20190927034139,0ED2$
```

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Configuration Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Next Packet	1	0-1	0
Current Packet	<=2	1-20	1
BSI	3	BSI	BSI
APN	<=40		
APN User Name	<=30		
APN Password.	<=30		
Backup APN	<=40		
Backup APN User Name	<=30		
Backup APN Password	<=30		
Network Mode/APN Authentication Methods	2		
LTE mode	1		
Manual Netreg	1		
SRI	3	SRI	SRI

Report Mode	1	0 – 7	0
Reserved	0		
Buffer Mode	1	0 1 2	1
Main Server IP/Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP/Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0 5 – 360min	0
Enable SACK	1	0 1 2	0
Protocol Format	1	0 1	0
Enable SMS ACK	1	0 1	0
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4–7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Enable ODO	1	0 1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
Reserved	0		
Reserved	0		
Report Component Mask	4	0000 – FFFF	003F
Power Saving Mode	1	0 – 2	1
Reserved	0		
Event Mask	4	0000 – FFFF	7FFF
IO Mode	1	0-1	0
LED On	1	0 1	0
Enable Info Report	1	0 1	0
Info Report Interval	<=5	30 – 86400sec	300

Location request mask	1	00 20	00
Reserved	0		
Backup Battery Charge Mode	1	0 1	0
AGPS Mode	1	0 1	0
Reserved	0		
GPS Lost Time	2	0 – 30min	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TOW	3	TOW	TOW
Tow Enable	1	0 1	0
Tow Detection Time	<=2	5 – 15min	10
Fake Tow Delay	<=2	0 – 10min	1
Tow Interval	<=5	30 – 86400sec	300
Output ID	1	0 - 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Rest Duration	<=3	1 – 255(×15sec)	2
Motion Duration	<=2	1 – 10(×100ms)	3
Motion Threshold	1	2 – 6	3
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0 1 2	0
Min. Threshold	≤ 5	250 – 32000 mV	250
Max. Threshold	≤ 5	250 – 32000 mV	250
Reserved	0		
Debounce Time	1	0 – 5($\times 1s$)	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	≤ 3	0 – 255($\times 100ms$)	0
Toggle Times	≤ 3	0 – 255	0
Sync with FRI	1	0 1	0
Hysteresis Error	≤ 4	0 – 2000 mV	200
Reserved	0		
Reserved	0		
DIS	3	DIS	DIS
Ignition Detection	1	0	0
Reserved	0		
Reserved	0		
Reserved	0		
Input ID 1	1	1	1
Enable	1	0 1	0
Reserved	0		
Validity Time	≤ 2	0 1 – 12($\times 2s$)	0

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OUT	3	OUT	OUT
DOS Report	1	0-3	0
Long Operation1	<=3	0 – 120min	0
Long Operation2	<=3	0 – 120min	0
Reserved	0		
Reserved	0		
Reserved	0		
IOB	3	IOB	IOB
IOB ID0	1	0	0
Input Mask	2	00 – 03	00
Trigger Mask	2	00– 03	00
Input Sample Period	<=2	0 1 – 12(×2s)	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
IOB ID1	1	1	1
Input Mask	2	00 – 03	00
Trigger Mask	2	00– 03	00
Input Sample Period	<=2	0 1 – 12(×2s)	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID2	1	2	2
Input Mask	2	00 – 03	00
Trigger Mask	2	00– 03	00
Input Sample Period	<=2	0 1 – 12(×2s)	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID3	1	3	3
Input Mask	2	00 – 03	00
Trigger Mask	2	00– 03	00
Input Sample Period	<=2	0 1 – 12(×2s)	0

Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TMA	3	TMA	TMA
Sign	1	+ -	+
Hour Offset	<=2	0-12	00
Minute Offset	<=2	0-59	00
Daylight Saving	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 5	0
Discard No Fix	<=2	0 1	1
Reserved	0		
Enable Period	1	0 1	1
Begin Time	4	HHMM	0000
End Time	4	HHMM	0000
Reserved	0		
Send Interval	<=5	0 5 – 86400sec	30
Distance	<=5	300 – 65535m	1000
Mileage	<=5	300 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 – 180	0

IGF Report Interval	<=5	0 5-86400sec	600
Auto Report Interval	<=5	0 5-90000	82800
Reserved	0		
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID2	1	2	2
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID3	1	3	3
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0

Reserved	0		
Reserved	0		
GEO ID4	1	4	4
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID5	1	5	5
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		

GEO ID6	1	6	6
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID7	1	7	7
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID8	1	8	8
Mode	1	0 – 3	0

Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID9	1	9	9
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID10	2	10	10
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000

Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID11	2	11	11
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID12	2	12	12
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0

Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID13	2	13	13
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID14	2	14	14
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0

Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID15	2	15	15
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID16	2	16	16
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID17	2	17	17
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID18	2	18	18
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0

Reserved	0		
Reserved	0		
GEO ID19	2	19	19
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	0.000000
Latitude	<=10	(-)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
SPD	3	SPD	SPD
Mode	1	0 1 2 3 4	0
Min Speed	<=3	0 – 400km/h	0
Max Speed	<=3	0 – 400km/h	0
Validity	<=4	15 – 3600sec	60
Send Interval	<=4	30 – 3600sec	300
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 2	0
Digital Input ID	1	0 – 1	0
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	1		
Reserved	1		
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
Enable Auto Unlock PIN	1	0 1	0
PIN	4-8	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OWH	3	OWH	OWH
Mode	1	0 1 2 3	0
Day of Work	<=2	0 – 7F	1F

Working Hours Start1	4	HHMM	0900
Working Hours End1	4	HHMM	1200
Working Hours Start2	4	HHMM	1300
Working Hours End2	4	HHMM	1800
Reserved	0		
Reserved	0		
Digital Input ID	1	0 – 1	0
Digital Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0 1 2	1
Ignition Frequency	<=3	10 – 120min	60
Interval	<=2	1 – 30	7
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0 1	1
Input ID	1	0-1	0
Unit	1	0 1	0
No Network Interval	4	0 5-1440 min	480
No Activation Interval	4	0 5-1440 min	480
Send Failure Timeout	4	0 5-1440 min	480
IDL		IDL	IDL
Mode	1	0 1	0
Time to Stationary	<=2	1 – 30 min	2

Time to Movement	1	1 – 5 min	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
IDF after IGF	1	0-1	0
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
Mode	1	0 -1	0
Acceleration Threshold 1	<=3	10-999(cm/s/s)	150
Acceleration Threshold 2	<=3	10-999(cm/s/s)	200
Acceleration Threshold 3	<=3	10-999(cm/s/s)	250
Acceleration Threshold 4	<=3	10-999(cm/s/s)	300
Harsh Acceleration Duration	<=2	10-50(*10ms)	50
Braking Threshold 1	<=3	10-999(cm/s/s)	150
Braking Threshold 2	<=3	10-999(cm/s/s)	200
Braking Threshold 3	<=3	10-999(cm/s/s)	250
Braking Threshold 4	<=3	10-999(cm/s/s)	300
Harsh Braking Duration	<=2	10-50(*10ms)	50
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0

Output Status	1	0 1	
Duration	<=3	0~255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Enable Hour Meter	1	0 1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GAM	3	GAM	GAM
Mode	1	0 1	1
Speed Mode	1	0 1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GPS Fix Failure Timeout	<=4	5-1800	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
WLT	3	WLT	WLT

Number Filter	1	0 1 2	7
White Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HRM	3	HRM	HRM
Reserved	0		
Reserved	0		
ACK Mask	2	'0' – '9' 'a' – 'f' 'A' – 'F'	7F
Response Mask	8	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFFFFFF
Event Mask	8	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFFFFFF
Information Mask	<=8	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFF
HBD Mask	2	'0' – '9' 'a' – 'f' 'A' – 'F'	FF
DAT Mask	<=8	00000000 – FFFFFFFF	7F
CRD Mask	4	0000–FFFF	7F
LGN MASK	4	0000–FFFF	FF
Reserved	0		
FFC	3	FFC	FFC
Priority	1	0	0
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0 5-86400s	300
Reserved	0		
Corner Report	<=3	0 – 180	0
Reserved	0		
Reserved	0		

Priority	1	1	1
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0 5-86400s	300
Reserved	0		
Corner Report	<=3	0 – 180	0
Reserved	0		
Reserved	0		
Priority	1	2	2
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0 5-86400s	300
Reserved	0		
Corner Report	<=3	0 – 180	0
Reserved	0		
Reserved			
Priority	1	3	3
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0 5-86400s	300
Reserved	0		

Corner Report	<=3	0 – 180	0
Reserved	0		
Reserved	0		
Priority	1	4	4
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0 5-86400s	300
Reserved	0		
Corner Report	<=3	0 – 180	0
Reserved	0		
Reserved	0		
SSR	3	SSR	SSR
Mode	1	0 1	0
Time to Stop	<=2	1 – 30 min	2
Time to Start	1	1 – 5 min	1
Start Speed	<=2	1 – 10 Km/h	5
Long Stop	<=5	0 – 43200 min	0
Reserved	0		
Reserved	0		
Reserved	0		
PDS	3	PDS	PDS
Mode	1	0 1 2	0
Mask	<=4	0000-07FF	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
PCS	3	PCS	PCS
Enable PPP Deactivation	1	0 1	1
Time to Deactivate	≤ 5	0 – 65535s	900
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CRA	3	CRA	CRA
Mode	1	0-1	0
Sensitivity	≤ 2	1-99(0.1g)	7
Gsensor data Pre-Crash	1	1-5	3
Gsensor data Post-Crash	1	1-5	3
Gsensor Sample Frequency	1	0 - 1	1
Reserved	0		
GPS Data Pre-Crash	≤ 2	0-10(s)	10
GPS Data Post-Crash	≤ 2	0-10(s)	10
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 1	
Duration	≤ 3	0~255(×100ms)	0
Toggle Times	≤ 3	0 – 255	0
Reserved	0		
BZA	3	BZA	BZA
Output ID	1	0-2	0
Reserved	0		
Reserved	0		

Reserved	0		
Alarm 1 Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	0
Toggle Times	≤ 3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 2 Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	0
Toggle Times	≤ 3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 3 Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	0
Toggle Times	≤ 3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 4 Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	0
Toggle Times	≤ 3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SPA	3	SPA	SPA
Mode	1	0 1 2	0
Speed Threshold 1	≤ 3	0 – 400km/h	50

Reserved	0		
Validity	≤ 4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 2	≤ 3	0 – 400km/h	70
Reserved	0		
Validity	≤ 4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 3	≤ 3	0 – 400km/h	90
Reserved	0		
Validity	≤ 4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 4	≤ 3	0 – 400km/h	110
Reserved	0		
Validity	≤ 4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
RMD	3	RMD	RMD

Mode	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Home Operator List	$\leq 6 \times 10$		
Reserved	0		
Reserved	0		
Roaming Operator List	$\leq 6 \times 100$		
Reserved	0		
Reserved	0		
Black Operator List	$\leq 6 \times 20$		
Reserved	0		
Reserved	0		
Known Roaming Event Mask	≤ 4	0000 – 7FFF	7FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	≤ 4	0000 – 7FFF	7FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 1	
Duration	≤ 3	0 ~ 255($\times 100\text{ms}$)	0
Toggle Times	≤ 3	0 – 255	0
Reserved	0		
Reserved	0		
PEO	3	PEO	PEO

PEO ID	1	0 – 19	0
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
...			
