GSM/GPRS/GPS Tracker **GV500**

@Track Air Interface Protocol

Application Notes: **TRACGV500AN001**

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0. Revision history

Revision	Date	Author	Description of change
V1.01	2013-04-27	Wokky Lin	Initial
V1.02	2013-09-30	John Wang	Add new parameter *<engine rpm>* and *<fuel Consumption>* in +RESP:GTFRI report; Add GPS and GSM information in +RESP:GTOBD report; Add new mask bit in *<OBD Report Mask>* of AT command AT+GTOBD;
V1.03	2013-10-11	John Wang	Change parameter *<gasoline type>* in AT command AT+GTOBD to *<fuel oil type>* and add two new parameters *<custom fuel ratio>* and *<custom fuel density>*;
V1.03	2013-10-14	Wokky.Lin	Modify the description of *<Engine Coolant Temperature>* in command GTOBD.
V1.04	2013-11-05	John.Wang	Add chapter 4.Hex format report message. Add OBD report message in hexadecimal format.
V1.04	2013-11-19	Machal.Zhao	Add new parameter *<throttle position>*,*<engine load>*,*<fuel level input>* in + RESP:GTOBD report; Add new parameter *<fuel level input>* in + RESP:GTFRI report;
V1.04	2013-11-28	Wokky.Lin	Modifiy the Length and Range/Format of *<Fuel Consumption>* in **+RESP:GTOBD** message. Modify the Length of *<Diagnostic Trouble Codes>* in **+RESP:GTOBD** message.
V1.04	2013-12-05	John.Wang	Add new message **+RESP:GTJDS** for jamming detection function. Modified the *<C1 Threshold>* parameter as *<Reserved>* and added *<Jamming Cell Number Threshold>*, *<Enter Jamming Timer Threshold>*, *<Quit Jamming Timer Threshold>* parameters in the **AT+GTJDC** command. Add value '2' in the *<mode>* of **AT+GTJDC** command to report **+RESP:GTJDS** message.
V1.05	2013-12-24	Machal.Zhao	Add two new LED working modes to parameter *<LED On>* in **AT+GTCFG** command and change the default value of it from 0 to 2.
V1.05	2013-12-27	Machal.Zhao	Add new message **+RESP: GTJES** for journey

			engine summary.Modify the description of parameter<Support PIDs> in message +**RESP: GTOBD**.
V1.05	2014-01-16	John.Wang	Add new function **AT+GTOSM** for OBDII status monitor
V1.05	2014-01-20	Machal.Zhao	Add mileage parameter in message +**RESP: GTOBD**.Modify the description of parameter OBD report mask.
V1.06	2014-03-21	Machal.Zhao	Add <*Sleep Mode*> parameter in command **AT**+**GTCFG**.

1. Overview

1.1. Scope of This Document

The @Track Air Interface Protocol is a digital communication interface based on printable ASCII characters over SMS or GPRS which 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. If necessary, the terminal also sends report messages to the backend server.

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 Abbreviation

Abbreviation	Description
APN	Access Point Network
ASCII	American National Standard Code for Information Interchange
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HDOP	Horizontal Dilution of Precision
ICCID	Integrated Circuit Card Identity
IP	Internet Protocol
SMS	Short Message Service
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
UTC	Coordinated Universal Time

2. System Architecture
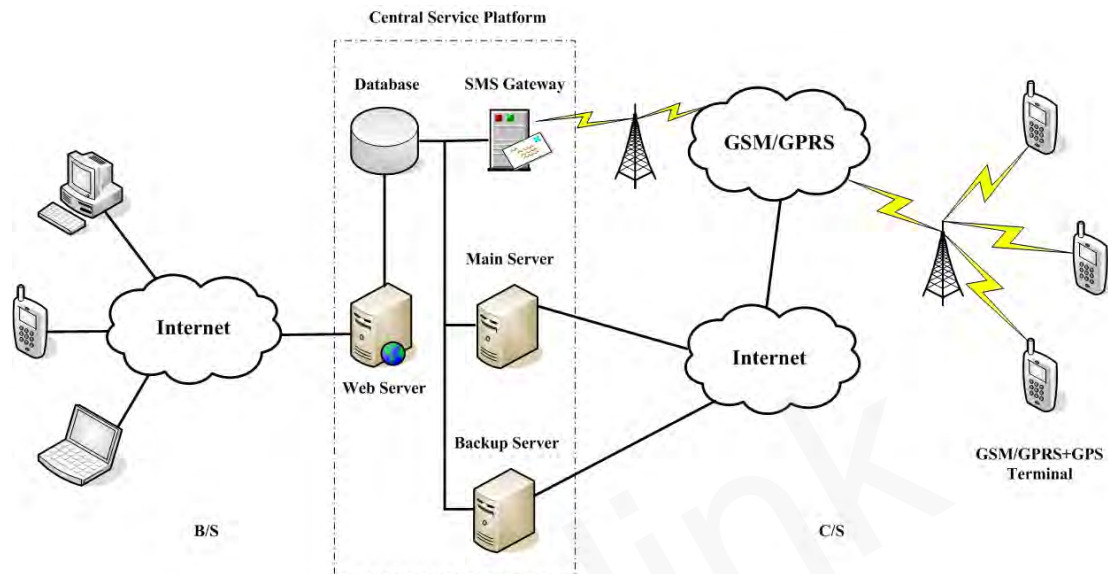
The backend server can be accessed by many terminals and should have the following abilities:

✧ The backend server should be able to access the internet and listen to the connection originating from the terminal.

✧ The backend server should be able to support a 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 of 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 deferent message.

The "<parameter1>,<parameter2>,…" carry the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighbouring 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.

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

According to the configuration of the parameters, the terminal can send Report messages to the backend server. Please see the following figure:
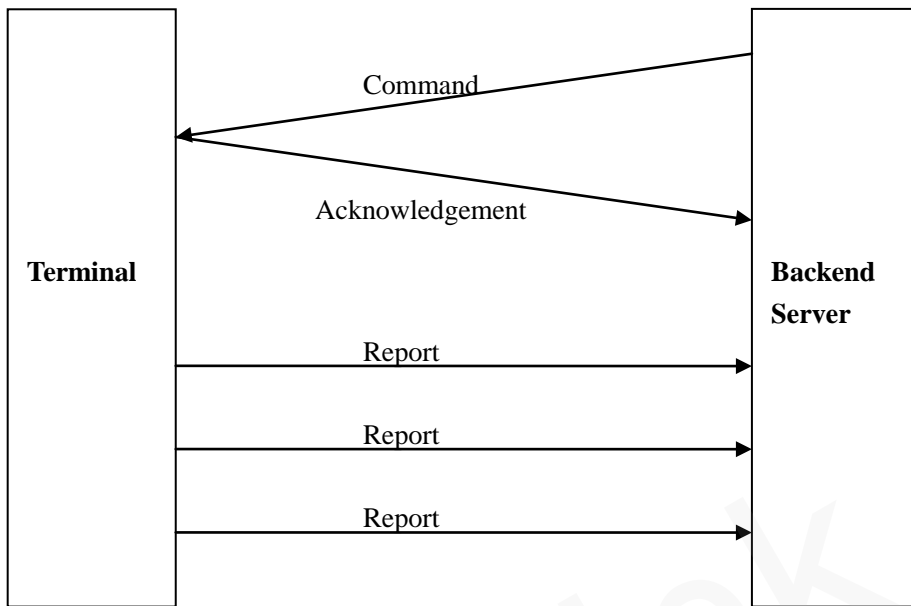
Figure **1**: @Tracker Protocol messages flow

3.2. Command And Acknowledgement

3.2.1.   Bearer Setting Information

The command **AT+GTBSI** is used to configure the GPRS parameters.

➤   **AT+GTBSI=**

Example: AT+GTBSI=gv500,cmnet,,,,,,,0000$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧   *<Password>*: The valid character of password is '0'﹣9', 'a' – 'z', 'A' – 'Z'. The default value is "gv500".

✧   *<APN>*: Access point name (APN).

✧   *<APN User Name>*: the GPRS APN user name. If the parameter field is empty, the current value of this parameter will be cleared.

✧   *<APN Password>*: the GPRS APN password. If the parameter field is empty, the current value of this parameter will be cleared.

✧   *<Reserved>*: Not used at present. Please keep empty.

✧   *<Serial Number>*: the serial number for the command. It will be invoked 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,1F0101,135790246811220,,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	$	$

✧ *<Protocol Version>*: The protocol version that the terminal conforms to. The first two characters point out the device type. As in the example, "**1F**" means GV500. The middle two characters point out the major version number of protocol and the last two characters point out the minor version number of protocol. And both version numbers are hex digital. For example, "**020A**" means version 2.10.

✧ *<Unique ID>*: The IMEI of the terminal.

✧ *<Device Name>:* The specified name of the device.

✧ *<Serial Number>*: A serial number which is equal to the *<Serial Number>* 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 report message. It begins 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. Must be "$".

Note:

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

3.2.2. 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. When the terminal is configured correctly, it should be able to report data to the backend server.

➢ **AT+GTSRI=**

Example:
AT+GTSRI=gv500,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$
AT+GTSRI=gv500,3,,1,some.host.name,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Report Mode	1	0 – 6	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	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	0
SACK Enable	1	0|1	0
Protocol Format	1	0|1	0
Reserved	0		
Reserved	0		
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 shut down 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 shut down 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 memory 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 using the heart beat data. The backend server should respond to the heart beat 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 GPRS network allows it. It is recommended to enable heartbeat sending and +**RESP:GTPDP** report when UDP receiving is the case.
- 5: Force on SMS. Only use the SMS for transmitting.
- 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using UDP protocol. The difference is the terminal will use fixed local port rather than random port to communicate with the server in this mode. Thus the backend server could use 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.

✧ *<Buffer Mode>*: The working mode the buffer report function. When buffer report function is enabled, if the device goes into areas without GSM/GPRS network covering, it will stores all report locally.　When the device goes back to areas with GSM/GPRS network covering, it will then send all the buffered reports through GPRS.

- 0: Disable the buffer report function.
- 1: Low priority. Enable the buffer report function. Under this working mode, the device will send the buffered messages after sending the normal messages.
- 2: High priority. Enable the buffer report function. Under this working mode, the device will send all the buffered messages before sending any normal message.

✧ *<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>*: The IP address 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 "+" for SMS messages sending. 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 set to 0, no heartbeat

package message sending.

✧ <*SACK Enable*>: This defines whether the backend server should respond to the terminal with SACK message when receiving messages from the terminal.
   ● 0: the backend server does not reply SACK message after receiving message from the terminal.
   ● 1: the backend server replies SACK message when receiving any message from the terminal.

✧ <*Protocol Format*>: This defines the format of the report message sent from the device to the backend server. 0 means using the ASCII format, 1 means the HEX format.

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

➢ **+ACK:GTSRI,**

Example:
+ACK:GTSRI,1F0101,135790246811220,,0001,20090214093254,11F0$

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

3.2.3. Quick Start Setting

The command **AT+GTQSS** is used to configure the GPRS parameter and backend server information in one command if all these settings are within 160 bytes, otherwise use **AT+GTBSI** and **AT+GTSRI** in two steps.

➢ **AT+GTQSS=**

Example:
AT+GTQSS=gv500,cmnet,,,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234, 15,1,,,0002$

Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Report Mode	1	0 – 6	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	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	0
SACK Enable	1	0|1	0
Protocol Format	1	0|1	0
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

➢ **+ACK:GTQSS,**

Example:

+ACK:GTQSS,1F0101,135790246811220,,0002,20090214093254,11F0$

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' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4. Global Configuration

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

➢ **AT+GTCFG=**

Example:			
AT+GTCFG=gv500,123456,gv500,,,,,,,,,,,,,,,,,0,0003$			
AT+GTCFG=gv500,,,1,123.4,0,,0,1,,2FF,,1,1,300,0,0,1,,,0,0003$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
New Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv500
ODO Enable	1	0|1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
ODO Mileage Mode	1	0|1	0
Reserved	0		
Report Composition Mask	<=4	0000 – FFFF	003F
Power Saving Mode	1	0 – 2	1
Sleep Mode	1	0 – 2	2
Event Mask	<=4	0000 – FFFF	3FFF
Reserved	0		
LED On	1	0|1|2|3	2
Info Report Enable	1	0|1	0
Info Report Interval	<=5	30 – 86400sec	300
Location By Call	1	0|1|2	0
Backup Battery Supply	1	0|1	0
Backup Battery Charge Mode	1	0|1	0
AGPS Mode	1	0|1|2	0
GSM Report	4	0000 – FFFF	000F
GPS Lost Time	2	0 – 30min	0
Serial Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ *<New Password>*: Set to change the current password.

✧ *<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 report message.

✧ *<ODO Initial Mileage>*: The initial value for calculating the total mileage.

✧ *<ODO Mileage Mode>*: Config the mode of calculating the total mileage.
  - 0: Calculate the total mileage only by GPS.
  - 1: Calculate the total mileage by OBD, but if the value of OBD is invalid, device will always calculate the total mileage by GPS. In this mode, the *<Mode>* in command AT+GTOBD must be 1 and the <OBD Check interval> should not be 0.

✧ *<Report Composition Mask>*: Bitwise report mask to configure the composition of report message, especially the GPS information composition.
  - Bit 0 for *<Speed>*
  - Bit 1 for *<Heading>*
  - Bit 2 for *<Altitude>*
  - Bit 3 for GSM tower 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>*
  - Bit 7 for *<VIN>*

For each bit, set it to 1 to enable corresponding component in the report, 0 to disable. This mask is effective to all report messages.

✧ *<Power Saving Mode>*: Set mode of power saving function. If mode of power saving function is set to 0, the GPS will be open always. If mode of power saving function is set to 1, the fixed report, geo-fence and speed alarm report functions are suspended when the device is at a standstill or the engine is off (ignition on before). If mode of power saving function is set to 2, it is mostly like mode 1 and the difference is that the fixed report will not be suspended and the fix and send interval of it will be set to *<IGF Report Interval>* in **AT+GTFRI** when the engine is off.
  - 0: Disable power saving function
  - 1: Mode 1 of power saving function
  - 2: Mode 2 of power saving function

✧ **<Sleep Mode>**: Set mode of sleeping function. If mode of sleeping function is set to 0, disable sleeping function.If set to 1, enable sleeping function to stop all the GPS fixing, OBDII checking and any reports when the voltage of the external power supply is lower than 11.5V; also, only to stop OBDII checking when the device is at a standstill and the engine is off 3 minutes later. If set to 2, it is mostly like mode 1 and the difference is that in sleeping mode only OBDII query function is closed. OBDII function is woken up timely by detecting the movement status and voltage changes of the OBDII interface.
  - 0: Disable sleeping function.
  - 1: Mode 1 of sleeping function.

- 2: Mode 2 of sleeping function (Default 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 the power on +**RESP:GTRTL**
  - Bit 12 for the ignition report +**RESP:GTIGN** and +**RESP:GTIGF**
  - Bit 13 for the ignition on location report +**RESP:GTIGL**

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

✧ *<LED On>*: Configure the working mode of OBD LED, CEL LED and GPS LED.
  - 0: Each time the device powers on, OBD LED and GPS LED will work for 30 minutes and then are turned off deadly.
  - 1: Turn on OBD LED and GPS LED if necessary.
  - 2: LED default working mode. Each time the device is connected to the vehicle or engine ignition status have changed, all the LED (OBD, GPS and CEL LED) will work for 5 minutes and then are turned off deadly. When disconnected, all the LED will recover working. If connected less than 5 minutes, LED will keep normal working.
  - 3: Each time the device is connected to the vehicle 5 minutes later, all the LED will work for 5 minutes and then are turned off deadly. If connected less than 5 minutes, LED will keep normal working.

✧ *<Info Report Enable>*: Enable/disable the device information report function (+**RESP:GTINF**). The device information include state of the device, ICCID, GSM signal strength, voltage of external power supply, battery voltage, charging status, OBD and GPS LED working mode, the last known time of GPS fix, outputs status, time zone information and daylight saving setting.
  - 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 By Call>*: Configure how to handle the incoming call.
  - 0: Just hang up the call.
  - 1: Hang up the call and report the current position (+**RESP:GTLBC**).
  - 2: Hang up the call and report the current position with Google Map link through SMS to the phone number of the incoming call.

✧ *<Backup Battery Supply>*: Configure the working mode of the backup battery supply.

