GV75M @Track Air Interface Protocol

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

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0. Revision History

Version	Date	Author	Description of Change
3.00	2020-12-09	Ted Li	Initial
3.01	2021-06-02	Ted Li	1. Added AT+GTASC command and CLASC in RTO. 2. Modified the device type to C8. 3. Added +RESP:GTCRG information.
3.02	2022-01-20	Ted Li	1. Added AT+GTGPJ command and corresponding event; 2. Added query GTGPJ configurations in AT+GTRTO; 3. Added output control in AT+GTJDC; 4. Added RAT and Band data to the mask of +RESP:GTERI.
3.03	2022-02-24	Ted Li	1. Added the AT+GTIGM command. 2. Modified the value range of <Digital Input ID> from (0|1|9 – C) to (0|1|6|9 – C) in AT+GTSOS. 3. Modified the value range of <Digital Input ID> from (0|1) to (0|1|6) in AT+GTDOG. 4. Modified the value range of <Digital Input ID> from (0|1|9 – C) to (0|1|6|9 – C) in AT+GTOWH. 5. Modified the value range of <Digital Input ID> from (0|1) to (0|1|6) in AT+GTCMS. 6. Added bit 18 and bit 19 of <Input ID Mask> in GTUDF. 7. Changed the value range of <Input Mask> and <Trigger Mask> to 0000 - 0F42 in AT+GTIOB. 8. Changed the value range of <Digital Input> to 0000 - 0F42 in device information report. 9. Added 5A to <Message Type> in hex +ACK.
	2022-04-13	Ted Li	1. Modified the length of <Password> to 4-7.
3.04	2022-06-09	Ted Li	1. Added <Tow Distance> to AT+GTTOW.
	2022-08-22		1.Added <Refuel Alarm> to AT+GTEFS.
3.05	2022-08-22	Ted Li	1. Added AT+GTGDO command. 2. Added mode 2 and mode 3 to AT+GTOUT. 3. Added status 1 and status 2 to output 1. 4. Added status 1 and status 2 to output 2. 5. Added bit 36, bit 37, bit 49 and bit 50 to <*Input*

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			ID Mask> in AT+GTUDF.
3.06	2022-12-15	Ted Li	1. Add Escort Fuel to AT+GTURT and AT+GTFSC. 2. Modified the length of <IGN Interval> and <IGN Interval> **in** +INF.
	2023-01-04		1. Modified the range of <Engine Off to Tow> in AT+GTTOW.
3.07	2023-03-22	Ted Li	1. Added the<Format> option to <Working Mode> selection 1 or 2 in AT+GTURT. 2. Added the <Order of card ID/Prompt mode> option to AT+GTURT.
3.08	2023-05-05	Ted Li	1. Added masks <RFID Length> and <RFID> to AT+GTHRM. 2. Modified the range of <Turn and Brake Threshold> in AT+GTHBM. Modified detail of <Turn and Brake Threshold> and <Acceleration Threshold> in AT+GTHBM. 3. Added <RFID Report Mode> to AT+GTIDA.
3.09	2023-07-05	Ted Li	1. Added <RFID Report Format> to AT+GTIDA. 2. Modified the range of <RFID> in +RSP and +EVT.
	2023-08-18		1. Added bit2 function to <Number Filter> in AT+GTWLT.
	2023-09-14		1. Added the information of <RFID>to +EVT and +RSP.
	2023-10-11		1. Added the note to <AC100 data (Reserved)> in +RESP:GTINF.
	2023-10-18		1. Modified the information about acceleration of gravity in **+RESP:GTCRD**.
3.10	2023-12-29	Ted Li	1. Added <MPN/MPF Validity Time> to AT+GTEPS. 2. Added <Battery Low Percentage> to AT+GTCFG.
	2024-02-05		1. Modified the detail of <Power Saving Mode> in AT+GTCFG.
3.11	2024-03-19	Ted Li	1. Added <Satellite Data>to ERI Mask in AT+GTFRI. 2. Added <Satellite Data> to +RESP:GTERI.

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1. Overview

1.1. Scope of This Document

The @Track Air Interface Protocol is a digital communication interface based on printable ASCII characters over network, which is used for all communications between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms the receipt with an acknowledgement message. If configured, the terminal also sends report messages to the backend server.

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

1.2. Reference

SN	Document Name	Remark
[1]	@Track Air Interface for Garmin-FMI Protocol	The air protocol interface between GV75M and Garmin.

1.3. Terms and Abbreviations

Abbreviation	Description
APN	Access Point Name
ASCII	American National Standard Code for Information Interchange
GNSS	Global Navigation Satellite System
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

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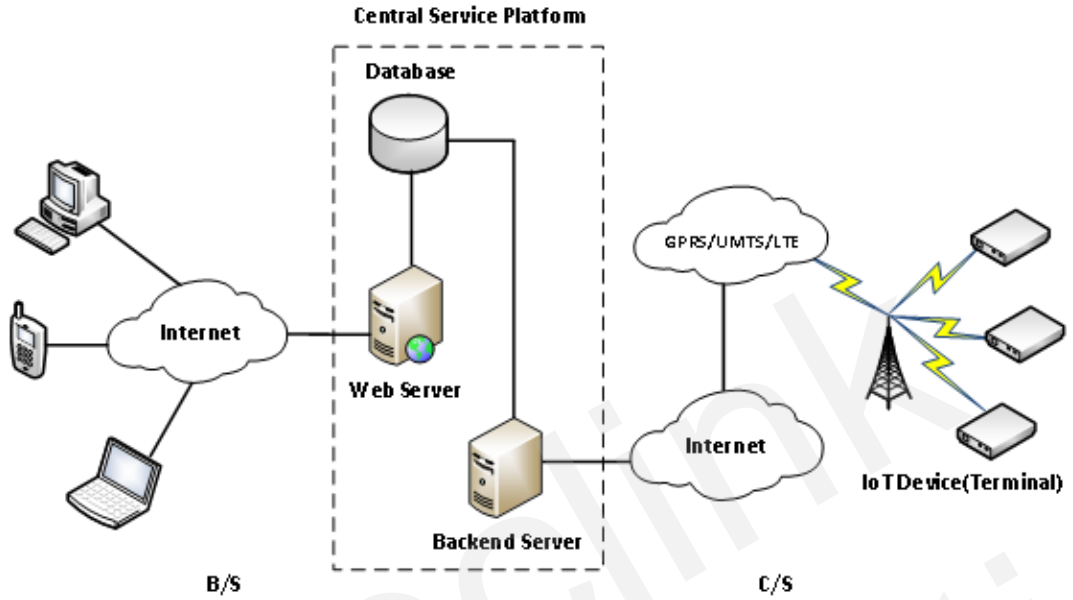
2. System Architecture



The backend server needs to be accessed by multiple terminals and should have the following abilities:

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

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3. Message Description

3.1. Message Format

All of the @Track Air Interface Protocol messages are composed of printable ASCII characters. Message format which varies with message type is shown in the table below:

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 the character '$'.
The characters 'XXX' allow the identification of the difference between messages.
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 neighboring parameter characters. The parameter string may contain the following ASCII characters: '0'–'9', 'a'–'z', and 'A'–'Z'.
Detailed information of each message format is available in the corresponding 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 when it performs 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:

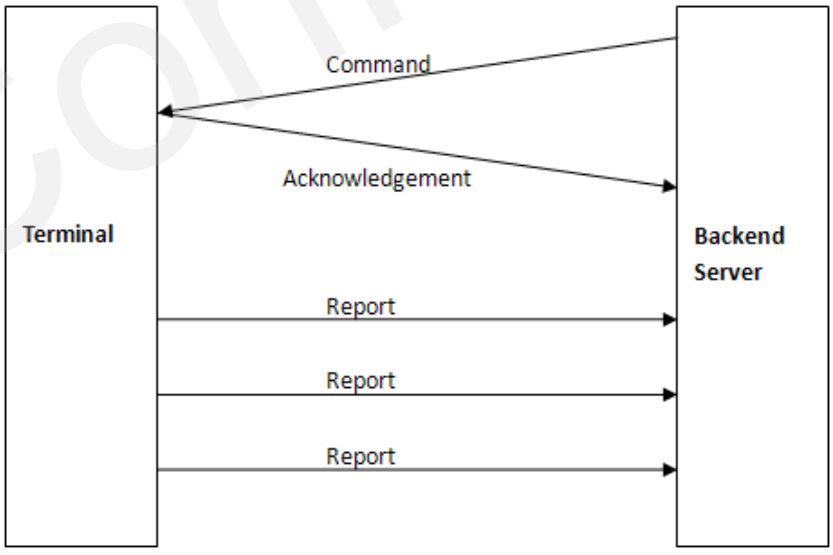

Figure 1: @Track Protocol Message Flow

3.2. Command and Acknowledgement

3.2.1. Server Connection

3.2.1.1. Bearer Setting Information

The command **AT+GTBSI** is used to configure the parameters for EGPRS/LTE Cat-M1/LTE Cat-NB1 data connection.

➢ **AT+GTBSI=**

Example: **AT+GTBSI=gv75m,,,,,,,,00,2,0,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	LTE APN	<=40	‘0’ - ‘9’, ‘a’ - ‘z’, ‘A’ - ‘Z’, ‘-’, ‘.’	
3	LTE APN User Name	<=30		
4	LTE APN Password	<=30		
5	GPRS APN	<=40	‘0’ - ‘9’, ‘a’ - ‘z’, ‘A’ - ‘Z’, ‘-’, ‘.’	
6	GPRS APN User Name	<=30		
7	GPRS APN Password	<=30		
8	Network Mode/APN Authentication Methods	2	00--0x53	00
9	LTE Mode	1	0-3	2
10	Manual Netreg	1	0-1	0
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Password*>: The valid characters of password include ‘0’–9’, ‘a’–‘z’, ‘A’–‘Z’. The default value is “gv75m”.

✧ <*LTE APN*>: Access point name (LTE APN).

✧ <*LTE APN User Name*>: The LTE APN user name. If the parameter field is empty, the current

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value of this parameter will be cleared.

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

Note:

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

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

  Mobile network modes of the device:
  - 0: Auto (LTE First & GSM).
  - 1: GSM only.
  - 2: LTE only.
  - 3: GSM first (LTE&GSM).

  Mobile APN authentication methods of the device:
  - 0: No authentication
  - 1: PAP authentication
  - 2: CHAP authentication
  - 3: PAP Or CHAP authentication
- ✧ <*LTE Mode*>: Select Cat-M1 and Cat-NB1 work mode.
  - 0: Cat-M1&Cat-NB1 (Cat-M1 first)
  - 1: Cat-M1&Cat-NB1 (Cat-NB1 first).
  - 2: Cat-M1.
  - 3: Cat-NB1.
  - 4: Cat-NB1 first (network search sequence: NB1, 2G, M1). It is valid when <*Network Mode*> is set to 0: Auto. (LTE &GSM).
  - 5: Cat-NB1 only (network search sequence: NB1, 2G). It is valid when <*Network Mode*> is set to 0: Auto. (LTE &GSM).

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

The network search sequence list is shown as below:

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

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		2	Cat-M1	M1	N/A	N/A
		3	Cat-NB1	NB1	N/A	N/A
3	GSM First	0	Cat-M1&Cat-NB1(Cat-M1 first)	2G	M1	NB1
		1	Cat-M1&Cat-NB1(Cat-NB1 first)	2G	NB1	M1
		2	Cat-M1	2G	M1	N/A
		3	Cat-NB1	2G	NB1	N/A

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

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

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

<*Tail Character*>: A character to indicate the end of the command. And it must be "$".

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

➢ **+ACK:GTBSI,**

Example: **+ACK:GTBSI,C80303,868446036548044,gv75m,0655,20210303062849,0CA7$**			
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 represent the device type. As in the example, "**C8**" means gv75m. The middle two characters represent the major version number of the protocol and the last two characters represent the minor version number of the protocol. Both version numbers are hex digits. For example, "**0301**" means version 3.01.

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

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

✧ <*Serial Number*>: A serial number which is the same as the <*Serial Number*> in the corresponding command. It is used 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. It recycles back after "FFFF".

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✧ <*Tail Character*>: A character which indicates the end of the command. It must be '$'.

Note: Only after both the commands **AT+GTBSI** and **AT+GTSRI** are properly set can the ACK messages and other report messages be received by the backend server.

3.2.1.2. Backend Server Registration 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=gv75m,3,,1,218.17.46.11,80,,0,13836001234,0,0,1,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Report Mode	1	0 – 7	0
3	Reserved	0		
4	Buffer Mode	1	0|1|2	1
5	Main Server IP/ Domain Name	<=60		
6	Main Server Port	<=5	0 – 65535	
7	Backup Server IP/ Domain Name	<=60		
8	Backup Server Port	<=5	0 – 65535	
9	SMS Gateway	<=20		
10	Heartbeat Interval	<=3	0|5 – 360min	0
11	SACK Enable	1	0|1|2	0
12	Protocol Format	1	0|1	0
13	SMS ACK Enable	1	0|1	0
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- 0: Stop mode.
- 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 heartbeat data. The backend server should respond to the heartbeat data from the terminal.
- 4: UDP mode. The terminal will send data to the backend server through the UDP protocol. Receiving protocol commands via UDP is supported if the network allows it. It is recommended to enable heartbeat sending and **+RESP:GTPDP** report when receiving commands via UDP is the case.
- 5: Forced SMS mode. Only SMS is used for data transmission.
- 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using the UDP protocol. The difference is the terminal will use a fixed local port rather than a random port to communicate with the server in this mode. Thus the backend server could use the identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the primary server.
- 7: Backup server connection supported TCP long-connection mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heartbeat data. The backend server should respond to the heartbeat data from the terminals. If the connection to the main server is lost, it will try to connect to the backup server. If the connection to the backup server is also lost, it will try to connect to the main server again.

✧ <*Buffer Mode*>: The working mode of the buffer report function. When the buffer report function is enabled and the device goes into areas without network coverage, it will store all reports locally. When the device goes to areas with network coverage, it will then send all the buffered reports through network.

- 0: Disable the buffer report function.
- 1: Low priority - Enable the buffer report function. In this working mode, the device will send the buffered messages after real time messages.
- 2: High priority - Enable the buffer report function. In this working mode, the device will send all the buffered messages before real time messages except the

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SOS message (**+RESP:GTSOS**).

- <*Main Server IP/Domain Name*>: The IP address or the domain name of the primary server.
- <*Main Server Port*>: The port of the primary server.
- <*Backup Server IP/Domain Name*>: The IP address or the domain name of the backup server.
- <*Backup Server Port*>: The port of the backup server.
- <*SMS Gateway*>: Maximum 20 characters including the optional national code starting with "+" for sending SMS messages. Short code (for example, 10086) is also supported.
- <*Heartbeat Interval*>: The interval for sending heartbeat message (**+ACK:GTHBD**) when report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat package message will be sent.
- <*Enable SACK*>: This defines whether the backend server should respond to the device with a SACK message when it receives messages from the device.
  - 0: The backend server does not reply with a SACK message after receiving a message from the device.
  - 1: The backend server replies with a SACK message when receiving a message from the device.
  - 2: The backend server replies with a SACK message when receiving a message from the device, but the device does not check the serial number of the SACK message. **Note:** If the device receives **+SACK:GTHBD** from the backend server, the device must check the serial number of the SACK message **+SACK:GTHBD** no matter what <*Enable SACK*> is.
- <*Protocol Format*>: This defines the format of the report message sent from the device to the backend server. 0 means "ASCII format", and 1 means "HEX format".
- <*Enable SMS ACK*>: This defines whether the ACK confirmation should be sent via SMS when the command is sent via SMS.
  - 0: The device will send the ACK confirmation according to the mode configured by <*Report Mode*>.
  - 1: The device will send the ACK confirmation via SMS to the phone number from which the command has been sent via SMS.

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

➢ **+ACK:GTSRI,**

Example: **+ACK:GTSRI,C80303,135790246811220,,0001,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.2.1.3. Quick Start Setting

The command **AT+GTQSS** is used to configure the parameters for EGPRS/LTE Cat-M1/LTE Cat-NB1 data connection and backend server information in one command if all these settings are within 160 bytes, otherwise two steps (**AT+GTBSI** and **AT+GTSRI**) are needed to configure the settings.

- **AT+GTQSS=**

Example: **AT+GTQSS=gv75m,3gnet,,,3,,1,218.17.46.11,80,,0,13836001234,0,0,1,0,0,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	APN	<=40		
3	APN User Name	<=30		
4	APN Password	<=30		
5	Report Mode	1	0 – 7	0
6	Reserved	0		
7	Buffer Mode	1	0|1|2	1
8	Main Server IP/Domain Name	<=60		
9	Main Server Port8	<=5	0 – 65535	
10	Backup Server IP	<=15		
11	Backup Server Port	<=5	0 – 65535	
12	SMS Gateway	<=20		
13	Heartbeat Interval	<=3	0|5 – 360min	0
14	Enable SACK	1	0|1|2	0
15	Protocol Format	1	0|1	0
16	Reserved	0		
17	Reserved	0		
	Serial Number	4	0000 – FFFF	

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	Tail Character	1	$	$

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

➢ **+ACK:GTQSS,**

Example: **+ACK:GTQSS,C80303,135790246811220,,0002,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2. Device Configuration

3.2.2.1. Global Configuration

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

➢ **AT+GTCFG=**

Example: **AT+GTCFG=gv75m,,GV75M,0,0,,,007F,0,00,0003FFFF,,0,0,300,00,,0,0,001F,0,0001,,,,,,,0,0,0,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	New Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	
3	Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv75m
4	Enable ODO	1	0|1	0
5	ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
6	Reserved	0		
7	Reserved	0		
8	Report Composition Mask	<=4	0 – FFFF	3F

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9	Power Saving Mode	1	0 – 2	1
10	IGS Composition Mask	<=2	0 – FF	0
11	Event Mask	<=8	0 – FFFFFFFF	3FFF
12	Reserved	0		
13	LED On	1	0|1	0
14	Enable Info Report	1	0|1	0
15	Info Report Interval	<=5	30 – 86400sec	300
16	Location Request Mask	2	High: 0-2 Low: 0	00
17	Reserved	0		
18	Backup Battery Charge Mode	1	0|1	0
19	AGPS Mode	1	0|1	0
20	GSM Report	<=4	00 – FFFF	1F
21	Duration of GNSS Signal Loss	2	0 – 30min	0
22	INF Expand Mask	<=4	0000 – FFFF	0
23	Reserved	0		
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Battery Low Percentage	1	0 - 30	0
30	Enter Movement by Command	1	0-2	0
31	Power Mode	1	0|1	0
32	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*New Password*>: It is set to change the current password.
- <*Device Name*>: An ASCII string which represents the name of the device.

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- <*Enable ODO*>: Enable/disable the odo graph 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.
- <*Report Composition Mask*>: Bitwise mask to configure the composition of a report message, especially the composition of GNSS information.
  - Bit 0 for <*Speed*>
  - Bit 1 for <*Azimuth*>
  - Bit 2 for <*Altitude*>
  - Bit 3 for Cell tower data, including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*Reserved*> parameter value "00"
  - Bit 4 for <*Mileage*>
  - Bit 5 for <*Send Time*>
  - Bit 6 for <*Device Name*>

  For each bit, set it to 1 to enable the corresponding component in the report, and 0 to disable the corresponding component in the report. This mask is valid for all report messages.
- <*Power Saving Mode*>: Set the mode of power saving function. If the mode of power saving function is set to 0, the fixed report will follow <IGF Report Interval> when the engine is off. If the mode of power saving function is set to 1, the fixed report, geo-fence and speed alarm report function is suspended when the device is standstill or the engine is off. If the mode of power saving function is set to 2, it is like mode 1 with the difference that the fixed report will not be suspended and the fix and sending interval will follow <IGF Report Interval> in AT+GTFRI when the engine is off.
  - 0: Disable the power saving function.
  - 1: GPS deep saving mode.
  - 2: GPS low saving mode.
- <*IGS Composition Mask*>: Bitwise mask to configure the composition of the **+RESP:GTIGS** message.
  - Bit 0 for <*Duration of Ignition On*>
  - Bit 1 for <*Ignition On Time*>
  - Bit 2 for <*Ignition Off Time*>
  - Bit 3 for Highest Speed Point data including <*GNSS Accuracy*>, <*Speed*>, <*Azimuth*>, <*Altitude*>, <*Longitude*>, <*Latitude*> and <*GNSS UTC Time*>

  For each bit, set it to 1 to enable the corresponding component in the report, and 0 to disable the corresponding component in the report. This mask is valid only for the **+RESP:GTIGS** message.
- <*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 Reserved
  - Bit 5 for **+RESP:GTBPL**

- Bit 6 for **+RESP:GTBTC**
- Bit 7 for **+RESP:GTSTC**
- Bit 8 for **+RESP:GTSTT**
- Bit 9 Reserved
- Bit 10 for **+RESP:GTPDP**
- Bit 11 for the power on **+RESP:GTRTL**
- Bit 12 for the ignition report **+RESP:GTIGN**, **+RESP:GTIGF, +REPS:GTVGN** and **+RESP:GTVGF**
- Bit 13 for ignition on/off location report **+RESP:GTIGL** and **+RESP:GTVGL**
- Bit 14 for the UFSxxx fault code report **+RESP:GTEXP**
- Bit 17 for the statistical information report **+RESP:GTIGS**

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

✧ <*LED On*>: It is used to configure the working mode of power LED and GNSS LED.

- 0: Each time the device powers on, both LED's will work for 30 minutes and then turn off.
- 1: Power LED and GNSS LED turn on as configured.

✧ <*Enable Info Report*>: Enable/disable the device information report (**+RESP:GTINF**). The device information includes state of the device, ICCID, cell signal strength, voltage of external power supply, battery voltage, charging status, Power and GNSS LED working mode, the last known time of GNSS fix, status of all digital inputs and outputs, 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 for reporting the device information.

✧ <*Backup Battery Charge Mode*>: It controls the charging mode of the backup battery.

- 0: When the main power supply is connected, the backup battery is charged as needed.
- 1: When the main power supply is connected, the backup battery is only charged when ignition on is detected. The charge process will begin 3 minutes after the ignition is turned on. The charge process is stopped when the ignition is turned off.

✧ <*Location Request Mask*>: It is used to configure how to handle the requests. 4 high bits are for SMS request and 4 low bits are reserved.