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GLM	3	GLM	GLM
Google Mode	1	0 1 2 3	0
Direct Number List	<=20*3		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
VMS	3	VMS	VMS
Virtual Ignition Mode	1	0 2	3
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
VVS	3	VVS	VVS

Reserved	0		
Reserved	0		
Reserved	0		
IGN Debounce	<=3	1-255(s)	1
IGF Debounce	<=3	1 -255 (s)	1
Reserved	0		
Reserved	0		
AVS	3	AVS	AVS
Sensor Rest Duration	<=3	1 – 255 sec	120
Sensor Motion Validity	<=3	1 – 255 sec	10
Reserved	0		
Reserved	0		
Reserved	0		
SDS	3	SDS	SDS
Start Report Mode	1	0 1 2	0
Drive Report Mode	1	0-3	0
Drive Report Interval	<=5	0 5 –86400 sec	0
Drive Report Distance	<=5	0 50 – 65535m	0
Drive Report Mileage	<=5	0 50 – 65535m	0
Max. Report Number	<=4	0-9999	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
STP	3	STP	STP
Mode	1	0 1	0
Time to Standard Stop	<=3	0 10 – 240 min	0
Time to Stipulation Stop	<=4	0 240 – 1440 min	0
Time to Abandonment Stop	<=2	0 1 – 30 day	0

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EMR	3	EMR	EMR
Ignition Time	≤ 2	0 20-90s	0
Ignition Count	≤ 2	0 5-60	0
Emergency Release Time	≤ 2	0 1-24h	0
Network Release	1	0-1	0
Release Again Time	≤ 2	1-60 day	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UPC	3	UPC	UPC
Max Download Retries	1	0 – 3	0
Download Timeout	≤ 2	5 – 30 min	10
Download Protocol	1	0	0
Report Enable	1	0 1	0
Update Interval	≤ 4	0 – 8760 hour	0
Download URL	≤ 100	URL	
Mode	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
ASC	3	ASC	ASC
Brake Speed Threshold	≤ 3	18 -250 km/h	50

Delta Speed Threshold	<=2	3 -46 km/h	10
Delta Heading Threshold	1	0-5	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 1	
Duration	<=3	0~255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		

✧ <Next Packet>: Related information packet is complete or not.

- 0: This is a complete information packet.
- 1: This is not a complete information packet.

✧ <Current Packet>: This is the index of **+RESP:GTALC**.

3.3.3.4. +RESP:GTCID

After the device receives the command **AT+GTRTO** to read the ICCID of the SIM card, it will send the ICCID to the backend server by the message **+RESP:GTCID**.

➤ **+RESP:GTCID**,

Example:

+RESP:GTCID,FE110A,868446032529642,gv50m,89860117851087150899,20190927034623,0EF0\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ICCID	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.5. +RESP:GTCSQ

After the device receives the command **AT+GTRTO** to read the GPRS/LTE signal level, it will send the GPRS/LTE signal level to the backend server by the message **+RESP:GTCSQ**.

➤ +RESP:GTCSQ,

Example:

+RESP:GTCSQ,FE110A,868446032529642,gv50m,19,0,20190927034905,0EF8\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CSQ RSSI	<=2	0 – 31	
CSQ BER	<=2	0 – 7 99	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <CSQ RSSI>: The signal strength level.

CSQ RSSI	Signal Strength (dBm)
0	<-133
1	-111
2 – 30	-109 – -53
31	>-51

✧ <CSQ BER>: The quality of the GPRS/LTE signal. The range is 0-7 and 99 means unknown.

3.3.3.6. +RESP:GTVR

After the device receives the command **AT+GTRTO** to get the versions (including firmware version, hardware version and module version), it will send the version information to the backend server by the message **+RESP:GTVR**.

➤ +RESP:GTVR,

Example:

+RESP:GTVR,FE110A,868446032529642,gv50m,GV50M,0606,0104,,BG96,BG96MAR02A07M1G,20190927034931,0EFA\$

Parameter	Length	Range/Format	Default
-----------	--------	--------------	---------

	(Byte)		
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Firmware Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Reserved	0	0	
Modem Hardware Version	<=20		
Modem Software Version	<=50		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Device Type>: The type of the device.
- ✧ <Firmware Version>: The firmware version. The first two characters represent the major version and the last two characters represent the minor version. For example: **010A** means the version GV50M_1713_R20A01V10.
- ✧ <Hardware Version>: The hardware version. The first two characters represent the major version and the last two characters represent the minor version. For example: **010A** means the version **1.10**.
- ✧ <Modem Hardware Version>: The module hardware version.
- ✧ <Modem Software Version>: The software version of the modem.

3.3.3.7. +RESP:GTBAT

After the device receives the command **AT+GTRTO** to read the power supply information, it will send the power supply information to the backend server by the message **+RESP:GTBAT**.

➤ +RESP:GTBAT,

Example: +RESP:GTBAT,FE110A,868446032529642,gv50m,1,,,4.17,0,1,20190927034951,0EFE\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' ' ' _'	
External Power Supply	1	0 1	
External Power VCC	<=5	0 – 32000mV	
Reserved	0		
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0 1	
LED On	1	0 1	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.8. +RESP:GTIOS

After the device receives the command **AT+GTRTO** to get all the IO ports status, it will send the status to the backend server by the message **+RESP:GTIOS**.

➤ +RESP:GTIOS,

Example:			
+RESP:GTIOS,FE110A,868446032529642,gv50m,0,,,00,02,20190927035016,0F00\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' ' ' _'	
IO Mode	1	0-1	
Reserved	0		
Reserved	0		
Digital Input	2	00 – 03	
Digital Output	2	00 – 03	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.9. +RESP:GTTMZ

After the device receives the command **AT+GTRTO** to get the time zone settings, it will send the time zone information by the message **+RESP:GTTMZ** to the backend server.

➤ **+RESP:GTTMZ,**

Example: +RESP:GTTMZ,FE110A,868446032529642,gv50m,+0000,0,20190927035022,0F02\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0 1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.10. +RESP:GTALS

After the device receives the command **AT+GTRTO** to get sub AT command configuration information, it will send the configuration information to the backend server by the message **+RESP:GTALS**. Different AT Command gets different configuration information. For example, to get FRI configuration: **AT+GTRTO=gv50m,2,FRI,0,,,,FFFF\$**

➤ **+RESP:GTALS,**

Example: +RESP:GTALS,FE110A,868446032529642,gv50m,FRI,1,0,,1,0000,0000,,30,1000,1000,,0,60,0,,,,20190929074549,28D6\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub AT Command	3	'a' – 'z' 'A' – 'Z' '	
Mode	1	0 – 4	

Discard No Fix	<=2	0 1	
Reserved	0		
Period Enable	1	0 1	
Start Time	4	HHMM	
End Time	4	HHMM	
Reserved	0		
Send Interval	<=5	5 – 86400sec	
Distance	<=5	50 – 65535m	
Mileage	<=5	50 – 65535m	
Reserved	0		
Corner Report	<=3	0 – 180	
IGF Report Interval	<=5	0 5-86400sec	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.11. +RESP:GTGSV

After the device receives the command **AT+GTRTO** to get the satellites information, it will send the satellites information by the report **+RESP:GTGSV** to the server.

➤ **+RESP:GTGSV,**

Example:			
+RESP:GTGSV,FE110B,868446036599153,gv350m,10,2,21,3,0,5,26,6,35,9,29,12,25,17,40,19,34,23,24,28,0,20190823114146,116C\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	20		

SV Count	2	0-16	
SV ID	2	> =0	
SV Power	2	> =0	
.....			
SV ID	2	> =0	
SV Power	2	> =0	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <SV Count>: The number of satellites.
- ✧ <SV ID>: Satellite ID. When there is no satellite, zero will be filled.
- ✧ <SV Power>: Satellite power. When there is no satellite, zero will be filled.

3.3.4. Event Report

The following event reports are triggered when certain events occur.

- +RESP:GTPNA:** Power on report
- +RESP:GTPFA:** Power off report
- +RESP:GTMPN:** The report for connecting main power supply
- +RESP:GTMPF:** The report for disconnecting main power supply
- +RESP:GTBTC:** Backup battery starts charging report
- +RESP:GTSTC:** Backup battery stops charging report
- +RESP:GTBPL:** Backup battery low
- +RESP:GTSTT:** Device motion state indication when the motion state is changed
- +RESP:GTPDP:** GPRS/LTE connection establishment report
- +RESP:GTIGN:** Ignition on report
- +RESP:GTIGF:** Ignition off report
- +RESP:GTIDN:** Enter into idling status
- +RESP:GTIDF:** Leave idling status
- +RESP:GTGSS:** GPS signal status
- +RESP:GTCRA:** Crash incident report
- +RESP:GTSTR:** Vehicle enters into start status
- +RESP:GTSTP:** Vehicle enters into stop status
- +RESP:GTLSP:** Vehicle enters into long stop status.
- +RESP:GTDOS:** Output status change with waveform 1
- +RESP:GTRMD:** The report for entering or leaving GSM/LTE roaming state
- +RESP:GTUPC:** Reporting information about UPC
- +RESP: GTVGN:** Virtual ignition on report
- +RESP: GTVGF:** Virtual ignition off report
- +RESP: GTASC:** Reporting event of calibration result

In +RESP:GTMPN, +RESP:GTMPF, +RESP:GTBTC, +RESP:GTSTC, +RESP:GTBPL, +RESP:GTSTT, +RESP:GTIGN, +RESP:GTIGF, +RESP:GTVGN, +RESP:GTVGF, +RESP:GTIDN, +RESP:GTIDF, +RESP:GTCRA, +RESP:GTGSS, +RESP:GTSTR, +RESP:GTSTP, +RESP:GTLSP, +RESP:GTDOS and +RESP:GTASC event reports, the last known GPS information and the current GPRS/LTE network information are included.

- +RESP:GTPNA,
- +RESP:GTPFA,
- +RESP:GTPDP,

Example:

```
+RESP:GTPNA,FE110A,868446032529642,,20190925074426,00A9$
+RESP:GTPFA,FE110A,868446032529642,gv50m,20190927035424,0F2E$
+RESP:GTPDP,FE110A,868446032529642,,20190925074510,00AF$
```

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- +RESP:GTMPN,
- +RESP:GTMPF,
- +RESP:GTBTC,

Example:

```
+RESP:GTMPN,FE110A,868446032529642,,1,0,0,0,123.7,114.016376,22.540277,20190925074
133,0460,0000,2493,16F9,,20190925074135,008A$
+RESP:GTMPF,FE110A,868446032529642,,1,0,0,0,123.7,114.016376,22.540277,201909250741
25,0460,0000,2493,16F9,,20190925074127,0089$
+RESP:GTBTC,FE110A,868446032529642,,1,0,0,0,330.2,114.015869,22.538896,201909250744
54,0000,0000,0000,0000,,20190925074456,00AD$
```

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Send Time	0 14	YYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ +RESP:GTCRA,

Example:

+RESP:GTCRA,FE110A,868446032529642,gv50m,1,1,0.0,0,255.4,114.015183,22.536939,20190927035529,0000,0000,253D,AEC3,,20190927035531,0F35\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Crash Counter	<=3	0-255	
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	

GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ +RESP:GTSTC,

Example:

+RESP:GTSTC,FE110A,868446032529642,,,1,0.0,0,137.8,114.015394,22.537344,20190925091842,0460,0000,2493,152D,,20190925091844,014D\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	

Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTBPL,****Example:**

+RESP:GTBPL,FE110A,868446032529642,gv50m,3.72,1,0.0,0,255.4,114.015183,22.536939,20190927050805,0460,0001,253D,AEC3,,20190927050807,0FF0\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Backup Battery VCC	<=4	0.00 – 4.50 V	
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTASC,**

Example:

+RESP:GTASC,FE110A,866425030925657,gv50m,2,9,98,-14,9,-15,-98,-99,8,-10,1,69.1,357,60.1,114.049001,22.665773,20190921012112,0460,0000,27BA,0F0C,,20190921092111,4D54\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Calibration Status	1	1-2	
X_ Forward	<=4	-100-100	
Y_ Forward	<=4	-100-100	
Z_ Forward	<=4	-100-100	
X_ Side	<=4	-100-100	
Y_ Side	<=4	-100-100	
Z_ Side	<=4	-100-100	
X_ Vertical	<=4	-100-100	
Y_ Vertical	<=4	-100-100	
Z_ Vertical	<=4	-100-100	
GPS Accuracy	<=4	0-99.9	
Speed	<=5	0.0 – 999.9 mile/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	\$	\$
----------------	---	----	----

- ✧ **<Calibrated Status>**: A numeric indicates calibration status.