- 0: Disable the backup battery power supply.
- 1: Enable the backup battery power supply.

✧ *<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, only charge the backup battery 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 ratio to get GPS position successfully and reduce the time to get GPS position.
- 0: Disable the AGPS function.
- 1: AGPS Offline mode.
- 2: AGPS Online mode.

✧ *<GSM Report>*: Control how or when to report cells' information.
 Bit 14 – 15, the 2 high bits mean GSM report mode
- 0: Not allow the cells' information report.
- 1: Allow the cells' information report after failed to get GPS position if cell's information available.
- 2: Report the message **+RESP: GTGSM** after getting GPS position successfully every time if cell's information available.
- 3: Report the message **+RESP:GTGSM** no matter what result of getting GPS position every time if cell's information available.

Bitwise mask to configure which event report should be sent to the backend server.
- Bit 0 for **+RESP:GTRTL**
- Bit 1 for **+RESP:GTLBC**
- Bit 2 for **+RESP:GTFRI**
- Bit 3 is reserved
- Bit 4 for **+RESP:GTTOW**
- Bit 5 – 13 are reserved

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

✧ *<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 lost. When the GPS signal is recovered or a successful fix obtained again, the device will send the event report **+RESP:GTGSS** to indicate the recovery. 0 means disable this function.

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

➢ **+ACK:GTCFG,**

Example:
+ACK:GTCFG,1F0101,135790246811220,,0003,20090214093254,11F0$

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	$	$

3.2.5. 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 matches the predefined alarm condition, the device will report 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, it is stroingly recommended to switch on the backup battery in case that the voltage of the external power may drop very low.

➢ **AT+GTEPS=**

Example:			
AT+GTEPS=gv500,2,250,12000,3,2,,,,,1,,,,0007$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Mode	1	0|1|2	0
Min Threshold	<=5	250 – 28000 mV	
Max Threshold	<=5	250 – 28000 mV	
Sample Period	<=2	0|1 – 12(×2s)	0
Debounce Time	1	0 – 5 (×1s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Sync with FRI	1	0|1	0
Reserved	0		
Reserved	0		

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.

✧ *<Min Threshold>*: The lower limit to the voltage of the external power supply to trigger the alarm.

✧ *<Max Threshold>*: The upper limit to the voltage of the external power supply to trigger the alarm.

✧ *<Sample Period>*: The sampling period to measure the external power supply.

✧ *<Debounce Time>*: The time for debouncing to avoid exceptional voltage drop of the external power supply.

✧ *<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 report message.
- 0: Do not report external power supply voltage with fixed report message.
- 1: Report external power supply voltage with fixed report message.

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

➢ **+ACK:GTEPS,**

Example:
+ACK:GTEPS,1F0101,135790246811220,,0007,20090214093254,11F0$

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	$	$

3.2.6. Fixed Report Information

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

➢ **AT+GTFRI=**

Example:
AT+GTFRI=gv500,0,,,,,,,,,,,,,,,,0009$
AT+GTFRI=gv500,1,1,,1,1000,2300,,30,,,,,600,,,,,0009$
AT+GTFRI=gv500,2,1,,1,1000,2300,,,500,,,,,,,,0009$
AT+GTFRI=gv500,3,1,,1,1000,2300,,,,1000,,,,,,,,0009$
AT+GTFRI=gv500,4,1,,1,1000,2300,,60,,300,,,,,,,,0009$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Mode	1	0 – 4	0
Discard No Fix	<=2	0|1	1
Reserved	0		
Period Enable	1	0|1	1
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
Reserved	0		
Send Interval	<=5	5 – 86400sec	30
Distance	<=5	50 – 65535m	1000
Mileage	<=5	50 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	5 - 86400sec	600
Reserved	0		
Reserved	0		
Reserved	0		
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 positional report message is sent to the backend server periodically according to the parameter *<Send Interval>*.
  ● 2: Fixed Distance Report. The positional report 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>*.
  ● 3: Fixed Mileage Report. The positional report 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>*.
  ● 4: Optimum Report. Simultaneously observe both time interval and path length between two adjacent reports. Report device position if the calculated time interval per current time against the last report time is greater than the *<Send Interval>*, and the length of path between the current position and the last position is greater than the *<Mileage>* setting.

✧ *<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 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.

✧ *<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 to disable the corner report. For other values, the device will compare the current heading with the last known corner, if the difference is greater than or equal to this value, send the corner report with +**RESP:GTFRI**.

✧ *<IGF Report Interval>:* Period to fix and send the position information when *<Power Saving Mode>* in **AT+GTCFG** is set to 2 and the engine is off and if *<Mode>* is set to 1 (Fixed Timing Report). Its value range is 5 – 86400 and the unit is second.

Note:

If current *<Mode>* is not 0 and the *<Power Saving Mode>* in **AT+GTCFG** is set to 0 or 2, the message +**RESP:GTFRI** will be sent to the backend server periodically according to the parameter *<IGF Report Interval>* when engine is off.

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

> **+ACK:GTFRI,**

Example:
+ACK:GTFRI,1F0101,135790246811220,,0009,20090214093254,11F0$

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	$	$

3.2.7. Geo-Fence Information

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

➢ **AT+GTGEO=**

Example:
AT+GTGEO=gv500,0,3,121.412248,31.187891,1000,600,1,1,0,0,,,,,,000A$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
GEO ID	1	0 – 4	
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0|5 – 86400sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*GEO ID*>: ID of the Geo-Fence. Total five zones, 0 to 4, are supported.

✧ <*Mode*>: The working mode of the Geo-Fence to report the message +**RESP:GTGEO** to the backend server.

- ● 0: disable the zone's 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.

✧ *<Longitude>*: The longitude of a point which is defined as the center of the Geo-Fence circular 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 minus "–" and east longitude is defined as positive without "+".

✧ *<Latitude>*: The latitude of a point which is defined as the centre of the Geo-Fence circular 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 minus "–" and north Latitude is defined as positive without "+".

✧ *<Radius>*: The radius of the Geo-Fence circular region. The value range is (50 – 6000000) and the unit is meter.

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

✧ *< Trigger Mode >*:
- 0 Disable auto trigger mode
- 21 Automatically set Geo Fence after ignition off. In this mode, the device will automatically set a Geo-Fence with the current location as the center point of the Geo-Fence when ignition is off. This Geo-Fence will only report exiting alarm. The Geo-Fence will be cancelled after exiting
- 22 Manually enable Geo-Fence after ignition off. In this mode, the device will automatically set a Geo-Fence with the current location as the center point of the Geo-Fence when ignition is off. This Geo-Fence will only report exiting alarm. When the device exits this Geo-Fence, it will cancel this Geo-Fence and disable the trigger mode at the same time. If the driver wants to use this trigger mode again, he has to manually set the trigger mode again

✧ *<Trigger Report>*: Whether to report +RESP:GTGES message when the 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,1F0101,135790246811220,,0,000A,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' '-' '_'	

GEO ID	1	0 – 4	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.8. Tow Alarm Configuration

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

➢ **AT+GTTOW=**

Example: AT+GTTOW=gv500,1,5,0,120,,,,,4,10,4,,,,,,,,,000B$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Tow Enable	1	0|1	0
Engine Off to Tow	<=2	5 – 15 min	10
Fake Tow Delay	<=2	0 – 10 min	1
Tow Interval	<=5	30 – 86400 sec	300
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Rest Duration	<=3	1 – 255 (×15sec)	2
Motion Duration	<=2	1 – 10 (×100ms)	3
Motion Threshold	1	2 – 4	2
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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

✧ *<Engine Off to Tow>*: A time parameter to judge whether the device is considered being towed after the engine off. If the motion sensor doesn't detect stillness within the specified time after engine off, the device is being towed.

✧ *<Fake Tow Delay>*: After engine off and stillness detected, if the motion sensor detects moving again, the device turns into a state called fake tow. If the device keeps in fake tow after a period of time defined by the parameter *<Fake Tow Delay>*, it is considered being towed.

✧ *<Tow Interval>*: The period to send tow alarm message.

✧ *<Rest Duration>*: A time parameter to make sure that the device enters stillness status, i.e. the status of the device will be changed to stillness if the motion sensor detects stillness and maintains for a period of time defined by the parameter *<Rest Duration>*.

✧ *<Motion Duration>*: A time parameter to make sure that the device enters motion status, i.e. the status of the device will be changed to motion if the motion sensor detects motion and maintains for a period of time defined by the parameter *<Motion Duration>*.

✧ *<Motion Threshold>*: The threshold for the motion sensor to measure whether the device is moving.

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

➢ **+ACK:GTTOW,**

Example: +ACK:GTTOW,1F0101,135790246811220,,000B,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	$	$

3.2.9. Speed Alarm

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

➤ **AT+GTSPD=**

Example:				
AT+GTSPD=gv500,1,80,120,60,300,,,,,,,,,,,,,,,,,,000C$				
AT+GTSPD=gv500,2,80,120,60,300,,,,,,,,,,,,,,,,,,000C$				
Parameter	**Length(byte)**	**Range/Format**	**Default**	
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500	
Mode	1	0|1|2|3	0	
Min Speed	<=3	0 – 400km/h	0	
Max Speed	<=3	0 – 400km/h	0	
Validity	<=4	0 – 3600sec	60	
Send Interval	<=4	30 – 3600sec	300	
Reserved	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			
Reserved	0			
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 one time 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.

✧ *<Min Speed>*: The lower limit speed.
✧ *<Max Speed>*: The upper limit speed.
✧ *<Validity>*: If the speed meets the alarm condition and maintains a period of time defined by *<Validity>*, 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,1F0101,135790246811220,,000C,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	$	$

3.2.10. Excessive Idling Detection

The command **AT+GTIDL** is used to detect the engine excessive 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 the idle status, it will report event message **+RESP:GTIDN** to the backend server. When the vehicle leaves the idle status, the device will report event message **+RESP:GTIDF** to the backend server.

> **AT+GTIDL=**

Example: AT+GTIDL=gv500,1,2,1,,,,,,,,,,,,,000F$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
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		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Mode>*: Working mode.
- 0: Disable this function
- 1: Enable this function.

✧ *<Time to Stationary>*: If the vehicle is detected to be stationary with ignition on for this time long, it is considered to be in idling status.

✧ *<Time to Movement>*: After the vehicle enters into idling status, if it moves again or turns ignition off and keeps in that status for this time long, the vehicle is considered to leave idling status.

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

➢ **+ACK:GTIDL,**

Example:
+ACK:GTIDL,1F0101,135790246811220,,000F,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	$	$

3.2.11. Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh behavior of drive with GPS and motion sensor. Three harsh behaviors would be monitored, the harsh braking, the harsh acceleration and the harsh turn. There are two methods to monitor the harsh behavior, one is by GPS, and the other is by motion sensor and GPS. This function works only when the engine is on and the status is movement.

➢ **AT+GTHBM=**

Example:			
AT+GTHBM=gv500,1,,,100,21,6,,60,21,6,,,21,15,,,,,,,,,,0010$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Mode	1	0|1|2|3	0
Reserved	0		
Reserved	0		
High Speed	<=3	100 – 400km/h	100
ΔVhb	<=3	0 – 100km/h	0
ΔVha	<=3	0 – 100km/h	0
Reserved	0		
Medium Speed	<=3	60 – 100km/h	60
ΔVmb	<=3	0 – 100km/h	0
ΔVma	<=3	0 – 100/km/h	0
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100/km/h	0
ΔVla	<=3	0 – 100/km/h	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Turn and Break Threshold	<=3	30-70	30
Turn and Break Duration	<=3	40-100(*8ms)	50

Accelerate Threshold	<=3	15-50	20
Accelerate Duration	<=3	50-250(*8ms)	65
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

According the speed read from GPS, 3 levels of speed are defined including high speed, medium speed and low speed. For each speed level, 2 thresholds of speed change are defined to determine the harsh braking and harsh acceleration. If the changes of speed within 5 seconds are greater than the corresponding threshold, the device will report +**RESP: GTHBM** message to the backend server to indicate the harsh behavior. The same harsh behavior occurred continuously within 30 seconds only reports once.

✧ < *Mode*>: Working mode.
- 0: Disable this function
- 1: Enable this function, detected by GPS only.
- 2: Enable this function, detected by motion sensor only. Motion sensor can detect three types of harsh behavior, and device can provide detail information about harsh behavior by using GPS, you need keep GPS open always to collect all the information needed.
- 3: Enable this function, detected by motion sensor and GPS.

✧ <*High Speed*>, <*Medium Speed*>: If the last known speed of the device read from GPS is greater or equal to <*High Speed*>, the vehicle that the device is attached to is considered to be high speed. If the last known speed is less than <*High Speed*> while greater or equal to <*Medium Speed*>, the vehicle is considered to be medium speed. If the last known speed is less than <*Medium Speed*>, the vehicle is considered to be low speed.

✧ <ΔVhb>: The threshold for harsh braking in high speed level. If within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to this value, a harsh braking is detected in high speed level. If set to 0, do not monitor harsh braking behavior in high speed level.

✧ <ΔVha>: The threshold for harsh acceleration in high speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected in high speed level. If set to 0, do not monitor harsh acceleration behavior in high speed level.

✧ <ΔVmb>: The threshold for harsh braking in medium speed level. If within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to this value, a harsh braking is detected in medium speed level. If set to 0, do not monitor harsh braking behavior in medium speed level.

✧ <ΔVma>: The threshold for harsh acceleration in medium speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected in medium speed level. If set to 0, do not monitor harsh acceleration behavior in medium speed level.

✧ <ΔVlb>: The threshold for harsh braking in low speed level. If within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to

this value, a harsh braking is detected in low speed level. If set to 0, do not monitor harsh braking behavior in low speed level.

✧ *<ΔVla>*: The threshold for harsh acceleration in low speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected in low speed level. If set to 0, do not monitor harsh acceleration behavior in low speed level.

✧ *<Turn and Break Threshold>*: The threshold for the motion sensor to measure whether the device is in harsh turn or harsh break status.

✧ *<Turn and Break Duration>*: The time parameter to confirm that the device enters harsh turn or harsh break status. I.e. The driver behaviors must maintain for a period of time larger than it defined by *<Turn and Break Duration>* so that harsh turn or harsh break behaviors event can be triggered.

✧ *<Accelerate Threshold >*: The threshold for the motion sensor to measure whether the device is in harsh accelerate behavior status.

✧ *<Accelerate Duration>:* The time parameter to confirm that the device enters harsh accelerate status. I.e. The driver behaviors must maintain for a period of time larger than it defined by *<Accelerate Duration>* so that harsh accelerate behaviors event can be triggered.

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

➢ **+ACK:GTHBM,**

Example:			
+ACK:GTHBM,1F0101,135790246811220,,0010,20090214093254,11F0$			
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	$	$

3.2.12. Time Adjustment

The command **AT+GTTMA** is used to adjust the local time of the device remotely. Upon this command, the device will set the time zone and daylight saving accordingly. Then it will use the given UTC time to adjust the local time based on the time zone and daylight saving setting. This command will also trigger the device to start GPS. After a successful GPS fix, the device will update the local time with the GPS UTC time again.

➢ **AT+GTTMA=**

Example: AT+GTTMA=gv500,-,3,30,0,20090917203500,,,,,0011$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Sign	1	+|−	+
Hour Offset	<=2	0 – 23	0
Minute Offset	<=2	0 – 59	0
Daylight Saving	1	0|1	0
UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character			

✧ *<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>*: UTC time to adjust the local time.

The acknowledgment message of **AT+GTTMA** command:
➢ **+ACK:GTTMA,**

Example:

+ACK:GTTMA,1F0101,135790246811220,,0011,20090214093254,11F0$			
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	$	$

3.2.13. Outside Working Hours

To protect the privacy of the driver 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 to protect the privacy. When this function is enabled, the device will report empty latitude, empty longitude, empty gsm cell information in all the report messages.

➢ **AT+GTOWH=**

Example: AT+GTOWH=gv500,3,1F,0900,1200,1300,1730,,,,,,,,,,,,,0012$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Mode	1	0|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		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Mode>*: Working mode.

  ● 0: Disable this function.

● 3: Automatic mode. It will automatically check the current time against the working hours arrange. If outside the working hours, hide the location information. Otherwise report normally.

✧ <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 day, 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.