- 4 high bits for SMS request have different meanings as follows.

  0: Ignore the SMS Position Request message via SMS.

  1: Report the current position (**+RESP:GTLBC**) when the device receives an SMS Position Request message via SMS.

  2: Report the current position with a Google Maps link through SMS to the original number when the device receives an SMS Position Request message via SMS.
- 4 low bits reserved 0.

✧ <*AGPS Mode*>: A numeral which indicates whether to enable AGPS. AGPS helps increase the chances of getting GNSS position successfully and reduces the time needed to get GNSS position.

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- 0: Disable the AGPS function.
- 1: Enable the AGPS function.

✧ <*GSM Report*>: It controls how or when to report cell information. The report +RESP:GTGSM is only sent via TCP short connection even if the report mode is Force on SMS.

The 2 high bits, Bit 14 – 15, represent GSM reporting mode.

- 0: Do not allow the cell information report.
- 1: Allow the cell information report in case of failure to get GNSS position if cell information is available.
- 2: Send the message **+RESP:GTGSM** after each successful GNSS fix if cell information is available.
- 3: Send the message **+RESP:GTGSM** regardless of whether getting GNSS position is successful or not if cell information is 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/+RESP:GTERI**
- Bit 3 for **+RESP:GTSOS**
- Bit 4 for **+RESP:GTTOW**
- Bit 5 – 13 Reserved

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

✧ <*Duration of GNSS Signal Loss*>: A time parameter to monitor the GNSS signal. If there is no GNSS signal or no successful GNSS fix for consecutive <*Duration of GNSS Signal Loss*>, the device will send the event report **+RESP:GTGSS** to indicate the "GNSS signal lost". When the GNSS signal is recovered or a successful fix is obtained, the device will send the event report **+RESP:GTGSS** to indicate the recovery. 0 means "Disable this feature".

Note: If the device is rebooted, it will not report **+RESP:GTGSS** to indicate GNSS signal recovery even though it has reported **+RESP:GTGSS** to indicate "GNSS signal lost" before reboot.

✧ <*INF Expand Mask*>: Bitwise mask to configure the composition of expanded information in **+RESP:GTINF**.

- Bit 0 for <*AC100 Data*>
- Bit 1 – 15 Reserved

✧ *<Enter Movement by Command>:* A numeral to indicate whether to force the device to enter movement state after receiving the AT+GTRTO command with subcommand RTL.

- 0: Do not change motion state after receiving the commands.
- 1: Force the device to enter movement state after receiving 1: ***RTL***. of **AT+GTRTO**.
- 2: Force the device to always enter movement state.

✧ <*Power Mode*>: The device's power supply mode. There are two modes listed below:

- 0: The external power supply will charge the internal backup battery on need and provide power to the device.
- 2: The external power supply will charge the internal backup battery when ignition on is detected or when the internal backup battery capacity is less than 30 percent and the ignition is off. During the charging process, the external power

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supply will power the device, otherwise the internal backup battery will supply power to the device.

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

- **+ACK:GTCFG,**

Example: **+ACK:GTCFG,C80303,135790246811220,,0003,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.2. Auto-unlock PIN

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

- **AT+GTPIN=**

Example: **AT+GTPIN=gv75m,1,0000,,,,,,0014$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Enable Auto-unlock PIN	1	0|1	0
3	PIN	4 – 8	'0' – '9'	
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		

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	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Enable Auto-unlock PIN*>: Set the field to 1 to enable the auto-unlock PIN function, and 0 to disable the function.

✧ <*PIN*>: The code used to unlock the USIM PIN.

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

➢ **+ACK:GTPIN,**

Example: **+ACK:GTPIN,C80303,135790246811220,,0014,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.3. 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 abnormal status for a long time. Besides these two automatic reboot methods, the device also supports the use of the digital input to trigger the reboot manually.

➢ **AT+GTDOG=**

Example: **AT+GTDOG=gv75m,1,,1,0130,,1,1,,60,60,,0013$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2	0
3	Ignition Frequency	<=3	10 – 120 min	60
4	Interval	<=2	1 – 30 day	30

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5	Time	4	HHMM	0200
6	Reserved	0		
7	Report Before Reboot	1	0|1	1
8	Input ID	1	0|1|6	0
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of the watchdog function.
  - 0: Disable
  - 1: Auto reboot
  - 2: Ignition reboot
- <*Ignition Frequency*>: If the time interval between the current ignition on and last ignition-on reboot is greater than the specified value when the working mode is 2, the device will automatically reboot upon ignition on. The device will reboot automatically upon the second ignition-on used for the first time whatever the time interval between the first ignition on.
- <*Interval*>: The interval for rebooting the device. It is measured in days. First time reboot of the device will ignore this interval.
- <*Time*>: It specifies the time at which the reboot operation is performed when the <*Interval*> condition is met.
- <*Report Before Reboot*>: Whether to report the **+RESP:GTDOG** message before reboot. 0 means "Do not report the **+RESP:GTDOG** message before reboot", and 1 means "Report the **+RESP:GTDOG** message before reboot". If this parameter is enabled, the device will initiate a real-time fix before sending the message with the current location information.
- <*Input ID*>: The ID of the digital input port which is used to trigger the manual reboot. 0 means "Do not trigger manual reboot". The corresponding digital input port should be configured by the command **AT+GTIGM** if digital input ID is set to 6.

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

- **+ACK:GTDOG,**

Example: **+ACK:GTDOG,C80303,135790246811220,,0013,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' –	

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

3.2.2.4. Time Adjustment

The command **AT+GTTMA** is used to adjust the local time of the device remotely. Upon receiving 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 settings. This command will also be a trigger for the device to start GNSS. After a successful GNSS fix, the device will update the local time with the GNSS UTC time again.

➢ **AT+GTTMA=**

Example: **AT+GTTMA=gv75m,+,8,10,0,20220102030405,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Sign	1	+|–	+
3	Hour Offset	<=2	0 – 23	
4	Minute Offset	<=2	0 – 59	
5	Daylight Saving	1	0|1	
6	UTC Time	14	YYYYMMDDHHMMSS	
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character			

✧ <*Sign*>: It indicates positive or negative offset of the local time from UTC.

- ✧ <*Hour Offset*>: UTC offset in hours.
- ✧ <*Minute Offset*>: UTC offset in minutes.
- ✧ <*Daylight Saving*>: Enable/disable daylight saving time.
  - ● 0: Disable daylight saving time.
  - ● 1: Enable daylight saving time.
- ✧ <*UTC Time*>: UTC time is used to adjust for the local time.

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

➢ **+ACK:GTTMA,**

Example: **+ACK:GTTMA,C80303,865284040842605,,0113,20220309095146,3D63$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.5. Outside Working Hours

To protect the privacy of the driver when he is off duty, the device can be configured to report empty location information outside working hours. The command **AT+GTOWH** is used to define the working hours and the working mode to protect the privacy. If this function is enabled and it is outside of working hours, in all ASCII format reports except **+RESP:GTSOS**, the fields Latitude, Longitude, MCC, MNC, LAC, Cell ID and the reserved field after Cell ID will be empty. Meanwhile, in HEX format reports where location should be hidden, the fields Latitude and Longitude will be filled with 0x054C5638, and the fields MCC, MNC, LAC Cell ID and the reserved field after Cell ID will be filled with 0.

➢ **AT+GTOWH=**

Example: **AT+GTOWH=gv75m,1,1F,0900,1200,1300,1730,,,3,1,1,0,0,,,,,0012$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2|3	0

3	Day of Work	<=2	0 – 7F	1F
4	Working Hours Start1	4	HHMM	0900
5	Working Hours End1	4	HHMM	1200
6	Working Hours Start2	4	HHMM	1300
7	Working Hours End2	4	HHMM	1800
8	Reserved	0		
9	Reserved	0		
10	Digital Input ID	1	0|1|6|9-C	0
11	Output ID	1	0 – 2|9-C	0
12	Output Status	1	0 - 3	
13	Duration	<=3	0 – 255(×100ms)	0
14	Toggle Times	<=3	0 – 255	0
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of this function.

- 0: Disable this function.
- 1: Manual start mode. By connecting an external unit to a specified digital input of the device, the driver manually enables time checking. If it is outside the working hours, the device will hide the location information in the report messages. Otherwise the location information will be reported normally.
- 2: Full manual mode. By connecting an external unit to a specified digital input of the device, the driver has full control of the privacy protection. The device will not check the time against the working hours range automatically. It just hides the location information when the input is enabled and sends the location information normally when the input is disabled.
- 3: Automatic mode. Under this mode, the device will ignore the status of the digital input. It will automatically check the current time against the working hours range. If it is outside the working hours, the location information will be hidden. Otherwise the location information will be sent normally.

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

- Bit 0 for Monday

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- 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”, and 1 means “working day”.

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

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

✧ <*Digital Input ID*>: The input ID used to trigger this function when mode is 1 or 2. The parameters of the specified input must be set by **AT+GTDIS** first. The corresponding digital input port should be configured by the command **AT+GTIGM** if digital input ID is set to 6. If an interruptible digital input is used, please connect slide button instead of tact button to that input for this function. If the input ID is set to 9 – C, please refer to **AT+GTIEX**.

✧ <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*>: When this function is enabled and it is outside working hours, the specified wave will be output to the specified output. If the output ID is set to 9 – C, please refer to **AT+GTOEX**.

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

➢ **+ACK:GTOWH,**

Example: **+ACK:GTOWH,C80303,135790246811220,,0012,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.6. Settings for Preserving Device’s Specified Logic States

The command **AT+GTPDS** is used to preserve specified logic states of the device. This function works according to the <*Mode*> setting and the logic states to be saved are selected according to the value of <*Mask*>.

➢ **AT+GTPDS=**

Example: **AT+GTPDS=gv75m,1,1F,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2	1
3	Mask	<=4	0000-7FF	7FF
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: A numeral to indicate the working mode of this function.

- 0: Disable this function.
- 1: Preserve specified logic states of the device according to the value of <*Mask*>.
- 2: Reset all the specified logic states of the device listed in <*Mask*> after receiving the command, and then preserve specified logic states of the device according to the value of <*Mask*>.

✧ <*Mask*>: Bitwise mask to configure the device states to be preserved.

Each bit represents a state.

- Bit 0: States of GEO
- Bit 1: Reserved
- Bit 2: Reserved
- Bit 3: Information of last known position
- Bit 4: State of ignition
- Bit 5: State of wave shape 1
- Bit 6: State of digital input
- Bit 7: State of SPD
- Bit 8: State of SSR
- Bit 9: State of main power
- Bit 10: State of PEO

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

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➢ **+ACK:GTPDS,**

Example: **+ACK:GTPDS,C80303,135790246811220,,000D,20160329093254,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	$	$

3.2.3. Position Related Report

3.2.3.1. Fixed Report Information

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

➢ **AT+GTFRI=**

Example:
AT+GTFRI=gv75m,0,,,,,,,,,,,,,,,0009$
AT+GTFRI=gv75m,1,1,,1,1000,2300,,30,,,,,600,,,,,0009$
AT+GTFRI=gv75m,2,1,,1,1000,2300,,,500,,,,,,,,0009$
AT+GTFRI=gv75m,3,1,,1,1000,2300,,,,1000,,,,,,,0009$
AT+GTFRI=gv75m,4,1,,1,0000,2300,,60,1000,2000,,45,600,1,,,,0009$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0 – 5	0
3	Discard No Fix	1	0|1	1
4	Reserved	0		
5	Enable Period	1	0|1	1
6	Start Time	4	HHMM	0000

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7	End Time	4	HHMM	0000
8	Reserved	0		
9	IGN Report Interval	<=5	5 – 86400sec	30
10	Distance	<=5	50 – 65535m	1000
11	Mileage	<=5	50 – 65535m	1000
12	Reserved	0		
13	Corner Report	<=3	0 – 180	0
14	IGF Report Interval	<=5	0|5-86400sec	600
15	ERI Mask	<=8	0-FFFFFFFF	00000000
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- 0: Disable this function.
- 1: Fixed Time Report. The position report message is sent to the backend server periodically according to the parameter <*Send Interval*>.
- 2: Fixed Distance Report. The position report message is sent to the backend server when the straight-line distance between the current GNSS position and the last sent GNSS position is greater than or equal to the distance specified by the parameter <*Distance*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.
- 3: Fixed Mileage Report. The position report message is sent to the backend server when the path length between the current GNSS position and the last sent GNSS position is greater than or equal to the mileage specified by the parameter <*Mileage*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.
- 4: Optimum Report. The device simultaneously checks both time interval and path length between two adjacent reports. Device position will be reported if the calculated time interval between the current time and time of last report is greater than <*Send Interval*>, and the length of path between the current position and the last position is greater than <*Mileage*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.
- 5: Fixed Time or Mileage Report. The device checks either time interval or path length between two adjacent reports. Device position will be reported if the calculated time interval between current time and time of last report is greater

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than <*Send Interval*>, or the length of path between the current position and the last position is greater than <*Mileage*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.

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

- <*Discard No Fix*>: Enable/disable report when there is no GNSS fix.
  - 0: Enable report.
  - 1: Disable report.
- <*Enable Period*>: Enable/disable 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 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 report. The valid format and range are the same as those for <*Start Time*>.
- <*IGN Report Interval*>: Period to send the position information. The value range is 5 – 86400 and the unit is second. When <Report Mode> in **AT+GTSRI** is set to Force on SMS and <*IGN Report Interval*> of **AT+GTFRI** is less than or equal to 15s, the port in the **AT+GTSRI** configuration must be TCP port, otherwise all data will be cached in buffer if buffer function is enabled and discarded if buffer function is disabled.
- <*Distance*>: The specified distance for sending the position information when <*Mode*> is 2. Unit: meter.
- <*Mileage*>: The specified length for sending the position information when <*Mode*> is 3, 4 and 5. Unit: meter.
- <*Corner Report*>: If the absolute value of the difference of the azimuth between two positions is greater than or equal to the set value of <Corner Report>, the device will send the corner report with **+RESP:GTFRI**.
- <*IGF Report Interval*>: If vehicle ignition is off, no matter which report mode it is, even if <*Power Saving Mode*> is set to "GPS low saving mode" in **AT+GTCFG**, the **+RESP:GTFRI** report is sent to the server using the time interval of <*IGF Report Interval*>. The range is 0|5 – 86400 and the unit is second.
- <*ERI Mask*>: This mask is used to configure whether to report the data from peripherals via **+RESP:GTERI**. When the serial port is connected with peripherals, and the bit for this peripheral is set to 1, the device will report **+RESP:GTERI** instead of **+RESP:GTFRI**.
  - Bit 0 for the <*Digital Fuel Sensor Data*> field in the **+RESP:GTERI** report.
  - Bit 1 for the <*AC100 Data*> field in the **+RESP:GTERI** report.
  - Bit 2 for the <*CAN Data*> field in **+RESP:GTERI** (This mask just works in **+RESP:GTERI** ASCII message)
  - Bit 3 for the <*Percentage*> field in the **+RESP:GTERI** report. If it is set to 1, the data block <*Fuel Sensor Data*> will appear.
  - Bit 4 for the <*Volume*> field in the **+RESP:GTERI** report. If it is set to 1, the data block <*Fuel Sensor Data*> will appear.
  - Bit 6 for the <Satellite Data> field in **+RESP:GTERI** report.
  - Bit 7 for the <*RF433 Accessory Data*> field in **+RESP:GTERI.**
  - **Bit 8-14** Reserved.

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- Bit 15 for the <*RAT and Band Data*> field in **+RESP:GTERI.** RAT means Radio Access Technology.

Note: Bit 3 and Bit 4 are related to **AT+GTFSC**. If none of the calibration table is set or <*Num of Node*> is 0, the <*Percentage*> and <*Volume*> fields of the fuel sensor data will be shown as reserved in the message **+RESP:GTERI**.

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

➢ **+ACK:GTFRI,**

Example: **+ACK:GTFRI,C80303,135790246811220,,0009,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.3.2. Frequency Change of Fixed Report Information

The command **AT+GTFFC** is used to change the parameters of fixed report when certain event occurs, so that different report interval requirements can be met. When the event disappears, the device will resume its previous settings.

The device supports up to 5 sets of parameters for different events. Priority is assigned among these events. Only the parameters of the highest priority event are applied if more than one event occurs at the same time.

➢ **AT+GTFFC=**

Example: **AT+GTFFC=gv75m,0,1,0,30,500,500,300,,,,,0000$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Priority	1	0-4	0
3	Mode	1	0-3	0

4	FRI Mode	1	0-5	0
5	FRI IGN Report Interval	<=5	5-86400s	30
6	FRI Report Distance	<=5	50-65535m	500
7	FRI Report Mileage	<=5	50-65535m	500
8	FRI IGF Report Interval	<=5	0|5-86400s	300
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Priority*>: The priority of the event which triggers the change of the fixed report parameters. 0 means "the highest priority".
- <*Mode*>: It specifies the trigger event for the change of fixed report parameters.
  - 0: Disable the parameters of the specified priority.
  - 1: Change the fixed report parameters when the device enters into any of the defined Geo-Fence.
  - 2: Change the fixed report parameters when the device enters into known roaming state. (Please refer to **AT+GTRMD** command for more information.)

  3: Change the fixed report parameters when the device enters into unknown roaming state.
- <*FRI Mode*>: When the specified event occurs, the working mode of the fixed report will be changed according to this parameter.
  - 0: Do not change the working mode.
  - 1: Change the working mode to "Fixed Time Report".
  - 2: Change the working mode to "Fixed Distance Report".
  - 3: Change the working mode to "Fixed Mileage Report".
  - 4: Change the working mode to "Optimum Report".
  - 5: Change the working mode to "Fixed Time or Mileage Report".
- <*FRI IGN Report Interval*>: Period of time for sending the position information when ignition is on. The value range is 1 – 86400 and the unit is second.
- <*FRI Report Distance*>: The specified distance for sending the position information when the mode is Fixed Distance Report. Unit: meter.
- <*FRI Report Mileage*>: The specified path length for sending the position information when the mode is Fixed Mileage Report or Optimum Report. Unit: meter.
- <*FRI IGF Report Interval*>: Period to get GPS fix and send the position information when ignition off if <*Power Saving Mode*> in **AT+GTCFG** is set to 2 and <*FRI Mode*> in this command is set to 1 (Fixed Timing Report). The value range is 0|5 – 86400 and the unit is

second.

✧ <*Corner Report*>: If the absolute value of the difference of the azimuth between two positions is greater than or equal to the set value of <*Corner Report*>, the device will send the corner report with **+RESP:GTFRI**.

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

➢ **+ACK:GTFFC,**

Example: **+ACK:GTFFC,C80303,135790246811220,,0009,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4. Alarm Settings

3.2.4.1. Geo-Fence Information

The command **AT+GTGEO** is used to configure the parameters of Geo-Fence. (Geo-Fence is a virtual perimeter around a geographic area using a location-based service. When the geo fencing terminal enters or exits the area, a notification is generated. The notification contains information of the location of the terminal and will be sent to the backend server according to the <*Mode*> setting.)

➢ **AT+GTGEO=**

Example: **AT+GTGEO=gv75m,0,3,121.412248,31.187891,1000,600,1,1,0,0,0,0,,,000A$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	GEO ID	<=2	0 – 19	
3	Mode	1	0 – 3	0
4	Longitude	<=11	-180 - 180	

5	Latitude	<=10	-90 - 90	
6	Radius	<=7	50 – 6000000m	50
7	Check Interval	<=5	0|5 – 86400sec	0
8	Output ID	1	0 – 2|9-C	0
9	Output Status	1	0 - 3	0
10	Duration	<=3	0 – 255(×100ms)	0
11	Toggle Times	<=3	0 – 255	0
12	Trigger Mode	<=2	0|21|22	0
13	Trigger Report	1	0|1	0
14	State Mode	1	0|1	0
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*GEO ID*>: The ID of the Geo-Fence. A total of 50 zones (0 - 49) are supported.
- <*Mode*>: The working mode of the device reporting the Geo-fence message **+RESP:GTGIN** or **+RESP:GTGOT** to the backend server.
  - 0: Disable the zone's circular Geo-fence function.
  - 1: Entering the zone. Device will send report **+RESP:GTGIN** to the server when it detects that vehicle enters the Geo-fence area.
  - 2: Exiting the zone. Device will send report **+RESP:GTGOT** to the server when it detects that vehicle exits the Geo-fence area.
  - 3: Report the **+RESP:GTGIN** and **+RESP:GTGOT** when entering and exiting the Geo-fence zone respectively.
- <*Longitude*>: The longitude of a point which is defined as the center of the circular region for Geo-Fence. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the minus sign "–" and east longitude is defined as positive without "+".
- <*Latitude*>: The latitude of a point which is defined as the centre of the circular region for Geo-Fence. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "–" and north latitude is defined as positive without "+".
- <*Radius*>: The radius of the circular Geo-Fence region. The value range is (50 – 6000000) and the unit is meter.
- <*Check Interval*>: The interval of GNSS checking position information against the Geo-Fence alarm.
- <*Trigger Mode*>: A numeral which indicates the trigger mode of the geofencing function.
  - 0: Disable auto trigger mode.

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- 21: Auto parking fence (Automatically set up Geo Fence after the ignition is turned off). In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is off. It will only send the alarm report when exiting the Geo-Fence zone. The Geo-Fence will be canceled after the device exits the zone.
- 22: Manual parking fence (Manually enable Geo-Fence after the ignition is turned off). In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is off. It will only send the alarm report when exiting the Geo-Fence zone. 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*>: Enable/disable the **+RESP:GTGES** report when the specified trigger mode is activated and when the Geo-Fence is canceled.
- 0: Disable the **+RESP:GTGES** report.
- 1: Enable the **+RESP:GTGES** report.

✧ <*State Mode*>: A numeral to indicate the mode of reporting GEO state.
- 0: Report when getting the GEO state for the first time.
- 1: Do not report until the GEO state changes.

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

➢ **+ACK:GTGEO,**

Example: **+ACK:GTGEO,C80303,135790246811220,,0,000A,20160329093254,11F0$**			
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	<=2	0 – 49	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.2. Polygon Geo-Fence

The command **AT+GTPEO** is used to configure the parameters of Polygon Geo-Fence. (Geo-Fence is a virtual perimeter around a geographic area using a location-based service. When the

geo-fencing terminal enters or exits the area, a notification is generated. The notification contains information of the location of the terminal and will be sent to the backend server according to the <*Mode*> setting.)