 - 1: Coarse calibrated
 - 2: Calibrated
- ✧ **<X_Forward>, <Y_Forward>, <Z_Forward>**: The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is:

$$X_{new} = \langle X_Forward \rangle * X/100 + \langle Y_Forward \rangle * Y/100 + \langle Z_Forward \rangle * Z/100.$$
- ✧ **<X_Side>, <Y_Side>, <Z_Side>**: The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in side direction Ynew is: $Y_{new} = \langle X_Side \rangle * X/100 + \langle Y_Side \rangle * Y/100 + \langle Z_Side \rangle * Z/100.$
- ✧ **<X_Vertical>, <Y_Vertical>, <Z_Vertical>**: The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in vertical direction Znew is: $Z_{new} = \langle X_Vertical \rangle * X/100 + \langle Y_Vertical \rangle * Y/100 + \langle Z_Vertical \rangle * Z/100.$

➤ **+RESP:GTSTT,**

Example:

+RESP:GTSTT,FE110A,866425030925657,gv50m,21,0,0.0,0,23.2,113.950600,22.568421,20190923043021,0460,0000,2495,116F,,20190923123053,5565\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11 12 21 22 41 42 16	
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	

Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <State>: The current movement state of the device.

- 16 (Tow): The device attached vehicle is ignition off and it is towed.
- 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
- 12 (Ignition Off Motion): The device attached vehicle is ignition off and it has been moving before it is regarded as being towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless
- 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
- 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
- 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

➤ +RESP:GTIGN

Example:

+RESP:GTIGN,FE110A,866425030925657,gv50m,168,0,0,0,0,23.2,113.950600,22.568421,20190923043021,0460,0000,2495,116F,,00032:14:37,13670.4,20190923123053,5566\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Duration of Ignition Off	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	

LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Duration of Ignition Off>: Duration since last ignition off. If it is greater than 999999 seconds, 999999 seconds will be reported.
- ✧ <Hour Meter Count>: If hour meter counter function is enabled by the command **AT+GTHMC**, total hours counted when engine is on will be reported in this field. If the function is disabled, this field will be reserved. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00 to 99999:00:00.

➤ +RESP:GTIGF

Example:

+RESP:GTIGF,FE110A,866425030925657,gv50m,1478,1,0.0,0,20.2,113.824313,22.669371,20190923045534,0460,0000,286C,1222,,00032:39:13,13692.8,20190923125531,55E1\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition On	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	

MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ *<Duration of Ignition On>*: Duration since last ignition on. If it is greater than 999999 seconds, 999999 seconds will be reported.
- ✧ *<Hour Meter Count>*: If hour meter counter function is enabled by the command **AT+GTHMC**, total hours counted when engine is on will be reported in this field. If the function is disabled, this field will be reserved. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00 to 99999:00:00.

➤ **+RESP:GTVGN,**

Example:

+RESP:GTVGN,FE110A,868446032529642,gv50m,2,923,1,0.0,0,272.6,114.016065,22.537606,20190927060647,0460,0001,253D,AEC3,,,,20190927060649,1066\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Virtual Ignition Mode	1	2	
Duration of Ignition off	<=6	0 – 999999 sec	
GPS Accuracy	<=4	0-99.9	
Speed	<=5	0.0 – 999.9 mile/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	

MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Virtual Ignition Mode>:

- 2: Accelerometer Virtual Ignition

➤ +RESP:GTVGF,

Example:

+RESP:GTVGF,FE110A,868446032529642,gv50m,2,13,1,0,0,0,137.7,114.015689,22.537363,20190927060700,0460,0001,253D,AEC3,,,,20190927060702,106A\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Virtual Ignition Mode	1	2	
Duration of Ignition On	<=6	0 – 999999 sec	
GPS Accuracy	<=4	0-99.9	
Speed	<=5	0.0 – 999.9 mile/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	

MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ +RESP:GTIDN,

Example:

+RESP:GTIDN,FE110A,868446032529642,,,,1,0,0,0,115.5,114.015407,22.537189,20190925073404,0460,0000,2493,1767,,,20190925073407,0062\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	

LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ +RESP:GTIDF,

Example:

+RESP:GTIDF,FE110A,868446032529642,,11,120,1,0,0,0,161.8,114.015517,22.537192,20190925073258,0460,0000,2493,1767,,,20190925073301,005C\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion State	2	11 12 1A 16 22	
Duration of Idling Status	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	

Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Motion State>: The current motion state when the vehicle exits idling status.
- ✧ <Duration of Idling Status>: The time that the vehicle has been in idling status. If it is greater than 999999 seconds, 999999 seconds will be reported.

➤ +RESP:GTGSS

Example:

+RESP:GTGSS,FE110A,868446032529642,,0,,21,,0,0,0,115.5,114.015407,22.537189,20190925073522,0460,0000,2493,16F9,,20190925073623,0069\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Signal Status	1	0 1	
Satellite Number	2	0 - 24	
Device State	2	11 12 21 22 41 42 16	
Reserved	0		
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		

Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <GPS Signal Status>: 0 means GPS signal lost or GPS fix failed; 1 means GPS signal has recovered and GPS fix succeeded.
- ✧ <Satellite Number>: The number of the visible satellites when fix succeeded. If fix failed, the parameter is reserved.
- ✧ <Device State>: The current movement state of the device.
 - 16 (Tow): The device attached vehicle is ignition off and it is towed.
 - 11 (Ignition off Rest): The device attached vehicle is ignition off and it is motionless.
 - 12 (Ignition off Motion): The device attached vehicle is ignition off and has been moving before it is regarded as being towed.
 - 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
 - 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
 - 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
 - 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

➤ +RESP:GTSTR,

➤ +RESP:GTSTP,

➤ +RESP:GTLSP,

Example:

+RESP:GTSTR,FE110A,866425030925657,gv50m,,,1,54.6,176,18.9,113.823588,22.679741,20190923061344,0460,0000,2869,0F5D,,13698.7,20190923141345,563F\$

+RESP:GTSTP,FE110A,866425030925657,gv50m,,,1,0.0,0,23.2,113.950600,22.568421,20190923043021,0460,0000,2495,116F,,13670.4,20190923123018,5564\$

+RESP:GTLSP,FE110A,866425030925657,gv50m,,,1,0.0,0,21.0,113.824304,22.669416,20190923052711,0460,0000,286D,1023,,13692.8,20190923132708,55F6\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' ' ' ' _ '	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	

Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ +RESP:GTDOS

Example:

+RESP:GTDOS,FE110A,868446032529642,gv50m,2,1,1,0,0,0,395.8,114.016484,22.538018,20190927055042,0460,0001,253D,AEC3,,20190927055044,102A\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Wave1 Output ID	1	1-2	
Wave1 Ouput Active	1	0 1	
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	

GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0 4	0XXX	
MNC	0 4	0XXX	
LAC	0 4	XXXX	
Cell ID	0 4 8	XXXXXXXX	
Reserved	0		
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Wave1 Output ID>: ID of the output with waveform 1

➤ <Wave1 Output Active>: The output status with waveform 1+RESP:GTRMD,

Example:
+RESP:GTRMD,FE110A,868446032529642,gv50m,2,1,0,0,0,272.6,114.016065,22.537606,20190927055300,0460,0001,253D,AEC3,,20190927055302,103D\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Roaming State	1	0-3	
GPS Accuracy	<=2	0 1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	

Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ **<Roaming State>**: A numeral to indicate the roaming state.

- 0: Home
- 1: Known roaming
- 2: Unknown roaming
- 3: Blocking report

➤ **+RESP:GTUPC:**

Example: +RESP:GTUPC,FE110A,868446032529642,,000,202,http://218.17.46.11:9146/GV50M/deltabin/111.ini,20190925071642,0029\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Command ID	<=3		
Result	3	100 101 102 103 200 201 202 300 301 302	
Download URL	<=100	Complete URL	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ **<Command ID>**: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It is the total number of the commands when the response code is 301. It is wrong format of command ID when the response code is 302.

✧ **<Result>**: A numeral to indicate whether the configuration is updated successfully.

- 100: The update command is starting.
- 101: The update command is confirmed by the device.
- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.

- 202: The device fails to download the package.
 - 300: The device starts to update the device configuration.
 - 301: The device finishes updating the device configuration successfully.
 - 302: The device fails to update the device configuration.
- ✧ *<Download URL>*: The complete URL to download the configuration. It includes the file name.

3.3.5. Buffer Report

If the buffer report function is enabled by command **AT+GTSRI**, the terminal will save the messages in a local buffer when the following occurs.

- ✧ No GPRS/LTE signal.
- ✧ Failed to activate GPRS/LTE context for the TCP or UDP connection.
- ✧ GPRS/LTE Failed to establish the TCP connection with the backend server.

These messages will be sent to the backend server when connection to the server recovers. The buffer reports are saved to the built-in non-volatile memory in case the device is reset. The terminal can buffer up to 10000 messages.

Detailed information about buffer report is listed below.

- ✧ Only **+RESP** messages are buffered.
- ✧ In the buffer report, the original header string "**+RESP**" is replaced by "**+BUFF**". Other content such as the original sending time and count number will be kept the same.
- ✧ Buffered messages will be sent only via GPRS/LTE by TCP or UDP protocol. They cannot be sent via SMS. If the current report mode is Force on SMS, the buffered messages will not be sent until the report mode is changed to TCP or UDP.
- ✧ The buffered messages will be sent after other normal messages if *<Buffer Mode>* in **AT+GTSRI** is set to 1.
- ✧ The buffered messages will be sent before other normal messages if *<Buffer Mode>* in **AT+GTSRI** is set to 2. The SOS message has the highest priority and is sent before the buffered messages.

Example:

The following is an example of the buffered message:

```
+BUFF:GTFRI,FE110A,866425030925657,gv50m,13198,10,1,1,57.9,301,21.1,114.005392,22.5432
86,20190923041230,0460,0000,27BD,134D,,13661.1,00031:59:04,0,220100,,,20190923121228,5
516$
```

3.3.6. Crash Data Packet

The message contains most 5s XYZ-axis acceleration data before and after crash. When crash accident is detected, the 5s XYZ-axis acceleration data before crash will be reported to backend server packed. And the device will continue to record 5s XYZ-axis data and then report to backend server packed. The message **+RESP:GTCRD** is only sent via TCP short connection even if the report mode is Force on SMS.