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

➢ **+ACK:GTOWH,**

Example:			
+ACK:GTOWH,1F0101,135790246811220,,0012,20090214093254,11F0$			
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	$	$

3.2.14. Protocol Watchdog

The **AT+GTDOG** command is used to reboot the device in a time based manner or upon ignition. This helps the device avoid working in an exceptional status for a long time.

➢ **AT+GTDOG=**

Example:
AT+GTDOG=gv500,1,,1,0130,,1,,,60,60,,0013$
AT+GTDOG=gv500,2,30,,,,1,,,60,60,,0013$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Mode	1	0|1|2	0
Ignition Frequency	<=3	10 – 120 min	60
Interval	<=2	1 – 30 day	30
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0|1	1
Reserved	0		
Reserved	0		
GSM Interval	4	0 | 5-1440 min	60
PDP Interval	4	0 | 5-1440 min	60
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Mode>*: Working mode.
- ● 0: Disable this function
- ● 1: Reboot periodically according to the *<Interval>* and *<Time>* setting.
- ● 2: Reboot when ignition on.

✧ *<Ignition Frequency>*: When the working mode is 2, if the time interval between two adjacent ignitions is greater than the specified value, the device will automatically reboot upon ignition on.

✧ *<Interval>*: The interval to reboot the device in day.

✧ *<Time>*: At what time to perform the reboot operation when *<Interval>* is met.

✧ *<Report Before Reboot>*: Whether to report the +**RESP:GTDOG** message before reboot. 0 means no report, 1 to report. If this is enabled, the device will make a real-time location before sending the message in order to send it with the current location information.

✧ *<GSM Interval>*: The internal to reboot the device when in no GSM signal situation. 0 means do not reboot the device.

✧ *<PDP Interval>*: The interval to reboot the device when GPRS unable to register successfully. 0 means do not reboot the device.

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

➢ **+ACK:GTDOG,**

Example:
+ACK:GTDOG,1F0101,135790246811220,,0013,20090214093254,11F0$

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	$	$

3.2.15. Auto-unlock PIN

The command **AT+GTPIN** is used to configure the auto-unlock PIN function of the device. Some operators offer SIM card with PIN code protection by default. To make the device work with the PIN-protected SIM card, use this command to let the device auto-unlock the SIM PIN with the pre-set PIN code.

➢ **AT+GTPIN=**

Parameter	Length(byte)	Range/Format	Default
Example: AT+GTPIN=gv500,1,0000,,,,,,0014$			
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Enable Auto-unlock PIN	1	0|1	1
PIN	4 – 8	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Enable Auto-unlock PIN>*: 1 to enable the auto-unlock PIN function, 0 to disable.
✧ *<PIN>*: Code used to unlock the SIM PIN.

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

➢ **+ACK:GTPIN,**

Parameter	Length(byte)	Range/Format	Default
Example: +ACK:GTPIN,1F0101,135790246811220,,0014,20090214093254,11F0$			
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	$	$

3.2.16. 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=gv500,9,,,,,,0015$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Sub Command	1	0 – C	
Sub AT Command	3		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Sub Command>*: Valid value is 0−9, A, B，C.
- 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:GTALL**.
- 3: *REBOOT*. Reboot the terminal.
- 4: *RESET*. Reset all parameters to factory setting and clear all buffer messages. Parameters configured by **AT+GTBSI** and **AT+GTSRI, AT+GTCFG and AT+GTTMA, AT+GTPIN** 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 GSM signal level 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 level and adapter status of the terminal via message +**RESP:GTBAT**.
- A: Reserved.
- B: *TMZ*. Get the time zone settings via message +**RESP:GTTMZ**.

- C: *GIR*. Get cell information via message +**RESP:GTGSM**.
- <*Sub AT Command*>: Including all the AT Command that we defined which save by NVRAM. For example, if you want to get configuration of **AT+GTFRI**, Please set **AT+GTRTO=gv500,2,FRI,,,,,0015$,** through +**RESP:GTALS** to get it. Exception: To get local time information, please use **TMZ**.

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

➢ **+ACK:GTRTO,**

Example:
+ACK:GTRTO,1F0101,135790246811220,,VER,0015,20090214093254,11F1$

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' '-' '_'	
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**.

3.2.17. Hour Meter Counter

The command **AT+GTHMC** is used to measure the accumulated time of use with each actuation of the ignition on. To use this command, the device must be connected to the vehicle by OBD interface. When the device sends +**RESP:GTFRI**, +**RESP:GTIGN** or +**RESP:GTIGF** message, <*hour meter counter*> will be involved into these reports.

➢ **AT+GTHMC=**

Example:
AT+GTHMC=gv500,1,12345:12:34,,,,,,,,,0018$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Hour Meter Enable	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		
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.
   ● 0: Disable hour meter counter function
   ● 1: Enable hour meter counter function
✧ *<Initial Hour Meter Count>*: Initial hours meter count. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00– 99999:00:00. When ignition is on at the first time, the *<Hour Meter Count>* which is reported in +**RESP:GTFRI**, +**RESP:GTIGN** or +**RESP:GTIGF** will be increased based on this value.

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

➢ **+ACK:GTHMC,**

Example:			
+ACK:GTHMC,1F0101,135790246811220,,0018,20090214093254,11F0$			
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	$	$

3.2.18. Jamming Detection

The command **AT+GTJDC** is used to configure the parameter for jamming detection. When the detection condition is matched, the device will report **+RESP:GTJDR** event message to the backend server.

➢ **AT+GTJDC=**

Example: AT+GTJDC=gv500,1,10,,5,10,10,,,,,,,0019$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Mode	1	0|1|2	0
Signal Threshold	<=3	0 – 31	25
Reserved	0		
Jamming Cell Number Threshold	<=2	0 – 99	5
Enter Jamming Timer Threshold	<=3	0 – 300 sec	10
Quit Jamming Timer Threshold	<=4	0 – 3600 sec	10
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Mode>*: Working mode.
- 0: Disable Jamming detection function.
- 1: Enable Jamming detection function, if the jamming is detected, the device will report **+RESP:GTJDR** message. This message only is reported with entering into "Jamming".
- 2: Enable Jamming detection function, if the jamming is detected, the device will report **+RESP:GTJDS** message. This message is reported with entering into "Jamming" or quiting the "Jamming".

✧ *<Signal Threshold>*, *<Jamming Cell Number Threshold>*: The built-in jamming detection algorithm uses these two parameters to judge whether the device is currently being jammed.

The smaller the parameter, the more sensitive.

✧ *<Enter Jamming Timer Threshold>*: when the device detects the jamming, the device based on *<Enter Jamming Timer Threshold>* parameter to trigger the enter Jamming event.

✧ *<Quit Jamming Timer Threshold>*: when the device quits the jamming, the device based on *<Quit Jamming Timer Threshold>* parameter to trigger the quit Jamming event.

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

➢ **+ACK:GTJDC,**

Example:
+ACK:GTJDC,1F0101,135790246811220,,0019,20090214093254,11F0$

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	$	$

3.2.19. White List

The command **AT+GTWLT** is used to configure a list of authorized phone numbers which are allowed to perform the location by call.

➢ **AT+GTWLT=**

Example: AT+GTWLT=gv500,1,1,2,13813888888,13913999999,,,,,0018$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Call Filter	1	0|1	0
Start Index	<=2	1 – 10	
End Index	<=2	1 – 10	
Phone Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Call Filter>*: The working mode of this function.
   ● 0: Disable this function. Allow any phone number to use the location by call.
   ● 1: White list for location by call. Only phone numbers saved in the white list could use the location by call function.
✧ *<Start Index>*, *<End Index>*: The index range of the white list to which the phone numbers are to be updated. For example, the *<Start Index>* is set to 1 and the the *<End Index>* is set to 2. Then the first two phone numbers in the white list will be updated by the numbers provided in the parameter *<Phone Number List>*. The *<Start Index>* and *<End Index>* defines the total amount of phone numbers that will be updated. If either one is empty, there should be no *<Phone Number List>* parameter followed.
✧ *<Phone Number List>*: A list of phone numbers, which are separated by comma, to be updated to the white list. The amount of the phone numbers are defined by *<Start Index>* and *<End Index>*.

The acknowledgment message of **AT+GTWLT** command:
➢ **+ACK:GTWLT,**

Example:
+ACK:GTWLT, 1F0101,135790246811220,,0018,20090214093254,11F0$

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:

It is necessary to make sure the total size of the command is not greater than 160 if it is sent via SMS.

3.2.20. Crash Detection

The command **AT**+**GTCRA** is used to configure the parameter for crash detection. When the detection condition is matched, the device will report +**RESP: GTCRA** event message and data packets +**RESP: GTCRD** to the backend server.

➢ **AT**+**GTCRA**=

Example:
AT+GTCRA=gv500,1,5,,,,,,0,1,10,6,,0019$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Mode	1	0|1	0
Sensitivity	1	1 – 9	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

✧ *<Mode>*: Working mode.
- ● 0: Disable this function.
- ● 1: Enable this function.

✧ *<Sensitivity>*: Sensitivity of the crash detection,. The smaller the number is, the more sensitive this function would be.

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

➢ **+ACK:GTCRA,**

Example:
+ACK:GTCRA, 1F0101,135790246811220,,0019,20090214093254,11F0$

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	$	$

3.2.21. Preserve special device logical state Setting

The command AT+GTPDS is used to preserve special device logical state for the terminal.
The special logical states chosen by the value of component mask will be preserved or reset according to the mode.

➢ **AT+GTPDS=**

Example:
AT+GTPDS=gv500,1,1F,,,,,,,,FFFF$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Mode	1	0|1|2	0
Mask	4	0000-FFFF	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Mode>*:
- 0: Disable this function
- 1: Preserve special device logical state according to the value of the MASK
- 2: Reset all the special device logical states list in the <Mask> after receiving the command, and then preserve special device 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

The acknowledgment message of AT+GTPDS command:

➢ **+ACK:GTPDS,**

Example:			
+ACK:GTPDS, 1F0101,135790246811220,,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	$	$

3.2.22. 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 leaves the start status, and then enters into stop status, it will report event message **+RESP:GTSTP** to the backend server.

➢ **AT+GTSSR=**

Example: AT+GTSSR=gv500,1,2,1,5,,,,,000F$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
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	3	0 – 43200 min	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Mode>*: Working mode.
- 0: Disable this function
- 1: Enable this function
✧ *<Time to Stop>*: After the vehicle enters into start status, if it rest again and keeps in that status for this time long, the vehicle is considered to leave start status.
✧ *<Time to Start>*: 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 start speed threshold to determine whether the vehicle is start or not.

When the device is detected to be moving with ignition on by the built-in motion sensor, it will start to check the speed from GPS. If the device speed stays greater than this *<Start Speed>* longer than *<Time to Start>*, the vehicle is regarded to be start status. The event report **+RESP:GTSTR** will be reported. Otherwise, if the device speed stays less than or equal with this *<Start Speed>* longer than *<Time to Stop>*, the vehicle is regarded to quit start status. The event report **+RESP:GTSTP** will be reported. If GPS fix abnormal more than 1 minute, only use the built-in motion sensor to detect the start / stop status and do not check the speed.

✧ *<Long Stop>*: After the vehicle enters into stop status and stay stop for this time long, the **+RESP:GTLSP** will be sent, and 0 means disable this function.

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

➢ **+ACK:GTSSR,**

Example:
+ACK:GTSSR,1F0101,135790246811220,,000F,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	$	$

3.2.23. OBDII Configuration

This command AT+GTOBD is used to set the OBDII configuration and request information from vehicle via OBD interface. Report OBDII information(+RESP:GTOBD) which includes VIN, OBD connect, OBD power voltage, engine speed, vehicle speed, engine coolant temperature, fuel consumption, Support PIDs, mileage after clearing malfunction, mileage after malfunction, mil light on, trouble codes number and detail trouble codes.

➢ **AT+GTOBD**

Example:
AT+GTOBD=gv500,1,60,300,300,1FFF,3,2.0,2,14.3,0.737,,,,,FFFF$
AT+GTOBD=gv500,1,30,30,30,30FFFF,7,2,0,,,7F,,,,FFFF$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500

Mode	1	0|1	1
OBD Check interval	<=5	0|30 – 86400sec	30
OBD Report Interval	<=5	0|30 – 86400sec	0
OBD Report Interval IGF	<=5	0|30 – 86400sec	0
OBD Report Mask	8	0 - FFFFFFFF	FFFF
OBD Event Mask	4	0 - FFFF	3
Displacement	4	0.0 - 10.0L	2.0
Fuel Oil Type	3	0 – 2|100	2
Custom Fuel Ratio	4	10.0 - 20.0	14.3
Custom Fuel Density	5	0.0 - 1.0g/mL	0.737
Journey Summary mask	8	0 - FFFFFFFF	7F
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Mode>: The mode
  ● 0: Disable OBD function.
  ● 1: Enable OBD function.
✧ <OBD Check interval>: Period to read information specified by <OBD Report Mask> via OBD interface. Its value range is 0|30 – 86400 and the unit is second. 0 means not getting reading OBD information.
✧ <OBD Report Interval>: Period to send +RESP:GTOBD report message to the backend server when ignition on. Its value range is 0|30 – 86400 and the unit is second. 0 means not reporting the message +RESP:GTOBD.
✧ <OBD Report Interval IGF>: Period to send +RESP:GTOBD report message to the backend server when ignition off. Its value range is 0|30 – 86400 and the unit is second. 0 means not reporting the message +RESP:GTOBD in ignition off state.
✧ <OBD Report Mask>: Bitwise report mask to configure the composition of OBD report message.

Bit	Item to Mask	Description
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	Reserved	
Bit 22	*<Mileage>*	The value of total mileage
Bit 21	*<GSM Information>*	Including *<MCC>*, *<MNC>*, *<LAC>*, *<Cell ID>* and the *<reserved>* parameter "00"
Bit 20	*<GPS Information>*	Including*<GPSAccuracy>*,*<Speed>*,*<Heading>*,*<Altitude>*,*<Longitude>*,*<Latitude>*,*<GPS UTC Time>*
Bit 19	Reserved	
Bit 18	Reserved	
Bit 17	Reserved	
Bit 16	Reserved	
Bit 15	*<Fuel Level Input>*	The value of fuel level input percentage
Bit 14	*<Engine Load>*	The value of calculated engine load percentage
Bit 13	*<Throttle Position>*	The value of throttle position sensor percentage
Bit 12	*<Diagnostic Trouble Codes>*	Details of emission - related DTCs
Bit 11	*<Number of DTCs>*	Number of emission-related DTCs
Bit 10	*<MIL Status>*	Malfunction Indicator Lamp(MIL) Status
Bit 9	*<MIL Activated Distance>*	This distance accumulated since MIL is activated
Bit 8	*<DTCs Cleared Distance>*	This distance accumulated since DTCs were cleared.
Bit 7	*<Fuel Consumption>*	The Fuel Consumption
Bit 6	*<Engine Coolant Temperature>*	Engine coolant temperature
Bit 5	*<Vehicle Speed>*	Vehicle road speed
Bit 4	*<Engine RPM>*	Revolutions per minute of the engine
Bit 3	*<Support PIDs>*	Parameter identification (PID) are supported.
Bit 2	*<OBD Power Voltage>*	The voltage from the vehicle via OBDII interface
Bit 1	*<OBD Connect>*	Whether the device connect with vehicle
Bit 0	*<VIN>*	Vehicle identification number

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

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	**+RESP:GTJES**
Bit 1	**+RESP:GTOPF**
Bit 0	**+RESP:GTOPN**

✧ *<Displacement>*: Displacement of the vehicle which is used for fuel consumption caculation.
✧ *<Fuel Oil Type>*: Fuel oil type of the vehicle using which is used for fuel consumption caculation.
- 0: 90# gasoline
- 1: 93# gasoline
- 2: 97# gasoline
- 100: Custom Mode. In this mode, you need to set *<Custom fuel ratio>* and *<Custom fuel density>*.

✧ *<Custom Fuel Rratio>:* Fuel oil ratio of the vehicle using.
✧ *<Custom Fuel Density>:* Fuel oil density of the vehicle using.
✧ *<Journey Summary mask>:* Bitwise report mask to configure the composition of +RESP: GTJES report 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	Reserved
Bit 22	Reserved
Bit 21	*<GSM Information>*
Bit 20	*<GPS Information>*
Bit 19	Reserved
Bit 18	Reserved
Bit 17	Reserved
Bit 16	Reserved
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	Average Calculated engine Load
Bit 5	Max Calculated engine Load
Bit 4	Average Throttle Position Sensor
Bit 3	Max Throttle Position Sensor
Bit 2	Average RPM
Bit 1	Max RPM
Bit 0	Journey Fuel Consumption

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

> **+ACK:GTOBD,**

Example:			
+ACK:GTOBD, 1F0101,135790246811220,,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	$	$

3.2.24. OBDII Real Time Request

This command is used to execute operation or read information from the vehicle via OBDII interface.