➢ **AT+GTPEO=**

Example: **AT+GTPEO=gv75m,0,0,1,3,121.412240,31.187801,** **121.412248,31.187891,121.412258,31.187991,600,1,1,0,0,,,,,000B$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	GEO ID	1	0 – 19	0
3	Mode	1	0 – 3	0
4	Start Point	<=2	1-10	1
5	End Point	<=2	3-10	3
5+2N-1	Longitude	<=11	-180 - 180	
5+2N	Latitude	<=10	-90 - 90	
6+2N	Check Interval	<=5	0|5 – 86400sec	0
7+2N	Output ID	1	0 – 2|9-C	0
8+2N	Output Status	1	0 - 3	
9+2N	Duration	<=3	0 – 255(×100ms)	0
10+2N	Toggle Times	<=3	0 – 255	0
11+2N	Reserved	0		
12+2N	Reserved	0		
13+2N	Reserved	0		
14+2N	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*GEO ID*>: The ID of the Geo-Fence. A total of 20 zones (0 – 19) are supported.

✧ <*Mode*>: The working mode for the polygon Geo-Fence to report message to the backend server.

- 0: Disable the zone's Geo-Fence function.
- 1: Entering the zone. The **+RESP:GTGIN** report will be generated only when the terminal enters the Geo-Fence.
- 2: Exiting the zone. The **+RESP:GTGOT** report will be generated only when the

terminal exits from the Geo-Fence.

- 3: Report message upon both entering and exiting the zone.

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

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

✧ <*Longitude*>: The longitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the minus sign "–" and east longitude is defined as positive without "+".

✧ <*Latitude*>: The latitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "–" and north latitude is defined as positive without "+".

Note: If more sets of <*Longitude*> and <*Latitude*> are needed, please adjust <*Start Point*> and <*End Point*> for appropriate setup. If some <*Longitude*> and <*Latitude*> are empty, then the corresponding vertex will be deleted. For example, to delete the 4th, 5th and 6th vertex of a polygon Geo-Fence, please set <*Start Point*> to 4 and set <*End Point*> to 6 and keep the three groups of <*Longitude*> and <*Latitude*> empty.

✧ <*Check Interval*>: The interval of GNSS checking position information against the polygon Geo-Fence alarm.

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

➢ **+ACK:GTPEO,**

Example: **+ACK:GTPEO,C80303,135790246811220,,0,000B,20160329093254,11F0$**			
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 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.3. Tow Alarm Configuration

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

➢ **AT+GTTOW=**

Example: **AT+GTTOW=gv75m,1,5,0,120,1,0,5,10,4,10,4,600,,,,,,,000B$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Enable Tow	1	0|1	0
3	Engine Off to Tow	<=2	1 – 15 min	10
4	Fake Tow Delay	<=2	0 – 10 min	1
5	Tow Interval	<=5	30 – 86400 sec	300
6	Tow Output ID	1	0 – 2|9-C	0
7	Tow Output Status	1	0- 3	0
8	Tow Output Duration	<=3	0 – 255 (×100ms)	0
9	Tow Output Toggle Times	<=3	0 – 255	0
10	Rest Duration	<=3	1 – 255 (×15sec)	2
11	Motion Duration	<=2	1 – 10 (×100ms)	3
12	Motion Threshold	1	2 – 9	2
13	Tow Distance	<=5	0|50-65535m	600
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Enable Tow*>: Enable/disable the tow alarm.

- 0: Disable the tow alarm.
- 1: Enable the tow alarm.

✧ <*Engine Off to Tow*>: A time parameter used to determine whether the device is considered to be towed after the engine is off. If the motion sensor does not detect stillness within the specified time after engine is turned off, the device is being towed.

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- <*Fake Tow Delay*>: If the motion sensor detects motion after engine-off and stillness is detected, the device enters into a state called fake tow. If the device stays in fake tow for a period of time longer the time specified by the parameter <*Fake Tow Delay*>, it is considered to be towed.
- <*Tow Interval*>: The time interval for sending the tow alarm message. If <*Tow Interval*> is less than 60s, the GNSS will keep working.
- <*Tow Output ID*>: The ID of the output port to output the specified wave shape when tow event is detected.
- <*Tow Output Status*>: Please refer to the parameter <Output1–2 Status> in Chapter 3.2.5.1.
- <*Tow Output Duration*>: Please refer to the parameter <*Duration*> in Chapter 3.2.5.1.
- <*Tow Output Toggle Times*>: Please refer to the parameter <*Toggle Times*> in Chapter 3.2.5.1.
- <*Rest Duration*>: A time parameter to determine whether the device enters rest status. The status of the device will be changed to rest if stillness is detected by the motion sensor and is maintained for a period of time longer than <*Rest Duration*>.
- <*Motion Duration*>: A time parameter to determine whether the device enters motion status. The status of the device will be changed to motion if the motion sensor detects the device motion lasts for the length of time specified by the parameter <*Motion Duration*>.
- <*Motion Threshold*>: The threshold for the motion sensor to measure whether the device is moving.
- <*Tow Distance*>: A distance parameter to determine whether the device is considered to be towed after the engine is turned off. If the vehicle moves more than or equals to <*Tow Distance*> after engine-off, the vehicle will be in tow status, and the report message **+RESP:GTTOW** will be reported.

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

- **+ACK:GTTOW,**

Example: **+ACK:GTTOW,C80303,135790246811220,,000B,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.4. Speed Alarm

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

➢ **AT+GTSPD=**

Example: **AT+GTSPD=gv75m,2,80,120,60,300,2,1,0,0,,,,,,,,,,,000C$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2|3|4	0
3	Min. Speed	<=3	0 – 400km/h	0
4	Max. Speed	<=3	0 – 400km/h	0
5	Validity	<=4	0 – 3600sec	60
6	Send Interval	<=4	30 – 3600sec	300
7	Output ID	1	0 – 2|9-C	0
8	Output Status	1	0 - 3	
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Reserved	0		
	Serial Number	4	0000 – FFFF	

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	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 specified by <*Min. Speed*> and <*Max. Speed*>.
- 2: Report speed alarm if the current speed is outside the speed range specified by <*Min. Speed*> and <*Max. Speed*>.
- 3: Report speed alarm only once if the current speed is within or outside the speed range specified by <*Min. Speed*> and <*Max. Speed*>. In this mode, <*Send Interval*> will be ignored.
- 4: Report speed alarm if the speed enters or exits from the speed range. But the backend server will not receive **+RESP:GTSPD** for speed exiting from the speed range unless it has received the alarm for speed entering the speed range at first. In this mode, <*Send Interval*> will be ignored.

✧ <*Min. Speed*>: The lower speed limit.

✧ <*Max. Speed*>: The upper speed limit.

✧ <*Validity*>: If the speed meets the alarm condition and is maintained for a period of time longer than the time specified by <*Validity*>, the speed alarm will be triggered.

✧ <*Send Interval*>: The time interval for sending speed alarm messages.

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

➢ **+ACK:GTSPD,**

Example: **+ACK:GTSPD,C80303,135790246811220,,000C,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.5. Buzzer Alarm Configuration

This command is used to set buzzer alarm. There are four kinds of buzzer alarms. Each alarm outputs a different sound with the buzzer, and all the alarms are settable in this command.

Before those alarms are used, the output ID which connects with the buzzer should be configured and enabled.

The overspeed alarm event (please refer to the command **AT+GTSPA**) can trigger buzzer alarm defined by this command.

➢ **AT+GTBZA=**

Example: **AT+GTBZA=gv75m,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,0000$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Output ID	1	0 - 2	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Alarm 1 Output Status	1	0 - 3	0
7	Duration	<=3	0 – 255(×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Alarm 2 Output Status	1	0 - 3	0
12	Duration	<=3	0 – 255(×100ms)	0
13	Toggle Times	<=3	0 – 255	0
14	Reserved	0		
15	Reserved	0		
16	Alarm 3 Output Status	1	0 - 3	0
17	Duration	<=3	0 – 255(×100ms)	0
18	Toggle Times	<=3	0 – 255	0
19	Reserved	0		
20	Reserved	0		
21	Alarm 4 Output Status	1	0 - 3	0
22	Duration	<=3	0 – 255(×100ms)	0
23	Toggle Times	<=3	0 – 255	0
24	Reserved	0		

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25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

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

➢ **+ACK:GTBZA,**

Example: **+ACK:GTBZA,C80303,135790246811220,,000D,20160329093254,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.6. Overspeed Alarm

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

➢ **AT+GTSPA**

Example: **AT+GTSPA=gv75m,1,20,,2,1,,,40,,2,2,,,60,,2,3,,,80,,2,4,,,,,,,,000C$**

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2	0
3	Speed Threshold 1	<=3	0 – 400km/h	50
4	Reserved	0		
5	Validity	<=4	0 – 3600sec	60
6	Alarm Type	1	0|1 – 4	0
7	Reserved	0		
8	Reserved	0		
9	Speed Threshold 2	<=3	0 – 400km/h	70
10	Reserved	0		
11	Validity	<=4	0 – 3600sec	60
12	Alarm Type	1	0|1 – 4	0
13	Reserved	0		
14	Reserved	0		
15	Speed Threshold 3	<=3	0 – 400km/h	90
16	Reserved	0		
17	Validity	<=4	0 – 3600sec	60
18	Alarm Type	1	0|1 – 4	0
19	Reserved	0		
20	Reserved	0		
21	Speed Threshold 4	<=3	0 – 400km/h	110
22	Reserved	0		
23	Validity	<=4	0 – 3600sec	60
24	Alarm Type	1	0|1 – 4	0
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		

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

- ✧ <*Mode*>: The working mode of overspeed alarm.
  - 0: Disable this function.
  - 1: Strict standard mode. In this mode, the device will check the speed and trigger the buzzer alarm during speedup or slowdown.
  - 2: Warning mode. In this mode, the device will only check the speed and trigger the buzzer alarm during speedup.
- ✧ <*Speed Threshold*>: The minimum speed to trigger the buzzer alarm.
- ✧ <*Validity*>: If the speed meets the alarm condition and is maintained for a period of time longer than the time specified by <*Validity*>, the buzzer alarm will be triggered.
- ✧ <*Alarm Type*>: The alarm type for each speed threshold. 0 means "No buzzer alarm".

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

- ➢ **+ACK:GTSPA,**

Example: **+ACK:GTSPA,C80303,135790246811220,,000D,20160329093254,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.7. SOS Function

This command is used to configure a specified input port for emergency. When an emergency occurs, the end user can use the specified input port to trigger the reporting of the position message **+RESP:GTSOS** to the backend server. A specific wave shape can be configured to be output on the specified output port.

➢ **AT+GTSOS=**

Example: **AT+GTSOS=gv75m,1,1,,1,1,0,0,,,,,000D$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|2|4	0
3	Digital Input ID	1	0|1|6|9-C	0
4	Reserved	0		
5	Output ID	1	0 – 2|9-C	0
6	Output Status	1	0 - 3	
7	Duration	<=3	0 – 255(×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- 0: Disable SOS function.
- 1: Reserved
- 2: Send the current position to the backend server.
- 3: Reserved
- 4: Send the current position to the SMS gateway via SMS.

✧ <*Digital Input ID*>: The ID of the digital input port which triggers the SOS function. 0 means "The SOS function is disabled". Parameters of the digital input port should be configured by the command **AT+GTDIS** first. And the corresponding digital input port should be configured by the command **AT+GTIGM** if digital input ID is set to 6. If a digital input port is configured to trigger the SOS function, there is no **+RESP:GTDIS** report message for the specified digital input port.

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

➢ **+ACK:GTSOS,**

Example:

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+ACK:GTSOS,C80303,135790246811220,,000D,20160329093254,11F0$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.8. Excessive Idling Detection

The command **AT+GTIDL** is used to detect the engine excessive idling (Vehicle stays stationary while the ignition is on). To use this command, the ignition signal must be connected to the device or enable virtual ignition detection. The device will report the event message **+RESP:GTIDN** to the backend server according to the <*Mode*> setting when it detects that the vehicle is entering into idle status. It will, according to the <*Mode*> setting, report the event message **+RESP:GTIDF** to the backend server when the vehicle leaves idle status.

- **AT+GTIDL=**

Example: **AT+GTIDL=gv75m,1,2,1,,,,,1,1,0,0,,,,,000F$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1	0
3	Idling Detection Time	2	1 – 30 min	2
4	Idling End Time	1	1 – 5 min	1
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Output ID	1	0 – 2|9-C	0
10	Output Status	1	0 - 3	0

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11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Debounce Option	1	0 - 1	0
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- ✧ <*Mode*>: The working mode of the excessive idling detection function.
  - ● 0: Disable this function.
  - ● 1: Enable this function.
- ✧ <*Idling Detection Time*>: If the vehicle is detected to be static with ignition on for this time long, it is considered to be in idling state.
- ✧ <<*Idling End Time*>: After the vehicle goes into idling state, if it moves again or ignition is off and hold that state for the time specified by <Idling End Time>, the vehicle is considered to exit idling state.
- ✧ <*Output ID*>: It specifies the ID of the output port to output specified wave shape when the vehicle enters into idling status. If it is set to 0, there will be no output wave.
- ✧ <*Debounce Option*>: Specify required debouncing time to exit idle state after ignition off. 0 means needing no debounce. 1 means needing to debounce <Idling End Time>.

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

- ➢ **+ACK:GTIDL,**

Example: **+ACK:GTIDL,C80303,135790246811220,,000F,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.4.9. Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh driving behavior based on GNSS or motion sensor.

➢ **AT+GTHBM=**

Example: **AT+GTHBM=gv75m,1,,,100,21,6,,60,21,6,,,21,15,,1,1,8,3,,,,,0010$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0 – 4	0
3	Reserved	0		
4	Reserved	0		
5	High Speed	<=3	100 – 400km/h	100
6	ΔVhb	<=3	0 – 100km/h	0
7	ΔVha	<=3	0 – 100km/h	0
8	Reserved	0		
9	Medium Speed	<=3	60 – 100km/h	60
10	ΔVmb	<=3	0 – 100km/h	0
11	ΔVma	<=3	0 – 100km/h	0
12	Reserved	0		
13	Reserved	0		
14	ΔVlb	<=3	0 – 100km/h	0
15	ΔVla	<=3	0 – 100km/h	0
16	Reserved	0		
17	Output ID	1	0 – 2|9-C	0
18	Output Status	1	0 - 3	0
19	Duration	<=3	0 – 255(×100ms)	0
20	Toggle Times	<=3	0 – 255	0
21	Turn and Brake Threshold	<=3	20 -70(0.01g)	30
22	Turn and Brake Duration	<=3	40-100(*8ms)	50
23	Acceleration Threshold	<=3	15-50(0.01g)	20
24	Acceleration Duration	<=3	50-250(*8ms)	65

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	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: Enable/disable the harsh behavior monitoring function.
  - 0: Disable
  - 1: Detected by GPS only.
  - 2: Detected by motion sensor only.
  - 3: Detected by motion sensor and GPS.
  - 4: Detected by motion sensor or GPS.
- <*High Speed*>, <*Medium Speed*>: If the last known speed of the device read from GNSS is greater than or equal to <*High Speed*>, the vehicle that the device is attached to is considered to be at high speed. If the last known speed is less than <*High Speed*> but greater than or equal to <*Medium Speed*>, the vehicle is considered to be at medium speed. If the last known speed is less than <*Medium Speed*>, the vehicle is considered to be at low speed.
- <*ΔVhb*>: The threshold for harsh braking at high speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at high speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at high speed level".
- <*ΔVha*>: The threshold for harsh acceleration at high speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at high speed level. If it is set to 0, it means "Do not monitor harsh acceleration behavior at high speed level".
- <*ΔVmb*>: The threshold for harsh braking at medium speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at medium speed level. If the parameter value is set to 0, it means "Do not monitor harsh braking behavior at medium speed level".
- <*ΔVma*>: The threshold for harsh acceleration at medium speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at medium speed level. If the value is set to 0, it means "Do not monitor harsh acceleration behavior at medium speed level".
- <*ΔVlb*>: The threshold for harsh braking at low speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at low speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at low speed level".
- <*ΔVla*>: The threshold for harsh acceleration at low speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at low speed level. If the parameter value is set to 0, it means "Do not monitor harsh acceleration behavior at low speed level".
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when harsh behavior is detected. If it is set to 0, there will be no output wave.

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- <*Turn and Brake Threshold*>: The threshold for the motion sensor to measure whether the device is in harsh turning or harsh braking state.
  Note: In order to monitor harsh turn event, <Mode> must be set to 3. The g is about 9.8 m/s/s or 980cm/s/s, so the unit is also 9.8cm/s/s. For example, the default value of acceleration threshold is 20, the value is 20*9.8=196cm/s/s.
- <*Turn and Brake Duration*>: The time parameter to determine whether the device enters harsh turning or harsh braking state. If the driver behaviors are maintained for a period of time longer than the time specified by <*Cornering and Braking Duration*>, the harsh turning or harsh braking event will be triggered.
- <*Acceleration Threshold*>: The threshold for the motion sensor to measure whether the device is in harsh acceleration state.
- <*Acceleration Duration*>: The time parameter to measure whether the device enters harsh acceleration state. If the driver behavior is maintained for a period of time longer than the time specified by <*Acceleration Duration*>, the harsh acceleration event will be triggered.

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

➢ **+ACK:GTHBM,**

Example: **+ACK:GTHBM,C80303,135790246811220,,0010,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.10. Start/Stop Report

The command **AT+GTSSR** is used to detect the status of a vehicle (Start or Stop status). When the vehicle entering into Start status is detected, the device can report the event message **+RESP:GTSTR** to the backend server. When the vehicle leaves Start status, and then enters into Stop status, the device can report the event message **+RESP:GTSTP** to the backend server.

➢ **AT+GTSSR=**

Example: **AT+GTSSR=gv75m,1,2,1,5,0,,,,000F$**

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SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1	0
3	Time to Stop	2	(0 – 30 min)| (0 – 1800 sec)	2 min
4	Time to Start	1	(0 – 5 min) | (0 – 300 sec)	1 min
5	Start Speed	2	1 – 10 Km/h	5
6	Long Stop	<=5	0 – 43200 min	0
7	Time Unit	1	0|1	0
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of the Start/Stop report function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Time to Stop*>: If the vehicle becomes motionless and stays in that status for the length of time specified by this parameter after it enters into Start status, the vehicle is considered to leave Start status.
- <*Time to Start*>: If it is detected that the vehicle is moving with ignition on for the length of time specified by this parameter, the vehicle is considered to be in Start status.
- <*Start Speed*>: The start speed threshold to determine whether the vehicle is started or not. When the built-in motion sensor detects the device is moving with ignition on, the device will start to check the speed from GNSS. If the device speed is maintained at a level higher than <*Start Speed*> for a period of time longer than <*Time to Start*>, the vehicle is considered to be in Start status, and the event message **+RESP:GTSTR** will be reported. If the device speed stays at a level lower than or equal to <*Start Speed*> for a period of time longer than <*Time to Stop*>, the vehicle is considered to quit Start status, and the event message **+RESP:GTSTP** will be reported. If GNSS fix error lasts more than 1 minute, the built-in motion sensor is used to detect the Start/Stop status only and the speed is not checked.
- <*Long Stop*>: After the vehicle enters into Stop status and stays in the Stop state for the length of time specified by this parameter, the **+RESP:GTLSP** message will be sent. 0 means "Disable this feature".
- <*Time Unit*>: It controls the time unit of <*Time to Stop*> and <*Time to Start*> parameters.
  - 0: Unit: minute
  - 1: Unit: second

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

- **+ACK:GTSSR,**

Example: +ACK:GTSSR,C80303,135790246811220,,000F,20160329093254,11F0$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.11. Roaming Detection Configuration

The command **AT+GTRMD** is used to configure the parameters for roaming detection.

- **AT+GTRMD=**

Example: AT+GTRMD=gv75m,0,,,,,1,2,46000F,46002F,,,1,1,,,,2,2,,,,1f,,,1f,,,,,0,0,0,0,,,0001$ AT+GTRMD=gv75m,1,,,,,1,3,46000,46002,46003,,,2,2,46007,,,1,1,46001,,,3fff,,,2ff,,,,,0,0,0,0,,,0002$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0/1	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Home Operator Start	<=2	1-10	1
8	Home Operator End	<=2	1-10	1
9	Home Operator List	<=6*10		
10	Reserved	0		
11	Reserved	0		

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12	Roaming Operator Start	<=3	1-100	1
13	Roaming Operator End	<=3	1-100	1
14	Roaming Operator List	<=6*100		
15	Reserved	0		
16	Reserved	0		
17	Black Operator Start	<=2	1-20	1
18	Black Operator End	<=2	1-20	1
19	Black Operator List	<=6*20		
20	Reserved	0		
21	Reserved	0		
22	Known Roaming Event Mask	<=6	000000 – FFFFFF	27DEF
23	Reserved	0		
24	Reserved	0		
25	Unknown Roaming Event Mask	<=6	000000 – FFFFFF	27DEF
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Output ID	1	0 – 2|9-C	0
31	Output Status	1	0 - 3	
32	Duration	<=3	0～255(×100ms)	0
33	Toggle Times	<=3	0 – 255	0
34	Reserved	0		
35	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the roaming detection function.

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

✧ <*Operator Start*>: A numeral which indicates the first index of the whitelist operator

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numbers to be input. For example, if it is 1, the device will update the whitelist operators from the 1st one. If it is empty, there should be no whitelist number.

- <*Operator End*>: A numeral which indicates the last index of the whitelist operator numbers to be input. For example, if it is 2, the device will update the whitelist operators until the 2nd one. If it is empty, there should be no whitelist number.
- <*Home Operator List*>: A white list of PLMN codes for network operators. The numbers are composed of MCC and MNC, both of which consist of 3 digits. The last digit of MNC can be omitted (e.g. both 46001F and 46001 are the PLMN of CHINA UNICOM). The operators in this list will be considered as in "Home" state. Two adjacent operator numbers are separated with ','. The number of the operators in the list is determined by the parameters <*Operator Start*> and <*Operator End*>. For example, if <*Operator Start*> is 1 and <*Operator End*> is 2, the operator list should include 2 operator numbers (empty value acceptable) and the two numbers are separated by with ','. 'MCCFF' type code is used to identify operators across a whole country. For example, 460FF covers the mobile network operators all across China.
- <*Roaming Operator List*>: It is mostly like the <*Home Operator List*>, and the difference is that the operators in this list will be considered to be in "Known Roaming" state.
- <*Black List Operator*>: It is mostly like the <*Home Operator List*>, and the difference is that the operators in this list will be considered to be in "Blocking Report" state. In this state, the device works normally except that all reports will be buffered instead of being sent.