➤ +RESP:GTCRD,

Example:

```
+RESP:GTCRD,FE110A,868446032529642,gv50m,1,0,6,1,00000003007E00000002007D0001000
3007D00010002007D00000003007D00000003007E00000003007E00010003007E00010003007
D00010003007E00010003007D00010003007E00000003007D00010003007D00000003007E000
10003007E00010003007E00010003007D00010003007D00010003007D00010003007D0000000
3007E00010003007D00000003007E00010003007E00000003007D00010003007E00010003007
D00010003007E00000003007E00000003007E00000002007E00010003007D00010003007D000
10003007D00010003007E00000003007D00000003007D00010003007D00000003007D0000000
3007D00010003007E00010003007E00000003007E00000003007F00000003007E00000003007D
00000003007D00000003007D00000003007D00000002007D00000003007E00010003007D0000
0002007D00010003007E00010003007D00010003007E00000003007D00000003007E00000003
007D00010003007E00000003007D00010003007D00010003007E00000003007E00010003007E
00000003007D00010003007D00000003007E00000003007D00000003007E00000003007E0000
0003007E00000003007E00000003007D00010003007D00000003007E00010003007D00010003
007D00000003007D00010004007E00010003007D00010003007E00010003007E00000003007E
00000003007E00000003007E00000003007E00000003007D00000003007E00010003007D00010
003007E00010003007D00000003007D00000003007E00000003007D00010003007E000000030
07D00000003007E00010003007E,20190927035531,0F36$
```

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Crash Counter	<=3	0-255	
Data Type	1	0 1	
Total Frame	1	10	
Frame Number	1	1 -10	
Data	1200	'0'-'9' 'a'-'f'	
Send Time	0 14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Crash Counter>: The number of crash incident.
- ✧ <Data Type>: The data reported to backend server is recorded before or after crash.
 - 0: Before crash.
 - 1: After crash.
- ✧ <Total Frame>: Total number of data frames reported to server.

- ✧ **<Frame Number>**: The sequence of data frame.
- ✧ **<Data>**: There are 1200 ASCII characters in one frame. 12 characters are a group. The first 4 characters of the 12 characters represent X axis acceleration data, the next 4 characters represent Y axis and last 4 characters is Z axis. The ASCII "0001" equals to "0x0001" in hex format, and the ASCII "afff" equals to "0xAFFF" in hex format.

Example:

+RESP:GTCRD,FE110A,868446032529642,,1,0,6,1,00000003007E...,20190927035531,0F36\$

This is the oldest XYZ-axis acceleration data:

Translated to hex format: X (axis acceleration data) = 0x0000; Y = 0x0003; Z = 0x007E;

Equal to decimal format: X (axis acceleration data) = 0; Y = 3; Z = 126;

+RESP:GTCRD,FE110A,868446032529642,,1,0,6,1,FFFE000DFF7D...,20190927035551,0F46\$

This is the oldest XYZ-axis acceleration data:

Translated to hex format: X (axis acceleration data) = 0xFFFE; Y = 0x000D; Z = 0xFF7D;

Equal to decimal format: X (axis acceleration data) = -2; Y = 13; Z = -131;

NOTE: Acceleration of gravity (+g) is 128 in decimal format and -g is -128. With the linear feature, the acceleration data 2048 represents +16g and -2048 represents -16g.

3.3.7. Crash GPS Information

+RESP:GTCRG

The message contains most 10s GPS information before and after crash. When crash is detected, the 10s GPS information before crash will be reported to backend server. And the device will continue to record the 10s GPS information after crash and report the packed data to the backend server. The message **+RESP:GTCRG** is only sent via TCP short connection even if the report mode is Force on SMS.

➤ +RESP:GTCRG

Example:

+RESP:GTCRG,FE110A,868446032529642,gv50m,1,0,10,1,0,0,0,191.8,114.015445,22.536838,20190927035522,1,0,0,0,191.8,114.015445,22.536838,20190927035522,1,0,0,0,191.8,114.015445,22.536838,20190927035523,1,0,0,0,191.8,114.015445,22.536838,20190927035524,1,0,0,0,191.8,114.015445,22.536838,20190927035525,1,0,0,0,191.8,114.015445,22.536838,20190927035526,1,0,0,0,191.8,114.015445,22.536838,20190927035527,1,0,0,0,191.8,114.015445,22.536838,20190927035529,1,0,0,0,191.8,114.015445,22.536838,20190927035530,1,0,0,0,191.8,114.015445,22.536838,20190927035530,20190927035531,0F3B\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Crash Counter	<=3	0-255	
Data Type	1	0 1	0
GPS Validity Number	2	0 – 10	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
.....			
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Crash Counter>: The number of crash incident.
- ✧ <Data Type>: The data reported to backend server is recorded before or after crash.
 - 0: Before crash.
 - 1: After crash.
- ✧ <GPS Validity Number>: The number of the successfully fixed GPS positions included in the message.

3.3.8. Report Google Maps Hyperlink

According to the setting of the command **AT+GTGLM** or SMS Request Position message via SMS, the device can send an SMS with Google Maps hyperlink to a mobile phone.

If the device receives SMS Request Position message via SMS, GV50M will send its current position to the original number via SMS with a Google Maps hyperlink if the original number is a direct number (please refer to <Direct Number List> in the Chapter 3.2.7.6) or a number in the white list (please refer to <White List> in the Chapter 3.2.7.5)

GV50M will send an SMS with a Google Maps hyperlink to the direct phone numbers after the messages +RESP:GTSOS and +RESP:GTGIN/+RESP:GTGOT.

➤ Google Maps Hyperlink

Example: LBC:gv50m http://maps.google.com/maps?q=22.5370606,114.016065 F1 D2019/09/27 T05:57:31 B65% I0 S0.00			
Parameter	Length (Byte)	Range/Format	Default
SMS Header	<=30	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Google Maps Hyperlink Header	30	http://maps.Google.com/maps?q=	http://maps.Google.com/maps?q=
Latitude	<=10	(-)xx.xxxxxx	
Longitude	<=11	(-)xxx.xxxxxx	
GPS Fix	<=3	F0 F1	
GPS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Battery Percentage	<=6	B0%-B100%	
Ignition Status	2	I0 I1	
Speed	<=6	S0.0 – S999.9 km/h	

- ✧ <SMS Header>: A string that includes the terminal name and GPS fix type ("SOS", "IN GEO-i", "OUT GEO-i", "IN PEO-i", "OUT PEO-i" "LBC").
- ✧ <Google Maps Hyperlink>: A string of a Google Maps hyperlink.
- ✧ <GPS Fix>: The accuracy of the location information. F0 means no GPS fix.
- ✧ <Battery Percentage>: The percentage of the backup battery.
- ✧ <Ignition Status>: The status of ignition. 0 means ignition off and 1 means ignition on.
- ✧ <Speed>: The current speed. Unit: km/h.

3.3.9. Login Message

Login message is reported at every newly established TCP or UDP connection. When the device is set to use TCP short connection, login message will be reported only for the first established connection, except when the IP address or port is changed.

➤ +RESP:GTLGN

Example:

+RESP:GTLGN,FE110A,868446032529642,gv50m,0606,0104,0,,2,20190927060257,1058\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Firmware Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Configuration String Length	2	0x0000 – 0xFFFF	
Configuration String	<=250	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' ','	
Reboot Reason	1	0x00 – 0xFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Configuration String Length>: The length of configuration string.
- ✧ <Configuration String>: The configuration string, a variable defined remotely to store in the device, is the device's current configuration. The max length of this field is 250.
- ✧ <Reboot Reason>: The reboot reason is an integer representing the reason for the last reboot.
 - 0: Connection reestablished. The connection is reestablished after a TCP or GPRS/LTE drop.
 - 1: Boot by ignition. The device is rebooted by ignition in **GTD OG** configuration.
 - 2: Boot by digital input. The device is rebooted by digital input in **GTD OG** configuration.
 - 3: Boot by clock. The device is rebooted by period interval in **GTD OG** configuration.
 - 4: Boot by user reset. The device is rebooted by **RTO-3 (REBOOT)** command.
 - 5: Boot by GSM/LTE lost. The device is rebooted by GSM/LTE lost in **GTD OG** configuration.
 - 6: Boot by GPRS/LTE lost or *Send Failure*. The device is rebooted by GPRS/LTE lost or *Send Failure* in **GTD OG** configuration.
 - 7: Boot by power on.

3.4. Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server via GPRS/LTE. The heartbeat package is sent to the backend server at the interval defined by <Heartbeat Interval> in **AT+GTSRI** command.

➤ **+ACK:GTHBD**

Example: +ACK:GTHBD,FE110A,868446032529642,gv50m,20190927060442,1060\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' '	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

Whenever the backend server receives a heartbeat package, it should reply an acknowledgement to the device.

➤ **+SACK:GTHBD**

Example: +SACK:GTHBD,FE110A,11F0\$ +SACK:GTHBD,,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ *<Protocol Version>*: The device type and the protocol version that the backend server supports. This field is optional. The backend server can send an empty field to decrease the length of the heartbeat data acknowledgement.
- ✧ *<Count Number>*: The backend server uses the *<Count Number>* extracted from the heartbeat package from the device as the *<Count Number>* in the server acknowledgement of the heartbeat.

3.5. Server Acknowledgement

If server acknowledgement is enabled by **AT+GTSRI** command, the backend server will reply to the device whenever it receives a message from the device.

➤ **+SACK:**

Example: +SACK:11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Count Number>: The backend server uses the <Count Number> extracted from the received message as the <Count Number> in the server acknowledgement.

4. HEX Format Report Message

From this version, the @Tracker protocol supports messages in HEX format. For all the commands, they still use the ASCII format as described above. By default the device uses ASCII format messages. Use **AT+GTQSS** or **AT+GTSRI** (set the *<Protocol Format>* to 1) to enable the HEX format messages.

All the messages are sorted into 7 categories (acknowledgement to command (**+ACK**), location report (**+RSP**), event report (**+EVT**), information report (**+INF**), data report (**+DAT**), crash data report (**+CRD**) and the heartbeat data (**+HBD**)). Messages of the same category have the same header string.

The composition of the HEX message could be customized by **AT+GTHRM** command. The actual length of each HEX message depends on the setting of the masks in **AT+GTHRM**.

The device uses CRC16 method to calculate the checksum of the report data and append the checksum to the end of the data. The backend server could use this checksum to verify the integrity of the received data.

At the end of each HEX message, the device uses 0x0D and 0x0A as the end.

The HEX messages are transmitted in network byte order (big-endian).

4.1. Hex Report Mask

AT+GTHRM command uses *<+ACK Mask>*, *<+RSP Mask>*, *<+EVT Mask>*, *<+INF Mask>*, *<+DAT Mask>*, *<+HBD Mask>* and *<+CRD Mask>* to control the composition of the corresponding HEX message. In each HEX message, the corresponding mask for the report is included to indicate which part is reported.

➤ **AT+GTHRM=**

Example: AT+GTHRM=gv50m,,,7F,FEFFFF,FEFFFF,2F7F,FF,,7F,,,0018\$			
Parameter	Length (Byte)	Range/Format	Default
Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv50m
Reserved	0		
Reserved	0		
+ACK Mask	2	00 – FF	7F
+RSP Mask	8	00000000 – FFFFFFFF	FE3FFF
+EVT Mask	8	00000000 – FFFFFFFF	FE3FFF

+INF Mask	<=8	00000000 – FFFFFFFF	7F7F
+HBD Mask	2	00 – FF	FF
+DAT Mask	<=8	00000000 – FFFFFFFF	7F
+CRD Mask	4	0000–FFFF	7F
+LGN Mask	4	0000–FFFF	00FD
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <+ACK Mask>: Component mask of the acknowledgement received.