> **AT+GTORR**

Example:			
AT+GTORR=gv500,0,F,,,,,FFFF$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Command	<=2	0 – 1	
Read Mask/ Execute Mask	8	0 - FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Command>*:

- 0: Reading operation. And the result will be report to the backend server in the message +RESP:GTOBD.
- 1: Executing operation

✧ *<Execute Mask/ Read Mask>*:
- Read Mask for Reading operation (Command is 0): Please refer to the parameter *<OBD Report Mask>* in the command AT+GTOBD.

- Execute Mask for executing operation (*<Command>* is 1):

Bit	Description
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	Reserved
Bit 22	Reserved
Bit 21	Reserved
Bit 20	Reserved
Bit 19	Reserved
Bit 18	Reserved
Bit 17	Reserved
Bit 16	Reserved
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	Clear/reset emission – related diagnostic information

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

➢ **+ACK:GTORR,**

Example:				
+ACK:GTORR, 1F0101,135790246811220,,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	$	$

3.2.25. OBDII Status Monitor

The command **AT+GTOSM** is used to monitor some vehicle's records according to the information reading from OBDII.

The monitored records include Engine RPM, Vehicle Speed, Engine Coolant Temperature, Fuel Consumption, MIL Status, the Number of DTCs, Throttle Position, Engine Load and Fuel Level Input.

➢ **AT+GTOSM**

Example:				
AT+GTOSM=gv500,1,0,007F,0,1000,30,,,,,,,,010A$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500

ID	1	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5		0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Mode>*: A numeric to indicate the working mode for the status monitor.
  - 0: Disable the status monitor.
  - 1: Report +**RESP:GTOSM** if the current value of the monitored record is within the range defined by *<Min Threshold>* and *<Max Threshold>*.
  - 2: Report +**RESP:GTOSM** if the current value of the monitored record is outside of the range defined by *<Min Threshold>* and *<Max Threshold>*.

✧ *<ID>*: The ID of corresponding record.

Record	ID
Engine RPM	0
Vehicle Speed	1
Engine Coolant Temperature	2
Fuel Consumption	3
MIL Status	4
Number of DTCs	5
Throttle Position	6
Engine Load	7
Fuel Level Input	8

✧ *<OBD Report Mask>*: Bitwise report mask to configure the composition of OBD report message.

Bit	Item to Mask	Description
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	Reserved	
Bit 22	Reserved	
Bit 21	*<GSM Information>*	Including *<MCC>*, *<MNC>*, *<LAC>*, *<Cell ID>* and the *<reserved>* parameter "00"
Bit 20	*<GPS Information>*	Including*<GPSAccuracy>*,*<Speed>*,*<Heading>*,*<Altitude>*,*<Longitude>*,*<Latitude>*,*<GPS UTC Time>*
Bit 19	Reserved	
Bit 18	Reserved	
Bit 17	Reserved	
Bit 16	Reserved	
Bit 15	*<Fuel Level Input>*	The value of fuel level input percentage
Bit 14	*<Engine Load>*	The value of calculated engine load percentage
Bit 13	*<Throttle Position>*	The value of throttle position sensor percentage
Bit 12	*<Diagnostic Trouble Codes>*	Details of emission - related DTCs
Bit 11	*<Number of DTCs>*	Number of emission-related DTCs
Bit 10	*<MIL Status>*	Malfunction Indicator Lamp(MIL) Status
Bit 9	*<MIL Activated Distance>*	This distance accumulated since MIL is activated
Bit 8	*<DTCs Cleared Distance>*	This distance accumulated since DTCs were cleared.
Bit 7	*<Fuel Consumption>*	The Fuel Consumption
Bit 6	*<Engine Coolant Temperature>*	Engine coolant temperature
Bit 5	*<Vehicle Speed>*	Vehicle road speed

Bit 4	<Engine RPM>	Revolutions per minute of the engine
Bit 3	<Support PIDs>	Parameter identification (PID) are supported.
Bit 2	<OBD Power Voltage>	The voltage from the vehicle via OBDII interface
Bit 1	<OBD Connect>	Whether the device connect with vehicle
Bit 0	<VIN>	Vehicle identification number

✧ <Min Threshold > and <Max Threshold >: The lower limit and upper limit of corresponding record.

Record	Min Threshold	Max Threshold	Unit
Engine RPM	0	16383	rpm
Vehicle Speed	0	255	Km/h
Engine Coolant Temperature	-40	215	℃
Fuel Consumption	0	999.9	L/100km
MIL Status	0	1	
Number of DTCs	0	127	
Throttle Position	0	100	%
Engine Load	0	100	%
Fuel Level Input	0	100	%

✧ <Send Interval>: The interval time of sending +**RESP:GTOSM** message.

The acknowledgment message of **AT+GTOSM** command:
➢ **+ACK:GTOSM,**

Example:
+ACK:GTOSM,1F0105,135790246811220,,010A,20140116102313,02A5$

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	$	$

3.3. Report

This section defines the formats of the report messages. Due to the max length of SMS message (160 bytes), it is recommended to carefully set the *<Report Composition Mask>* in **AT+GTCFG** to limit the length of the report which contains GPS position information if you choose SMS as the transmit method. 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 tow.

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

➢ **+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 detected into the alarm range,.

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

➢ **+RESP:GTDOG,**
The protocol watchdog reboot message.

➢ **+RESP:GTIGL,**
Location message for ignition.

➢ **+RESP:GTHBM,**
If harsh behavior is detected, this message will be sent to the backend server.

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

Example:
+RESP:GTTOW,1F0101,135790246811220,1G1JC5444R7252367,,,10,1,1,4.3,92,70.0,121.35
4335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTGEO,1F0101,135790246811220,1G1JC5444R7252367,,,00,1,1,4.3,92,70.0,121.35
4335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTSPD,1F0101,135790246811220,1G1JC5444R7252367,,,00,1,1,4.3,92,70.0,121.354

335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTRTL,1F0101,135790246811220,1G1JC5444R7252367,,,00,1,1,4.3,92,70.0,121.354
335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTDOG,1F0101,135790246811220,1G1JC5444R7252367,,,01,1,1,4.3,92,70.0,121.35
4335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTIGL,1F0101,135790246811220,1G1JC5444R7252367,,,00,1,1,4.3,92,70.0,121.354
335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTHBM,1F0101,135790246811220,1G1JC5444R7252367,,,10,1,1,4.3,92,70.0,121.35
4335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTHBM,1F0101,135790246811220,1G1JC5444R7252367,,,11,1,1,24.3,92,70.0,121.3
54335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID/Report Type	2	X(0-4)X(0-3)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<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 different messages as below.

● The ID of Geo-Fence in the report message +**RESP:GTGEO**. The range is 0 – 4.

● The speed level of which the harsh behavior is detected in message +**RESP:GTHBM**. 3 is high speed, 2 is medium speed and 1 is low speed. If the mode 2 was be chosen, the value is always 0, indicate unknown speed.

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

Report type has different meanings in different messages as below.

● In Geo-Fence report message +**RESP:GTGEO**

0: Exit from the Geo-Fence.

1: Enter the Geo-Fence.

● In the message of speed alarm +**RESP:GTSPD**

0: Outside of the predefined speed range.

1: Inside of the predefined speed range.

● In the message of protocol watch dog reboot message +**RESP:GTDOG**

1: Reboot message for time based working mode

2: Reboot message for ignition on working mode

3: Reserved

4: Reboot message for GSM watchdog reboot

5: Reboot message for GPRS watchdog reboot

● In the message of harsh behavior monitoring message +**RESP:GTHBM**

0: Harsh braking behavior

1: Harsh acceleration behavior

2: Harsh turn behavior

3: Harsh brake and turn behavior

4: Harsh acceleration and turn behavior

5: Unknown harsh behavior

● In the message of ignition message +**RESP:GTIGL**

0: Ignition off.

1: Ignition on.

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

✧ *<Number>*: The number of the GPS position included in the report 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 value is 0 – 50. Here 0 means no GPS fix.

✧ *<Speed>*: The current speed. Unit: km/h

✧ *<Heading>*: The Heading of the GPS fixing.

✧ *<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 digits in length and ranges from 000–999.

✧ *<MNC>*: Mobile network code. It is 3 digits in length and ranges from 000–999.

✧ *<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,1F0101,135790246811220,1G1JC5444R7252367,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,12345:12:34,,,80,210100,,,50,20090214093254,11F0$

+RESP:GTFRI,1F0101,135790246811220,1G1JC5444R7252367,,,00,2,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,0,4.3,92,70.0,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,2000.0,12345:12:34,,,80,210100,,,50,20090214093254,11F0$

+RESP:GTFRI,1F0101,135790246811220,1G1JC5444R7252367,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,12345:12:34,,92,80,210100,,,50,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Voltage	<=5	0 – 99999 mV	
Report ID/Report Type	2	X(1-4)X(0-1)	
Number	<=2	0 – 2	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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		
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Reserved	0		
Reserved	0		
Backup Battery Percentage	<=3	0 – 100	
Device Status	6	000000 – FF0000	
Engine RPM	<=5	0 – 16383 rpm	
Fuel Consumption	<=5	0.0 – 999.9L/100km | Inf | NaNInf NaN	
Fuel Level Input	<=3	0-100	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<External Power Voltage>*: The voltage of the external power supply. If using command **AT**+**GTEPS** to set the device report the external power supply voltage periodically with

fixed report, the device will send the current voltage along with +**RESP:GTFRI** message to the backend server. If not set, 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 four meanings as below.

- 1: fixed timing report.
- 2: fixed distance report.
- 3: fixed mileage report.
- 4: fixed timing and mileage report.

Report type has two meanings as below.

- 0: the normal fixed report.
- 1: corner report which indicates that the device just turns around a corner.

✧ <*Number*>: The number of the GPS position included in the report message. In the message +**RESP:GTFRI**, it probably includes one or two. If multi-position in one +**RESP:GTFRI** message, the green part repeats.

✧ <*Hour Meter Count*>: If hour meter counter function is enabled by the command **AT+GTHMC**, total hours meter counted when engine is on 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– 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 other four bits are always 0.

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 is moving before it is treated as being towed.
- 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motion less
- 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: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.

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

Example:

+RESP:GTEPS,1F0101,135790246811220,1G1JC5444R7252367,,13500,00,1,1,4.3,92,70.0,12
1.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Voltage	<=5	0 – 99999mV	
Report ID/Report Type	2	X(0-2)X(0-1)	
Number	<=2	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ < *External Power Voltage*>: The value of the external power voltage. When the voltage of the external input meets the alarm condition as set by command **AT+GTEPS**, the device will send the current external input voltage with **+RESP:GTEPS** 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 is always 0.

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 position included in the report message. Generally, it equals to 1.

➢ **+RESP:GTLBC,**

If the parameter *<Location By Call>* is enabled by the command **AT+GTCFG**, the device will get and send the current position to the backend server by the message **+RESP:GTLBC** when there is an incoming call.

Example:
+RESP:GTLBC,1F0101,135790246811220,1G1JC5444R7252367,,+8613800000000,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Call Number	<=20	phone number	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Call Number>*: The phone number of the incoming call which triggers the report message.

➢ **+RESP:GTGES**

Report +**RESP:GTGES** According Trigger Mode and Trigger Report in **AT+GTGEO** after ignition off.

> **Example:**
> +RESP:GTGES,1F0101,135790246811220,gv5001G1JC5444R7252367,,,00,0,100,30,11,1,1,24.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID/Report Type	2	X(0-4)X(0-1)	
Trigger Mode	<=3	0|21|22	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Number	<=2	0 – 15	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ < *Report Type* >:   Current Parking-Fence is active or inactive.
   ● 0 Current Parking -Fence is inactive.
   ● 1 Current Parking -Fence is active.

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,1F0101,135790246811220,1G1JC5444R7252367,,16,898600810906F8048812 ,16,0,1,12000,,4.2,0,0,,,20090214013254,,,,,,,+0800,0,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11|12|21|22|41|42|1A|16	

ICCID	20		
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
External Power Supply	1	0|1	
External Power Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery *Voltage*	<=4	0.0 – 4.2 V	
Charging	1	0|1	
LED On	1	0|1	
Reserved	0		
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0|1	
Send Time	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 is moving before it is treated as being towed.
- 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motion less
- 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

✧ *<ICCID>*: The ICCID of the SIM card.

✧ *<CSQ RSSI>*: The signal strength level.

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

✧ *<CSQ BER>*: The quality of the GSM signal. The range is 0-7, 99 for unknown.

✧ *<External Power Supply>*: Whether the external power supply is connected.

● 0: Not connected

● 1: Connected

✧ *<External Power Voltage>*: The voltage of the external power supply.

✧ *<Backup Battery Voltage>*: 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 charging 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.

✧ *<Time Zone Offset>*: The time offset of the local time zone to the UTC time.

✧ *<Daylight Saving>*: The current setting of the daylight saving.

● 0: Daylight saving is disabled

● 1: Daylight saving is enabled

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,1F0101,135790246811220,1G1JC5444R7252367,,,,,0000,,,20090214013254, 20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
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	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.3.3.2. +RESP:GTALL

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:GTALL**. This message only sends

via GPRS even if the report mode is force on SMS. The **+RESP:GTALL** is not support the HEX report.

➢ **+RESP:GTALL,**

Example:

+RESP:GTALL,1F0105,135790246811220,,,BSI,cmnet,,,,,,SRI,3,,2,116.228.146.250,8190,192.0.0.0,,0,0,0,,,,CFG,gv500,gv500,0,0.0.0.0,,003F,1,,3FFF,,2,0,300,0,0,0,0,000F,0,TOW,0,10,1,300,,,,,2,3,2,,,,,,,,,EPS,0,0,0,0,0,,,,,0,,,,TMZ,+0000,0,,,,,FRI,0,1,,1,0000,0000,,30,1000,1000,,0,600,,,,GEO,0,0,,,50,0,,,,0,0,,,1,0,,,50,0,,,,0,0,,,2,0,,,50,0,,,,0,0,,,3,0,,,50,0,,,,0,0,,,4,0,,,50,0,,,,0,0,,,SPD,0,0,0,60,300,,,,,,,,,,,,PIN,1,,,,,,OWH,0,1F,0900,1200,1300,1800,,,,,,,,,,DOG,0,60,30,0200,,1,,,60,60,,IDL,0,2,1,,,,,,,,,,,HMC,0,00000:00:00,,,,,,,,HBM,0,,,100,0,0,,60,0,0,,,0,0,,,,,30,50,20,65,JDC,0,25,,5,10,10,,,,,,WLT,0,,,,,,,,,,,,,,HRM,,,EF,FC1FBF,FC1FBF,FD7D,EF,7D,7D,,,CRA,0,5,,,,,,,,,,PDS,0,0,,,,,,SSR,0,2,1,5,0,,,,OBD,1,30,0,0,FFFF,3,2.0,2,14.3,0.737,7F,,,,OSM,0,1,007F,0,1000,30,,,,,,,1,2,007F,0,10,30,,,,,,2,2,0F7F,-40,215,30,,,,,,,3,2,007F,0,1000,30,,,,,,,4,2,007F,0,1,30,,,,,,,5,1,007F,0,127,30,,,,,,,6,0,007F,0,100,0,,,,,,,7,1,007F,0,100,30,,,,,,,8,2,007F,0,100,30,,,,,,,,20110101000045,02A2$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
BSI	3	BSI	BSI
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SRI	3	SRI	SRI
Report Mode	1	0 – 6	
Reserved	0		
Buffer Mode	1	0|1|2	

Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	
SACK Enable	1	0|1	
Protocol Format	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ODO Enable	1	0|1	
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	
ODO Mileage Mode	1	0|1	0
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Power Saving Mode	1	0 – 2	
Reserved	4	0000 – FFFF	0000
Event Mask	4	0000 – FFFF	
Reserved	0		
LED On	1	0|1	
Info Report Enable	1	0|1	
Info Report Interval	<=5	30 – 86400sec	
Location By Call	1	0|1|2	
Backup Battery Supply	1	0|1	
Backup Battery	1	0|1	