  Operators that are not in <*Home Operator List*>, <*Roaming Operator List*> or <*Black List Operator*> will be considered to be in "Unknown Roaming" state.

  Note: If more operators are needed, please adjust <*Operator Start*> and <*Operator End*> for appropriate setup. If some operators in <*Operator List*> are empty, then the corresponding operators will be deleted. For example, to delete the 4th, 5th and 6th operator of the <*Operator List*>, please set <*Operator Start*> to 4 and set <*Operator End* > to 6 and keep those three operators of <*Operator List*> empty.
- <*Known Roaming Event Mask*>: Bitwise mask to configure which event report should be sent to the backend server when roaming state is detected. If the roaming state is "Known Roaming", the <*Known Roaming Event Mask*> parameter will be valid; otherwise, the <*Unknown Roaming Event Mask*> will be valid.
  - Bit 0 for **+RESP:GTPNA**
  - Bit 1 for **+RESP:GTPFA**
  - Bit 2 for **+RESP:GTMPN**
  - Bit 3 for **+RESP:GTMPF**
  - Bit 4 Reserved
  - Bit 5 for **+RESP:GTBPL**
  - Bit 6 for **+RESP:GTBTC**
  - Bit 7 for **+RESP:GTSTC**
  - Bit 8 for **+RESP:GTSTT**
  - Bit 9 Reserved
  - Bit 10 for **+RESP:GTPDP**
  - Bit 11 for the power on **+RESP:GTRTL**
  - Bit 12 for the ignition report **+RESP:GTIGN**, **+RESP:GTIGF, +RESP:GTVGN** and **+RESP:GTVGF**

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- Bit 13 for the ignition on location report **+RESP:GTIGL** and **+RESP:GTVGL**
- Bit 14 for the UFSxxx fault code report **+RESP:GTEXP**
- Bit 17 for the statistical information report **+RESP:GTIGS**
- Others Reserved

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

✧ <*Unknown Roaming Event Mask*>: It is mostly like the <*Known Roaming Event Mask*>.

✧ <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*>: If this function is enabled and roaming state is detected, the specified wave will be output at the specified output.

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

➢ **+ACK:GTRMD,**

Example: **+ACK:GTRMD,C80303,135790246811220,,0000,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note: An AT command string which has no more than 100 fields can be accepted by the device.

3.2.4.12. Binding SIM Card

The **AT+GTSIM** command is used to bind SIM card. If the current SIM card is replaced by another SIM card, it works according to the mode and trigger operation according to the value of <*Operation Mask*>.

➢ **AT+GTSIM =**

Example: **AT+GTSIM =gv75m,1, 898600910909f0385552,0,,2,1,0,0,,,,,0013$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**

1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2|3	0
3	ICCID	20		
4	Operation Mask	<=8	0-FFFFFFFF	0
5	Reserved	0		
6	Output ID	1	0 – 3|9 – C	0
7	Output Status	1	0 - 3	0
8	Duration	<=3	0 – 255(×100ms)	0
9	Toggle Times	<=3	0 – 255	0
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: A numeral which indicates whether to bind SIM card.

- 0: Do not bind SIM card.
- 1: Bind the current SIM card.
- 2: Bind the specified SIM card by ICCID.
- 3: Bind the SIM card and lock. In this mode, after ICCID is bound and locked, **AT+GTSIM** command cannot be used until reinstall the firmware. If the ICCID is given in parameter <*ICCID*>, the given ICCID will be bind. If the parameter <*ICCID*> is empty, the current SIM card will be bind.

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

✧ <*Operation Mask*>: Bitwise mask to configure which operation will be trigged while current SIM card is replaced by another SIM card.

- Bit 0: Unregister to the network.

✧ <*Output Status*>: After it is detected that the SIM card is changed, the digital output port <*Output ID*> will output the status to indicate that the SIM card is changed.

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

➢ **+ACK:GTSIM,**

Example: **+ACK:GTSIM,C80303,135790246811220,,0013,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**

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

3.2.4.13. Crash Detection and Acceleration Report

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

➢ **AT+GTCRA=**

Example: **AT+GTCRA=gv75m,1,5,,,,,,0,1,10,6,,001D$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0/1	0
3	G-Sensor Sensitivity	<=2	1 – 99(*0.1g)	7
4	Report ACC	1	0|1	0
5	GPS Data Pre-Crash	<=2	0-10	10
6	GPS Data Post-Crash	<=2	0-10	10
7	Sample Period Pre-Crash	<=2	1-10	10
8	Sample Period Post-Crash	<=2	1-10	10
9	Output ID	1	0 – 2|9-C	0
10	Output Status	1	0 - 3	0
11	Duration	<=3	0～255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0

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

- ✧ <*Mode*>: Working Mode.
  - 0: Disable this function.
  - 1: Enable this function.
- ✧ <*G-Sensor Sensitivity*>: Sensitivity of the crash detection. The smaller the number is, the more sensitive this function would be.
- ✧ <Gsensor data Pre-Crash>: The acceleration sample duration of record XYZ-axis data for Pre-Crash. The unit is second.
- ✧ <Gsensor data Post-Crash>: The acceleration sample duration of record XYZ-axis data for Post-Crash. The unit is second.
- ✧ <*GPS Data Pre-Crash*>: The duration of the GNSS data before crash. The unit is second.
- ✧ <*GPS Data Post-Crash*>: The duration of the GNSS data after crash. The unit is second.

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

➢ **+ACK:GTCRA,**

Example: **+ACK:GTCRA,C80303,135790246811220,,0019,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.14. Three Axis Self-Calibration

The command **AT+GTASC** is used to define the condition for calibrating the directions of accelerometer. When the condition is matched and calibration of the accelerometer succeeds, the device will report the event message **+RESP:GTASC** which includes the calibration result to the backend server. It is strongly recommended to clear calibration data with subcommand 15 in **AT+GTRTO** after installing the device.

➢ **AT+GTASC=**

Example: **AT+GTASC=gv75m,50,10,2,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Brake Speed Threshold	<=3	30 – 400km/h	50
3	Delta Speed Threshold	<=2	5 – 72km/h	10
4	Delta Heading Threshold	1	0 – 5°	2
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- *<Brake Speed Threshold>*: The lower threshold of the speed before braking. If the speed is beyond the threshold before braking, the braking event could trigger the calibration of the accelerometer.
- *<Delta Speed Threshold>*: The lower threshold of the delta speed in one second during braking. If the delta speed is beyond the threshold, the braking event could trigger the calibration of the accelerometer.
- *<Delta Heading Threshold>*: The upper threshold of the delta heading during braking. If the delta heading is smaller than the threshold, the braking event could trigger the calibration of the accelerometer. The unit is degree.

Note: It is strongly recommended to clear the self-calibration status of the acceleration data (via the sub command 15 (**CLASC**) in **AT+GTRTO**) after the device is installed to avoid inaccuracy which may result from historical calibration data.

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

- **+ACK:GTASC**

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Example: **+ACK:GTASC,C80303,135790246811220,,0017, 20170101123542,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X ∈ {'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0'–'9' 'a'–'z' 'A'–'Z''-''_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.15. Jamming Detection

The command **AT+GTJDC** is used to configure the parameters for jamming detection. When the detection condition is matched and the MCC is in <*Home MCC List*>, the device will report the **+RESP:GTJDS** event message to the backend server according to the <*Mode*> setting.

➢ **AT+GTJDC=**

Example: **AT+GTJDC=gv75m,1,3,,0,0,,,,,,0,0,0,0,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2	0
3	Jamming Level	1	1|2|3	2
4	Reserved			
5	Enter Jamming Timer Threshold	<=4	0 - 3600(sec)	0
6	Quit Jamming Timer Threshold	<=4	0 - 3600(sec)	0
7	Reserved			
8	Reserved			
9	Reserved			
10	Reserved			
11	Reserved			
12	Output ID	1	0 – 2|9 – C	0

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13	Output Status	1	0 - 3	0
14	Duration	<=3	0 – 255(×100ms)	0
15	Toggle Times	<=3	0 – 255	0
16	Home MCC List	<= 3 * 20		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the jamming detection function.

- 0: Disable jamming detection function.
- 1: Enable jamming detection function. If jamming is detected, the device will report the **+RESP:GTJDS** message upon entering into "jamming".
- 2: Enable jamming detection function. If jamming is detected, the device will report the **+RESP:GTJDS** message upon entering into "jamming" or quitting "jamming".

✧ <*Jamming Level*>: If the signal is stronger than Jamming Level for over 15s, the device will enter "jamming".

- 1: Low Jamming. As long as the interference exceeds 15 seconds in current environment, jamming report will be generated.
- 2: Medium Jamming. When interference causes the loss of network registration, jamming report will be generated.
- 3: High Jamming. When interference causes the loss of network registration and still unable to search any network for a while, then jamming report will be generated.

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

✧ <*Quit Jamming Timer Threshold*>: When the device detects quits jamming, the device will trigger the "quit jamming" event based on the <Quit jamming Timer Threshold>parameter.

✧ <*Home MCC List*>: A list of comma-separated home MCC to determine which MCC can detect jamming. If <Home MCC list> is empty, device can detect jamming with any MCC.

✧ <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*>: If this function is enabled and jamming is detected, the specified wave shape will be output at the specified output.

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

➢ **+ACK:GTJDC,**

Example: **+ACK:GTJDC,C80303,135790246811220,,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	$	$

3.2.4.16. Jamming Behavior Setting

The command **AT+GTJBS** is used for the Jamming Behavior Setting function. There are two modes of Jamming Behavior Setting, i.e. Jamming Behavior Setting Configure Mode and Jamming Behavior Setting Reset Mode. The output1 is used for "cut off fuel" and the output2 is used for "siren".

- **Jamming Behavior Setting Configure Mode**
  - **AT+GTJBS=**

Example:
AT+GTJBS=gv75m,1,,60,30,1800,1,30,0,0,5,1,1,1,5,001A$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1	0
3	Reserved	0		
4	Siren On Timer (T1)	5	1 – 65535 (×100ms)	10
5	Siren Off Timer (T2)	5	1 – 65535 (×100ms)	10
6	Ready Fuel Release Timer (T3)	5	1 – 65535 (sec)	1800
7	Check Speed	1	0|1	1
8	Speed Limit	3	0 – 999km/h	30
9	Output 1 Init State	1	0|1	0
10	Motion Sensor	1	0|1	0
11	GNSS Fix Failure Timeout Timer (T4)	3	1 – 100 (min)	5
12	Enable Siren	1	0|1	1
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	

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	Tail Character	1	$	$

- ✧ <*Mode*>: A numeral to indicate the working mode of Jamming Behavior Setting (JBS) function.
  - ● 0: Disable the JBS function.
  - ● 1: Jamming Behavior Setting Configure Mode.
- ✧ <*Siren On Timer (T1)*>: It specifies the length of time the siren is on.
- ✧ <*Siren Off Timer (T2)*>: It specifies the length of time the siren is off.
- ✧ <*Ready Fuel Release Timer (T3)*>: It indicates the length of time when the fuel is cut off.
- ✧ <*Check Speed*>: Whether to check speed when the device enters into jamming state.
  - ● 0: Disable speed check.
  - ● 1: Enable speed check.
- ✧ <*Speed Limit*>: The speed limit to cut off fuel.
- ✧ <*Output 1 Init State*>: It is used to set the initial state of output 1.
- ✧ <*Motion Sensor*>: It controls whether the motion sensor needs to measure the motion status to cut off fuel when the GNSS fix failure timeout expires. If the <*Motion Sensor*> is set to 0, the state machine will always measure the GNSS fix status.
  - ● 0: Disable motion sensor.
  - ● 1: Enable motion sensor.
- ✧ <*GNSS Fix Failure Timeout Timer (T4)*>: It indicates the length of timeout for acquiring GNSS fix.
- ✧ <*Enable Siren*>: It defines whether to control siren with digital output 2 in the current JBS state.

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

➢ **+ACK:GTJBS,**

Example: **+ACK:GTJBS,C80303,135790246811220,,001A,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX8000 – XX80FF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.4.17. GNSS Jamming Status Report

The command **AT+GTGPJ** is used to configure the parameters for GNSS jamming detection. When GNSS jamming has been detected or suspected, the device will report the **+RESP:GTGPJ** event message to the backend server.

➢ **AT+GTGPJ=**

Example: **AT+GTGPJ=gv75m,1,15,3,,,,,0,0,0,0,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gb100cau
2	Mode	1	0|1	0
3	CW Threshold	<=2	0-31	15
4	BB Threshold	<=2	0-15	3
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Output ID	1	0 – 3|9 – C	0
10	Output Status	1	0 - 3	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the GNSS jamming detection function.
- 0: Disable this function.
- 1: Enable this function.

✧ <BB Threshold>: Broadband jamming detection threshold (unit: dB)

✧ <CW Threshold>: Continuous wave (narrowband) jamming detection threshold (unit: dB)

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

➢ **+ACK:GTGPJ,**

Example: **+ACK:GTGPJ,C80303,865084030960726,,004B,20190411104525,0316$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**

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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. IO Application

3.2.5.1. Digital Output Port Setting

The **AT+GTOUT** command is used to output specified wave shape from digital output ports. A total of four wave shapes are supported as shown below. If set to wave shape 1, the device will still output this wave shape at the specified output port after power reset.
The digital output 1 is a latched output. The final status of the output will be latched during power off. It only supports wave shape 1.

If a specified output port is set to wave shape 4, then the port will output square wave. When the main power is turned off, the port will stop outputting the wave. If the main power is turned on again, the port will start to output the wave again. If the device is rebooted, the port will still output the wave.

Wave Shape 1:

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



Figure 2: Wave Shape 1

Wave Shape 2:

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

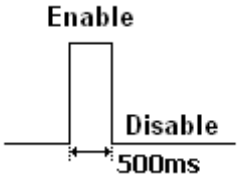

Figure 3: Wave Shape 2

Wave Shape 3:

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

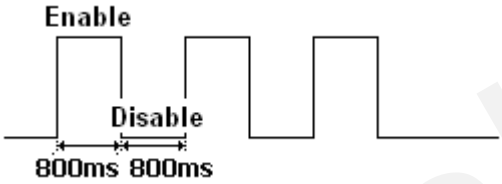

Figure 4: Wave Shape 3

Wave Shape 4:

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

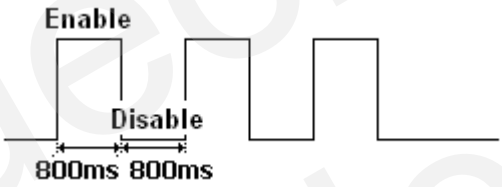

Figure 5: Wave Shape 4

➢ **AT+GTOUT=**

Example: **AT+GTOUT=gv75m,1,,,0,0,0,,,,0,,1,1,,,,0004$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Output1 Status	1	0 – 3	0
3	Reserved	0		
4	Reserved	0		
5	Output2 Status	1	0 – 3	0
6	Duration	<=3	0 – 255(×100ms)	0
7	Toggle Times	<=3	0 – 255	0
8	Reserved	0		

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9	Reserved	0		
10	Reserved	0		
11	DOS Report	1	0-3	0
12	Reserved	0		
13	Long Operation2	<=3	0 – 120min	0
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Output1–2 Status*>: Valid only for the wave shape 1 as shown in **Figure 2**, it is used to set the final status of the output port.
  - 0: Disable status.
  - 1: Enable status.
  - 2: Gradual progressive high wave shape enable status. For detailed information, please refer to **AT+GTGDO**. This wave shape is only valid for digital output 1-2.
  - 3: Gradual progressive low wave shape enable status. For detailed information, please refer to **AT+GTGDO**. This wave shape is only valid for digital output 1-2.
- <*Duration*>: Please refer to Figure 3, Figure 4 and Figure 5. The unit is 100ms.
- <*Toggle Times*>: Please refer to Figure 3, Figure 4 and Figure 5. If the <*Duration*> is set to 0, the <*Toggle Times*> must be set to 0 rather than other values; otherwise the command will be invalid.
- <*DOS Report*>: Whether or not to report **+RESP:GTDOS** when the status of wave shape 1 output changes.
  - Bit 0: for output 1 (not) to report **+RESP:GTDOS**.
  - Bit 1: for output 2 (not) to report **+RESP:GTDOS**.

  For each bit, set it to 1 to enable the **+RESP:GTDOS** report, and 0 to disable it.
- <*Long Operation2*>: The long operation time for output2. The output wave will be stopped at the specified output port after the length of time specified by this parameter. The parameter is valid only when the output wave shape is 1 or 4.

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

- **+ACK:GTOUT,**

Example: **+ACK:GTOUT,C80303,135790246811220,,0004,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**

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

3.2.5.2. Digital Input Port Setting

The command **AT+GTDIS** is used to configure the parameters for 2 digital input ports. The input <*Ignition Detection*> is dedicated to ignition detection. The other input is customizable. If the logic status of the customizable digital input port changes, the device will report the message **+RESP:GTDIS** to the backend server.

➢ **AT+GTDIS=**

Example: **AT+GTDIS=gv75m,0,1,,0,1,1,4,,,,,,,,,,,,0005$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Ignition Detection	1	0	0
3	Reserved	0		
4	Debounce Time	<=2	0 – 255(×10ms)	100
5	Ignition Detection Mode	1	0-4	0
6	Input ID 1	1	1	1
7	Enable	1	0|1	0
8	Debounce Time	<=2	0 – 20(×10ms)	0
9	Validity Time	<=2	0|1 – 12(×2s)	0
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		

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

- <*Ignition Detection*>: The ID of the ignition detection port.
- <*Input ID 1*>: The digital input port ID.
- <*Sample Period*>: The sample period of the non-interruptible input port.
- <*Enable*>: Enable/disable the interrupt input.
  - 0: Disable the interrupt input.
  - 1: Enable the interrupt input.
- <*Debounce Time*>: The debounce time for interruptible input port.
- <*Ignition Detection Mode*>: A numeral to define the ignition detection mode.
  - 0: Hard-wired ignition detection mode.
  - 1: Motion status to simulate ignition status.
  - 2: External power voltage mode (virtual ignition detection). Ignition state correlates with the voltage of external power. Please use the command **AT+GTVVS** to configure the parameters.
  - 3: Reserved.
  - 4: Accelerometer mode (virtual ignition detection). Ignition state correlates with the state of accelerometer. Please use command **AT+GTAVS** to configure the parameters.

  Note: If the ignition input is not configured as a digital input via **AT+GTIGM** (i.e. <Enable> in **AT+GTIGM** is set to 0), the hard-wired ignition signal has the highest priority. This means even if <*Ignition Detection Mode*> is not set to 0, but hard-wired line has connected to the device, then the device will only measure the ignition state by hard-wired ignition detection mode.

  When both virtual ignition detection function and the corresponding bits of <*Event Mas*k> in the command **AT+GTCFG** are enabled, **+RESP:GTVGN**, **+RESP:GTVGF** and **+RESP:GTVGL** will be reported to the backend server.
- <*Validity Time*>: The validity time of an input state. 0 means “Do not check the validity time”.

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

- **+ACK:GTDIS,**

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Example: +ACK:GTDIS,C80303,135790246811220,,0005,20160329093254,11F0$			
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	$	$

3.2.5.3. Ignition Multiplexing Setting

The command **AT+GTIGM** is used to make the ignition input available as a digital input. If the logic status of the digital input port changes, the device will report the message **+RESP:GTDIS** to the backend server.

➢ **AT+GTIGM=**

Example: AT+GTIGM=gv75m,6,0,0,,,1,,,,, 0005$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Input ID	1	6	6
3	Enable	1	0|1	0
4	Report Mode	1	0 - 3	0
5	Reserved	0		
6	Reserved	0		
7	Sample Period	<=2	0|1 – 12(×2s)	1
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	

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	Tail Character	1	$	$

✧ <*Input ID*>: The ID of the digital input that the ignition input is configured as.

✧ <*Enable*>: Enable/disable the interrupt input.

- 0: Disable the interrupt input.
- 1: Enable the interrupt input.

✧ <*Report Mode*>: It defines the event(s) to trigger the **+RESP:GTDIS** report to the backend server.

- 0: Disable the **+RESP:GTDIS** report.
- 1: Activate the digital input.
- 2: Deactivate the digital input.
- 3: Both upon activating and deactivating the digital input.

✧ <*Sample Period*>: The sampling period of the non-interruptible input port.

Note: The device needs to be restarted for the change of the <*Enable*> setting in the **AT+GTIGM** command to take effect.

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

➢ **+ACK:GTIGM,**

Example: **+ACK:GTIGM,C80303,135790246811220,,0005,20090214093254,11F0$**			
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	$	$

3.2.5.4. Input/output Port Binding

This command is used to configure the user defined output port actions triggered by input ports. If the IO binding is configured and the corresponding condition is met, the device will output a specific wave shape on the specified output port; otherwise, the device will restore the initial status of the specified output port. The device will report the message **+RESP:GTIOB** to the backend server when the logic status of bound input ports changes.

➢ **AT+GTIOB=**

Example:

AT+GTIOB=gv75m,0,01,01,1,0,0,0,0,,,,,FFFF$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	IOB ID	1	0 – 3	
3	Input Mask	<=4	0 – 0F42	0
4	Trigger Mask	<=4	0 – 0F42	0
5	Input Sample Period	<=2	0|1 – 12(×2s)	0
6	Output ID	1	0 – 2|9-C	0
7	Output Status	1	0 - 3	0
8	Duration	<=3	0 – 255(×100ms)	0
9	Toggle Times	<=3	0 – 255	0
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*IOB ID*>: ID of the user defined IO binding.
- <*Input Mask*>: Bitwise mask for the configuration of input ports. Each bit, from Bit 0 to Bit 15, represents one digital input port. Set a bit to 1 to enable the corresponding input port and 0 to disable the corresponding input port.
  - Bit 0: Ignition detection
  - Bit 1: Digital input 1
  - Bit 2 – Bit 5: Reserved
  - Bit 6: Digital input 6
  - Bit 7: Reserved
  - Bit 8: EIO100 input 9
  - Bit 9: EIO100 input A
  - Bit 10: EIO100 input B
  - Bit 11: EIO100 input C
  - Bit 12 – Bit 15: Reserved

  Note: Because bit6 is the digital input multiplexing of bit0, the two are actually the same IO port, which cannot be enabled at the same time, otherwise the function will not work properly.
- <Trigger Mask>: Bitwise mask for trigger condition composition of the corresponding input ports. Each bit, from bit 0 to bit1, represents the logical status of the corresponding input

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port to trigger the IOB event. Set it to 1 to use enabled status as the trigger condition and 0 to use disabled status. Only when the logical status of all the input ports in the IO binding meets the trigger condition will the IOB event be triggered.