Bit	Item to Mask
Bit 7	Reserved
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Device Name>
Bit 3	<Firmware Version>
Bit 2	<Protocol Version>
Bit 1	<Device Type>
Bit 0	<Length>

✧ <+RSP Mask>: Component mask of the location message.

Bit	Item to Mask
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved

Bit 23	<Total Hour Meter Count>
Bit 22	<Current Hour Meter Count>
Bit 21	<Total Mileage>
Bit 20	<Current Mileage>
Bit 19	<Satellites Information>
Bit 18	<Motion Status>
Bit 17	<Digital IO Status>
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	<IO mode>
Bit 12	<External Power Supply Voltage>
Bit 11	<Battery Percentage>
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Device Name>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<network Data>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

✧ <+EVT Mask>: Component mask of the event message.

Bit	Item to Mask
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved

Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	<Total Hour Meter Count>
Bit 22	<Current Hour Meter Count>
Bit 21	<Total Mileage>
Bit 20	<Current Mileage>
Bit 19	<GPS Satellites Information>
Bit 18	<Motion Status>
Bit 17	<Digital IO Status>
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	<IO mode>
Bit 12	<External Power Supply Voltage>
Bit 11	<Battery Percentage>
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Device Name>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<network data>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

✧ <+INF Mask>: Component mask of the information message. Bit 8 to Bit 15 indicate which

group of items is included when sending messages other than **+RESP:GTINF**.

Bit	Item to Mask
Bit 15	Reserved
Bit 14	+RESP:GTTMZ
Bit 13	+RESP:GTCSQ
Bit 12	+RESP:GTCID
Bit 11	+RESP:GTBAT
Bit 10	+RESP:GTGPS
Bit 9	+RESP:GTIOS
Bit 8	+RESP:GTVER
Bit 7	Expand INF Mask
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Firmware Version>
Bit 3	<Protocol Version>
Bit 2	<Device Type>
Bit 1	<Device Name>
Bit 0	<Length>

- ✧ <Expand INF Mask>: Component mask of the information message. Bit 0 to Bit 15 indicate which group of items is included when sending messages except **+RESP: GTINF**.

Bit	Item to Mask
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved

Bit 7	Reserved
Bit 6	Reserved
Bit 5	Reserved
Bit 4	Reserved
Bit 3	Reserved
Bit 2	Reserved
Bit 1	Reserved
Bit 0	+RESP:GTGSV

✧ <+HBD Mask>: Component mask of the heartbeat data.

Bit	Item to Mask
Bit 7	Reserved
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Device Name>
Bit 3	<Firmware Version>
Bit 2	<Protocol Version>
Bit 1	<Device Type>
Bit 0	<Length>

✧ <+DAT Mask>: Component mask of data message.

Bit	Item to Mask
Bit 31	Reserved
⋮	Reserved
Bit 7	Reserved
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Device Name>
Bit 3	<Firmware Version>
Bit 2	<Protocol Version>

Bit 1	<Device Type>
Bit 0	<Length>

✧ <+CRD Mask>: Component mask of the crash data packet.

Bit	Item to Mask
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Firmware Version>
Bit 3	<Protocol Version>
Bit 2	<Device Type>
Bit 1	<Device Name>
Bit 0	<Length>

✧ <+LGN Mask>: Component mask of the login message.

Bit	Item to Mask
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved

Bit 9	Reserved
Bit 8	Reserved
Bit 7	<Hardware Version>
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Firmware Version>
Bit 3	<Protocol Version>
Bit 2	<Device Type>
Bit 1	<Unique ID>
Bit 0	<Length>

The acknowledgment message of **AT+GTHRM** command:

➤ **+ACK:GTHRM,**

Example: +ACK:GTHRM,FE110A,862170019025640,,0019,20140511093254,11F0\$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

4.2. Acknowledgement +ACK

➤ **+ACK,**

Example: 2B 41 43 4B 06 7F 24 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 00 00 49 07 E3 09 1D 09 1E 15 2A 21 37 B3 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+ACK	+ACK

Message Type	1		
Report Mask	1	00 – FF	
Length	1		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	0101
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
ID	1		
Serial Number	2	0000 – FFFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of the command that the device received.

Command	ID
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
Reserved	3
AT+GTCFG	4
AT+GTTOW	5
AT+GTEPS	6
AT+GTDIS	7
AT+GTOUT	8
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14

Reserved	15
AT+GTRTO	16
Reserved	17-20
AT+GTUPD	21
AT+GTPIN	22
Reserved	23
AT+GTOWH	24
AT+GTDG	25
Reserved	26
Reserved	27
AT+GTIDL	28
AT+GTHBM	29
AT+GTHMC	30
Reserved	31
Reserved	32
Reserved	33
AT+GTWLT	34
AT+GTHRM	35
AT+GTFFC	36
AT+GTSSR	38
Reserved	39-44
AT+GTPDS	45
AT+GTCRA	46
AT+GTBZA	47
AT+GTSPA	48
AT+GTASC	49
Reserved	50-52
AT+GTRMD	53
AT+GTPEO	54
Reserved	55-60

AT+GTCMD	61
AT+GTUDF	62
Reserved	63
Reserved	64
AT+GTGAM	65
Reserved	66-69
AT+GTUPC	70
Reserved	71
AT+GTPCS	72
AT+GTVVS	73
AT+GTAVS	74
Reserved	75
AT+GTVMS	76
Reserved	77
Reserved	78
AT+GTGLM	79
Reserved	80-85
AT+GTEMR	86
AT+GTSDDS	87
AT+GTSTP	88

- ✧ *<Report Mask>*: It refer to the *<+ACK Mask>* in **AT+GTHRM**.
- ✧ *<Length>*: The length of the acknowledgement message (total characters from header to the tail).
- ✧ *<Unique ID>*: If Bit 4 of *<+ACK Mask>* is 0, IMEI of the device will be used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 4 of *<+ACK Mask>* is 1, the device name is used as the unique ID of the device. Refer to the *<Device Name>* in **AT+GTCFG** for the device name. Device name is an 8-bytes string. If the length of the *<Device Name>* is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	5	0	m			
HEX	67	76	35	30	6D	00		

- ✧ <ID>: Sub-command ID of **AT+GTRTO** or the ID of **AT+GTIOB** and **AT+GTGEO**. Set it to 0 for other reports.
- ✧ <Send Time>: The local time to send the acknowledgement message. Total 7 bytes. The first 2 bytes are for year, the rest 5 bytes for month, day, hour, minute and second respectively.

Send Time	2011		01	31	06	29	11
HEX	07	DB	01	1F	06	1D	0B

- ✧ <Checksum>: The CRC16 checksum for data from <Message Type> to <Count Number>.

4.3. Location Report +RSP

Location messages (including +RESP:GTTOW, +RESP:GTDIS, +RESP:GTIOB, +RESP:GTFRI, +RESP:GTSPD, +RESP:GTRTL, +RESP:GTDG, +RESP:GTIGL, +RESP:GTSRT, +RESP:GTDREV, +RESP:GTSSP, +RESP:GTTSP, +RESP:GTASP +RESP:GTHBM and +RESP:GTEPS) use this format.

➤ +RSP,

Example:

2B 52 53 50 17 00 FE 3F FF 00 63 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 00 32 F5 00 00 01 00 22
06 10 01 01 00 03 06 01 3C 00 61 06 CA 3B E1 01 57 95 30 07 E3 09 18 0C 0A 0D 01 CC 00 00 24
93 00 00 12 68 00 00 02 07 00 00 35 DC 03 00 0C 17 00 00 00 26 15 0B 07 E3 09 18 14 0A 0C 5D
EC C2 8C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites	1		
Report ID/Report Type	1		
Number	1	1	1

GPS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of location message.

Command	ID
+RESP:GTPNL	0
+RESP:GTTOW	1
Reserved	2
+RESP:GTLBC	3
+RESP:GTEPS	4
+RESP:GTDIS	5
+RESP:GTIOB	6
+RESP:GTFRI	7

Reserved	8
+RESP:GTSPD	9
+RESP:GTSOS	10
+RESP:GTRTL	11
+RESP:GTDOG	12
Reserved	13
Reserved	14
+RESP:GTHBM	15
+RESP:GTIGL	16
Reserved	17
Reserved	18
Reserved	19
+RESP:GTGIN	20
+RESP:GTGOT	21
+RESP:GTSRT	22
+RESP:GTDRV	23
+RESP:GTSSP	24
+RESP:GTTSP	25
+RESP:GTASP	26

- ✧ <Report Mask>: It refer to the <+RSP Mask> in **AT+GTHRM**.
- ✧ <Unique ID>: If the Bit 6 of <+RSP Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 6 of <+RSP Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	5	0	m			
HEX	67	76	35	30	6D			

- ✧ <Input Mode>: The mode of the digital and analog input ports. The high byte is for digit IO mode and the low byte is reserved.

- ✧ <Digital Input Status>:

Input status mask	ID
Ignition Detection	0x01
Digital Input1	0x02

- ✧ <Digital Output Status>:

Input status mask	ID
Digital Output1	0x01
Digital Output2	0x02

- ✧ <Satellites>: Satellites number.
- ✧ <Report ID/Report Type>: The high nibble is for <Report ID> and the low nibble is for <Report Type>.
- ✧ <Speed>: Total 3 bytes. The first two bytes are for the integer part of the speed and the last byte is for the fraction part. The fraction part has only 1 digit.
- ✧ <Longitude>: The longitude of the current position. Total 4 bytes. The longitude is converted to an integer with 6 implicit decimals and this integer is reported in HEX format. If the value of the longitude is negative, it is represented in 2's complement format.

Longitude	121390847			
121.390847				
HEX	07	3C	46	FF

- ✧ <Latitude>: The latitude of the current position. Total 4 bytes. The latitude is converted to an integer with 6 implicit decimals and this integer is reported in HEX format. If the value of the latitude is negative, it is represented in 2's complement format.

Latitude	31164503			
31.164503				
HEX	01	DB	88	57

- ✧ <GPS UTC Time>: The UTC time from the GPS chip. Total 7 bytes. The first 2 bytes are for year, the rest 5 bytes for month, day, hour, minute and second respectively.

GPS UTC Time	2011		07	14	08	24	13
HEX	07	DB	07	0E	08	18	0D

- ✧ <Current Mileage>: Total 3 bytes. The first 2 bytes are for the integer part of the current mileage and the last byte is for the fraction part. The fraction part has only 1 digit.

Current Mileage	0		0
HEX	00	00	00

- ✧ **<Total Mileage>**: Total 5 bytes. The first 4 bytes are for the integer part of the total mileage and the last byte is for the fraction part. The fraction part has only 1 digit.

Total Mileage	0				0
HEX	00	00	00	00	00

- ✧ **<Total Hour Meter Count>**: Total 6 bytes. The first 4 bytes are the hour part. The fifth byte is the minute part. The sixth byte is the second part.

Total Hour Meter Count	0				0	0
HEX	00	00	00	00	00	00

Location message for **+RESP:GTSOS** uses below format.