Charge Mode			
Agps Mode	1	0|1	
GSM Report	4	0000 – FFFF	
GPS Lost Time	2	0 – 30min	0
TOW	3	TOW	TOW
Tow Enable	1	0|1	
Engine Off to Tow	<=2	5 – 15min	
Fake Tow Delay	<=2	0 – 10min	
Tow Interval	<=5	30 – 86400sec	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Rest Duration	<=3	1 – 255(×15sec)	
Motion Duration	<=2	1 – 10(×100ms)	
Motion Threshold	1	2 – 4	
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	
Min Threshold	<=5	250 – 28000 mV	
Max Threshold	<=5	250 – 28000 mV	
Sample Period	<=2	0|1 – 12(×2s)	
Debounce Time	1	0 – 5(×1s)	

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Sync with FRI	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
TMZ	3	TMZ	TMZ
Time Zone	5	–|+HHMM	
Daylight Saving	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 4	
Discard No Fix	<=2	0|1	
Reserved	0		
Period Enable	1	0|1	
Begin Time	4	HHMM	
End Time	4	HHMM	
Reserved	0		
Send Interval	<=5	0|5 – 86400sec	
Distance	<=5	300 – 65535m	
Mileage	<=5	300 – 65535m	
Reserved	0		
Corner Report	<=3	0 – 180	
IGF Report Interval	<=5	5 - 86400sec	
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	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	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	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	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	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	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	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	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	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	
Min Speed	<=3	0 – 400km/h	
Max Speed	<=3	0 – 400km/h	
Validity	<=4	0 – 3600sec	
Send Interval	<=4	30 – 3600sec	
Reserved	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		
Reserved	0		
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
Enable Auto-unlock PIN	1	0|1	
PIN	1	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OWH	3	OWH	OWH
Mode	1	0|3	
Day of Work	<=2	0 – 7F	
Working Hours Start1	4	HHMM	
Working Hours End1	4	HHMM	
Working Hours Start2	4	HHMM	
Working Hours End2	4	HHMM	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
DOG	3	DOG	DOG
Mode	1	0|1|2	
Ignition Frequency	<=3	10 – 120min	
Interval	<=2	1 – 30	
Time	4	HHMM	
Reserved	0		
Report Before Reboot	1	0|1	
Reserved	0		
Reserved	0		
GSM Interval	4	0 | 5-1440 min	60
PDP Interval	4	0 | 5-1440 min	60
Reserved	0		
IDL	3	IDL	IDL
Mode	1	0|1	
Time to Stationary	2	1 – 30 min	
Time to Movement	1	1 – 5 min	
Speed	2	0 – 20 km/h	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC

Hour Meter Enable	1	0|1	
Initial Hour Meter Count	11	00000:00:00-99999:00:00	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
HBM Enable	1	0|1|2|3	
Reserved	0		
Reserved	0		
High Speed	<=3	100 – 400km/h	
ΔVhb	<=3	0 – 100km/h	
ΔVha	<=3	0 – 100km/h	
Reserved	0		
Medium Speed	<=3	100 – 400km/h	
ΔVmb	<=3	0 – 100km/h	
ΔVma	<=3	0 – 100km/h	
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100km/h	
ΔVla	<=3	0 – 100km/h	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Turn and Break Threshold	<=3	30-70	30
Turn and Break Duration	<=3	40-100(*8ms)	50
Accelerate Threshold	<=3	15-50	20
Accelerate Duration	<=3	50-250(*8ms)	65
JDC	3	JDC	JDC
Mode	1	0|1	0
Signal Threshold	<=3	0 – 31	25
Reserved	0		
Jamming Cell Number Threshold	<=2	0 – 99	5
Enter Jamming Timer Threshold	<=3	0 – 300 sec	10
Quit Jamming Timer Threshold	<=4	0 – 3600 sec	10
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
WLT	3	WLT	WLT
Call Filter	1	0|1|2	
Phone 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'	FF
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'	FFFFFFFF
HBD Mask	2	'0' – '9' 'a' – 'f' 'A' – 'F'	FF
Crash Data Mask	4	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFF
OBD Mask	8	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFFFFFF
Reserved	0		
Reserved	0		
CRA	3	CRA	CRA
Mode	1	0|1	0
Sensitivity	1	1 – 9	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PDS	3	PDS	PDS
Mode	1	0|1|2	0
Mask	4	0000-FFFF	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	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	3	0 – 255 min	0
Reserved	0		
Reserved	0		
Reserved	0		
OBD	3	OBD	OBD
Mode	1	0|1	1
OBD Check interval	<=5	0|30 – 86400sec	60
OBD Report Interval	<=5	0|30 – 86400sec	300
OBD Report Interval IGF	<=5	0|30 – 86400sec	300
OBD Report Mask	8	0 - FFFFFFFF	1FFF
OBD Event Mask	4	0 - FFFF	3
Displacement	4	0.0 – 10.0	2.0
Fuel Oil Type	3	0 – 2|100	2
Custom Fuel Ratio	4	10.0 - 20.0	14.3
Custom Fuel Density	5	0.0 - 1.0g/mL	0.737
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OSM	3	OSM	OSM
ID	0	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF

Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ID	1	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ID	2	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ID	3	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ID	4	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
ID	5	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ID	6	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ID	7	0 - 8	0
Mode	1	0|1|2	0

OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ID	8	0 - 8	0
Mode	1	0|1|2	0
OBDII Report Mask	8	0 - FFFFFFFF	FFFF
Min threshold	<=5	0 – 16383 rpm	0
Max threshold	<=5		0
Send Interval	<=4	0|30 – 3600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.3. +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 get different configuration information.For example, get FRI configuration,**AT+GTRTO=gv500,2,FRI,,,,,0015$**

➢ **+RESP:GTALS,**

Example: **+RESP:GTALS,1F0101,862170011520077,1G1JC5444R7252367,gv500,FRI,1,0,,1,0000,0000** **,,60,1000,100,,0,60,,,,,20130809081544,4FBC$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
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	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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,1F0101,135790246811220,1G1JC5444R7252367,,898600810906F8048812,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
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 GSM signal level, it will send the GSM signal level to the backend server by the message +**RESP:GTCSQ**.

➢ **+RESP:GTCSQ,**

Example:
+RESP:GTCSQ,1F0101,135790246811220,1G1JC5444R7252367,,16,0,20090214093254,11F0$

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

Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
Send Time	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
99	Unknown

✧ *<CSQ BER>*: The quality of the GSM signal. The range is 0-7, 99 for unknown.

3.3.3.6. +RESP:GTVER

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

➤ **+RESP:GTVER,**

Example:
+RESP:GTVER,1F0101,135790246811220,1G1JC5444R7252367,,GV500,0100,0101,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	

Software Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Device Type*>: The type of the device.

✧ <*Software Version*>: The software 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**.

✧ <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**.

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,1F0101,135790246811220,1G1JC5444R7252367,,1,12000,,4.2,0,0,20090214 093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Supply	1	0|1	
External Power *Voltage*	<=5	0 – 99999mV	
Reserved	0		
Backup Battery *Voltage*	<=4	0.0 – 4.2 V	
Charging	1	0|1	
LED On	1	0|1	

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

3.3.3.8. +RESP:GTTMZ

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

➢ **+RESP:GTTMZ,**

Example:
+RESP:GTTMZ,1F0101,135790246811220,1G1JC5444R7252367,,+0800,0,20090214093254, 11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
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	$	$

3.3.4. 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 stop charging report.

+**RESP:GTBPL**: Backup battery low(4 times report before power off)

+**RESP:GTSTT**: Device motion state indication when the motion state is changed

+**RESP:GTPDP**: GPRS 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:GTGSM**: The report for the information of the service cell and the neighbor cells.

+**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:GTJDR**: Jamming indication.

+**RESP:GTJDS**: Jamming detection status.

In +**RESP:GTMPN**, +**RESP:GTMPF**, +**RESP:GTBTC**, +**RESP:GTSTC**, +**RESP:GTBPL**, +**RESP:GTSTT**, +**RESP:GTIGN**, +**RESP:GTIGF**, +**RESP:GTIDN**, +**RESP:GTIDF**, +**RESP:GTJDR**, +**RESP:GTJDR**, +**RESP:GTSTR**, +**RESP:GTSTP**, +**RESP:GTLSP** and +**RESP:GTGSS** event reports, the last known GPS information and the current GSM network information are involved.

➢ +**RESP:GTPNA,**

➢ +**RESP:GTPFA,**

➢ +**RESP:GTPDP,**

Example:
+**RESP:GTPNA**,1F0101,135790246811220,1G1JC5444R7252367,,20090214093254,11F0$
+**RESP:GTPFA**,1F0101,135790246811220,1G1JC5444R7252367,,20090214093254,11F0$
+**RESP:GTPDP**,1F0101,135790246811220,1G1JC5444R7252367,,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ +**RESP:GTMPN,**

➢ +**RESP:GTMPF,**

➢ +**RESP:GTBTC,**

> **+RESP:GTCRA,**

Example:
+RESP:GTMPN,1F0101,135790246811220,1G1JC5444R7252367,,0,4.3,92,70.0,121.354335,
31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTMPF,1F0101,135790246811220,1G1JC5444R7252367,,0,4.3,92,70.0,121.354335,3
1.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTBTC,1F0101,135790246811220,1G1JC5444R7252367,,0,4.3,92,70.0,121.354335,3
1.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTCRA,1F0101,135790246811220,1G1JC5444R7252367,,0,4.3,92,70.0,121.354335,
31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$

Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	$	$

> **+RESP:GTJDR,**

Example:

**+RESP:GTJDR,1F0101,135790246811220,1G1JC5444R7252367,,0,4.3,92,70.0,121.354335,3
1.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'	
GPS Accuracy	<=2	0	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	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTJDS,**

Example:

**+RESP:GTJDS,040408,135790246811220,,2,0,4.3,92,70.0,121.354335,31.222073,2009021401
3254,0460,0000,18d8,6141,00,20090214093254,11F0$**

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

Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'	
Jamming Status	1	1|2	
GPS Accuracy	<=2	0	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	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Jamming Status*>: The current Jamming status of the device.
- 1: Quit the jamming.
- 2: Enter the jamming.

➢ **+RESP:GTSTC,**

Example:
+RESP:GTSTC,1F0101,135790246811220,1G1JC5444R7252367,,,0,4.3,92,70.0,121.354335, 31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$

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

VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	$	$

> **+RESP:GTBPL,**

Example:

**+RESP:GTBPL,1F0101,135790246811220,1G1JC5444R7252367,,3.53,0,4.3,92,70.0,121.354
335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Backup Battery Voltage	<=4	0.0 – 4.2 V	

GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	$	$

> **+RESP:GTSTT,**

Example:
+RESP:GTSTT,1F0101,135790246811220,1G1JC5444R7252367,,16,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11|12|21|22|41|42|16	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	2	00	00
Send Time	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 is moving before it is treated as being towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motion less
- 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,1F0101,135790246811220,1G1JC5444R7252367,,1200,0,4.3,92,70.0,121.354
335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

Duration of Ignition Off	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	2	00	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Duration of Ignition Off>*: Duration since last time the ignition is off. If greater than 999999 seconds, report as 999999 seconds.

✧ *<Hour Meter Count>*: If hour meter counter function is enabled by the command **AT+GTHMC**, total hours meter 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– 99999:00:00.

➢ **+RESP:GTIGF,**

Example:
+RESP:GTIGF,1F0101,135790246811220,1G1JC5444R7252367,,1200,0,4.3,92,70.0,121.354 335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

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

VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition On	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	2	00	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Duration of Ignition On>: Duration since last time the ignition is on. If greater than 999999 seconds, report as 999999 seconds.

✧ <Hour Meter Count>: If hour meter counter function is enabled by the command **AT**+**GTHMC**, total hours meter counted when engine is on will be reported in this field. If the function is disabled, this field will be filled with '00'. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00– 99999:00:00.

➢ **+RESP:GTIDN,**
➢ **+RESP:GTSTR,**
➢ **+RESP:GTSTP,**
➢ **+RESP:GTLSP,**

Example:
+RESP:GTIDN,1F0101,135790246811220,1G1JC5444R7252367,,,,0,4.3,92,70.0,121.354335,

31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
+RESP:GTSTR,1F0101,135790246811220,1G1JC5444R7252367,,,,0,4.3,92,70.0,121.354335,
31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
+RESP:GTSTP,1F0101,135790246811220,1G1JC5444R7252367,,,,0,4.3,92,70.0,121.354335,
31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
+RESP:GTLSP,1F0101,135790246811220,1G1JC5444R7252367,,,,0,4.3,92,70.0,121.354335,
31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

> **+RESP:GTIDF,**

Example:

+RESP:GTIDF,1F0101,1357902468112201G1JC5444R7252367,,,22,300,0,4.3,92,70.0,121.35 4335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion State	2	11|12|16|22	
Duration of Idling Status	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Motion State>*: The current motion state when the vehicle leaves idling status.

✧ *<Duration of Idling Status>*: The time that the vehicle has been in idling status. If greater than 999999 seconds, report as 999999 seconds.

> **+RESP:GTGSM**

<table>
<tr><td colspan="4">

Example:

+RESP:GTGSM,080100,1357902468112201G1JC5444R7252367,,FRI,0460,0000,1878,0871, 20,,0460,0000,1878,0152,16,,,,,,,,,,,,,,,,,,,,,,0460,0000,1878,0873,57,00,20090214093254,11F0 $

</td></tr>
<tr><th>Parameter</th><th>Length(byte)</th><th>Range/Format</th><th>Default</th></tr>
<tr><td>Protocol Version</td><td>6</td><td>XX0000 – XXFFFF,
X∈{'A'-'Z','0'-'9'}</td><td></td></tr>
<tr><td>Unique ID</td><td>15</td><td>IMEI</td><td></td></tr>
<tr><td>VIN</td><td>17</td><td>'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'</td><td></td></tr>
<tr><td>Fix Type</td><td>3</td><td>RTL|LBC|FRI|GIR</td><td></td></tr>
<tr><td>MCC1</td><td>4</td><td>0XXX</td><td></td></tr>
<tr><td>MNC1</td><td>4</td><td>0XXX</td><td></td></tr>
<tr><td>LAC1</td><td>4</td><td></td><td></td></tr>
<tr><td>Cell ID1</td><td>4</td><td></td><td></td></tr>
<tr><td>RX Level1</td><td>2</td><td>0-63</td><td></td></tr>
<tr><td>Reserved</td><td>2</td><td>00</td><td></td></tr>
<tr><td>MCC2</td><td>4</td><td>0XXX</td><td></td></tr>
<tr><td>MNC2</td><td>4</td><td>0XXX</td><td></td></tr>
<tr><td>LAC2</td><td>4</td><td></td><td></td></tr>
<tr><td>Cell ID2</td><td>4</td><td></td><td></td></tr>
<tr><td>RX Level2</td><td>2</td><td>0-63</td><td></td></tr>
<tr><td>Reserved</td><td>2</td><td>00</td><td></td></tr>
<tr><td>MCC3</td><td>4</td><td>0XXX</td><td></td></tr>
<tr><td>MNC3</td><td>4</td><td>0XXX</td><td></td></tr>
<tr><td>LAC3</td><td>4</td><td></td><td></td></tr>
<tr><td>Cell ID3</td><td>4</td><td></td><td></td></tr>
<tr><td>RX Level3</td><td>2</td><td>0-63</td><td></td></tr>
<tr><td>Reserved</td><td>2</td><td>00</td><td></td></tr>
<tr><td>MCC4</td><td>4</td><td>0XXX</td><td></td></tr>
<tr><td>MNC4</td><td>4</td><td>0XXX</td><td></td></tr>
<tr><td>LAC4</td><td>4</td><td></td><td></td></tr>
</table>

Cell ID4	4		
RX Level4	2	0-63	
Reserved	2	00	
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	4		
RX Level5	2	0-63	
Reserved	2	00	
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4		
Cell ID6	4		
RX Level6	2	0-63	
Reserved	2	00	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	4		
RX Level	2	0-63	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Fix Type>* : A string to indicate what kind of GPS fixing this cell information is for.

    "RTL"   This cell information is for RTL requirement.

    "LBC"   This cell information is for LBC requirement.

    "FRI"   This cell information is for FRI requirement.

    "GIR"   This cell information is for sub command "**C**" in **AT+GTRTO** command.