- Bit 0: Ignition detection
- Bit 1: Digital input 1
- Bit 2 – Bit 5: Reserved
- Bit 6: Digital input 6
- Bit 7: Reserved
- Bit 8: EIO100 input 9
- Bit 9: EIO100 input A
- Bit 10: EIO100 input B
- Bit 11: EIO100 input C
- Bit 12 – Bit 15: Reserved

✧ <Input Sample Period>: The period to check the state of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use independent sample period to check the input port state even for the same input port.

✧ <Output ID>: ID of the output port to output specified waveform when the trigger condition meets. 0 means no waveform will be output.

Note: If <*Input Mask*> includes EIO100 input(s), <*Input Sample Period*> should be multiplied by 4s. If <*Output ID*> indicates EIO100 output, only wave shape 1 is supported.

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

➢ **+ACK:GTIOB,**

Example: **+ACK:GTIOB,C80303,135790246811220,,1,0006,20160329093254,11F0$**			
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' '-' '_'	
IOB ID	1	0 – 3	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.5.5. External Power Supply Monitoring

The command **AT+GTEPS** is used to configure the parameters for external power supply

monitoring. The device will measure and monitor the voltage of the external power supply. If the voltage of the external power supply meets the predefined alarm condition, the device will report the alarm message **+RESP:GTEPS** to the backend server to indicate the status of the external power supply.

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

➢ **AT+GTEPS=**

Example: **AT+GTEPS=gv75m,0,250,250,,0,0,0,0,0,0,0,3,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2	0
3	Min. Threshold	<=5	250 – 32000 mV	250
4	Max. Threshold	<=5	250 – 32000 mV	250
5	Reserved	0		
6	Debounce Time	1	0 – 5 (×10s)	0
7	Output ID	1	0 – 2|9-C	
8	Output Status	1	0 - 3	
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Sync with FRI	1	0|1	0
12	Voltage Margin Error	<=3	0 – 100(×10mv)	0
13	MPN/MPF Validity Time	1	0 - 255(x1s)	0
14	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the external power supply monitoring function.

- 0: Disable external power supply monitoring.
- 1: Enable 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 voltage of the external power supply to trigger the alarm.
- <*Max. Threshold*>: The upper limit voltage of the external power supply to trigger the alarm.
- <*Sample Period*>: The sampling period for measuring the external power supply.
- <*Debounce Time*>: The debounce time to avoid excessive voltage drop of the external power supply.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when the **+RESP:GTEPS** alarm is triggered. If it is set to 0, there will be no output wave.
- <*Sync with FRI*>: Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the fixed report message.
  - 0: Do not report external power supply voltage with the fixed report message.
  - 1: Report external power supply voltage with the fixed report message.
- <*Voltage Margin Error*>: This parameter will be used together with <*Min. Threshold*> and <*Max. Threshold*> parameters. It indicates the voltage margin error of the <*Min. Threshold*> and the <*Max. Threshold*>. If the current voltage detected falls within the range of the <*Voltage Margin Error*> of the <*Min. Threshold*> or <*Voltage Margin Error*> of the <*Max. Threshold*>, then the voltage value will not trigger **+RESP:GTEPS** alarm report. For example, if <*Min. Threshold*> is set to 6000mv, the <*Max. Threshold*> is set to 12000mv, and the <*Voltage Margin Error*> is set to ±100mv, the current voltage will not trigger **+RESP:GTEPS** alarm report when the current voltage meets the condition (5900mv < current voltage < 6100mv) or (11900mv < current voltage < 12100mv). The parameter improves the performance of the **+RESP:GTEPS** alarm report.
- <*MPN/MPF Validity Time*>: Used to configure the detection and stabilization time for MPN/MPF.

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

- **+ACK:GTEPS,**

Example: **+ACK:GTEPS,C80303,135790246811220,,0007,20160329093254,11F0$**			
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	$	$

3.2.5.6. Gradual Digital Output Configuration

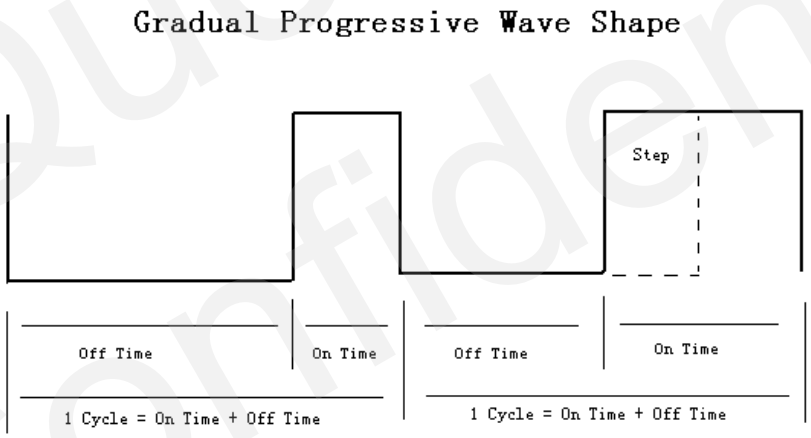
The **AT+GTGDO** command is used to configure specified gradual progressive wave shape from the digital output ports.

For progressive output, an increment step is added to the ON/OFF Time until the ON/OFF Time (including the time increment) becomes equal to (=) or greater than (>) the Cycle Time. This phase is defined as progressive state. After the condition On/Off Time + Incremental Step ≥ Cycle Time is met, the output becomes steady until it is deactivated by the command (**AT+GTOUT**). This phase in which the output is steady is defined as constant state. If the device reboots during constant state and the **AT+GTPDS** settings are configured and enabled, the device will restore the previous output state.

Next-time progressive output is activated, the cycle described above starts over again regardless of the former progressive state.

The following figure shows the components of an output cycle. Here are some notes:

- The time for one complete cycle is equal to OFF phase time plus ON phase time which is prior to OFF time.
- For constant output, the ON time and the Cycle Time should be the same.
- For progressive output, when the <Output1 Status> is set to 2, an incremental step will be added to the ON time at the end of a cycle before the start of the next.



- For progressive output, when the <Output1 Status> is set to 3, an incremental step will be added to the OFF time at the end of a cycle before the start of the next.

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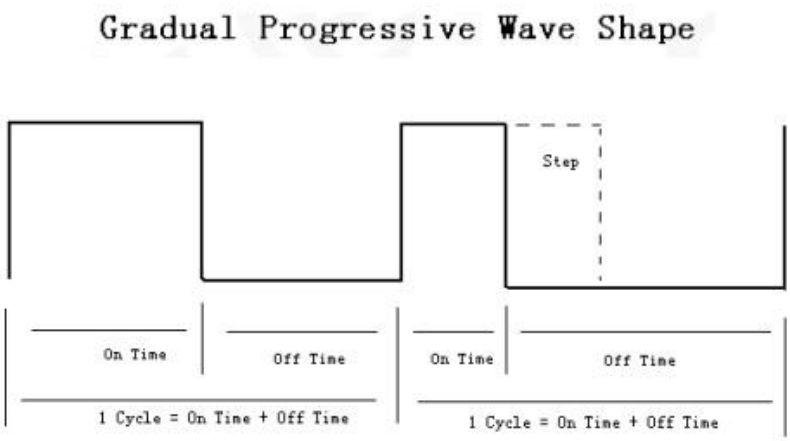

➢ **AT+GTGDO=**

Example: **AT+GTGDO=gv75m,0,30,1,,,,,0004$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Time of First Active Phase (ON Time)/Time of First Inactive Phase (OFF Time)	<=3	0 - 100*(100ms)	0
Cycle Time (Total Time)	<=3	0 - 100*(100ms)	30
Incremental Step	<=3	0 - 100*(100ms)	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Time of First Active Phase*>: Time (in unit of 100ms) that the output will be in active state during the first cycle.

✧ <*Cycle Time*>: Time (in units of 100ms) that forms a complete cycle (ON phase time + OFF phase time).

✧ <*Incremental Step*>: Time (in unit of 100ms) that shall be added to the ON phase time before starting the next cycle. If this parameter value is 0, the cycles are equal.

Note: The value of <*Time of First Active Phase*> or <*Time of First Inactive Phase*> cannot be greater than <*Cycle Time*>.

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

- **+ACK:GTGDO,**

Example: **+ACK:GTGDO,C80304,861039050318795,,0004,20221027034609,00FD$**			
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. Serial Port Application

3.2.6.1. Serial Port Setting

The serial port of the device is used to connect with external devices to extend the application of the device. The command **AT+GTURT** is used to configure the working mode of the serial port for different external devices and the parameters for serial port communication.

- **AT+GTURT=**

Example: **AT+GTURT=gv75m,1,5,8,1,0,,,,,0018$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Working Mode	1	0|2 – 9 |12|17|22	0
3	Baudrate Index	<=2	1 – 12	5
4	Data Bits	1	7 – 8	8
5	Stop Bits	1	1 – 3	1
6	Parity Bits	1	0 – 2	0
7	Enable Sleep	1	0|1	0

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8	Reserved (Optional)	0		
9	Reserved (Optional)	0		
10	Reserved (Optional)	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Working Mode*>: It is used to configure the working mode of UART.

- 0: Disable UART.
- 1: Used for data transfer via **AT+GTDAT**.
- 2: Used for Garmin function.
- 3: Used for specific RFID card reader to communicate with UART of the terminal. The terminal will report the card ID received from the card reader to the backend server via the message **+RESP:GTIDA**.

9	RFID Type	1	0 – 4	0
10	Order of Card ID/Prompt Mode	2	0x00|0x01|0x10| 0x11	0x00

- 4: Used for digital fuel sensor. Two reserved parameters are used as follows.

9	Digital Fuel Sensor Type	1	2 – 4 | 6|8	0
10	Reserved	0		

Note: Different fuel sensors support different baudrates. Make sure that the baudrate set is appropriate for the sensor.

- 5: Used for AC100 devices.

Note: Whenever a new temperature sensor is connected, restart the device for it to work properly. The maximum number of AC100 devices is one iButton and two temperature sensors.

- 6: Used to transfer data from auxiliary serial port to the backend server when the serial port receives the byte specified by <*Terminator Character*>. Two reserved parameters are used as follows. When the size of the data received exceeds 1280 bytes, responses will also be composed and sent to the server.

9	Format	1		0
10	Terminator Character	2	0x00-0xFF	0D

- 7: Used for transparent transfer based on received data length and data-receiving interval. The data in **+RESP:GTDTT** is packed in hexadecimal ASCII format code. The three reserved parameters are used as follows.

8	Format	1		0
9	Interval	<=4	1-3600sec	3600
10	Length	<=4	1-640	640

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- 8: Used for transparent transfer based on the length of received data and data-receiving interval. The data in **+RESP:GTDTT** is packed in pure HEX code. The three reserved parameters are used as follows.

8	Format	1		0
9	Interval	<=4	1-3600sec	3600
10	Length	<=4	1-1280	1280

- 9: Used for camera.
- 12: Used for CANBUS device connected to a vehicle. Two reserved parameters are used as follows. In this mode, the baudrate must be set to 9600.

9	CANBUS Device Type	1	0 - 0	0
10	Reserved	0		

- 17: Used for EIO100 device. In this mode, the baudrate can be set to any value corresponding to <*Baudrate Index*>.

  Note: The maximum size of external data to serial port which the device can handle is 1024 bytes in one transmission cycle except **AT+GTDAT**.
- 22: Used for WRT100 Accessory. In this mode, configure the following settings: 9600 baud rate, 8 bits, with no parity, 1 stop bit.

✧ <*Baudrate Index*>: The index of the baudrate supported by the serial port. All supported baudrates are listed below.

Baudrate Index	**Baudrate**
1	1200
2	2400
3	4800
4	7200
5	9600
6	14400
7	19200
8	28800
9	33900
10	38400
11	57600
12	115200

✧ <*Data Bits*>: Data Bits of the UART. The value can be 7 or 8.

✧ <*Stop Bits*>: Stop Bits of the UART. The value can be 1, 2 or 3.

- 1: 1 Stop Bit
- 2: 2 Stop Bits
- 3: 1.5 Stop Bits

✧ <*Parity Bits*>: Parity Bits of the UART. The value can be 0, 1, 2, or 3.

- 0: None Parity

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- 1: Odd Parity
- 2: Even Parity

✧ <*Enable Sleep*>: This parameter is used to enable or disable the sleep mode. The device supports sleep mode which helps reduce power consumption. When the device enters into sleep mode, its response to the serial port will be very slow unless it is waked up.

- 0: Disable the device sleep mode.
- 1: Enable the device sleep mode.

✧ <*Digital Fuel Sensor Type*>: The type of the digital fuel sensor connected with the serial port.

- 2: DUT-E
- 3: Reserved
- 4: UFSxxx
- 6:DUT-E SUM
- 8: Escort Fuel.

✧ <*RFID Type*>: The type of RFID connected with the serial port.

- 0: Reserved
- 1: Reserved
- 2: MR2. Set MR2 card reader to 9600 baudrate, 8 data bits, 1 stop bit, and no parity. MR2 serial (RS232) ASCII output format is shown below:

STX (02 HEX)	Data (8 or 14HEX characters)	CR	LF	EXT (03 HEX)

The start character is factory defined as an STX (02 HEX). This is followed by data represented by 8 Hex characters or 14 Hex characters. The EXT (03 HEX) character denotes the end of the current transmission.

- 3: Reserved
- 4: DR102: 19200 baudrate, 8 data bits, 1 stop bit, and no parity.

✧ <*Format*>: The format used for data transfer from the auxiliary serial port to the backend server when <*Working Mode*> is 6.

- 0: Short format
- 1: Long format

✧ <*Interval*>: When <*Working Mode*> is 7 or 8, the data in UART buffer will be sent if no data is received for a period of time longer than <*Interval*>.

✧ <*Terminator Character*>: When the auxiliary serial port receives this specified character, data received before the <*Terminator Character*> will be packed into the message **+RESP:GTDTT** and sent to the backend server. This parameter is enabled when <*Working Mode*> is 6.

✧ <*Length*>: The maximum length of data in the message **+RESP:GTDTT** when <*Working Mode*> is 7 or 8.

✧ <*Prompt Mode*>: Select the reading prompt mode of DR102 for ignition verification.

0: Normal.

1: LED on the reader start flashing/beeping in 1s intervals.

✧ <*Order of Card ID*>: Enable/disable reverse card ID order.

- 0: No reversing
- 1: Reversing

Note: Only If <RFID Type> is DR102, <Prompt mode> and <Order of card ID> will be valid.

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

➢ **+ACK:GTURT**,

Example: +ACK:GTURT,C80303,135790246811220,,0018,20160329093254,11F0$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.2. AC100 Device Settings

The command **AT+GTACD** is used to configure the parameters of AC100 devices which include iButton and temperature sensors. When the iButton is connected, a specified wave shape can be configured to the specified output port. Temperature sensor can be configured to read real-time temperature at a specified time interval. Temperature sensor information is reported in the message **+RESP:GTERI**, and iButton information is reported in the message **+RESP:GTIDA**.

➢ **AT+GTACD**

Example: AT+GTACD=gv75m,2,0,0,0,0,,,,,,0005$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	iButton Timer	<=2	0|1 – 10(s)	0
3	Output ID	1	0 – 2	0
4	Output status	1	0 - 3	0
5	Duration	<=3	0 – 255(×100ms)	0
6	Toggle Times	<=3	0 – 255	0
7	Temperature Timer	<=3	0|10 – 255(s)	0
8	Reserved			
11	Reserved			
12	Reserved			

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

- <*iButton Timer*>: The time interval for searching the iButton ID or RFID reader DR200.
  Note: The number of iButton ID is in the opposite order with the number printed on iButton. The ID structure is composed of <1 Byte Family ID> + <6 Byte Serial Number> + <1 Byte CRC>. The first byte of ID number is iButton's family ID. For example, if the ID on iButton is 12 345678901234 01, then the actual iButton ID is 01 341290785634 12.
- <*Temperature Timer*>: The time interval for reading temperature sensor value. If more than one temperature sensor is connected to 1-wire, the device will read the temperature from the temperature sensors one by one according to sensor ID every time the <*Temperature Timer*> condition is met.

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

- **+ACK:GTACD,**

Example: **+ACK:GTACD,C80303,135790246811220,,0005,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.3. Transparent Data Transmission

The command **AT+GTDAT** is used to transfer data between the backend server and an external device connected to the second serial port of the terminal device. Data to the backend server is wrapped into the message **+RESP:GTDAT** and sent to the backend server while data to the external device is directly output to the second serial port. All data is transparent to the terminal device.

Before this command is used, the **AT+GTURT** command is used to set the parameters for the second serial port.

➢ **AT+GTDAT=**

Example: **AT+GTDAT=gv75m,0,,data to the backend server,,,,,0017$** **AT+GTDAT=gv75m,1,,data to the serial port,,,,,0017$** **AT+GTDAT=gv75m,2,,data to the backend server,,,,,0011$** **AT+GTDAT=gv75m,3,,data to the serial port,,,,,0017$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Command Type	1	0|1|2|3	
3	Reserved	0		
4	Data	<=1280	ASCII Code	
5	Need Ack	1	0|1	
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Command Type*>: It indicates how to send the data.

- 0: Send message to the backend server with **+RESP:GTDAT** (short format).
- 1: Send the pure data directly to the serial port.
- 2: Send message to the backend server with **+RESP:GTDAT** (long format).
- 3: Send the pure data directly to the serial port without CRLF.

✧ <*Data*>: Data to be transferred between the backend server and the external device connected to the second serial port of the terminal device.

✧ <*Need Ack*>: Need to report **+ACK:GTDAT** or not.

- 0: Do not need to report Ack.
- 1: Need to report Ack.

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

➢ **+ACK:GTDAT,**

Example: **+ACK:GTDAT,C80303,135790246811220,,0017,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	

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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	$	$

3.2.6.4. External Digital Fuel Sensor

The command **AT+GTEFS** is used to configure the parameters of the external digital fuel sensor. If <*Working Mode*> in **AT+GTURT** is set to 4, the parameters of this command are used.

➢ **AT+GTEFS=**

Example: **AT+GTEFS=gv75m,,,9999,30,10,0,0,10,0,0,300,,10,5,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Reserved	0		
3	Reserved	0		
4	Ex Full Value	<= 5	0 – 65535	9999
5	Ex Fuel Sensor Delay	<=3	0 – 600 sec	30
6	Ex Fuel Loss Alarm	<=2	0 – 50 %	10
7	Refuel Alarm	<=3	0-100%	0
8	Ex Unsolicited Enable	1	0 | 1	0
11	Ex Detection Frequency	<=3	5 – 600 sec	10
12	Ex Filter Factor	1	0 – 9	0
13	Report Sensor Data	1	0 | 1	0
14	Ex Detection Frequency IGF	<=4	30-1800s	300
15	Reserved	0		
16	IGN Sample Count	<=2	3 – 30	10
17	Ex Fuel Loss Alarm IGN	<=3	0 – 100 %	5
	Serial Number	4	0000 – FFFF	

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	Tail Character	1	$	$

- <*Ex Full Value*>: The value read from the sensor when the fuel tank is full.
  Note: Now this value needs to be set only for UFSxxx and DUT-E SUM, while it is ignored by other sensors. The unit for UFSxxx is 0.1mm. Set the unit of DUT-E sensors connected to DUT-E SUM to liter.
- <*Ex Fuel Sensor Delay*>: After the ignition is turned on, the fuel sensor will need to delay for the length of time specified by this parameter before it can report the correct fuel level.
- <*Ex Fuel Loss Alarm*>: If the difference between the current fuel level after ignition on and the last measured fuel level before the previous ignition off is greater than this value, and the current fuel level is less than the previous fuel level, an unusual fuel consumption alarm is sent via the event message **+RESP:GTFLA**. 0 means "Disable this feature".
- <Refuel Alarm>: If the difference between the current fuel level after ignition on and the last measured fuel level before the previous ignition off is greater than this value, and the current fuel level greater than the previous fuel level, an unusual fuel consumption alarm is sent via the event message **+RESP:GTFLA**. 0 means "Disable this feature".
- <*Ex Unsolicited Enable*>: If this parameter is enabled, the device will not send command to the fuel sensor, and the sensor must be set to periodic data output. QFS100 and UFS100 do not support this function.
- <*Ex Detection Frequency*>: If <*Ex Unsolicited Enable*> is disabled, the device will send READ command to the fuel sensor and read the data at this frequency.
- <*Ex Filter Factor*>: The filter factor of the sensor. Now only QFS100 supports this factor, and for other sensors, this parameter is ignored.
  - 0: No filter
  - 1: 12 seconds
  - 2: 24 seconds
  - 3: 36 seconds
  - 4: 60 seconds
  - 5: 120 seconds
  - 6: 180 seconds
  - 7: 240 seconds
  - 8: 480 seconds
  - 9: 960 seconds
- <*Report Sensor Data*>: A numeral to indicate whether to report raw data from the fuel sensor to the backend server via **+RESP:GTFSD**. Only the report of raw data from UFSxxx is supported now.
  - 0: Do not report raw data from the fuel sensor.
  - 1: Report raw data from the fuel sensor.
- <*Ex Detection Frequency IGF*>: If <Ex Unsolicited Enable> is disabled, the device will send READ command to the fuel sensor and read the data at this frequency when the ignition is off.
- <*IGN Sample Count*>: The count of readings of fuel level used for fuel alarm detection after ignition on. The ignition-on fuel alarm detection time = <*IGN Sample Count*>* <*Ex Detection Frequency*>.

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✧ <*Ex Fuel Loss Alarm IGN*>: If the difference between the current fuel level after ignition on and the last measured fuel level is greater than this parameter value during the time <*IGN Sample Count*> * <*Ex Detection Frequency*>, an abnormal fuel consumption alarm is sent via the event message **+RESP:GTFLA**. 0 means "Disable this function".