➤ **+RSP,**

Example:

2B 52 53 50 0A 00 FE 3F FF 00 64 FE 11 0A 06 06 6F 70 35 30 6D 00 00 00 00 00 00 00 02 00 11
07 10 00 01 04 00 00 00 00 00 01 A1 06 CB C1 8A 01 57 E6 B8 07 E3 09 19 07 1A 31 01 CC 00 00
24 93 00 00 14 90 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 19 07 1A 33 00
46 E6 AB 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42	

		0x16 0x1A	
Satellites in View	1		
Report ID/Report Type	1		
Reserved	1		
Number	1	1	1
GPS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHHHMMSS	
Send Time	7	YYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Location messages for **+RESP:GTGIN** and **+RESP:GTGOT** use this format.

➤ **+RSP,**

Example:

```
2B 52 53 50 14 00 FE 3F FF 00 6C FE 11 0A 06 06 67 76 35 30 6D 00 00 00 00 31 7C 00 00 01 00 22
08 01 01 00 00 00 00 00 00 00 01 01 03 00 13 08 00 AA 00 0E 06 CB C6 33 01 57 ED 0E 07 E3 09
19 02 09 25 01 CC 00 00 27 BD 00 00 11 DC 00 00 00 04 00 00 36 2B 04 00 03 19 00 00 00 29 0D
```

27 07 E3 09 19 0A 09 24 61 FB EA 39 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Area Type	1	0 1	
Group Mask	1	01-1F	
GEO ID Group	8	64bit 0000000000000001-0000 0000000FFFFF (GEOID 0 - 19)	
Number	1	1	1
GPS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		

Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Area Type>: This text belongs to Polygon or circle area, 0 means Polygon.
- ✧ <Group Mask>: The bitwise mask to confirm the reported <GEO ID Group>. For GV50M, only bit 0 is valid and it should be set to 1.
- ✧ <GEO ID Group>: The bitwise mask for trigger condition composition of the corresponding GEO ID. For GV50M, only the lowest 20 bits are valid. Each bit, from bit 0 to bit 19, represents the logical status of the corresponding GEO ID to trigger the entering or exiting event. 1 means that the event of the GEO ID set has been triggered and 0 means has not.

Location message for +RESP:GTLBC uses below format.

➤ +RSP,

Example: 2B 52 53 50 03 00 FE 3F FF 00 6A FE 11 0A 06 06 67 76 35 30 6D 00 00 00 64 00 00 00 00 00 11 09 00 70 18 56 57 23 84 5F 01 02 00 00 00 00 00 01 DF 06 CB CC 9E 01 57 E5 9E 07 E3 09 1B 03 1C 03 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 1B 03 1C 05 0E A5 AE AC 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		

Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Report ID/Report Type	1		
Number Length/Number Type	1		
Phone Number	<=10		
Number	1	1 – 15	
GPS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00

Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ **<Number Length/Number Type>**: The high nibble is for **<Number Length>** and the low nibble is for **<Number Type>**. **<Number Length>** is the number of bytes used to represent the phone number. **<Number Type>** indicates if there is a '+' sign before the phone number. 1 means there is the sign and 0 means no such a sign.

	Number Length	Number Type
HEX	7	0

- ✧ **<Phone Number>**: No more than 10 bytes. Each byte uses the high nibble and low nibble to represent one digit of the phone number respectively. If the last low nibble has no digit to represent, fill in 0xF.

Phone Number	02	15	44	50	29	3
02154450293						
HEX	02	15	44	50	29	3F

4.4. Information Report +INF

Information messages include **+RESP:GTINF**, **+RESP:GTGPS**, **+RESP:GTCID**, **+RESP:GTCsq**, **+RESP:GTVER**, **+RESP:GTBAT**, **+RESP:GTIOS**, **+RESP:GTTMZ**. These messages use the same format as below. Only **+RESP:GTINF** includes all the items. The other reports only include information related to them.

➤ +INF,

Example:

2B 49 4E 46 01 7F 7F 00 00 00 62 6F 70 35 30 6D 00 00 00 FE 11 0A 06 06 01 04 00 00 00 00 00 00 00 00 01 00 00 00 22 00 06 00 07 E3 09 19 07 12 29 00 01 00 2F 00 1E 02 58 00 00 00 00 90 00 00 00 00 00 89 86 04 41 19 18 C3 69 18 51 0E 00 00 00 00 07 E3 09 19 07 13 09 00 2D 3D D9 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+INF	+INF

Message Type	1		
Report Mask	2	0000 – FFFF	
Expand INF Mask	2	0000 – FFFF	
Length	2		
Unique ID	8	IMEI/Device Name	
Device Type	1	FE	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	+RESP:GTVER
Reserved	2	0000	
Reserved	2	0000	
IO Mode	2		+RESP:GTIOS
Reserved	2		
Reserved	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Reserved	2	00	+RESP:GTGPS
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Reserved	1	00	
Satellites in View	1		
Power Saving Enable/OWH Mode/Outside Working Hour/AGPS	1		
Last Fix UTC Time	7	YYYYMMDDHHMMSS	
Reserved	1	00	
FRI Discard No Fix	1	0 1	
Report Item Mask	2		
IGN Interval	3		
IGF Interval	3		
Reserved	2	0000	

Reserved	1	00	
Main Supply/Backup Battery On/Charging/LED On/Backup Battery Charge Mode	1		+RESP:GTBAT
External Power Supply VCC	2	0	
Backup Battery VCC	2	0 – 4500mV	
Backup Battery Percentage	1	00	
ICCID	10	ICCID	+RESP:GTCID
CSQ RSSI	1	0 – 31 99	+RESP:GTCSQ
CSQ BER	1	0 – 7 99	
Time Zone Offset Sign/ Enable Daylight Saving	1		+RESP:GTTMZ
Time Zone Offset	2	HHMM	
SV Count	1		+RESP:GTGSV
SV id	1		
SV Power	1		
.....			
SV id	1		
SV Power	1		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of information message.

Command	ID
+RESP:GTINF	1
+RESP:GTGPS	2
Reserved	3
+RESP:GTCID	4
+RESP:GTCSQ	5
+RESP:GTVER	6

+RESP:GTBAT	7
+RESP:GTIOS	8
+RESP:GTTMZ	9
Reserved	10
+RESP:GTGSV	11

- ✧ **<Report Mask>**: It refers to the **<+INF Mask>** in **AT+GTHRM**.
- ✧ **<Expand INF Mask>**: It refers to the **<Expand INF Mask>** in **AT+GTHRM**.
- ✧ **<Unique ID>**: If the Bit 1 of **<+INF Mask>** is 0, IMEI of the device is used as the unique ID. IMEI has 14 bytes in hexadecimal format. In the Hex format message, every two bytes are encoded into one byte as an integer. The 8th byte is reserved and its value is 0x00.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 1 of **<+INF Mask>** is 1, the device name is used as the unique ID of the device. Refer to the **<Device Name>** in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the **<Device Name>** is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	5	0	m			
HEX	67	76	35	30	6D	00		

- ✧ **<IO Mode>**: the mode of the digital and analog input ports. The high byte is for digit IO mode and the low byte is reserved.
- ✧ **<Power Saving Enable/OWH Mode/Outside Working Hour>**: The highest bit, bit 7 is reserved. Bit 5 and bit 6 are for **<Power Saving Enable>** the range of this field is 0-2. bit 4 and bit 3 are for **<OWH Mode>** the range of this field is 0-3, bit 2 is for **<Outside Working Hour>** and bit 0 is for **<AGPS>**, bit1 is reserved. **<Outside Working Hour>** is used to indicate whether the device is currently outside the working hour. 1 means it is outside the working hours.
- ✧ **<Main Supply/Backup Battery On/Charging/LED On/Backup Battery Charge Mode>**: The highest bit, bit 7 is for **<Main Supply>** to indicate whether the external power supply is connected to the device. Bit 6 is for **<Backup Battery On>** to indicate whether the backup battery is working. Bit 5 is for **<Charging>** to indicate whether the backup battery is currently charging. Bit 4 is for **<LED On>** to indicate whether the LEDs are turned on. Bit 0 is for **<Backup Battery Charge Mode>**.

Note: 1 means it is valid or open, 0 means it is invalid or closed.

- ✧ **<ICCID>**: ICCID is a 20-digit string. In the HEX format message, every 4 bits are used to represent one digit of the ICCID.

ICCID	89	86	00	00	09	09	17	21	49	53
HEX	89	86	00	00	09	09	17	21	49	53

- ✧ **<Time Zone Offset Sign/Enable Daylight Saving>**: Bit 1 is for **<Enable Daylight Saving>** which

indicates whether the daylight saving function is currently enabled. Bit 0 is for *<Time Zone Offset Sign>* which indicates the positive or negative offset of the local time to UTC. 1 means “negative offset”.

- ✧ *<Cell Number>*: It represents the number of the IMSI. The IMSI consists of MCC, MNC, LAC, and Cell ID.

4.5. Event Report +EVT

Event messages (+RESP:GTPNA, +RESP:GTPFA, +RESP:GTMPN, +RESP:GTMPF, +RESP:GTBTC, +RESP:GTSTC, +RESP:GTSTT, +RESP:GTPDP, +RESP:GTIDN, +RESP:GTSTR, +RESP:GTSTP, +RESP:GTLSP,) use this format.

➤ +EVT,

Example:

2B 45 56 54 04 00 FE 3F FF 00 62 FE 11 0A 06 06 6F 70 35 30 6D 00 00 00 64 00 00 00 00 00 11
07 01 01 00 00 00 00 00 86 06 CB BD 49 01 57 E4 55 07 E3 09 19 07 31 36 01 CC 00 00 24 93 00
00 17 67 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 19 07 31 38 00 C9 22 95
0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	

Satellites in View	1		
Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of event message.

Command	ID
+RESP:GTPNA	1
+RESP:GTPFA	2
+RESP:GTMPN	3
+RESP:GTMPF	4
Reserved	5

+RESP:GTBPL	6
+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
Reserved	10
Reserved	11
+RESP:GTPDP	12
+RESP:GTIGN	13
+RESP:GTIGF	14
+RESP:GTUPD	15
+RESP:GTIDN	16
+RESP:GTIDF	17
Reserved	18
Reserved	19
Reserved	20
+RESP:GTGSS	21
Reserved	22
+RESP:GTSTR	23
+RESP:GTSTP	24
+RESP:GTCRA	25
Reserved	26
+RESP:GTDOS	27
+RESP:GTGES	28
+RESP:GTLSP	29
Reserved	32
+RESP:GTRMD	33
Reserved	34
Reserved	35
+RESP:GTASC	36
Reserved	37

Reserved	38
+RESP:GTUPC	39
Reserved	40
+RESP:GTVGN	45
+RESP:GTVGF	46
Reserved	48
Reserved	49

- ✧ <Report Mask>: It refers to the <+EVT Mask> in **AT+GTHRM**.
- ✧ <Unique ID>: If the Bit 6 of <+EVT Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 6 of <+EVT Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	5	0	m			
HEX	67	76	35	30	6D	00		

Event message **+RESP:GTBPL** uses this format.

➤ **+EVT,**

Example: 2B 45 56 54 06 00 FE 3F FF 00 64 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 10 00 00 00 00 00 00 41 08 0E 74 01 01 00 00 00 00 00 01 8B 06 CB C0 E4 01 57 E7 21 07 E3 09 1B 05 30 1E 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 1B 05 30 20 10 21 DE 18 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Backup Battery VCC	2	0 – 4500 mV	
Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	

Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event message **+RESP:GTCRA** uses this format.