✧ *<MCC(i)>* : MCC of the neighbor cell *i* (*i* is the index of the neighbor cell).

✧ *<MNC(i)>* : MNC of the neighbor cell *i*.

✧ *<LAC(i)>* : LAC in hex format of the neighbor cell *i*.

✧ *<Cell ID(i)>* : Cell ID in hex format of the neighbor cell *i*.

✧ *<RX Level(i)>* : The signal strength of the neighbor cell *i*. This parameter is a 6-bit coded in 1 dB steps:

    0:        -110 dBm

    1 to 62:   -109 to -48 dBm

    63:      -47 dBm

✧ *<MCC>*: MCC of the service cell.

✧ *<MNC>*: MNC of the service cell.

✧ *<LAC>*: LAC in hex format of the service cell.

✧ *<Cell ID>*: Cell ID in hex format of the service cell.

✧ *<RX Level>*: The signal strength of the service cell.

Note:

1. It probably includes only several neighbor cells' (even no neighbor cell) information. If some neighbor cell wasn't find, all the fields of the neighbor cell will be empty.

2. "ffff" in the field of *<LAC(i)>*, *<Cell ID(i)>* means the terminal doesn't know the value.

3. This message cannot be sent via SMS.

➢ **+RESP:GTGSS**

Example:
+RESP:GTGSS,1F0101,135790246811220,1G1JC5444R7252367,,1,9,11,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
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	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*GPS Signal Status*>: 0 means lost GPS signal or no successful GPS fix, 1 means GPS signal recovered and successful GPS fix.

✧ <*Satellite Number*>: The number of the in sight satellites when fix successful, 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 it is moving before it is treated as being towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motion less
- 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

3.3.5. Buffer Report

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

✧ GSM network is not available

✧ Failed to activate GPRS context for the TCP or UDP connection.

✧ 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 again. The buffer reports are saved to the built-in non-volatile memory in case the device is reset. The terminal can buffer up to 3000 messages (160 bytes per message).

Detailed information about buffer report is listed below.

✧ Only +**RESP** messages are buffered except that +**RESP:GTALL** is not buffered

✧ In the buffer report, the original header string "+**RESP**" is replaced by "+**BUFF**" while keeps

the other content untouched including the original sending time and count number.

✧ Buffered messages will be sent only via GPRS by TCP or UDP protocol. They cannot be sent via SMS. If the current report is forcing on SMS, the buffered message will not be sent until the report mode is changed to TCP or UDP.

✧ The buffered messages will be sent after the other normal messages sending if *<Buffer Mode>* in **AT+GTSRI** is set to 1.

✧ The buffered messages will be sent before the other normal messages sending if *<Buffer Mode>* in **AT+GTSRI** is set to 2.

Example:

The following is an example of the buffered message:

+**BUFF**:GTFRI,1F0101,868034001000579,gv5001G1JC5444R7252367,,0,10,1,1,0.4,60,56.6,117.201309,31.833082,20130107182151,0460,0000,5678,2079,00,21188.6,,,,100,210100,,,,20130107182154,01B8$

3.3.6. Report Google Maps Hyperlink

If *<Location By Call>* in command **AT+GTCFG** is set to 2, the device will send its current location position to the incoming call via SMS with Google Maps hyperlink.

➢ **Google Maps hyperlink**

Example:			
gv500:			
<http://maps.google.com/maps?q=31.222073,121.354335			
F1 D2009/01/01T00:00:00>			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Device Name	<=20	'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 – F50	
GPS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	

✧ *<GPS Fix>*: The accuracy of the location information. F0 means no GPS fix.

3.3.7. Crash Data Packet

The message contains 10s XYZ-axis acceleration data before and after crash. When crash accident is detected, the 10s XYZ-axis acceleration data before crash happened will be reported to backend server packed with three frames. And the device will continue to record 10s XYZ-axis data and

then report to backend server packed with other three frames.

➢ **+RESP:GTCRD,**

Example:

+RESP:GTCRD,1F0101,359231038715676,1G1JC5444R7252367,,0,3,1,00010001005500010
00200510000000000550000000100520001000100560001000100530000000000540000000100 05
1000100000054000000010053000100010055000100000530001000100540000000300 51000000
00100530001ffff0053000000001005300010000005200000000005400030001005300 02ffff005300
0100010052000000020051000100030053000100000053001ffff00540000000100520 00000030
05500020001005300010000005200010001005500010001005400001ffff00530000000 20053000000
00020056ffff0000000530000000000052000100000052000100020052000200 00100540000000100 5
4ffff0002005200000001005100001ffff00530002ffff00540001fffe0052000 1ffff005300000002005
200000002005200020001005200010001005600010001005200 01ffff005300010002005600001ffff
00510001000100550001000000510002000200530 000000000005500010000005200010001005500
0100010053ffffffff00520000ffff00520001 0002005300020001005400010000005500010002005 3
0001000000530000000100530001000100520000ffff00510001000000520002000000 520002ffff0
005200010002005300000000200540000000000540001fffe00530001ffff005200010001005200010 0
01005300010001005200000,20120330120443,005C$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Data Type	1	0 | 1	
Total frame	1	3	
Frame Number	1	1 -3	
Data	1000	'0'-'9' 'a'-'f'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <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 report to server.

✧ <Frame Number>: The sequence of data frame.

✧ *<Data>:* There are 1000 ASCII characters in one frame, 12 characters as a group, The first 4 characters of these 12 characters represent X axis acceleration data, the next 4 characters

represent Y axis and next 4 characters is Z axis,. The ASCII "0001" equal to "0x0001"in hex format , the ASCII "afff " equal to "0xAFFF" in hex format.

Example:

+RESP:GTCRD,1F0101,359231038715676,1G1JC5444R7252367,,0,3,1,000100010055… ,2012 0330120443,005C$

This is the oldest XYZ-axis acceleration data:

Translate to hex format: X (axis acceleration data) = 0x0001; Y = 0x0001 ;0 Z = 0x0055;

Equal to decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;

+RESP:GTCRD,1F0101,359231038715676,1G1JC5444R7252367,,1,3,3,...ffffff10052,20120330 115736,005A$

This is the latest XYZ-axis acceleration data:

Translate to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; 0 Z = 0x0052;

Equal to decimal format: X (axis acceleration data) = -1; Y = -15 ; Z = 82;

NOTE: Acceleration of gravity(+g) is the 82 in decimal format and –g is -82.With the linear feature, the acceleration data 1312 represents +16g and -1312 represents -16g.

3.3.8. OBDII Information Report

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

➢ **+RESP:GTOBD,**

Example: +RESP:GTOBD,1F0101,135790246854321,1G1JC5444R7252367,,0,1fff,1G1JC5444R72523 67,1,0,FFFFDFFFF,8045,181,140,30,0,20,1,2,29008200,10,20,30,20130628044803,010F$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Report Type	1	0|1	
Report Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9' 'A' - 'Z' except 'I',	

		'O', 'Q'	
OBD Connect	1	0|1	
OBD Power Voltage	<=5	0 – 99999mV	
Support PIDs	8	00000000 - FFFFFFFF	
Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 - 255Km/h	
Engine Coolant Temperature	<=3	-40 – +215 ℃	
Fuel Consumption	<=5	0.0 – 999.9L/100km | Inf | NaN	
DTCs Cleared Distance	<=5	0 - 65535Km	
MIL Activated Distance	<=5	0 - 65535Km	
MIL status	1	0|1	
Number of DTCs	<=3	0-127	
Diagnostic Trouble Codes	<=4*127	'0' – '9' 'a' – 'f' 'A' – 'F'	
Throttle Position	<=3	0-100	
Engine Load	<=3	0-100	
Fuel Level Input	<=3	0-100	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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		
Mileage	<=9	0.0 – 4294967.0 km	

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

✧ *<Report type>*:
- 0: Periodically report (controlled by AT+GTOBD).
- 1: Realtime request report (request by AT+GTORR)

✧ *<Report Mask>*: Bitwise report mask to configure the composition of OBD report message.

✧ *<OBD Connect>*: Whether the device is connected with vehicle.
- 0: Not connected.
- 1: Connected.

✧ *<OBD Power Voltage>*: The voltage from the vehicle via OBDII interface.

✧ *<Support PIDs>*:Parameter identifications (PID) are supported.

Bit	Item to Mask	Description
Bit 31	*<MIL Status>*	Malfunction Indicator Lamp(MIL) Status
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	*<Engine Load>*	The value of calculated engine load percentage
Bit 27	*<Engine Coolant Temperature>*	Engine coolant temperature
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	Reserved	
Bit 21	*<Intake manifold absolute pressure>*	The output value of intake manifold absolute pressure sensor
Bit 20	*<Engine RPM>*	Revolutions per minute of the engine
Bit 19	*<Vehicle Speed>*	Vehicle road speed
Bit 18	Reserved	
Bit 17	*< Intake air temperature>*	The output value of intake air temperature sensor
Bit 16	*<MAF air flow rate>*	The output value of mass air flow(MAF) sensor
Bit 15	*<Throttle Position>*	The value of throttle position sensor percentage
Bit 14	Reserved	
Bit 13	Reserved	

Bit 12	Reserved	
Bit 11	Reserved	
Bit 10	Reserved	
Bit 9	Reserved	
Bit 8	<VIN>	Vehicle identification number
Bit 7	<DTCs Cleared Distance>	This distance accumulated since DTCs were cleared
Bit 6	<MIL Activated Distance>	This distance accumulated since MIL is activated
Bit 5	<Fuel Level Input>	The value of fuel level input percentage
Bit 4	Reserved	
Bit 3	Reserved	
Bit 2	Reserved	
Bit 1	Reserved	
Bit 0	Reserved	

✧ <Engine RPM>: Revolutions per minute of the engine.
✧ <Vehicle Speed>: Vehicle road speed.
✧ <Engine Coolant Temperature>: The Engine Coolant Temperature.
✧ <Fuel Consumption>: The Fuel consumption. Because the consumption is caculated depend to values which read from vehicle. There will have Inf and NaN value.
✧ <MIL Activated Distance>: This distance accumulated since MIL is activated.
✧ <DTCs Cleared Distance>: This distance accumulated since DTCs were cleared.
✧ <MIL Status>: Malfunction Indicator Lamp(MIL) Status
   ● 0: OFF
   ● 1: ON
✧ <Number of DTCs>: Number of emission-related DTCs.
✧ <Diagnostic Trouble Codes>: Details of emission - related DTCs.
✧ <Throttle Position>: Indicates a percentage of throttle position sensor value. Usually above 0% at idle and less than 100% at full throttle.
✧ <Engine Load>: Indicates a percentage value of peak available torque. Reaches 100% at wide open throttle at any altitude or RPM for both naturally aspirated and boosted engines.
✧ <Fuel Level Input>: Indicates the nominal fuel tank liquid fill capacity as a percent of maximum.
✧ <Mileage>: The current total mileage.

3.3.9. OBDII Event Report

The following event reports are triggered when certain vehicle events occur.

+**RESP:GTOPN**: The report for connecting with vehicle through OBDII interface**.**

+**RESP:GTOPF**: The report for disconnecting with vehicle through OBDII interface.

+**RESP:GTJES**: The report for summarizing engine information (include fuel consumed, the Max value and average of RPM,throttle position sensor, Calculated engine load).

In +**RESP: GTOPN**, +**RESP: GTOPF**, +**RESP: GTJES** OBD event reports, the last known GPS information and the current GSM network information are involved.

➢ +**RESP:GTOPN**

➢ +**RESP:GTOPF**

Example:

+**RESP:GTOPN,1F0101,135790246811220,1G1JC5444R7252367,,0,4.3,92,70.0,121.354335,3 1.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**

+**RESP:GTOPF,1F0101,135790246811220,1G1JC5444R7252367,,0,4.3,92,70.0,121.354335,3 1.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	$	$

> **+RESP:GTJES**

Example:

**+RESP:GTJES,1F0104,862193022000541,1G1JC5444R7252367,,7F,0,1180,1034,90,50,54,22
,0,0.0,0,58.1,117.201418,31.833063,20131226121346,0460,0000,5678,2D7E,00,201312261213
48,000C$**

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
JES Mask	8	0000-FFFFFFFF	
Journey Fuel Consumption	<=3	0-100	
Max RPM	<=5	0 – 16383 rpm	
Average RPM	<=5	0 – 16383 rpm	
Max Throttle Position	<=3	0-100	
Average Throttle Position	<=3	0-100	
Max engine Load	<=3	0-100	
Average engine Load	<=3	0-100	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	$	$

✧ *<Journey Fuel Consumption>*: The value of fuel consumed percentage in the journey.

✧ *<Max RPM>*: The value of Max RPM in the journey.

✧ *<Average RPM>*: The value of Average RPM in the journey.

3.3.10. OBDII Status Monitor

➢ **+RESP:GTOSM,**

Example:

**+RESP:GTOSM,1F0104,135790246811220,,,8,30FFFF,1G1JC5444R7252367,1,12001,FFFF
DFFF,14535,78,100,126.4,60,0,0,0,,54,47,54,0,0.0,0.0,55.0,117.201266,31.832962,201401141315
13,0460,0000,5663,5A02,00,20140114131515,033D$**

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Record ID	2		
Report Type	1	0|1	
Report Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
OBD Connect	1	0|1	
OBD Power Voltage	<=5	0 – 99999mV	
Support PIDs	8	00000000 - FFFFFFFF	

Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 - 255Km/h	
Engine Coolant Temperature	<=3	-40 – +215 ℃	
Fuel Consumption	<=5	0.0 – 999.9L/100km ｜ Inf ｜ NaN	
DTCs Cleared Distance	<=5	0 - 65535Km	
MIL Activated Distance	<=5	0 - 65535Km	
MIL status	1	0|1	
Number of DTCs	<=3	0-127	
Diagnostic Trouble Codes	<=4*127	'0' – '9' 'a' – 'f' 'A' – 'F'	
Throttle Position	<=3	0-100	
Engine Load	<=3	0-100	
Fuel Level Input	<=3	0-100	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=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	$	$

✧ *<Record ID>*: The ID of corresponding record. Please refer to the parameter <Record ID> in the command **AT+GTOSM**.

✧ *<Report Type>*: The type of the report:
- ● 0: Inside of the range defined by <Min Threshold> and <Max Threshold>.
- ● 1: Outside of the range defined by <Min Threshold> and <Max Threshold>.

✧ *<Report Mask>*: A bistwise mask in hex to indicate the filed included in the report. Please refer to *<OBDII Report Mask>* in the command **AT+GTOSM**.

3.4. Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server if communicating via GPRS. 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,1F0101,135790246811220,,20100214093254,11F0$

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' '-' '_'	
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,1F0101,11F0$
+SACK:GTHBD,,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'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 supported. This field is optional. The backend server could just 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 should 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 starts to support report messages in HEX format. For all the commands, they are still using the ASCII format as described above. By default the device using ASCII format report messages. The backend server could use **AT+GTQSS** or **AT+GTSRI** command to enable the HEX format report messages by setting the *<Protocol Format>* to 1.

All the report messages are sorted into 5 categories and messages in the same category use the same header string, including acknowledgement to command (+**ACK**), location report (+**RSP**), event report (+**EVT**), information report (+**INF**) and the heartbeat data (+**HBD**).

The composition of the HEX report message could be customized by **AT+GTHRM** command. The actual length of each HEX report message varies depending on set some mask in **AT+GTHRM** .

The device uses CRC16 method to calculate the checksum of the report data and appends 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 report message, the device uses 0x0D and 0x0A to mark the end.

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

4.1. Hex Report Mask

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

➢ **AT+GTHRM=**

Example:			
AT+GTHRM=gv500,,,EF,FE3FBF,FE3FBF,7FFF,AF,FFFD,FFFD,,,FFFF$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv500
Reserved	0		
Reserved	0		
+ACK Mask	2	00– FF	EF
+RSP Mask	8	00000000 – FFFFFFFF	FC1FBF
+EVT Mask	8	00000000 – FFFFFFFF	FC1FBF
+INF Mask	<=8	00000000 – FFFFFFFF	FD7D
+HBD Mask	2	00 – FF	EF
+CRD Mask	4	0000–FFFF	7D
+OBD Mask	8	00000000 – FFFFFFFF	7D
Reserved	0		
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	*<Unique ID>*
Bit 3	*<Firmware Version>*

Bit 2	*<Protocol Version>*
Bit 1	*<Device Type>*
Bit 0	*<Length>*

✧ *<+RSP Mask>*: Component mask of the location report 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	Reserved
Bit 16	*<Fuel Level Input>*
Bit 15	*<Fuel Consumption>*
Bit 14	*<Engine RPM>*
Bit 13	*<VIN>*
Bit 12	*<External Power Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*

Bit 7	<Length>
Bit 6	<Unique ID>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<MCC/MNC/LAC/Cell ID/Reserved>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

✧ <+EVT Mask>: Component mask of the event report 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	Reserved
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	<VIN>
Bit 12	<External Power Voltage>

Bit 11	<Battery Level>
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Unique ID>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<MCC/MNC/LAC/Cell ID/Reserved>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

✢ <+INF Mask>: Component mask of the information report message. Bit 8 to Bit 15 indicate which group of items is included when reporting message other than +**RESP:GTINF**.