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

➢ **+ACK:GTEFS,**

Example: **+ACK:GTEFS,C80303,135790246811220,,0008,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.5. ID Authentication

The command **AT+GTIDA** is used to protect against unauthorized use. This function needs an ID card reader and an external relay. To use this command, make sure both the ID card reader and the external relay are connected to the device. When the device reads an ID, it will send event report **+RESP:GTIDA** to the server. If the ID is in the White Number List Configuration, it will be authorized until next ignition off. After the ignition off, the authentication valid time will last for a short period of time (settable). Within this period, the driver can turn on the engine again without reidentification.

➢ **AT+GTIDA=**

Example: **AT+GTIDA=gv75m,1,1,2,D2C4FBC5,87654321,35,3,40,,,,1,1,0,0,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1|2	0
3	Start Index	<=2	1 – 250	1
4	End Index	<=2	1 – 250	1

5	ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
6	Timeout After Ignition Off	<=3	0 | 15 – 600sec	30
7	Report Mode	1	0 – 7	0
8	ID Validity Time	<=3	15 – 600sec	30
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Output ID	1	0 – 2	0
15	Output Status	1	0 - 3	0
16	Duration	<=3	0 – 255(×100ms)	0
17	Toggle Times	<=3	0 – 255	0
18	RFID Report Mode	1	0-1	0
19	RFID Report Format	1	0-1	0
20	Reserved	0		
21	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of the ID authentication function.
  - 0: Disable this function.
  - 1: Enable this function. Only authorized ID cards can unlock the vehicle.
  - 2: Enable this function. Any ID card can unlock the vehicle.
- <*Start Index*>, <*End Index*>: The index range of the white list to which the ID numbers are to be updated. For example, if the <*Start Index*> is set to 1 and the <*End Index*> is set to 2, then the first two ID numbers in the white list will be updated by the numbers provided in the parameter <*ID Number List*>. The parameters <*Start Index*> and <*End Index*> determine the total number of ID numbers that will be updated. If either one is empty, there should be no ID number. A maximum of eight numbers can be updated each time.
- <*ID Number List*>: A list of comma-separated ID numbers to be updated to the white list. The number of the ID numbers is determined by <*Start Index*> and <*End Index*>.

  Note: If more ID Numbers are needed, please adjust <*Start Index*> and <*End Index*> for appropriate setup. If some ID Numbers in <*ID Number List*> are empty, then the corresponding ID will be deleted. For example, to delete the 4th, 5th and 6th ID of the <*ID Number List*>, please set <*Start Index*> to 4 and set <*End Index*> to 6 and keep the three IDs of <*ID Number List*> empty.
- <*Timeout After Ignition Off*>: When the ignition is turned off, the ID will still be authorized for the length of time specified by this parameter. In this period, re-authentication is not

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needed. 0 means "The ID will be unauthorized when the ignition is turned off".

- <*Report Mode*>: It is used to configure the mode of reporting ID.
  - 0: Do not report ID.
  - 1: Report authorized ID.
  - 2: Report unauthorized ID.
  - 3: Report both authorized and unauthorized ID.
- <*ID Validity Time*>: The ID will remain authorized for this period of time when it is valid.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when it is authorized. Only wave shape 1 is supported.
- <RFID Report Mode>: The mode of reporting the RFID number in HEX format +RSP and +EVT messages.
  - 0: Report the latest RFID number after getting the card ID.
  - 1: Report the latest RFID number when the ignition is turned on and the card is authorized, or the ignition is turned off and the timeout period specified by <Timeout after Ignition Off> is not reached.
- <RFID Report Format>: The setting of RFID format in hex protocol.
  - 0: ASCII format.
  - 1: HEX format.

Note: The messages **+RESP:GTIDA, +RESP:GTIGF, +REST:GTIGN, +RESP:GTVGF** and **+RESP:GTVGN** in HEX format will always report RFID number after the device gets the card ID.

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

- **+ACK:GTIDA,**

Example: **+ACK:GTIDA,C80303,862170013895931,,FFFF,20160101000009,0088$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.6. Temperature Alarm

This command is used to set a temperature range for the temperature alarm function of the terminal. According to the working mode, the device will report the event message **+RESP:GTTMP** to the backend server when the device detects the temperature is outside or inside the range.

➢ **AT+GTTMP=**

Example: **AT+GTTMP=gv75m,0,1,28131A4103000056,,,-20,50,,,2,10,,,1,1,0,0,,,,,000C$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Alarm ID	1	0-3	
3	Mode	1	0-3	0
4	Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
5	Reserved	0		
6	Reserved	0		
7	Low Temperature	<=3	-55 – 125℃	0
8	High Temperature	<=3	-55 – 125℃	0
11	Reserved	0		
12	Reserved	0		
13	Valid Time	<=2	1 – 10	2
14	Report Interval	<=2	0 – 60	10
15	Reserved	0		
16	Reserved	0		
17	Output ID	1	0 – 2	0
18	Output Status	1	0 - 3	0
19	Duration	<=3	0 – 255(×100ms)	0
20	Toggle Times	<=3	0 – 255	0
21	Reserved	0		
22	Reserved	0		
23	Reserved	0		
24	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Alarm ID*>: The ID of the temperature alarm. A total of four IDs (0-3) are supported.

✧ <*Mode*>: The working mode of the temperature alarm.

- 0: Disable temperature alarm.

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- 1: Report temperature alarm if the current temperature is within the temperature range specified by <*Low Temperature*> and <*High Temperature*>.
- 2: Report temperature alarm if the current temperature is outside the temperature range specified by <*Low Temperature*> and <*High Temperature*>.
- 3: Report temperature alarm only once if the current temperature is within or outside the temperature range specified by <*Low Temperature*> and <*High Temperature*>. In this mode, <*Send Interval*> will be ignored.

✧ <*Sensor ID*>: The ID of the temperature sensor. A total of four sensors are supported.

✧ <*Low Temperature*>: The lower temperature limit.

✧ <*High Temperature*>: The upper temperature limit.

✧ <*Valid Time*>: When the temperature sensor detects the environment temperature meets the alarm condition, it will continuously check the temperature based on the reading timer <*Temperature Timer*> set in the command **AT+GTACD**. If the temperature keeps meeting the alarm condition for <*Valid Time*> times, the temperature alarm will be triggered.

✧ <*Report Interval*>: After <*Valid Time*> checking, the device will report temperature alarm every <*ReportInterval*> times of temperature reading based on the reading timer of temperature sensor. If <*Report Interval*> is set to 0, temperature alarm will only be reported once.

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

➢ **+ACK:GTTMP,**

Example: **+ACK:GTTMP,C80303,135790246811220,,0,000C,20160329093254,11F0$**			
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' '-' '_' '?'	
Alarm ID	1	0-3	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.7. UART Data Transfer

The command **AT+GTUDT** is used to transfer data to the serial port. Data to the serial port is wrapped into the message **+RESP:GTUDT** and sent to the serial port.

➢ **AT+GTUDT=**

Example: **AT+GTUDT= gv75m,0,,0,0,,1,,00087FFF,,,,,, 0000$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1	0
3	Reserved	0		
4	IGN Send Interval	<=3	0|5-250	0
5	Enable IGF Sending	1	0|1	0
6	Reserved	0		
7	Event Mask	<=8	0-FFFFFFFF	1
8	Reserved	0		
11	Report Composition Mask	<=8	0-FFFFFFFF	00086FFF
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: Enable/disable data transfer to the serial port via the message **+RESP:GTUDT**.

- 0: Disable the data transfer.
- 1: Enable the data transfer.

✧ <*IGN Send Interval*>: The time interval for sending data via **+RESP:GTUDT** when the ignition is on. The value range is 0|5-250 and the unit is second. If it is set to 0, no data will be sent.

✧ <*Enable IGF Sending*>: Whether to send information via **+RESP:GTUDT** periodically when the ignition is off. If it is enabled, the device reports **+RESP:GTUDT** according to <*IGF Report Interval*> and <*Mode*> of **AT+GTFRI** in ignition off state. When tow alarm is triggered, the device will report **+RESP:GTUDT** according to <*Tow Interval*> of **AT+GTTOW**.

- 0: Disable the feature.
- 1: Enable the feature.

✧ <*Event Mask*>: Bitwise mask to configure the event which triggers the sending of **+RESP:GTUDT** to the serial port.

- Bit 0 for activated GEO
- Bit 1 for activated PEO

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- Bit 2-31 Reserved

✧ <*Report Composition Mask*>: Bitwise mask to configure which information should be sent to the serial port.

- Bit 0 for Protocol Version, Firmware Version
- Bit 1 for Hardware Version
- Bit 2 for Unique ID
- Bit 3 for Device Name
- Bit 4 for Speed
- Bit 5 for Azimuth
- Bit 6 for Altitude
- Bit 7 for MCC, MNC, LAC, Cell ID
- Bit 8 for Mileage
- Bit 9 for HMC
- Bit 10 for GSV
- Bit 11 for Circular GEO State
- Bit 12 Reserved
- Bit 13 for Digital Input, Motion Status
- Bit 14 for External Power VCC, Backup Battery Level, Charging
- Bit 15 for Circular GEO Status Mask
- Bit 16 for PEO State
- Bit 17 for PEO Status Mask
- Bit 18 Reserved
- Bit 19 for Send Time
- Bit 20-31 Reserved

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

➢ **+ACK:GTUDT,**

Example: **+ACK:GTUDT,C80303,135790246811220,,0004,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.6.8. Fuel Sensor Calibration Table

This command is used to set up the fuel sensor's calibration table.

➢ **AT+GTFSC=**

Example: **AT+GTFSC=gv75m,,0,21,1,,,3,16000,0,10000,50,250,100,,,,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 7	'0'～'9' 'a'～'z' 'A'～'Z'	gv75m
Reserved			
Table ID	1	0 – 4	1
Sensor Type	<= 1	2|4| 6|8	2
Enable	1	0|1	0
Max. Tank Volume	<= 5	0 –10000	100
Reserved			
Num of Node	<= 2	0|2 – 11	0
Node 1 Value	< = 5	0～99999	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	< = 5	0～99999	
Node N Percentage	<= 2	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000～FFFF	
Tail Character	1	$	$

✧ <*Table ID*>: The ID of the calibration table that is currently set up.

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- ✧ <*Sensor Type*>: The sensor type of the current table.
  - 0: Reserved
  - 1: Reserved
  - 2: DUT-E
  - 3: Reserved
  - 4: UFSxxx
  - 6: DUT-E SUM
  - 8: Escort Fuel
- ✧ <*Enable*>: Enable/disable this table. If this table is disabled, the calculation of fuel level will be linearized.
- ✧ <*Max. Tank Volume*>: The maximum volume of the tank. The unit is Liter.
- ✧ <*Num of Node*>: The number of nodes in the table.
- ✧ <*Node N Value*>: The value of this specific node.
- ✧ <*Node N Percentage*>: The corresponding percentage value of this node. This item must be in ascending order beginning with 0% and ending with 100%.

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

➢ **+ACK:GTFSC,**

Example: **+ACK:GTFSC,C80303,135790246811220,,0004,20160329093254,11F0$**			
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	$	$

3.2.6.9. Camera Support

3.2.6.9.1. Camera Setting Command

The **AT+GTCMS** command is used for setting camera parameters.

➢ **AT+GTCMS=**

Example: **AT+GTCMS=gv75m,0,3,5,150,2,1,0003,0,,2,1,1,20,,,,,FFFF$**

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Camera ID	1	0-3	
3	Number	<=2	1-10	1
4	Interval	<=2	1-60s	5
5	Photo Compression Ratio	<=3	20-250	150
6	Photo Resolution	1	1-3	2
7	Digital Input ID	1	0|1|6	0
8	Attribute Mask	<=4	0000 - FFFF	0x0003
11	Server Type	1	0|1	0
12	EHD Support	1	0|1	0
13	Output ID	1	0 – 2	0
14	Output Status	1	0 - 3	0
15	Duration	<=3	0 – 255(×100ms)	0
16	Toggle Times	<=3	0 – 255	0
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Number*>: The number of pictures taken in one continuous shooting.
- <*Interval*>: The interval between two pictures in one continuous shooting.
- <*Photo Compression Ratio*>: The compression ratio of the pictures. Picture quality is better with a smaller compression ratio.
- <*Photo Resolution*>: The resolution of the pictures.
  - 1: 160*120
  - 2: 320*240
  - 3: 640*480
- <*Digital Input ID*>: The input ID used to trigger photographing. The corresponding digital input port should be configured by the command **AT+GTIGM** if digital input ID is set to 6.
- <*Attribute Mask*>: The <*Attribute Mask*> in messages **+RESP:GTPHL** and **+RESP:GTPHD** in HEX format.

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Mask Bit	Item
Bit 15	Reserved
⋮	Reserved
Bit 2	Reserved
Bit 1	<*Camera ID*>
Bit 0	<*Photo Time*>

✧ <*Server Type*>: The server that pictures are transferred to.

- 0: Backend server
- 1: FTP server

✧ <*EHD Support*>: Whether to pack photo data via **+RESP:GTEHD** (instead of **+RESP:GTPHD**) in HEX format. **+RESP:GTEHD** in HEX format can support a larger picture size.

Note: A specified wave is output according to the output settings when the camera is photographing (or trying to photograph) and data is being transmitted between camera and the device.

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

➢ **+ACK:GTCMS,**

Example: **+ACK:GTCMS,C80303,862170019025640,,FFFF,20160518074736,003B$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.9.2. Take-Picture Command

AT+GTTAP is used for real-time photographing.

➢ **AT+GTTAP=**

Example:

AT+GTTAP=gv75m,0,,,1,,,,,FFFF$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Camera ID	1	0-3	0
3	Reserved	0		
4	Reserved	0		
5	Photo Resolution	1	1-3	1
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

Note: When **AT+GTTAP** is used to take pictures, the basic camera settings such as <*Photo Compression Ratio*>, <*Attribute Mask*>, <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*> are the same as those of **AT+GTCMS**.

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

- **+ACK:GTTAP,**

Example: **+ACK:GTTAP,C80303,862170019025640,,FFFF,20160518075847,0057$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.6.10. FTP Server Information

The command **AT+GTFTP** is used to configure the FTP server information as to where and how to upload pictures. When the device is configured correctly and the <*Server Type*> in the command **AT+GTCMS** is 1, pictures are able to be transferred to the FTP server.

➢ **AT+GTFTP =**

Example: **AT+GTFTP=gv75m,116.228.146.250,21,SW_RD/Projects/,,,1,,,,,,000B$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Server Address	<=60		
3	Server Port	<=5	0 – 65535	0
4	Full Name	<=60		
5	User Name	<=20		
6	Login Password	<=20		
7	Transfer Mode	1	0|1	0
8	Oper Type	1	0|1	0
9	Report FTP	1	0|1	0
10	File Name Prefix	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Server Address*>: The IP address or the domain name of the FTP server.
✧ <*Server Port*>: The server port of the FTP server.
✧ <*Full Name*>: The file path to save pictures. In the case of changing to another path from the previously set path, the parameter value should not be null.
✧ <*User Name*>: The user name to login to the FTP server.
✧ <*Login Password*>: The password to login to the FTP server.
✧ <*Transfer Mode*>: The mode of picture transfer.
- 0: Passive mode
- 1: Active mode

✧ <*Oper Type*>: The mode of picture transfer after transfer fails.
- 0: Continue to upload the failed picture.
- 1: Discard uploaded part and re-upload the failed pictures from beginning.

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- ✧ <*Report FTP*>: Enable/disable the **+RESP:GTFTP** report to the backend server after transferring a file.
  - 0: Disable the report.
  - 1: Enable the report.
- ✧ <*File Name Prefix*>: The file name prefix of picture. <*File Name Prefix*> can not be ".jpg" because the device uses it as the suffix of the <*File Name*> in the message **+RESP:GTFTP**.

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

➢ **+ACK:GTFTP,**

Example: **+ACK:GTFTP,C80303,135790246811220,,0003,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	14	MEID	
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	$	$

3.2.6.11. Output Expansion

The **AT+GTOEX** command is used to output wave shape 1 on EIO100 output. To use this function, please change <*Working Mode*> in **AT+GTURT** to 17 for EIO100 device.

➢ **AT+GTOEX=**

Example: **AT+GTOEX=gv75m,,,2,9,1,0,0,B,1,0,0,,,1,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Reserved	0		
3	Reserved	0		
4	Output Number	1	1 – 4	
5	Output ID	1	9 – C	
6	Status	1	0|1	0

7	Duration	1	0	0
8	Toggle Times	1	0	0
9	Reserved	0		
10	Reserved	0		
11	DOS Report	1	0 – F	
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Output Number*>: The total number of configured EIO100 outputs. In one output configuration, <*Output ID*>, <*Status*>, <*Duration*> and <*Toggle Times*> are included.
- <*Output ID*>: The ID of EIO100 output port. The range is 9–C (in HEX format).
- <*DOS Report*>: Whether or not to report **+RESP:GTDOS** when wave shape 1 status of EIO100 output changes. 1 means "Report **+RESP:GTDOS**", and 0 means "Do not report **+RESP:GTDOS**".
  - Bit 0: for EIO100 output 9 (not) to report **+RESP:GTDOS**
  - Bit 1: for EIO100 output A (not) to report **+RESP:GTDOS**
  - Bit 2: for EIO100 output B (not) to report **+RESP:GTDOS**
  - Bit 3: for EIO100 output C (not) to report **+RESP:GTDOS**

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

- **+ACK:GTOEX,**

Example: **+ACK:GTOEX,C80303,862170013988157,,FFFF,20160101000045,0008$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

3.2.6.12. Input Expansion

The command **AT+GTIEX** is used to configure the parameters of four EIO100 inputs. All these four inputs are customizable. If the logic status of one of EIO100 input ports changes, the device will report the message **+RESP:GTDIS** to the backend server. To use this function, please change <*Working Mode*> in **AT+GTURT** to 17 for EIO100 device.

➢ **AT+GTIEX=**

Example: **AT+GTIEX=gv75m,,,2,9,5,B,5,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Reserved	0		
3	Reserved	0		
4	Input Number	1	1 – 4	
5	Input ID	1	9 – C	
6	Sample Period	<=2	0|1 – 12(×4s)	0
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Input Number*>: The total number of configured EIO100 inputs. In one configuration, <*Input ID*> and <*Sample Period*> are included.

✧ <*Input ID*>: The ID of EIO100 input. The range is 9 – C (in HEX format).

✧ <*Sample Period*>: The sampling period of EIO100 input status.

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

➢ **+ACK:GTIEX,**

Example: **+ACK:GTIEX,C80303,862170013988157,,FFFF,20160101000127,0012$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.13. RF433 Accessory Setting

The command **AT+GTWRT** is used to configure the parameters of RF433 accessory devices.
Before this command is used, the <*Working Mode*> in the **AT+GTURT** command should be set to 22.

- **AT+GTWRT=**

Example: **AT+GTWRT=gv75m,1,0,2,1,4,5,,,,,0005$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300w
Accessory Type ID	1	0|1	1
Sample Interval	<=3	0|3 – 255(×10s)	0
Temperature Threshold	<=2	2 – 30(×1°C)	2
Humidity Threshold	<=3	1 – 100(×1%)	1
Pair Count	<=2	0 – 10	4
Pair Time	<= 2	1 – 30min	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Accessory Type ID* >: The sensor type ID in the command:
  - 0: Wireless temperature sensor ID(WTS100)
  - 1: Wireless temperature &humidity sensor ID(WTH100)

  <*Sample Interval*>: To set the sample interval. The range is 0|3-255 and the unit is 10s. If sample interval is set to 0, the sensors will collect the data every 5 minutes and the data will be reported only when:
  |Current temperature value - last reported temperature value| >=Temperature Threshold or
  |Current humidity value - last reported humidity value| >= Humidity Threshold
- <*Temperature Threshold*>: To set the temperature change threshold. Temperature threshold will be ignored if <*Sample Interval* > is not 0. The range is 2-30 and the unit is 1°C.
  Note:|Current temperature value - last reported temperature value| >=Temperature Threshold.
- <*Humidity Threshold*>: To set the humidity change threshold. Humidity threshold will be ignored if <*Sample Interval* > is not 0. The range is 1-100% and the unit is 1%.
  Note: |Current humidity value - last reported humidity value| >= Humidity Threshold. It is only used when <*Accessory Type ID*> is 1.
- <*Pair Count*>: The count of accessory. When the count of pairing reaches <*Pair Count*> the device will stop pairing.
- <*Pair Time*>: The time for pairing accessory when the time of pairing reaches <*Pair Time*> the device will stop pairing.

Note: All the parameters can be configured independently except for <*Pair Count*> and <*Pair Time*>.

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

- **+ACK:GTWRT,**

Example: **+ACK:GTWRT, C80303,135790246811220,,0005,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.7. Virtual Ignition Detection

3.2.7.1 Voltage Virtual Ignition Setting

The command **AT+GTVVS** is used to configure parameters for checking ignition state by voltage. It will work when hard-wired ignition line is not connected and Voltage Virtual Ignition mode is enabled by **AT+GTDIS** (<*Ignition Detection Mode*> is set to 2).

➢ **AT+GTVVS=**

Example: **AT+GTVVS=gv75m,13000,500,10,,,000B$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
Ignition On Voltage	<=5	250 – 28000 mV	13500
Voltage Offset	<=4	200 – 2000 mV	600
Debounce	<=3	5 – 255sec	10
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Ignition On Voltage*>: The external power voltage in ignition on state. Different vehicles have different voltages in ignition on state. This parameter should be set very close to the original external power, so that the device can detect ignition event more accurately.

✧ <*Voltage Offset*>: The offset from <*Ignition On Voltage*> used to determine ignition on or ignition off state. If the voltage of the external power is higher than <*Ignition On Voltage*> - <*Voltage Offset*> and is maintained for <*Debounce*> seconds, the device will consider it as virtual ignition on state. If the voltage of the external power is lower than <*Ignition On Voltage*> - <*Voltage Offset*> and is maintained for <*Debounce*> seconds, the device will consider it as virtual ignition off state.

Note: <*Ignition On Voltage*> and <*Voltage Offset*> values will be adjusted automatically according to measured external power voltage data if necessary to make the ignition judgement more precisely.