➤ **+EVT,**

Example: 2B 45 56 54 19 00 FE 3F FF 00 63 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 64 00 00 00 00 00 00 41 0A 01 01 00 00 00 00 00 00 00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 30 17 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 1D 07 33 05 28 F2 7A 56 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Crash Counter	1	0x00 -0xFF	

Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event messages **+RESP:GTIGN** and **+RESP:GTIGF** use this format. For these two messages, the *<Mileage>* field will always be shown regardless the *<Report Items Mask>* setting.

➤ **+EVT,**

Example: 2B 45 56 54 0D 00 FE 3F FF 00 66 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 00 2E 69 00 00 01 00 22 0B 00 00 00 45 01 00 00 07 03 00 1E 00 22 06 CA 6C 13 01 57 A2 6A 07 E3 09 18 09 2A 11 01 CC 00 00 24 93 00 00 0E E4 00 00 00 00 00 00 35 DA 06 00 00 00 00 00 26 08 30 07 E3 09 18 13 39 2D 5D C3 80 6A 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		

Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	

Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event messages **+RESP:GTVGN** and **+RESP:GTVGF** use this format. For these two messages, the *<Mileage>* field will always be shown regardless the *<Report Items Mask>* setting.

➤ **+EVT,**

Example: 2B 45 56 54 2D 00 FE 3F FF 00 67 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 34 00 00 00 00 00 00 42 07 02 00 00 00 D6 01 01 00 00 00 00 00 01 E5 06 CB C3 05 01 57 E8 B3 07 E3 09 1B 05 2D 35 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 1B 05 2D 37 10 10 3D DA 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42	

		0x16 0x1A	
Satellites in View	1		
Virtual Ignition Mode	1	2	
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event message **+RESP:GTASC** uses following format.

➤ **+EVT,**

Example:

2B 45 56 54 24 00 FE 3F FF 00 6C FE 11 0A 06 06 67 76 35 30 6D 00 00 00 00 33 9A 00 00 01 00 22 0C 02 07 0A 9D 63 F6 06 F6 9E F5 01 01 00 08 01 00 CB 00 1E 06 CA 7C 3D 01 59 01 7A 07 E3 0A

0A 00 2B 16 01 CC 00 00 24 7E 00 00 11 BE 00 00 02 08 00 00 38 6B 06 00 05 0E 00 00 00 38 1D 17 07 E3 0A 0A 08 2B 16 9B 67 58 EF 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT/+BVT	+EVT/+BVT
Message Type	1		39
Report Mask	4	00000000 -FFFFFFFF	
Length	2		
Device Type	1	FE	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Calibration Status	1	1-2	
X_Forward	1	-100 -100	
Y_Forward	1	-100 -100	
Z_Forward	1	-100 -100	
X_Side	1	-100 -100	
Y_Side	1	-100 -100	
Z_Side	1	-100 -100	
X_Vertical	1	-100 -100	
Y_Vertical	1	-100 -100	
Z_Vertical	1	-100 -100	

Number	1	1	
GPS Accuracy/GPS Age	1	0 1 -255	
Speed	3	0.0 -999.9km/h	
Azimuth	2	0 -359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 -999	
MNC	2	000 - 999	
LAC	2	0000 -FFFF	
Cell ID	2	0000 -FFFF	
Reserved	1	00	
Current Mileage	3	0.0 -65535.0 km	
Total Mileage	5	0.0 - 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 -FFFF	
Checksum	2	0000 -FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Message Type>: Please refer to <Message Type> in [+EVT](#).
- ✧ <Report Mask>: Please refer to <+EVT Mask> in **AT+GTHRM**.
- ✧ <Calibrated Status>: A numeric indicates calibration status.
 - 1: Coarse calibrated
 - 2: Calibrated
- ✧ <X_Forward>, <Y_Forward>, <Z_Forward>: The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is: $X_{new} = \langle X_Forward \rangle * X/100 + \langle Y_Forward \rangle * Y/100 + \langle Z_Forward \rangle * Z/100$.
- ✧ <X_Side>, <Y_Side>, <Z_Side>: The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in side direction Ynew is: $Y_{new} = \langle X_Side \rangle * X/100 + \langle Y_Side \rangle * Y/100 + \langle Z_Side \rangle * Z/100$.
- ✧ <X_Vertical>, <Y_Vertical>, <Z_Vertical>: The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in vertical direction Znew is:

$$Z_{new} = \langle X_Vertical \rangle * X/100 + \langle Y_Vertical \rangle * Y/100 + \langle Z_Vertical \rangle * Z/100.$$

✧ Other parameters please refer to [+RSP](#)

Event message **+RESP:GTUPC** uses this format.

Example:

2B 45 56 54 27 00 FE 3F FF 00 95 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 64 00 00 00 00 00 02 11
05 00 00 65 2F 68 74 74 70 3A 2F 2F 32 31 38 2E 31 37 2E 34 36 2E 31 31 3A 39 31 34 36 2F 47 56
35 30 4D 2F 64 65 6C 74 61 62 69 6E 2F 31 31 31 2E 69 6E 69 01 02 00 00 00 00 00 00 00 00 00 00
C8 01 57 E4 20 07 E3 09 1D 08 00 25 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 07 E3 09 1D 08 00 27 29 2D B2 FD 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Command ID	1		
Result	2	100 101 102 103 200 201 202 300 301 302	
URL Length	1		
Download URL	<=60	Complete URL	1

Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ **<Command ID>**: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the successfully executed commands when the result code is 301. And it is the number of the commands which have failed to execute when the result code is 302.
- ✧ **<Result>**: A numeral to indicate whether the configuration is updated successfully.
- 100: The update command is starting.
 - 101: The update command is confirmed by the device.
 - 102: The update command is refused by the device.
 - 103: The update process is refused because the battery is low.
 - 200: The device starts to download the package.
 - 201: The device finishes downloading the package successfully.
 - 202: The device fails to download the package.
 - 300: The device starts to update the device configuration.

- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.
- ✧ <URL Length>: The length of complete URL.
- ✧ <Download URL>: The complete URL to download the configuration. It includes the file name.

Event message **+RESP:GTIDF** uses this format.

➤ **+EVT,**

Example:

2B 45 56 54 11 00 FE 3F FF 00 66 FE 11 0A 06 06 6F 70 35 30 6D 00 00 00 00 00 00 00 00 00 12
07 00 00 00 3C 01 01 00 00 00 00 00 00 01 D0 06 CB C2 0B 01 57 EA DA 07 E3 09 19 07 17 1E 01 CC
00 00 24 93 00 00 14 90 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 19 07 17
21 00 3D 29 52 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Duration of Idling	4		
Number	1	1	1

Event message **+RESP:GTUPD** uses this format.

Example:

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		

Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Code	2		
Retry	1		
Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00

Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event message **+RESP:GTGSS** uses this format.

➤ **+EVT,**

Example: 2B 45 56 54 15 00 FE 3F FF 00 67 FE 11 0A 06 06 6F 70 35 30 6D 00 00 00 00 00 00 00 00 01 00 22 00 00 00 00 00 00 01 00 00 00 00 00 00 00 91 06 CB BD 0C 01 57 E3 D2 07 E3 09 19 07 12 29 01 CC 00 00 24 93 00 00 14 90 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 19 07 14 2A 00 31 94 05 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22	

		0x41 0x42 0x16 0x1A	
Satellites in View	1		
GPS Signal Status	1	0 1	
Reserved	4	00000000	
Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <GPS Signal Status>: 0 means GPS signal lost or GPS fix failed; 1 means GPS signal has recovered and GPS fix succeeded.

Event message **+RESP:GTDOS** uses this format.

➤ +EVT,

Example:

2B 45 56 54 1B 00 FE 3F FF 00 64 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 64 00 00 00 00 02 41
 0A 02 01 01 01 00 00 00 00 00 00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 36 0A 01 CC 00 01
 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 1D 07 36 0C
 29 02 41 72 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Wave1 Output ID	1	1 - 2	
Wave1 Output Active	1	0 1	
Number	1	1	1
GPS Accuracy	1	0 1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		

Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event message **+RESP:GTGES** uses this format.

➤ **+EVT,**

Example:

2B 45 56 54 1C 00 FE 3F FF 00 6E FE 11 0A 06 06 67 76 35 30 6D 00 00 00 64 00 00 00 00 02 11 05 00 00 01 15 00 00 00 32 00 00 00 05 01 02 00 00 00 00 00 00 6E 06 CB BC C8 01 57 E4 20 07 E3 09 1D 07 3B 1E 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 1D 07 3B 20 29 24 EC FD 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	

Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Trigger GEO ID	2	0-19	
Trigger GEO Enable	1	0 1	
Trigger Mode	1	0 21 22	
Radius	4	50 – 6000000m	
Check Interval	4	0 5 – 86400sec	
Number	1	1	1
GPS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 – 999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	

Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Trigger GEO ID>: The ID of Geo-Fence, The range is 0 – 19.
- ✧ <Trigger GEO Enable>: Current Parking-Fence is active or inactive.
 - 0 Current Parking -Fence is inactive.
 - 1 Current Parking -Fence is active.

Event message **+RESP:GTRMD** uses the format below.

➤ **+EVT,**

Example:

2B 45 56 54 21 00 FE 3F FF 00 63 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 64 00 00 00 00 00 02 41
 0A 02 01 01 00 00 00 00 00 00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 37 08 01 CC 00 01 25
 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 09 1D 07 37 0A 29
 09 54 FC 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Percentage	1	0~100	
External Power Supply Voltage	2		
IO Mode	2		
Digital Input Status	1	00 – 03	

Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Roaming State	1	0-3	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	000 –999	
MNC	2	000 – 999	
LAC	2	0000 – FFFF	
Cell ID	4	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

4.6. Data Report +DAT

Data message **+RESP:GTCRG** uses the format below. They are only sent via GPRS/LTE even if the report mode is Force on SMS.

➤ **+DAT,**

Example:

2B 44 41 54 04 00 00 00 7F 01 0E FE 11 0A 06 06 67 76 35 30 6D 00 00 00 01 01 0A 00 00 00 00 00
00 00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 30 17 00 00 00 00 00 00 82 06 CB BD 33 01
57 E3 D2 07 E3 09 1D 07 30 17 00 00 00 00 00 00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07
30 17 00 00 00 00 00 00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 30 17 00 00 00 00 00 00
00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 30 17 00 00 00 00 00 00 82 06 CB BD 33 01 57
E3 D2 07 E3 09 1D 07 30 17 00 00 00 00 00 00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 30
17 00 00 00 00 00 00 82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 30 17 00 00 00 00 00 00
82 06 CB BD 33 01 57 E3 D2 07 E3 09 1D 07 30 17 00 00 00 00 00 00 82 06 CB BD 33 01 57 E3
D2 07 E3 09 1D 07 30 17 07 E3 09 1D 07 33 11 28 F7 B7 05 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+DAT	+DAT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Crash Counter	1	0x00 -0xFF	+RESP:GTCRG
Data Type	1	0 1	
GPS Validity Number	1	0 – 10	
GPS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9 km/h	
Azimuth	2	0 – 359	
Altitude	2	(-)xxxxx.x m	
Longitude	4	(-)xxx.xxxxxx	
Latitude	4	(-)xx.xxxxxx	
GPS UTC Time	7	YYYYMMDDHHMMSS	
.....			

GPS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9 km/h	
Azimuth	2	0 – 359	
Altitude	2	(-)xxxxx.x m	
Longitude	4	(-)xxx.xxxxxx	
Latitude	4	(-)xx.xxxxxx	
GPS UTC Time	7	YYYYMMDDHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of data message.

Command	ID
+RESP:GTCRG	4

✧ <Report Mask>: Please refer to the <+DAT Mask> in **AT+GTHRM**.