Bit	Item to Mask
Bit 15	**+RESP:GTGIR**
Bit 14	**+RESP:GTTMZ**
Bit 13	**+RESP:GTCSQ**
Bit 12	**+RESP:GTCID**
Bit 11	**+RESP:GTBAT**
Bit 10	**+RESP:GTGPS**
Bit 9	Reserved
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	<Unique ID>

Bit 0	*<Length>*

✧ *<Expand INF Mask>*: Component mask of the information report message. Refer to bit 7 in parameter *<+INF Mask>*.

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	*<VIN>*

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

Bit	Item to Mask
Bit 7	*<UID>*
Bit 6	*<Count Number>*
Bit 5	*<Send Time>*
Bit 4	*<Unique ID>*
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	*<VIN>*
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>*

✧ *<+OBD Mask>*: Component mask of the OBDII Information packet.

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	Reserved
Bit 22	Reserved

Bit 21	Reserved
Bit 20	Reserved
Bit 19	Reserved
Bit 18	Reserved
Bit 17	Reserved
Bit 16	Reserved
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	*<VIN>*
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, 1F0101,135790246811220,,0019,20090214093254,11F0$			
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	$	$

4.2. Acknowledgement +ACK

➢ **+ACK,**

Example:
2B 41 43 4B 01 EF 24 1F 01 03 03 02 56 50 22 00 0A 00 27 07 00 07 F9 07 DD 01 1E 0A 15 0A 01 01 F9 19 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
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
Reserved	7
Reserved	8
Reserved	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
Reserved	14
Reserved	15
AT+GTRTO	16
Reserved	17
Reserved	18
Reserved	19
Reserved	20
AT+GTUPD	21
AT+GTPIN	22
Reserved	23
AT+GTOWH	24
AT+GTDOG	25
Reserved	26
AT+GTJDC	27
AT+GTIDL	28
AT+GTHBM	29
AT+GTHMC	30
Reserved	31
Reserved	32

Reserved	33
AT+GTWLT	34
AT+GTHRM	35
AT+GTCRA	36
AT+GTPDS	38
Reserved	39
Reserved	40
AT+GTSSR	41
AT+GTOBD	44
AT+GTORR	45

✧ *<Report Mask>*: It refer to the *<+ACK Mask>* in **AT+GTHRM.**

✧ *<Length>*: The whole length of the acknowledgement message header to the tail characters.

✧ *<Unique ID>*: If the Bit 4 of *<+ACK Mask>* is 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

✧ *<ID>*: Sub-command ID of **AT+GTRTO** and **AT+GTGEO**, for others, set to 0.

✧ *<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 report messages including **+RESP:GTTOW**, **+RESP:GTEPS**, **+RESP:GTGEO**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTDOG**, **+RESP:GTIGL**, **+RESP:GTFRI** and **+RESP:GTHBM** use this format.

➢ **+RSP,**

Example:

2B 52 53 50 0B 00 FC 3F BF 00 6E 1F 01 04 02 05 0D 39 5A 18 44 0B 16 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 2D 55 41 05 00 01 01 00 00 00 00 00 00 46 06 FC 59 F9 01

E5 BB FF 07 DD 0B 10 07 27 0C 04 60 00 00 56 78 20 79 00 00 00 00 00 00 00 00 00 00 00 00

---

00 00 00 00 00 00 07 DD 0B 10 07 27 0D 00 05 FC 1C 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Voltage	2		
Engine RPM	2	0 - 16383 rpm	
Fuel Consumption	2	0.0 – 999.9L/100km | Inf | NaN	
Fuel Level Input	1	0-100	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Report ID / Report Type	1		
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	0000 – FFFF	

MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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

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

Command	ID
+RESP:GTRTL（**PNL**）	0
+RESP:GTTOW	1
Reserved	2
+RESP:GTLBC	3
+RESP:GTEPS	4
Reserved	5
Reserved	6
+RESP:GTFRI	7
+RESP:GTGEO	8
+RESP:GTSPD	9
Reserved	10
+RESP:GTRTL	11
+RESP:GTDOG	12
Reserved	13
Reserved	14
+RESP:GTHBM	15
+RESP:GTIGL	16

❖ *<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 as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

❖ *<Motion Status>*: 0x1A is a status which before 0x16 status.

❖ *< Satellites>*: The low nibble is for *<Satellites>*.

❖ *<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 2 two bytes are for the integer part of the speed and the last byte is for the fraction part. The fraction part only has 1 digit.

❖ *<Longitude>*: The longitude of the current position. Total 4 bytes. Convert the longitude to an integer with 6 implicit decimals and report this integer in HEX format. If the value of the longitude is negative, it is represented in 2's complement format.

Longitude 121.390847	121390847			
HEX	07	3C	46	FF

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

Latitude 31.164503	31164503			
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 only has 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 only has 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 report message for +**RESP:GTLBC** use below format

Example:

2B 52 53 50 03 00 FE 1F BF 00 66 1F 01 03 03 02 56 50 22 00 0A 00 27 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 62 2E 46 01 00 21 08 00 70 02 15 44 50 29 3F 01 01 00 00 03 00 81 00 40 06 FC 59 86 01 E5 BC 2D 07 DD 01 1E 03 28 08 04 60 00 00 56 78 5D 7B 00 00 00 01 00 00 00 0B 05 00 04 32 00 00 00 0E 2A 29 07 DD 01 1E 0B 28 09 01 82 6A 27 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Voltage	2		
Engine RPM	2	0 - 16383 rpm	
Fuel Consumption	2	0.0 – 999.9L/100km | Inf | NaN	
Fuel Level Input	1	0-100	
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	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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

✧ *<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 byte used to represent the phone number including this byte. *<Number Type>* indicates if there is a '+' sign before the phone number. 1 means has the sign, 0 means no sign.

	Number Length	Number Type
HEX	**7**	**0**

✧ *<Phone Number>*: Not more than 10 bytes. In each byte, use 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 02154450293	02	15	44	50	29	3
HEX	02	15	44	50	29	3F

4.4. Information Report +INF

Information report messages include **+RESP:GTINF**, **+RESP:GTGPS**, **+RESP:GTCID**, **+RESP:GTCSQ**, **+RESP:GTVER**, **+RESP:GTBAT**, **+RESP:GTTMZ and +RESP:GTGIR**. These messages use the same format as below, however only **+RESP:GTINF** includes all the items while others only include related information to themselves.

➢ **+INF,**

Example:
2B 49 4E 46 01 FF FD 00 AF 0D 39 5A 18 44 0B 16 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 1F 01 03 02 05 01 01 00 00 00 00 41 00 0C 00 07 DD 0B 06 07 2F 18 00 00 00 3F 00 3C 00 3C 00 00 00 00 00 90 0F 8B 00 2C 00 89 86 02 12 12 02 16 01 68 88 18 00 00 00 00 00 07 04 60 00 00 56 78 20 79 00 27 04 60 00 00 56 65 20 6E 00 24 04 60 00 00 56 78 02 36 00 22 04 60 00 00 56 63 59 E4 00 21 04 60 00 00 56 78 20 78 00 20 04 60 00 00 56 78 2D 80 00 1F 04 60 00 00 56 78 2D 7E 00 2F 07 DD 0B 06 07 2F 1B 08 77 1B 54 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	
VIN	17		
Device Type	1	1F	+RESP: GTVER
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	
MCU Version	2	0000 – FFFF	
Reserved	2	0000	
Motion Status	1	0x11	0x12	+RESP:

		0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	**GTGPS**
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	
Response Report Items Mask	2		
IGN Interval	2		
IGF Interval	2		
Reserved	4	00000000	
Reserved	1	00	
External Power Supply / Backup Battery On / Charging / LED On / Backup Battery Charge Mode	1		**+RESP: GTBAT**
External Power Voltage	2	0	
Backup Battery Voltage	2	0 – 4200mV	
Backup Battery Level	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 / Daylight Saving Enable	1		**+RESP: GTTMZ**
Time Zone Offset	2	HHMM	
GIR Trigger Type	1		**+RESP: GTGIR**
Cell Number	1		
MCC	2		
MNC	2		
LAC	2		

Cell ID	2					
TA	1					
RX Level	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 report message.

Command	ID
+RESP:GTINF	1
+RESP:GTGPS	2
+RESP:GTCID	4
+RESP:GTCSQ	5
+RESP:GTVER	6
+RESP:GTBAT	7
Reserved	8
+RESP:GTTMZ	9
+RESP:GTGIR	10

✧ *<Report Mask>*: It refer to the *<+INF Mask>* in **AT+GTHRM.**

✧ *<Unique ID>*: If the Bit 1 of *<+INF Mask>* is 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

✧ *< Power Saving Enable / OWH Mode / Outside Working Hour/ >*: The highest bit, bit 7 is reserved, bit 5 and bit 6 is for*<Power Saving Enable>*, bit 4 and bit 3 are for *<OWH Mode>*, bit 2 is for *<Outside Working Hour>*. Bit 0 is for *<AGPS>*. *<Outside Working Hour>* is used to indicate whether the device is currently outside the working hour. 1 means outside.

✧ *<External Power 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 LED's are turned on. Bit 0

is for <*Backup Battery Charge Mode*>.

✧ <*ICCID*>: ICCID is a 20-digit string. In the HEX format message, every 4 bits are used to represent one digit of the 20 digits 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 / Daylight Saving Enable*>: Bit 1 is for <*Daylight Saving Enable*> to indicate whether the daylight saving function is currently enabled. Bit 0 is for <Time Zone Offset Sign> to indicate the positive or negative of the local time offset to UTC. 1 means negative.

✧ <*GIR Trigger Type*>: A string to indicate what kind of GPS fixing this cell information is for.

"INF"   This cell information is for INF requirement.

"RTL"   This cell information is for RTL requirement.

"LBC"   This cell information is for LBC requirement.

"TOW"   This cell information is for TOW requirement.

"FRI"   This cell information is for FRI requirement.

"GIR"   This cell information is for sub command "**C**" in **AT**+**GTRTO** command.

Fix Type	ID
INF	0
Reserved	1
RTL	2
LBC	3
TOW	4
FRI	5
GIR	6

✧ <*Cell Number*>: <*Cell Number*> express number of the IMSI**.** The IMSI consist of MCC, MNC, LAC, Cell ID.

4.5. Event Report +EVT

Event report messages including **+RESP:GTPNA**, **+RESP:GTPFA**, **+RESP:GTMPN**, **+RESP:GTMPF**, **+RESP:GTBTC**, **+RESP:GTSTC**, **+RESP:GTSTT**, **+RESP:GTPDP,** **+RESP:GTIDN, +RESP:GTJDR,+RESP:GTSTR** and **+RESP:GTSTP, +RESP:GTLSP,** use this format.

➢ **+EVT,**

Example:

2B 45 56 54 09 00 FC 3F BF 00 6D 1F 01 03 02 05 0D 39 5A 18 44 0B 16 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 0F 8B 41 05 01 00 00 00 00 00 00 00 3C 06 FC 5A 11 01 E5 BB D0 07 DD 0B 06 0B 06 1A 04 60 00 00 56 63 5A 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 0B 06 0B 06 1C 0A 43 8E EC 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Voltage	2		
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
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	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	

Cell ID	2	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

✧ *<Message Type>*: The ID of event report 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

+RESP:GTJDR	20
+RESP:GTGSS	21
Reserved	22
+RESP:GTCRA	23
Reserved	25
+RESP:GTGES	26
+RESP:GTSTR	28
+RESP:GTSTP	29
+RESP:GTLSP	30
+RESP:GTJDS	32

✧ *<Report Mask>*: It refer to the *<+EVT Mask>* in **AT**+**GTHRM.**

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

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

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

➢ **+EVT,**

<table>
<tr><td colspan="4">Example:
2B 45 56 54 06 00 7E 1F 3F 1F 01 03 03 02 56 50 22 00 0B 31 5C 01 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 04 00 00 00 00 11 07 0D C1 01 00 00 01 02 01 0A 00 33 06 FC 59 81 01
E5 BC 2A 07 DD 01 1F 08 0B 15 04 60 00 01 55 04 69 D3 00 00 00 00 00 00 00 17 04 00 00 00
07 DD 01 1F 10 0B 18 00 B6 69 C2 0D 0A</td></tr>
<tr><td>Parameter</td><td>Length(byte)</td><td>Range/Format</td><td>Default</td></tr>
<tr><td>Message Header</td><td>4</td><td>+EVT</td><td>+EVT</td></tr>
<tr><td>Message Type</td><td>1</td><td></td><td></td></tr>
<tr><td>Report Mask</td><td>4</td><td>00000000 – FFFFFFFF</td><td></td></tr>
<tr><td>Length</td><td>2</td><td></td><td></td></tr>
<tr><td>Device Type</td><td>1</td><td>1F</td><td>1F</td></tr>
<tr><td>Protocol Version</td><td>2</td><td>0000 – FFFF</td><td></td></tr>
<tr><td>Firmware Version</td><td>2</td><td>0000 – FFFF</td><td></td></tr>
<tr><td>Unique ID</td><td>8</td><td>IMEI</td><td></td></tr>
</table>

VIN	17		
Battery Level	1	0~100	
External Power Voltage	2		
Reserved	1	00	00
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Backup Battery Voltage	2	0 – 4200 mV	
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	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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

Event report message **+RESP:GTIGN** and **+RESP:GTIGF** use this format. For these two messages, the *<mileage>* field will always be present in spite of the *<Report Items Mask>* setting.

➢ **+EVT,**

Example:

2B 45 56 54 0D 00 FE 1F BF 00 62 1F 01 03 03 02 56 50 22 00 0A 00 27 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 57 00 00 01 00 22 08 00 00 00 00 01 00 00 00 04 00 6B 00 38 06 FC 59 7D 01 E5 BC 00 07 DD 01 1D 0C 07 24 04 60 00 00 56 78 5D 7B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 01 1D 14 07 27 00 3E 0F 13 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Voltage	2		
Reserved	1	00	00
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	
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	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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

Event report message +**RESP:GTUPD** uses this format. For this message, the <*Protocol Version*> and <*Firmware Version*> will always be present in spite of the <*Report Items Mask*> setting

➢ **+EVT,**

Example:

2B 45 56 54 0F 00 FE 1F BF 00 61 1F 01 03 03 02 56 50 22 00 0B 31 5C 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 62 2C C9 00 00 41 05 01 2C 00 01 00 00 00 01 00 00 00 43 06 FC 59 ED 01 E5 BC 09 07 DD 01 1F 0A 05 0E 04 60 00 01 55 04 58 2B 00 00 00 00 00 00 00 03 04 00 00 00 00 00 30 34 00 02 07 DD 01 1F 03 00 30 00 27 F7 0C 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	1F	1F

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Voltage	2		
Reserved	1	00	00
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Code	2		
Retry	1		
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	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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	

	7	YYYYMMDDHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report message +**RESP:GTIDF** uses this format.

➢ **+EVT,**

Example:

2B 45 56 54 11 00 FE 1F BF 00 62 1F 01 03 03 02 56 50 22 00 0A 00 27 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 5D 00 00 00 03 12 07 00 00 03 FF 01 00 00 01 01 00 99 00 21 06 FC 59 75 01 E5 BB BD 07 DD 01 1E 09 1C 07 04 60 00 00 56 78 5D 7B 00 00 00 02 00 00 00 0B 07 00 0B 28 00 00 00 00 00 00 07 DD 01 1E 11 1C 0A 03 C9 2A A1 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Voltage	2		
Reserved	1	00	00
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Duration of Idling	4		
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	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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

Event report message +**RESP:GTGSS** uses this format.