✧ <*Debounce*>: The debounce time before updating virtual ignition state according to the external power voltage. Unit: second.

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

➢ **+ACK:GTVVS,**

Example: **+ACK:GTVVS,C80303,864802030065720,,FFFF,20191028022258,000C$**

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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	$	$

3.2.7.2 Accelerometer (Motion status) Virtual Ignition Settings

The command **AT+GTAVS** is used to configure parameters for checking ignition states based on motion status. It will work when hard-wired ignition line is not connected and Accelerometer (Motion status) Virtual Ignition mode is enabled by **AT+GTDIS** (<*Ignition Detection Mode*> is set to 4).

➢ **AT+GTAVS=**

Example: **AT+GTAVS=gv75m,20,30,,,,000B$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
Sensor Rest Duration	<=3	1 – 255 sec	120
Sensor Motion Validity	<=3	1 – 255 sec	10
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Sensor Rest Duration*>: A time parameter to determine whether the device enters stationary state. The device will be considered in stationary state after the motion sensor detects stationary state and the stationary state is maintained for the period of time specified by the parameter <*Sensor Rest Duration*>.

✧ <*Sensor Motion Validity*>: A time parameter to determine whether the device enters moving

state. The device will be considered in moving state after the motion sensor detects movement and the moving state is maintained for the period of time specified by the parameter *<Sensor Motion Validity>*.

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

- **+ACK:GTAVS,**

Example: **+ACK:GTAVS,C80303,864802030065720,,FFFF,20191028022258,000D$**			
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	$	$

3.2.8. FOTA

3.2.8.1. Over-the-air Configuration Update

The **AT+GTUPC** command is used to set the parameters for over-the-air configuration update.

- **AT+GTUPC=**

Example: **AT+GTUPC=gv75m,0,10,0,0,168,http://www.queclink.com/configure.ini,0,,,,0001$**				
Sn	**Parameter**	**Length (Byte)**	**Range/Format**	**Default value**
1	Password	4~20	'0'-'9', 'a'-'z', 'A'-'Z'	gv75m
2	Max. Download Retry	1	0 – 3	0
3	Download Timeout	<=2	5 – 30 min	10
4	Download Protocol	1	0	0
5	Enable Report	1	0|1	0
6	Update Interval	<=4	0 – 8760 hour	0
7	Download URL	<=100	URL	
8	Mode	1	0|1	0
9	Reserved	0		
10	Extended Status Report	1	0|1	0
11	Identifier Number	8	00000000 – FFFFFFFF	0
12	Reserved	0		

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13	Update Status Mask	1	0 – F	3
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	$	$

- <*Password*>: The valid characters for the password include '0'-'9', 'a'-'z', and 'A'-'Z'. The default value is "gv75m".
- <*Max. Download Retry*>: It specifies the maximum number of times to retry to download the configuration file upon download failure.
- <*Download Timeout*>: It specifies the expiration timeout of one download. If the download expires, it is considered to be failure.
- <*Download Protocol*>: The protocol used to download the file. Only HTTP is supported now. It is set to 0.
- <*Enable Report*>: A numeral which indicates whether to report the message **+RESP:GTUPC** when the configuration is updated over the air.
  - 0: Do not report the message **+RESP:GTUPC.**
  - 1: Report the message **+RESP:GTUPC.**
- <*Update Interval*>: The time interval measured in hours for updating the configuration over the air.
- <*Download URL*>: It specifies the URL to download the configuration file. If the URL ends with "/", which means this is just a path without file name, the unit will add <imei>.ini as the default configuration file name at the end of the URL. If it is larger than 100 bytes in length, "error" will be returned.
- <*Mode*>: A numeral which indicates the working mode of downloading configuration over the air.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Identifier Number*>: A numeral to identify the update configuration request command. This will be included in the message **+RESP:GTEUC** to inform the request it is related to.
- <*Extended Status Report*>: A numeral to indicate the message to be reported for the configuration update status when <*Enable Report*> is 1.
  - 0: Report the message **+RESP:GTUPC.**
  - 1: Report the message **+RESP:GTEUC** to include more information.
- <*Update Status Mask*>: Bitwise mask to configure the status in which the device could update the configuration.
  - Bit 0 for <*ignition off*>.
  - Bit 1 for <*ignition on*>.

Note:

1. The maximum size of configuration file is 10240 bytes. If the file size exceeds the limit allowed, the device will fail to download the configuration file.
2. The length of one command should not exceed 320 bytes in the configuration file.
3. Make sure there is only one command per line in the configuration file.
4. There should be no space before each command.
5. It is not recommended to include the commands **AT+GTUPC** and **AT+GTUPD** in the

configuration file to be downloaded.
6. Please DO NOT execute the commands **AT+GTUPC** and **AT+GTUPD** at the same time.
7. Please DO NOT execute another command when the **AT+GTUPC** is being executed (i.e. during the period from sending **AT+GTUPC** command until the reporting of **+RESP:GTUPC** with result 301 or 302).
8. <*Download URL*> should be a full URL ending with configuration file name. If <*Download URL*> ends with "/", which means the URL is just a path without file name, the unit will add <imei>.ini as the file name to complete the URL. If the URL is larger than 100 bytes in length, "error" will be returned.

The acknowledgement message of the **AT+GTUPC** command:

- **+ACK:GTUPC,**

Example: **+ACK:GTUPC,C80303,135790246811220,,0005,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.8.2. UFSxxx FOTA Upgrade

The command **AT+GTUFS** is used to upgrade the UFSxxx fuel sensor firmware over the air.

- **AT+GTUFS=**

Example: **AT+GTUFS=gv75m,3,30,0,,,http://220.178.67.210:8208/gv75m/deltabin/csb_des_07_build1116.bin,,,,,0001$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
Retry Times	1	0 – 3	0
Timeout	2	1-30min	10
Protocol Type	1	0	0
Server User Name	<=6	'0-9', '_', 'a-z', 'A-Z'	
Server Password	<=6	'0-9', '_', 'a-z', 'A-Z'	
Server URL	<=100	Legal URL	0

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

- <*Retry Times*>: It specifies the maximum number of retries to download the update package upon download failure.
- <*Timeout*>: It specifies the expiration timeout of one download. If the download expires, it is considered to be failure.
- <*Protocol Type*>: The protocol used to download the package.
  - 0: HTTP. Only HTTP is supported now.
- <*Server User Name*>: If the file server uses authentication, the user name is specified here.
- <*Server Password*>: If the file server uses authentication, the password is specified here.
- <*Server URL*>: It specifies the URL to download the package.

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

➢ **+ACK:GTUFS,**

Example: **+ACK:GTUFS,C80303,135790246811220,,0018,20160329093254,11F0$**			
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. Serial Port Application

3.2.9.1. Real Time Operation

The command **AT+GTRTO** is used to retrieve information from the device or control the device when it executes certain actions.

➢ **AT+GTRTO=**

Example: **AT+GTRTO=gv75m,A,,,,,,0015$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Sub Command	<=2	0 – 12	
3	AT Command/ Configuration Mask/ CLASC Action/ATI Mask/Reset Level/ RF433 Accessory Working Mode	3|16	"SRI"| 0000000000000000 – FFFFFFFFFFFFFFFF | 0 - 2	
4	Output Direction	1	0|1|3	
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Sub Command*>: Valid values are 0 – 12.

- 0: ***GPS***. Get the GNSS related information via the message **+RESP:GTGPS**.
- 1: ***RTL***. Request the device to report its current position immediately via the message **+RESP:GTRTL**.
- 2: ***READ***. Get the current configuration of the device via the message **+RESP:GTALM**, **+RESP:GTALS** or **+RESP:GTALC**.
- 3: ***REBOOT***. Reboot the device.
- 4: ***RESET***. Reset all parameters to factory settings. Parameters configured by **AT+GTBSI**, **AT+GTSRI**, device password **(AT+GTCFG)**, **AT+GTTMA** and **AT+GTPIN** will not be reset.
- 5: ***PWROFF***. Power off the device.
- 6: ***CID***. Get the ICCID of the USIM card which is being used by the device via the message **+RESP:GTCID**.
- 7: ***CSQ***. Get the current network signal level of the device via the message **+RESP:GTCSQ**.
- 8: ***VER***. Get the version information of the device via the message **+RESP:GTVER**.
- 9: ***BAT***. Get the battery level and adapter status of the device via the message **+RESP:GTBAT**.
- A: ***IOS***. Get status of all the IO ports via the message **+RESP:GTIOS**.
- B: ***TMZ***. Get the time zone settings via the message **+RESP:GTTMZ**.
- C: ***GIR.*** Get cell information via report **+RESP:GTGSM**.
- D: ***AIF.*** Get APN, ICCID, RSSI, cell ID, IP, DNS server and network type via

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+RESP:GTAIF.

- E: ***GSV***. Request the device to report the GNSS fix level.
- F: ***Reserved***.
- 10: ***CAN***. Get CAN information via the message **+RESP:GTCAN**. The **+RESP:GTCAN** report is valid only when the <*Working Mode*> of **AT+GTURT** is 12.
- 11: **UVN**. Get the version number information of UFSxxx fuel sensor via the message **+RESP:GTUVN**. The **+RESP:GTUVN** report is valid only when the working mode of **AT+GTURT** is 4 and the <*Digital Fuel Sensor Type*> is 4.
- 12: ***CVN***. Get the version number information of CAN100 via the message **+RESP:GTCVN**. The **+RESP:GTCVN** report is valid only when the working mode of **AT+GTURT** is 12.
- 14: ***DELBUF***. Delete all the buffered reports.
- 15: ***CLASC***. It is used to read or clear calibration data (please refer to the **AT+GTASC** command and **+RESP:GTASC** report).
- *1C: **ATI***. Get basic device information via the message **+RESP:GTATI**.
- 27: ***RF433***. Set the working mode for the RF433 accessories.

✧ <***AT Command/Configuration Mask/ATI Mask/RF433 Accessory Working Mode/CLASC Action/Reset Level***>:

- AT Command: To get single AT command configuration when the <*Sub Command*> is set to 2, please follow the format in the following example. E.g. to get the configuration of **AT+GTFRI**, set AT+GTRTO=gv75m,2,FRI,,,,,0015$, and get it via **+RESP:GTALS**.
- Configuration Mask: If <*Sub Command*> is set to 0x1C, the basic information will be reported via the message **+RESP:GTATI** according to chosen <*ATI Mask*>. The Configuration Mask must be no less than 18 bytes; if it is less than 18 bytes, add '0' in the high bytes of the Configuration Mask.
- Configuration Mask: If <*Sub Command*> is set to 2, configuration information for a specific configuration mask can be obtained via the message **+RESP:GTALC** as the **+RESP:GTALM** consists of information of fixed combination of items and may not be compatible with those commands whose parameters are fully configured such as **AT+GTFSC** and **AT+GTRMD**. The Configuration Mask must be 18 bytes. If it is less than 18 bytes, please fill '0' at the high bytes of the Configuration Mask.

Configuration Mask Table:

Mask Bit	Item
Bit 69	WRT
⋮	Reserved
Bit 67	GDO
⋮	Reserved
Bit 65	TAP
⋮	Reserved

Bit 63	AVS
Bit 62	VVS
⋮	Reserved
Bit 60	GPJ
Bit 59	GAM
Bit 58	FMI
Bit 57	Reserved
Bit 56	UPC
Bit 55	IEX
Bit 54	OEX
Bit 53	Reserved
Bit 52	Reserved
Bit 51	SIM
Bit 50	UDF
Bit 49	CMD
Bit 48	Reserved
Bit 47	FTP
Bit 46	CAN
Bit 45	CMS
Bit 44	PEO
Bit 43	RMD
Bit 42	FSC
Bit 41	TMP
Bit 40	UDT
Bit 39	Reserved
Bit 38	UFS
Bit 37	SPA
Bit 36	BZA
Bit 35	ASC
Bit 34	IGM

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Bit 33	PDS
Bit 32	ACD
Bit 31	IDA
Bit 30	EFS
Bit 29	SSR
Bit 28	JBS
Bit 27	FFC
Bit 26	CRA
Bit 25	HRM
Bit 24	WLT
Bit 23	JDC
Bit 22	URT
Bit 21	HBM
Bit 20	HMC
Bit 19	IDL
Bit 18	Reserved
Bit 17	DOG
Bit 16	OWH
Bit 15	PIN
Bit 14	Reserved
Bit 13	SOS
Bit 12	SPD
Bit 11	GEO
Bit 10	FRI
Bit 9	TMA
Bit 8	IOB
Bit 7	OUT
Bit 6	DIS
Bit 5	EPS
Bit 4	TOW

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Bit 3	CFG
Bit 2	Reserved
Bit 1	SRI
Bit 0	BSI

Set the <*Sub Command*> to 4 to specify the configuration to be reset. To specify a configuration, use the last three letters of the protocol command. For example, to reset configuration of the **AT+GTFRI** command, send the command "**AT+GTRTO=gv75m,4,FRI,,,,,000F$**". Also, the buffered messages saved can be deleted with the command "**AT+GTRTO=gv75m,4,BUF,,,,,000F$**". Configurations of the commands **AT+GTBSI**, **AT+GTSRI**, **AT+GTQSS**, **AT+GTCFG**, **AT+GTTMA**, **AT+GTPIN,AT+GTTAP** and **AT+GTDAT** cannot be reset by this command.

- <*CLASC Action*>: If the sub command is 0x15, this parameter works as follows.

0: Read calibration data via the message **+RESP:GTASC**.

1: Clear calibration data.

- ATI Mask: If <*Sub Command*> is set to 1C, the basic information will be reported via the message **+RESP:GTATI** according to chosen <*ATI Mask*>.

ATI Mask Table:

Mask Bit	Item
Bit 0	Firmware Version
Bit 4	Reserved
Bit 7	Modem Firmware Version
Bit 12	Hardware Version
Bit 13	Modem Hardware Version
Bit 16	Bootloader Version
Other Bits	Reserved

- RF433 Accessory Working Mode: If the sub command is 0x27, this parameter will work as follows.

0: Start learn mode

1: Read the RF433 accessories which are paired.

2: Clear the current paired RF433 accessories list.

- <*Reset Level*>: If <Sub Command> is 0x04, this parameter works as follows.

0: Light Reset. Reset all configuration parameters, except Parameters configured by **AT+GTBSI**, **AT+GTSRI,** device password **(AT+GTCFG), AT+GTPIN** and **AT+GTTMA**.In addition,if ICCID is locked, **AT+GTGSIM** not reset.

1: Heavy Reset. Reset all configuration parameters, except **AT+GTPIN**.In addition,if ICCID is locked, **AT+GTGSIM** not reset.

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

- 0: The message will be output to the backend server.
- 1: The message will be output to the serial port. In this case, the **AT+GTURT** command should be used to set proper parameters for the second serial port first.
- 2: Reserved
- 3: If the command is received via SMS, the message will be output to the original SMS number; otherwise the message will be output to the backend server.

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

➢ **+ACK:GTRTO,**

Example: **+ACK:GTRTO,C80303,135790246811220,,IOS,0015,20160329093254,11F1$**			
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**.

3.2.9.2. Hour Meter Count

The command **AT+GTHMC** is used to measure the accumulated time of use with each actuation of ignition on. To use this command, the ignition signal must be connected to the device or enable virtual ignition detection. If the hour meter count function is enabled, <*Hour Meter Count*> will be included in the **+RESP:GTFRI**, **+RESP:GTIGN** or **+RESP:GTIGF** report message sent by the device.

➢ **AT+GTHMC=**

Example: **AT+GTHMC=gv75m,1,12345:12:34,,,,,,,,0018$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Enable Hour Meter	1	0|1	0
3	Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00

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

- <*Enable Hour Meter*>: Enable/disable the hour meter count function. If the hour meter counter function is enabled, hour meter count will be increased when the device detects the vehicle ignition is turned on.
  - 0: Disable hour meter count function.
  - 1: Enable hour meter count function.
- <*Initial Hour Meter Count*>: It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00. When the ignition is turned on for 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 the **AT+GTHMC** command:

- **+ACK:GTHMC,**

Example: **+ACK:GTHMC,C80303,135790246811220,,0018,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.9.3. White List

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

➢ **AT+GTWLT=**

Example: **AT+GTWLT=gv75m,1,1,2,13813888888,13913999999,,,,,0018$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Number Filter	1	0|1|4|5	1
3	Phone Number Start	1|2	1-10	1
4	Phone Number End	1|2	1-10	1
5	White Number List	<=20*10		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Number Filter*>: The working mode of the white list function.

- Bit 0: White list for <*Location Request Mask*>
- Bit 1: Reserved
- Bit 2: While list for SMS. <SMS Gateway>in AT+GTSRI will ignore the white list function.

For each bit, set it to 1 to enable the corresponding function, and 0 to disable the corresponding function. If all the bits are set to 0, it means "Disable this white list function and allow any phone number to use the location by request function".

✧ <*Start Index*>, <*End Index*>: The index range of the white list to which the phone numbers are to be updated. For example, if <*Start Index*> is set to 1 and <*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 parameters <*Start Index*> and <*End Index*> determine the total number of phone numbers that will be updated. If either one is empty, there will be no <*Phone Number List*> following the empty value.

✧ <*Phone Number List*>: A list of comma-separated phone numbers to be updated to the white list. The number of the phone numbers is determined by <*Start Index*> and <*End Index*>.

Note: If more phone numbers are needed, please adjust <*Start Index*> and <*End Index*> for appropriate setup. If some phone numbers in <*Phone Number List*> are empty, then the

corresponding phone number will be deleted. For example, to delete the 4th, 5th and 6th number of the <*Phone Number List*>, please set <*Start Index*> to 4 and set <*End Index*> to 6 and keep the three phone numbers of <*Phone Number List*> empty.

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

➢ **+ACK:GTWLT,**

Example: **+ACK:GTWLT,C80303,135790246811220,,0018,20160329093254,11F0$**			
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: Make sure the total size of the command is not greater than 160 bytes if it is sent via SMS.

3.2.9.4. CANBUS Device Configuration

AT+GTCAN is used to set the CANBUS configuration to report **+RESP:GTCAN** with CANBUS device information.

➢ **AT+GTCAN**

Example: **AT+GTCAN=gv75m,1,30,60,FFFFFFFF,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Mode	1	0|1	0
3	CAN Report Interval	<=5	0|5 – 86400sec	0
4	CAN Report Interval IGF	<=5	0|5 – 86400sec	0
5	CAN Report Mask	<=8	0 - FFFFFFFF	C00FFFFF
6	Additional Event	1	0|1	0
7	Reserved	0		

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

- <*Mode*>: The mode of CAN function.
  - 0: Disable CAN function.
  - 1: Enable CAN function.
- <*CAN Report Interval*>: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is on. Its value range is 0|5 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTCAN**".
- <*CAN Report Interval IGF*>: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is off. Its value range is 0|5 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTCAN** in ignition off state".
- <*Additional Event*>: Whether to trigger the sending of the **+RESP:GTCAN** report message by additional event.
  - 0: Ignore all additional events.
  - 1: By ignition on/off event.
- <*CAN Report Mask*>: Bitwise mask to configure the composition of a CAN report message.

Note:

Bit 31 <*Cell Information*> in <*CAN Report Mask*> control the composition of **+RESP:GTCAN**. The <*+CAN Mask*> in **AT+GTHRM** controls the report of cell information in **+RESP:GTCAN** in HEX format.

Bit 22 <*Total Distance Impulses*> in <*CAN Report Mask*> controls the composition of **+RESP:GTCAN** only in HEX format.

Mask Bit	Item	Description
Bit 31	<*Cell Information*>	Including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*Reserved*> parameter value "00"
Bit 30	<*GNSS Information*>	Including <*GNSS Accuracy*>, <*Speed*>, <*Azimuth*>, <*Altitude*>, <*Longitude*>, <*Latitude*>, and <*GNSS UTC Time*>
Bit 29	Reserved	
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	

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Bit 23	Reserved	
Bit 22	*<Total Distance Impulses>*	Vehicle total distance in impulses (if distance from dashboard is not available)
Bit 21	*<Total Vehicle Engine Overspeed Time>*	The total time when vehicle engine speed is greater than the limit defined in CAN100 configuration
Bit 20	*<Total Vehicle Overspeed Time>*	The total time when vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	*<Doors>*	An 8-bit hexadecimal number. Each bit contains information of one door.
Bit 18	*<Lights>*	An 8-bit hexadecimal number. Each bit contains information of one particular type of light.
Bit 17	*<Detailed Information/ Indicators>*	A hexadecimal number. Each bit contains information of one indicator.
Bit 16	*<Tachograph Information>*	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	*<Axle Weight 2nd>*	Weight of vehicle's second axle
Bit 14	*<Total Idle Fuel Used>*	Number of liters of fuel used since vehicle manufacture or device installation
Bit 13	*<Total Engine Idle Time>*	Time of engine running during idling status (vehicle at a standstill) since vehicle manufacture or device installation
Bit 12	*<Total Driving Time>*	Time of engine running during driving (non-zero speed) since vehicle manufacture or device installation
Bit 11	*<Total Engine Hours>*	Time of engine running since vehicle manufacture or device installation
Bit 10	*<Accelerator Pedal Pressure>*	Pressure applied onto accelerator pedal
Bit 9	*<Range>*	The number of kilometers to drive on remaining fuel
Bit 8	*<Fuel Level>*	The level of fuel in vehicle's tank (in Liters or Percentage)
Bit 7	*<Fuel Consumption>*	The fuel consumption
Bit 6	*<Engine Coolant Temperature>*	Engine coolant temperature
Bit 5	*<Engine RPM>*	Revolutions per minute of the engine

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Bit 4	*<Vehicle Speed>*	Vehicle road speed
Bit 3	*<Total Fuel Used>*	Number of liters of fuel used since vehicle manufacture or device installation
Bit 2	*<Total Distance>*	Vehicle total distance
Bit 1	*<Ignition Key>*	Ignition status
Bit 0	*<VIN>*	Vehicle identification number

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

➢ **+ACK:GTCAN,**

Example: **+ACK:GTCAN,C80303,135790246811220,,000D,20160329093254,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	$	$

3.2.9.5. Command String Storage

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

➢ **AT+GTCMD=**

Example: **AT+GTCMD=gv75m,1,1,AT+GTRTO=gv75m,0,,,,,,000B$,,,,,0005$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv75m
2	Mode	1	0-1	0
3	Stored Cmd ID	3	0 – 31	
4	Command String	200	AT command	
5	Reserved	0		

6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Serial Number	4	0000 – FFFF	
10	Tail Character	1	$	$

✧ <*Mode*>: A numeral to indicate whether to delete or to add the stored command string.
- 0: Delete the stored command.
- 1: Add the stored command.