✧ <Data Type>: The data reported to backend server is recorded before or after crash.

- 0: Before crash.
- 1: After crash.

✧ <GPS Validity Number>: The number of the successfully fixed GPS positions included in the message.

✧ <GPS Point Index>: The index of GPS point.

4.7. Heartbeat Data +HBD

➤ +HBD,

Example:			
2B 48 42 44 FF 20 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 07 E3 09 1D 07 33 08 28 F6 33 B9 0D 0A			
Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	FE	FE
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Report Mask>: It refers to the <+HBD Mask> in **AT+GTHRM**.
- ✧ <Unique ID>: If Bit 4 of <+HBD Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 4 of <+HBD Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	5	0	l	t	m	
HEX	67	76	35	30	6C	74	6D	00

If the mask of <UID> is set to 0 in the <+HBD Mask> of **AT+GTHRM**, the heartbeat message will not include device name or IMEI information. If the mask of <UID> is set to 1, the heartbeat message will report device name or IMEI according to the mask of <Device Name>.

4.8. Crash Data Packet +CRD

➤ +CRD,

Example:

```
2B 43 52 44 00 7F 02 80 FE 11 0A 06 06 67 76 35 30 6D 00 00 00 01 00 01 01 02 58 00 01 00 03 00
7D 00 01 00 03 00 7E 00 01 00 02 00 7E 00 01 00 03 00 7D 00 01 00 03 00 7D 00 01 00 03 00 7D
00 01 00 03 00 7D 00 00 00 03 00 7D 00 01 00 03 00 7D 00 01 00 03 00 7E 00 01 00 03 00 7D 00
01 00 02 00 7D 00 01 00 02 00 7D 00 01 00 03 00 7D 00 01 00 02 00 7D 00 00 00 03 00 7E 00 00
00 03 00 7E 00 01 00 03 00 7D 00 01 00 03 00 7D 00 01 00 02 00 7D 00 01 00 02 00 7D 00 01 00
03 00 7D 00 01 00 03 00 7D 00 00 00 03 00 7D 00 01 00 02 00 7D 00 01 00 03 00 7D 00 01 00 02
00 7D 00 00 00 03 00 7D 00 01 00 03 00 7D 00 01 00 03 00 7D 00 01 00 02 00 7D 00 00 00 03 00
7E 00 01 00 03 00 7D 00 01 00 02 00 7E 00 00 00 03 00 7E 00 01 00 02 00 7E 00 01 00 03 00 7E 00
00 00 03 00 7D 00 01 00 03 00 7D 00 01 00 03 00 7D 00 01 00 03 00 7D 00 01 00 03 00 7E 00 01
00 03 00 7D 00 01 00 03 00 7E 00 00 FF FF 00 7E 00 00 FF F9 00 7D 00 01 FF FC 00 7D 00 01 00 03
00 7D FF FB FF F7 00 7E 00 00 FF FC 00 7D FF FA FF F8 00 7D FF FB FF FB 00 7D FF FA 00 06 00 7F
FF F9 00 14 00 7D FF FD 00 26 00 7F 00 05 00 23 00 88 FF FE 00 15 00 8A FF F4 00 0C 00 98 FF F2
00 02 00 90 FF F5 FF FE 00 92 FF F9 00 0A 00 A6 00 0A 00 0E 00 BB 00 26 FF FE 00 C8 00 34 FF EE
00 C4 00 30 FF EA 00 BC 00 26 FF F4 00 B3 00 16 00 03 00 A3 00 05 00 0C 00 91 FF F8 00 12 00 80
FF F4 00 11 00 6F FF F4 00 0C 00 60 FF F2 00 08 00 51 FF F3 00 07 00 3C FF F3 00 06 00 2C FF F1
00 09 00 1D FF F0 00 0C 00 17 FF F5 00 0C 00 0C FF FE 00 08 FF F9 00 08 00 06 FF EB 00 0D 00 09
FF EA 00 0D 00 0D FF EB 00 04 00 04 FF F7 FF FD 00 00 00 14 FF FF FF FA 00 27 00 03 FF F3 00 3A
00 04 FF EF 00 4F 00 94 00 1B 00 8A 00 38 FF FB 00 91 00 23 FF D5 00 85 FF FB FF FB 00 84 FF F0
00 0E 00 80 00 01 00 04 00 7C 00 01 00 05 00 7C 00 00 FF FF 00 7A 00 00 00 01 00 7D 00 01 00 04
00 7C 00 00 00 03 00 7C 00 03 00 05 00 82 00 00 00 00 00 7D FF FE 00 01 00 7D 07 E3 09 1D 07 33
05 28 F3 01 F9 0D 0A
```

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+CRD	+ CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	FE	FE
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Crash Counter	1	0x00 -0xFF	
Data Type	1	0 1	
Total Frame	1	6	

Frame Number	1	1-10	
Data Length	2		
Data	<=600		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Report Mask>: It refers to the <+CRD Mask> in **AT+GTHRM**.
- ✧ <Unique ID>: If Bit 1 of <+CRD Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 1 of <+CRD Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	5	0	m			
HEX	67	76	35	30	6D	00		

- ✧ <Length>: The length of the crash data message (total characters from header to the tail).
- ✧ <Data Type>: The data reported to backend server is recorded before or after crash.
 - 0: Before crash.
 - 1: After crash.
- ✧ <Total Frame>: Total number of data frames that reported to server.
- ✧ <Frame Number>: The sequence of data frame.
- ✧ <Data>: There are 600 bytes in one frame. 6 bytes form a group. The first 2 bytes of the 6 bytes represent X axis acceleration data, the next 2 bytes represent Y axis and last 2 bytes are Z axis.

4.9. Login Message +LGN

Login message is reported at every newly established TCP or UDP connection. When the device is set to use TCP short connection, login message will be reported only for the first established connection, except when the IP address or port is changed.

➤ **+LGN,**

Example: 2B 4C 47 4E 00 FF 00 26 FE 11 0A 06 06 01 04 56 54 2E 03 19 1D 40 02 00 00 07 E3 09 1D 08 04 1B 29 3C 48 68 0D 0A			
Parameter	Length(byte)	Range/Format	Default
Message Header	4	+LGN	+LGN
Report Mask	2	0x0000–FFFF	
Length	2		
Device Type	1	FE	31
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Configuration String Length	1	0x00 – 0xFF	
Configuration String	<=250	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' ','	
Reboot Reason	1	0x00 – 0xFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Report Mask>: It refers to the <+LGN Mask> in **AT+GTHRM**.
- ✧ <Unique ID>: The Bit 1 of <+LGN Mask> is always 0. IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into a hexadecimal number as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

- ✧ <Configuration String Length>: the length of configuration string.
- ✧ <Configuration String>: The configuration string, a variable defined remotely to store in the device, is the device's current configuration. The max length of this field is 250.
- ✧ <Reboot Reason>: The reboot reason is an integer representing the reason of the last reboot.
 - 0: Connection reestablished. The connection is reestablished after a TCP or GPRS/LTE drop.
 - 1: Boot by ignition. The device is rebooted by ignition in **GTDG** configuration.
 - 2: Boot by digital input. The device is rebooted by digital input in **GTDG** configuration.
 - 3: Boot by clock. The device is rebooted by period interval in **GTDG** configuration.

- 4: Boot by user reset. The device is rebooted by **RTO-3 (REBOOT)** command.
- 5: Boot by GSM/LTE lost. The device is rebooted by GSM/LTE lost in **GTDog** configuration.
- 6: Boot by GPRS/LTE lost. The device is rebooted by GPRS/LTE lost in **GTDog** configuration.
- 7: Boot by power on.

4.10. Buffer Report in HEX Format

When HEX format messages go into the local buffer, the device will replace the second byte of the messages with 'B'. Thus, **+BSP** is buffered report for **+RSP**, **+BNF** is buffered report for **+INF**, **+BVT** is buffered report for **+EVT**, **+BRD** is buffered report for **+CRD**, **+BAT** is buffered report for **+DAT** and **+BGN** is buffered report for **+LGN**. The rest part of the messages is the same.

5. Appendix: Message Index

✧ Command and ACK

AT+GTBSI

+ACK:GTBSI

AT+GTSRI

+ACK:GTSRI

AT+GTQSS

+ACK:GTQSS

AT+GTCFG

+ACK:GTCFG

AT+GTPIN

+ACK:GTPIN

AT+GTDOG

+ACK:GTDOG

AT+GTTMA

+ACK:GTTMA

AT+GTOWH

+ACK:GTOWH

AT+GTPDS

+ACK:GTPDS

AT+GTPCS

+ACK:GTPCS

AT+GTFRI

+ACK:GTFRI

AT+GTFFC

+ACK:GTFFC

AT+GTGEO

+ACK:GTGEO

AT+GTPEO

+ACK:GTPEO

AT+GTTOW

+ACK:GTTOW

AT+GTSPD

+ACK:GTSPD

AT+GTSOS

+ACK:GTSOS

AT+GTRMD

+ACK:GTRMD

AT+GTBZA

+ACK:GTBZA

AT+GTSPA

+ACK:GTSPA

AT+GTIDL

+ACK:GTIDL

AT+GTHBM

+ACK:GTHBM

AT+GTCRA

+ACK:GTCRA

AT+GTSSR

+ACK:GTSSR

AT+GTSDS

+ACKSDS

AT+GTSTP

+ACKSTP

AT+GTOUT

+ACK:GTOUT

AT+GTEPS

+ACK:GTEPS

AT+GTDIS

+ACK:GTDIS

AT+GTIOB

+ACK:GTIOB

AT+GTRTO

+ACK:GTRTO

AT+GTWLT

+ACK:GTWLT

AT+GTCMD

+ACK:GTCMD

AT+GTUDF

+ACK:GTUDF

AT+GTASC

+ACK:GTASC

AT+GTGLM

+ACK:GTGLM

AT+GTHMC

+ACK:GTHMC

AT+GTGAM

+ACK:GTGAM

AT+GTUPC

+ACK:GTUPC

AT+GTEMR

+ACK:EMR

Position Related Report

+RESP:GTTOW
+RESP:GTEPS
+RESP:GTDIS
+RESP:GTIOB
+RESP:GTFRI
+RESP:GTSPD
+RESP:GTSOS
+RESP:GTRTL
+RESP:GTDOG
+RESP:GTIGL
+RESP:GTHBM
+RESP:GTGES
+RESP:GTGIN
+RESP:GTGOT
+RESP:GTLBC

✧ Device Information Report

+RESP:GTINF

✧ Report for Querying

+RESP:GTGPS
+RESP:GTALM
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTIOS
+RESP:GTTMZ
+RESP:GTALS
+RESP:GTALC

✧ Event Report

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN
+RESP:GTMPE
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF

+RESP:GTGSS

+RESP:GTSTR

+RESP:GTSTP

+RESP:GTLSP

+RESP:GTDOS

+RESP:GTCRA

+RESP:GTPDP

+RESP:GTUPC

✧ Crash Data Packet

+RESP:GTCRD

+RESP:GTCRG

✧ Heartbeat

+ACK:GTHBD

+SACK:GTHBD

✧ Server Acknowledgement

+SACK

✧ Hex format message

+ACK

+RSP

+EVT

+DAT

+INF

+HBD

+CRD

+LGN