➢ **+EVT,**

Example:

2B 45 56 54 15 00 FE 1F BF 00 63 1F 01 03 03 02 56 50 22 00 0A 00 27 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 50 00 00 00 03 1A 05 00 00 00 00 00 01 00 00 02 04 00 2A 00 35 06 FC 59 9A 01 E5 BC 2C 07 DD 01 1E 09 25 24 04 60 00 00 56 78 5D 7B 00 00 00 02 00 00 00 0B 07 00 0B 28 00 00 00 00 00 00 07 DD 01 1E 12 04 19 03 D7 64 41 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Voltage	2		
Reserved	1	00	00
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
GPS Signal Status	1	0 | 1	
Reserved	4	00000000	00000000
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	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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

✧ <*GPS Signal Status*>: 0 means lost GPS signal or no successful GPS fix, 1 means GPS signal recovered and successful GPS fix.

Event report message +**RESP:GTGES** uses this format.

➢ **+EVT,**

Example:
2B 45 56 54 1C 01 FE DF FF 00 70 1F 02 0F 08 23 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 11 17 30 00 00 00 01 F4 00 00 01 68 01 00 00 00 00 00 00 00 32 06 FC 59 DC 01 E5 BB CD 07 DC 0C 1A 09 20 18 04 60 00 00 56 63 5A 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 0C 1A 09 20 21 00 1B 42 F0 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Supply Voltage	2		
Reserved	1	00	00
Motion Status	1	0x11 | 0x12 0x21 | 0x22	

		0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Trigger GEO ID / Trigger GEO Enable	1		
Trigger Mode	1	0|21|22	
Radius	4	50 – 6000000m	
Check Interval	4	0|5 – 86400sec	
Number	1	1	
GPS Accuracy	1	0|1	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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

✧ *<Trigger GEO ID/Trigger GEO Enable>*: The *<Trigger GEO ID>* and *<Trigger GEO Enable>* in hex format. High bit means *<Trigger GEO ID>* and low bit means *<Trigger GEO*

Enable>.

> *Trigger GEO ID*: The ID of Geo-Fence, The range is 0 – 4.
> *Trigger GEO Enable*: Enable or disable the zone's Geo-Fence function.
>   ● 0: Disable the zone's Geo-Fence function
>   ● 1: Enable the zone's Geo-Fence function

Event report message +**RESP:GTJDS** uses this format.

> **+EVT,**

Example:

2B 42 56 54 20 00 FC 3F BF 00 6E 1F 01 04 03 03 56 15 5D 02 14 01 09 03 31 47 31 4A 43 35 34 34 34 52 37 32 35 32 33 36 37 64 2E 8F 21 03 02 01 00 00 00 00 00 EB 00 1A 06 FC 5B C5 01 E5 BE 89 07 DD 0B 19 07 31 1E 04 60 00 01 55 04 58 2B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 0B 19 07 31 2E 02 B8 EB FA 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	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Battery Level	1	0~100	
External Power Supply Voltage	2		
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Jamming Status	1	1|2	
Number	1	1	
GPS Accuracy	1	0|1	
Speed	3	0.0 – 999.9km/h	

Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	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

✧ <*Jamming Status*>: The current Jamming status of the device.
- 1: Quit the jamming.
- 2: Enter the jamming.

4.6. Heartbeat Data +HBD

➢ **+HBD,**

Example:
2B 48 42 44 EF 20 1F 01 03 03 02 56 50 22 00 0A 00 27 07 07 DD 01 1D 14 02 13 00 39 D2 5B 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	1F	1F

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Report Mask>*: It refer to the *<+HBD Mask>* in **AT+GTHRM.**

✧ *<Unique ID>*: If the Bit 4 of *<+HBD Mask>* is 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

If the mask of *<UID>* set as 0 in the *<+HBD Mask>* of **AT+GTHRM**, the heart beat message will not report IMEI information. If the mask of *<UID>* is set as 1, then according to the mask of *< Unique ID >*, the heart beat message will report IMEI information

4.7. Crash Data Packet +CRD

➢**+CRD,**

Example:
2B 43 52 44 00 7D 02 19 1F 80 01 01 02 0D 39 5A 18 44 0B 16 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 03 03 00 5A FF FE FF FC 00 58 FF FD FF FD 00 55 FF FE FF FE 00 56 FF FF FF FF 00 57 FF FC FF FC 00 54 FF FC FF FF 00 57 FF FD FF FF 00 57 FF FD FF FF 00 55 FF FC FF FE 00 58 FF FE FF FE 00 57 FF FD FF FE 00 56 FF FB 00 00 00 57 FF FB FF FD 00 57 FF FD 00 00 00 57 FF FF 00 00 00 58 FF FE FF FF 00 57 FF FC FF FE 00 57 FF FD 00 01 00 58 FF FD FF FD 00 5A FF FC FF FE 00 53 FF FE FF FF 00 57 FF FD FF FF 00 54 FF FD FF FD 00 53 FF FB FF FF 00 55 FF FE FF FE 00 56 FF FC FF FD 00 58 FF FD FF FF 00 57 FF FD FF FD 00 56 FF FF FF FF 00 57 FF FD 00 00 00 56 FF FD FF FF 00 56 FF FD 00 00 00 56 FF FE FF FE 00 58 FF FD FF FD 00 58 FF FC 00 00 00 57 FF FE FF FD 00 55 FF FE FF FE 00 56 FF FD 00 00 00 5A FF FC FF FE 00 58 FF FC FF FF 00 58 FF FC FF FE 00 56 FF FF 00 00 00 57 FF FD 00 01 00 55 FF FD FF FF 00 58 FF FD FF FD 00 56 FF FC FF FF 00 57 FF FC FF FD 00 57 FF FE FF FE 00 57 FF FD FF FF 00 57 FF FB FF FE 00 56 FF FB FF FE 00 56 FF FF FF FD 00 54 00 00 FF FF 00 56 FF FC FF FF 00 56 FF FD FF FE 00 59 FF FC 00 00 00 57 FF FC FF FD 00 57 FF FD FF FE 00 59 FF FC FF FE 00 5C FF

FB FF FD 00 57 FF FB 00 00 00 58 FF FF FF FD 00 55 FF FD FF FF 00 58 FF FB FF FE 00
56 00 00 FF FD 00 58 FF FD FF FF 00 56 FF FB FF FD 00 55 FF FC FF FF 00 57 FF FB FF
FF 00 58 FF FC FF FF 00 55 FF FD FF FE 00 58 FF FC FF FE 00 56 FF FC FF FF 00 54 FF
FC FF FD 00 59 FF FE 00 00 00 58 FF FF FF FF 00 55 FF FE FF FF 00 57 FF FA FF FE 00
55 FF FD FF FE 00 58 FF FD FF FE 00 5A FF FC FF FD 00 57 FF FF FF FD 00 58 FF FD 00
00 00 55 07 DB 01 01 14 10 24 00 D8 14 37 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+CRD	+CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	1F	1F
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Data Type	1	0|1	
Total frame	1	3	
Frame Number	1	1|2|3	
Data	500		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Report Mask>*: It refer to the *<+CRD Mask>* in **AT+GTHRM.**

✧ *<Unique ID>*: If theBit 1of*<+CRDMask>* is 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

✧ *<Length>*: The whole length of the crash data message from header to the tail characters.

✧ <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 report to server.

✧ <Frame Number>*:* The sequence of data frame.

✧ *<Data>:* There are 500 numbers in one frame, 6 numbers as a group, The first 2 numbers of these 6 numbers represent X axis acceleration data, the next 2 numbers represent Y axis and next 2 numbers is Z axis.

4.8. OBDII Information Report +OBD

4.8.1. OBDII Information Report

OBDII Information report message +**RESP:GTOBD** use this format.

➢ **+OBD,**

<table>
<tr><td colspan="4">Example:
2B 4F 42 44 00 00 00 00 FD 00 81 1F 01 04 03 01 56 15 5D 02 14 01 09 03 31 47 31 4A 43 35 34 34 34 52 37 32 35 32 33 36 37 00 00 30 1F FF 31 47 31 4A 43 35 34 34 34 52 37 32 35 32 33 36 37 01 2E 53 FF FF DF FF 38 93 00 B6 00 0E 00 B1 00 50 00 00 00 00 00 00 00 00 01 4A 00 33 06 FC 5A 22 01 E5 BB F1 07 DD 0B 0E 01 33 27 04 60 00 01 55 04 58 2B 00 07 DD 0B 0E 01 33 28 2A 3E EC 58 0D 0A</td></tr>
<tr><td>Parameter</td><td>Length(byte)</td><td>Range/Format</td><td>Default</td></tr>
<tr><td>Message Header</td><td>4</td><td>+OBD</td><td>+OBD</td></tr>
<tr><td>Message Type</td><td>1</td><td></td><td></td></tr>
<tr><td>Report Mask</td><td>4</td><td>0x00000000 – 0xFFFFFFFF</td><td></td></tr>
<tr><td>Length</td><td>2</td><td></td><td></td></tr>
<tr><td>Device Type</td><td>1</td><td>1F</td><td>1F</td></tr>
<tr><td>Protocol Version</td><td>2</td><td>0000 – FFFF</td><td></td></tr>
<tr><td>Firmware Version</td><td>2</td><td>0000 – FFFF</td><td></td></tr>
<tr><td>Unique ID</td><td>8</td><td>IMEI</td><td></td></tr>
<tr><td>VIN</td><td>17</td><td></td><td></td></tr>
<tr><td>Report Type</td><td>1</td><td>0|1</td><td></td></tr>
<tr><td>OBD Report Mask</td><td>4</td><td>0x00000000 - 0xFFFFFFFF</td><td></td></tr>
<tr><td>VIN</td><td>17</td><td></td><td></td></tr>
<tr><td>OBD Connect</td><td>1</td><td>0|1</td><td></td></tr>
<tr><td>OBD Power Voltage</td><td>2</td><td></td><td></td></tr>
<tr><td>Support PIDs</td><td>4</td><td>0x00000000 - 0xFFFFFFFF</td><td></td></tr>
<tr><td>Engine RPM</td><td>2</td><td>0 - 16383 rpm</td><td></td></tr>
</table>

Vehicle Speed	2	0 - 255Km/h	
Engine Coolant Temperature	2	-40 – +215 ℃	
Fuel Consumption	2	0.0 – 999.9L/100km | Inf | NaN	
DTCs Cleared Distance	2	0 - 65535Km	
MIL Activated Distance	2	0 - 65535Km	
MIL status	1	0|1	
Number of DTCs	1	0-127	
Diagnostic Trouble Codes	<=2*127		
Throttle Position	1	0-100	
Engine Load	1	0-100	
Fuel Level Input	1	0-100	
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	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Total Mileage	5	0.0 – 4294967.0 km	
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 report message.

Command	ID
+RESP:GTOBD	0
+RESP:GTOPN	1
+RESP:GTOPF	2
Reserved	3
Reserved	4
Reserved	5
Reserved	6
Reserved	7
Reserved	8
Reserved	9
Reserved	10
Reserved	11
Reserved	12
Reserved	13
Reserved	14
Reserved	15
Reserved	16

✧ *<Report Mask>*: It refer to the *<+OBD Mask>* in **AT+GTHRM.**

✧ *<Unique ID>*: If the Bit 1of*<+OBD Mask>* is 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

✧ *<Length>*: The whole length of the crash data message from header to the tail characters.

✧ *<Report Type>*: Report type has different meanings in different **+OBD** messages as below.

● In OBD Information report message **+RESP:GTOBD**

0: Periodically report (controlled by AT+GTOBD).

1: Realtime request report (request by AT+GTORR).

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

✧ *<OBD Report Mask>*: It refer to the *<OBD Report Mask>* in **AT+GTOBD**. In OBDII Event Report bit 20 *<GPS Information>* and bit 21 *<GSM Information>* will always be 1.

✧ *<VIN>*: A 17-byte string, reported in HEX format.

✧ *<OBD Connect>*: Total 1 byte for *<OBD Connect >*.

✧ *<Engine Coolant Temperature>*: The engine coolant temperature of vehicle. Total 2 bytes. If this value is negative, it is represented in 2's complement format.

✧ *<Fuel Consumption>*: Total 2 bytes. Convert the fuel consumption value to an integer with 1 implicit decimal and report this integer in HEX format. Inf is represented as FF FE and NAN is represented as FF FF.

Fuel Consumption 12.1	121	
HEX	00	79

✧ *<Number of DTCs>*: Number of diagnostic Trouble Codes, total one byte;

✧ *<Diagnostic Trouble Codes>*: Each Diagnostic Trouble Code is represented in two bytes hexademical digit. The number of Diagnostic Trouble Code reported determined by *<Number of DTCs>,* Please enable both bit 11 and bit 12 in parameter *<OBD Report Mask >* while you want *<Diagnostic Trouble Codes>* be reported.

4.8.2. OBDII Event Report

OBDII Event report message +**RESP:GTOPN,** +**RESP:GTOPF** uses this format.

➢ **+OBD,**

Example: 2B 4F 42 44 02 00 00 00 FD 00 5B 1F 01 04 03 01 56 15 5D 02 14 01 09 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 4C 00 3D 06 FC 5A 09 01 E5 BC 3C 07 DD 0B 0D 06 0B 29 04 60 00 01 55 04 58 2B 00 07 DD 0B 0D 06 0D 33 24 14 8C 27 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+OBD	+OBD
Message Type	1		
Report Mask	4	0x00000000 – 0xFFFFFFFF	
Length	2		
Device Type	1	1F	1F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
VIN	17		
Report Type	1	0|1	
OBD Report Mask	4	0x00000000 - 0xFFFFFFFF	

GPS Accuracy	1	0|1	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

4.9. Buffer Report in HEX Format

When HEX format messages go into the local buffer, the device will replace the 2nd byte of the report messages with 'B'. Thus, **+BSP** is buffered report for **+RSP**, **+BNF** is buffered report for **+INF** and **+BVT** is buffered report for **+EVT**. The rest part of the report messages keep untouched.

Appendix: Message Index

✧   Command and ACK

AT+GTBSI
+ACK:GTBSI
AT+GTSRI
+ACK:GTSRI
AT+GTQSS
+ACK:GTQSS
AT+GTCFG
+ACK:GTCFG
AT+GTEPS
+ACK:GTEPS
AT+GTFRI
+ACK:GTFRI
AT+GTGEO
+ACK:GTGEO
AT+GTTOW
+ACK:GTTOW
AT+GTSPD
+ACK:GTSPD
AT+GTIDL
+ACK:GTIDL
AT+GTHBM
+ACK:GTHBM
AT+GTTMA
+ACK:GTTMA
AT+GTOWH
+ACK:GTOWH
AT+GTDOG
+ACK:GTDOG
AT+GTPIN
+ACK:GTPIN
AT+GTRTO
+ACK:GTRTO
AT+GTHMC
+ACK:GTHMC
AT+GTJDC
+ACK:GTJDC
AT+GTWLT
+ACK:GTWLT
AT+GTCRA
+ACK:GTCRA

AT+GTPDS
+ACK:GTPDS
AT+GTSSR
+ ACK:GTSSR
AT+GTOBD
+ACK:GTOBD
AT+GTORR
+ACK:GTORR
AT+GTOSM
+ACK:GTOSM

✧ Position Related Report
+RESP:GTTOW
+RESP:GTEPS
+RESP:GTFRI
+RESP:GTGEO
+RESP:GTSPD
+RESP:GTRTL
+RESP:GTLBC
+RESP:GTDOG
+RESP:GTIGL
+RESP:GTHBM
+RESP:GTGES

✧ Device Information Report
+RESP:GTINF

✧ OBDⅡ Information Report
+RESP:GTOBD

✧ Report for Querying
+RESP:GTGPS
+RESP:GTALL
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTTMZ
+RESP:GTALS

✧ Event Report
+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN

+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTPDP
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF
+RESP:GTJDR
+RESP:GTGSM
+RESP:GTGSS
+RESP:GTCRA
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTJDS

✧ OBDⅡ Event Report
+RESP:GTOPN
+RESP:GTOPF
+RESP:GTJES
+RESP:GTOSM

✧ Crash Data Packet
+RESP:GTCRD

✧ Heartbeat
+ACK:GTHBD
+SACK:GTHBD

✧ Server Acknowledgement
+SACK

✧ Hex format report message
+ACK
+RSP
+EVT
+INF
+HBD
+OBD
+CRD