✧ <*Stored Cmd ID*>: A numeral to identify the stored command.

✧ <*Command String*>: The whole content of the stored command.

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

➢ **+ACK:GTCMD,**

Example: **+ACK:GTCMD,C80303,135790246811220,,0005,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.9.6. User Defined Function

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

➢ **AT+GTUDF=**

Example: **AT+GTUDF=gv75m,1,1,FFFFFFFF,30,,,1F,1,,,,,0005$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv75m
2	Mode	1	0-2	0

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3	Group ID	<=2	0 – 31	
4	Input ID Mask	<=16	0-FFFFFFFFFFFFFFFF	
5	Debounce Time	<=5	0-86400(s)	0
6	Inzizo Mask	<=5	0-FFFFF	0
7	Outzizo Mask	<=5	0-FFFFF	0
8	Stocmd ID Mask	<=8	0-FFFFFFFF	
9	Stocmd Ack	1	0|1	0
10	Inpeo Mask	<=5	0-FFFFF	0
11	Outpeo Mask	<=5	0-FFFFF	0
12	Reserved			
13	Reserved			
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the user defined function.

- 0: Disable the group.
- 1: Enable the group.
- 2: Delete the group.

✧ <*Group ID*>: A numeral to identify the group of input events and stored commands to be executed.

✧ <*Input ID Mask*>: The bitwise mask to indicate the input events included in the group.

Bit 0 (00000001): Select ID1
Bit 1 (00000002): Select ID2
Bit 2 (00000004): Select ID3
Bit 3 (00000008): Select ID4
For example:
Bit (00000003): Select ID1, ID2
Bit (00000017): Select ID1, ID2, ID3, and ID5

ID	Mask Bit	Item
1	**Bit 0**	Power on finished
2	**Bit 1**	Ignition on
3	**Bit 2**	Ignition off
4	**Bit 3**	Data service is activated.
5	**Bit 4**	Data service is not activated.
6	**Bit 5**	Registered on network.
7	**Bit 6**	Not registered on network.
8	**Bit 7**	Network roaming
9	**Bit 8**	Network non-roaming

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10	**Bit 9**	SIM card is locked.
11	**Bit 10**	GNSS is turned on.
12	**Bit 11**	GNSS is turned off.
13	**Bit 12**	The device is stationary.
14	**Bit 13**	The device is moving.
15	**Bit 14**	External charge inserted
16	**Bit 15**	No external charge
17	**Bit 16**	The device is charging.
18	**Bit 17**	The device is not charging.
19	**Bit 18**	Digital input 6 is inactive
20	**Bit 19**	Digital input 6 is active
21	**Bit 20**	Digital input 1 is low.
22	**Bit 21**	Digital input 1 is high.
23	**Bit 22**	SIM card is inserted.
24	**Bit 23**	SIM card is not inserted.
25	**Bit 24**	Reserved
26	**Bit 25**	Reserved
27	**Bit 26**	Inside the speed range
28	**Bit 27**	Outside the speed range
29	**Bit 28**	Messages need to be sent
30	**Bit 29**	No messages need to be sent
31	**Bit 30**	Reserved
32	**Bit 31**	Reserved
33	**Bit 32**	Backup battery inserted
34	**Bit 33**	No Backup battery
35	**Bit 34**	No change of SIM card
36	**Bit 35**	SIM card change
37	**Bit 36**	Network jamming is detected
38	**Bit 37**	Network jamming is not detected
…	**…**	Reserved
50	**Bit 49**	GNSS fix is successful
51	**Bit50**	GNSS fix fails

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

✧ <*Inzizo Mask*>: The bitwise mask to indicate the input events within the GEO-fence.

ID	Mask Bit	Item
1	**Bit 0**	Inside the Geo 0
2	**Bit 1**	Inside the Geo 1
3	**Bit 2**	Inside the Geo 2
4	**Bit 3**	Inside the Geo 3
5	**Bit 4**	Inside the Geo 4

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6	**Bit 5**	Inside the Geo 5
7	**Bit 6**	Inside the Geo 6
8	**Bit 7**	Inside the Geo 7
9	**Bit 8**	Inside the Geo 8
10	**Bit 9**	Inside the Geo 9
11	**Bit 10**	Inside the Geo 10
12	**Bit 11**	Inside the Geo 11
13	**Bit 12**	Inside the Geo 12
14	**Bit 13**	Inside the Geo 13
15	**Bit 14**	Inside the Geo 14
16	**Bit 15**	Inside the Geo 15
17	**Bit 16**	Inside the Geo 16
18	**Bit 17**	Inside the Geo 17
19	**Bit 18**	Inside the Geo 18
20	**Bit 19**	Inside the Geo 19

✧ <*Outzizo Mask*>: The bitwise mask to indicate the input events outside the GEO-fence.

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

✧ <*Stocmd ID Mask*>: Bitwise mask of the stored commands which will be executed after the state of the group becomes TRUE (i.e. all the input events included in the group occur.).

✧ <*Stocmd Ack*>: A numeral to indicate whether to return an acknowledgement message after

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a stored command is executed.

- 0: Do not send an acknowledgement message after a stored command is executed.
- 1: Send an acknowledgement message after a stored command is executed.

✧ <*Inpeo Mask*>: Bitwise mask which indicates the input events within the polygon geo-fence.

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

✧ <*Outpeo Mask*>: Bitwise mask which indicates the input events outside the polygon geo-fence.

ID	Mask Bit	Item
1	**Bit 0**	Outside the Peo 0
2	**Bit 1**	Outside the Peo 1
3	**Bit 2**	Outside the Peo 2
4	**Bit 3**	Outside the Peo 3
5	**Bit 4**	Outside the Peo 4
6	**Bit 5**	Outside the Peo 5
7	**Bit 6**	Outside the Peo 6
8	**Bit 7**	Outside the Peo 7
9	**Bit 8**	Outside the Peo 8
10	**Bit 9**	Outside the Peo 9
11	**Bit 10**	Outside the Peo 10
12	**Bit 11**	Outside the Peo 11

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13	**Bit 12**	Outside the Peo 12
14	**Bit 13**	Outside the Peo 13
15	**Bit 14**	Outside the Peo 14
16	**Bit 15**	Outside the Peo 15
17	**Bit 16**	Outside the Peo 16
18	**Bit 17**	Outside the Peo 17
19	**Bit 18**	Outside the Peo 18
20	**Bit 19**	Outside the Peo 19

Note: The maximum number of stored commands to be executed in a group is five.

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

- **+ACK:GTUDF,**

Example: **+ACK:GTUDF,C80303,135790246811220,,0005,20160329093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.9.7. SMS Position Request

This command can only be sent via SMS, and configures the device to report an SMS message with a Google Maps hyperlink to the current position immediately. Please refer to the Chapter 3.3.7 for details of the position report.

Command format	**get position**
Example	get position

get position: It is a command string to request the current position.

3.2.9.8. GNSS-Assisted Motion Measurement

The command **AT+GTGAM** used to assist in motion judgment with GNSS if the sensor detects stationary status and the vehicle is ignition on.

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➢ **AT+GTGAM=**

Example: **AT+GTGAM=gv75m,1,1,10,10,10,5,,,,,0006$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: The working mode of the GNSS-assisted motion measurement function.
- 0: Disable this function.
- 1: Enable this function.

✧ <*Speed Mode*>: Enable/disable the use of GNSS speed to assist with motion measurement based on motion sensor state.
- 0: Disable this feature.
- 1: Enable this feature.

✧ <*Motion Speed Threshold*>: The speed threshold which is combined with GNSS speed to measure the status of movement.

✧ <*Motion Cumulative Time*>: If the average speed is higher than <*Motion Speed Threshold*> for <*Motion Cumulative Time*>, the device is considered in moving state.

✧ <*Motionless Cumulative Time*>: If the average speed is lower than <*Motion Speed Threshold*> for <*Motionless Statistical Time*>, the device is considered in stationary state.

✧ <*GNSS Fix Failure Timeout*>: If the time of GNSS fix failure is more than <*GNSS Fix Failure Timeout*>, the device will update motion status by motion sensor again.

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

➢ **+ACK:GTGAM,**

Example:

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+ACK:GTGAM,C80303,135790246811220,,1,0006,20090214093254,11F0$			
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	$	$

3.3. Report

This section defines the formats of the report messages. Due to the size limit of an 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 GNSS position information in the case of SMS transmission. Otherwise the report will be truncated to fit the length of an 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:GTDIS**,

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

- **+RESP:GTIOB**,

If the IO binding is configured and the corresponding condition is met, the device will report the message **+RESP:GTIOB** to the backend server.

- **+RESP:GTSPD**,

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

- **+RESP:GTSOS**,

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

- **+RESP:GTRTL**,

After the device receives the command **AT+GTRTO**, it will start GNSS 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**,

The location message for ignition on and ignition off.

- **+RESP:GTVGL,**

The location message for virtual ignition on and ignition off.

- **+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,C80303,865284040842605,,,00,1,2,20.1,0,123.0,114.015236,22.537137,20220118060909,0460,0000,2493,1465,00,0.0,20220118060909,2519$

+RESP:GTDIS,C80303,865284040840609,,,10,1,3,0.0,0,144.6,114.015481,22.537475,20220119021031,0460,0000,27BD,0DFC,00,0.0,20220119021031,002F$

+RESP:GTIOB,C80303,865284040840609,,,01,1,1,0.0,0,144.6,114.015481,22.537475,20220119021111,0460,0000,27BD,0DFC,00,0.0,20220119021110,0034$

+RESP:GTSPD,C80303,865284040840609,,,00,1,1,0.0,197,105.3,114.015309,22.537264,20220119021501,0460,0000,27BD,0DFC,00,0.0,20220119021500,0042$

+RESP:GTSOS,C80303,865284040840609,,,10,1,1,0.0,0,144.6,114.015481,22.537475,20220119021237,0460,0000,27BD,0DFC,00,0.0,20220119021236,0037$

+RESP:GTRTL,C80303,865284040840609,,,00,1,1,0.0,0,105.3,114.015309,22.537264,20220119021521,0460,0000,27BD,0DFC,00,0.0,20220119021521,0045$

+RESP:GTDOG,C80303,865284040840609,,,13,1,1,0.0,0,105.3,114.015309,22.537264,20220119021554,0460,0000,27BD,0DFC,00,0.0,20220119021553,004C$

+RESP:GTIGL,C80303,865284040840609,,,00,1,2,0.0,0,340.4,114.016647,22.538554,20220119021631,0000,0000,0000,0000,00,0.0,20220119021630,0053$

+RESP:GTVGL,C80303,865284040840609,,,20,1,1,0.0,0,137.4,114.015570,22.537481,20220119021959,0460,0000,27BD,0DFC,00,0.0,20220119021959,006F$** **+RESP:GTHBM,C80303,865284040842605,,,11,1,1,12.0,330,72.8,114.015128,22.537086,20210302121850,0460,0000,27BD,0DFC,00,0.0,20210302121850,0614$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID/Report Type	2	X(0-F)X(0-5)	
Number	1	0 – 1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report ID/Report Type*>: It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second

byte (4 lower bits of the hexadecimal value) indicates Report Type.

Report ID has different meanings in different messages as follows.

- The ID of the digital input port which triggers the report messages **+RESP:GTDIS** and **+RESP:GTSOS**. The range is 1, 6 and 9 – C.
- The ID of the bound IO which triggers the report message **+RESP:GTIOB**. The range is 0 – 3.
- The ID of the digital input port which triggers the reboot message **+RESP:GTDOG**. The valid value is 1.
- The speed level at which the harsh behavior is detected in report **+RESP:GTHBM**. 3 is high speed, 2 is medium speed and 1 is low speed. If mode 2 is selected, the value is always 0, indicating unknown speed. For the rest of the reports, it will always be 0.
- The value of <*Ignition Detection Mode*>, which indicates the trigger of the message **+RESP:GTVGL**. The value range is 0 – 4.

Report type has different meanings in different messages below.

- In the **+RESP:GTDIS** report message generated by the digital input

0: The current logic status of the input port is “Disable status”.

1: The current logic status of the input is “Enable status”.

- In the **+RESP:GTIOB** report message generated by bound IO

0: The current logic status of the bound IO does not meet the alarm condition.

1: The current logic status of the bound IO meets the alarm condition.

- In the speed alarm message **+RESP:GTSPD**

0: Outside the predefined speed range

1: Inside the predefined speed range

- In the protocol watchdog reboot message **+RESP:GTDOG**

1: Reboot message for time based working mode

2: Reboot message for ignition on working mode

3: Message for input triggered reboot

- In the ignition on and ignition off message **+RESP:GTIGL** and **+RESP:GTVGL**

0: The engine is ignition on.

1: The engine is ignition off.

- In the harsh behavior monitoring message **+RESP:GTHBM**

0: Harsh braking behavior

1: Harsh acceleration behavior

2: Harsh cornering behavior

3: Harsh braking and cornering behavior

4: Harsh acceleration and cornering behavior

For other messages, it will always be 0.

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

✧ <*GNSS Accuracy*>: A numeral to indicate the GNSS fix status and HDOP of the GNSS position. 0 means the current GNSS fix fails and the last known GNSS position is used. A non-zero value (1 – 50) means the current GNSS fix is successful and represents the HDOP of the current GNSS position.

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- <*Speed*>: The current speed. Unit: km/h.
- <*Azimuth*>: The azimuth information of the GNSS fix.
- <*Altitude*>: The height above the sea level.
- <*Longitude*>: The longitude of the current position.
- <*Latitude*>: The latitude of the current position.
- <*GNSS UTC Time*>: The UTC time read from the GNSS 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 **+RESP:GTFRI** message to the backend server according to the working mode.

Example: **+RESP:GTFRI,C80303,865284040842605,gv75m,,10,1,1,0.0,184,199.6,114.015436,22.537862,20210224073205,0460,0000,2493,1767,00,0.0,,,,40,0000110000,,,,20210224073205,0894$**			
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' '-' '_'	
External Power VCC	<=5	0 – 32000 mV	
Report ID/Report Type	2	X(1-5)X(0-6)	
Number	<=2	0 – 1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	

LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
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	<=10	000000-0F0F424203	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*External Power VCC*>: The voltage of the external power supply. If the command **AT+GTEPS** is configured for the device to report the external power supply voltage periodically with fixed information report, the device will send the current voltage along with **+RESP:GTFRI** message to the backend server. If the command is not configured as such, this field will be empty.

✧ <*Report ID/Report Type*>: It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

Report ID has five meanings below.

- 1: Fixed time report
- 2: Fixed distance report
- 3: Fixed mileage report
- 4: Fixed time and mileage report
- 5: Fixed time or mileage report

Report type has seven meanings below.

- 0: Normal fixed report
- 1: Corner report which indicates that the device just turns around a corner
- 2: Change of FRI report frequency which indicates that the device enters into Geo-Fence status or roaming status
- 3: Corner report when fixed report frequency changes
- 4: Mileage report when fixed report is Mode 5

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- 5: Reserved
- 6: Mileage report when fixed report is mode 5 and **AT+GTFFC** works.

✧ <*Number*>: The number of the GNSS position(s) included in the report message. In the message **+RESP:GTFRI**, it is always 1.

✧ <*Hour Meter Count*>: If the hour meter count function is enabled by the command **AT+GTHMC**, total hours the meter has counted when the engine is on will be reported in this field. It is formatted with 5 hour digits, 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 status of the device. From left to right, the first two characters indicate EIO100 input status, the second two characters indicate EIO100 output status, the third two characters indicate the current motion status of the device, the fourth two characters indicate the status of input ports, and the last two characters indicate the status of output ports.

The current motion status of the device:

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

Regarding digital IO status and EIO100 IO status, for each bit, 0 means “Disable status”, and 1 means “Enable status”. If EIO100 device is not connected or the mode of **AT+GTURT** is not 17 (for EIO100), the optional Bits will not be included.

Mask Bit	**Item**
Bit 39 (Optional)	Reserved
…(Optional)	Reserved
Bit 35 (Optional)	EIO100 input C
Bit 34 (Optional)	EIO100 input B
Bit 33 (Optional)	EIO100 input A
Bit 32 (Optional)	EIO100 input 9
…(Optional)	Reserved
Bit 27 (Optional)	EIO100 output C
Bit 26 (Optional)	EIO100 output B
Bit 25 (Optional)	EIO100 output A
Bit 24 (Optional)	EIO100 output 9
Bit 16-23	Motion status of device

…	Reserved
Bit 14	Digital input 6
…	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Digital input 1
Bit 8	Ignition detection
…	Reserved
Bit 3	Reserved
Bit 2	Reserved
Bit 1	Digital output 2
Bit 0	Digital output 1

➢ **+RESP:GTERI,**

If the **+RESP:GTERI** report is enabled, the device will send the **+RESP:GTERI** message to the backend server instead of **+RESP:GTFRI**.

Example:

/*1-wire bus connected with no device*/

+RESP:GTERI,C80303,865284040842605,,00000002,,10,1,1,0.0,0,123.0,114.015357,22.537170,20220118062427,0460,0000,2493,1490,00,0.0,,,,0,110002,2,0,20220118062427,251D$

/*1-wire bus connected with only one device*/

+RESP:GTERI,C80303,865284040842605,,00000002,,10,1,1,0.0,0,123.0,114.015357,22.537170,20220118062637,0460,0000,2493,1490,00,0.0,,,,0,110002,2,1,FD0000034129ED28,2,01A2,20220118062637,2523$

/*1-wire bus connected with two devices*/

+RESP:GTERI,C80303,865284040842605,gv75m,00000002,,10,1,1,0.0,0,127.3,114.015383,22.537177,20220118063107,0460,0000,2493,1490,00,0.0,,,,0,110002,2,3C00000340FD1128,2,019E,FD0000034129ED28,2,01AC,20220118063107,2527$

/*Digital fuel sensor*/

+RESP:GTERI,C80303,865284040842605,gv75m,00000001,,10,1,3,0.0,0,109.3,114.015222,22.537112,20220120022818,0460,0000,2493,1490,00,0.0,,,,100,110002,0,,20220120022817,2D9A$

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' '-' '_'	
ERI Mask	8	00000000 – FFFFFFFF	
External Power Supply	<=5	0 – 32000 mV	

Report ID/Report Type		2	X(1-5)X(0-6)	
Number		1	0 – 1	
GNSS Accuracy		<=2	0|1 – 50	
Speed		<=5	0.0 – 999.9 km/h	
Azimuth		<=3	0 – 359	
Altitude		<=8	(–)xxxxx.x m	
Longitude		<=11	-180 - 180	
Latitude		<=10	-90 - 90	
GNSS UTC Time		14	YYYYMMDDHHMMSS	
MCC		4	0XXX	
MNC		4	0XXX	
LAC		4	XXXX	
Cell ID		<=8	XXXX	
Reserved		2	00	
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		<=10	000000-0F0F424203	
UART Device Type		1	0|1|2|5|7	
Digital Fuel Sensor Data (Optional)	Digital Fuel Sensor Data	<=20		
AC100 Data (Optional)	AC100 Device Number	<= 2	0 - 8	
	1-wire Device ID	<=16		
	1-wire Device Type	1	1	
	1-wire Device Data	<= 4		
CAN Data (Optional)	CAN Data	<=1000		

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Fuel Sensor Data (Optional)	Sensor Number	<=2	0 – 99	
	Sensor Type	<= 2	2|4|6	
	Reserved	0		
	Percentage (Optional)	<= 3	0 –100	
	Volume (Optional)	<= 5	0 –10000	
Satellite Data (Optional)	SV Count	2	0-32	
	SV ID	2	> =0	
	SV Power	2	> =0	
	…			
	SV ID	2	> =0	
	SV Power	2	> =0	
RF433 Accessory Data (Optional)	Accessory number	<=2	0 – 10	
	Accessory Serial Number	5	00001 – FFFFE	
	Accessory Type	1	1|2	
	Temperature	<=3	-20 – 60(×1°C)	
	Humidity(Optional)	<=3	0 – 100(×1%)	
RAT and Band Data (Optional)	RAT	<=2	0|1|3|4	
	Band	<=4	0-39|850|900|1800|1900	
Send Time		14	YYYYMMDDHHMMSS	
Count Number		4	0000 – FFFF	
Tail Character		1	$	$

✧ *<UART Device Type>*: The type of the device connected to the serial port.

- 0: No device connected
- 1: Digital fuel sensor
- 2: AC100 1-wire bus
- 5: CANBUS device
- 7: RF433 accessory

✧ *<AC100 Device Number>*: The number of 1-wire devices connected to AC100. If it is 0, the fields *<1-wire Device ID>*, *<1-wire Device Type>*, and *<1-wire Device Data>* will not be displayed. If there are more than one 1-wire devices connected, the fields *<1-wire Device ID>*, *<1-wire Device Type>*, and *<1-wire Device Data>* will repeat to show the information for

each 1-wire device connected. If Bit 1 of <*ERI Mask*> in **AT+GTFRI** is enabled, the <*AC100 Data*> related information will be displayed; otherwise, the <*AC100 Data*> related information will not be displayed.

- <*1-wire Device ID*>: The 1-wire device ID read from the device.
- <*1-wire Device Type*>: The type of the 1-wire device.
  - 1: Temperature sensor
- <*1-wire Device Data*>: It indicates the data read from the 1-wire devices. If the device is a temperature sensor, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix A). To get the real temperature in degrees Celsius, please convert the data to a decimal value according to the calculation in Appendix A first and then multiply the decimal value by 0.0625.
- <CAN Data>: If Bit 2 of <ERI Mask> in **AT+GTFRI** is set to 1, the data got from CAN device will be displayed.
- <Digital Fuel Sensor Data>: The raw data read from the digital fuel sensor. If Bit 0 of <ERI Mask> in **AT+GTFRI** is enabled, this field will be displayed; otherwise, this field will not be displayed.
- <*SV Count*>: The number of satellites the device finds.
- <*SV ID*>: Satellite ID. If there is no satellite, the field will be omitted.
- <*SV Power*>: Satellite power. If there is no satellite, the field will be omitted.
- <*Accessory Number*>: Number of RF433 accessories which are paired.
- < *Accessory Serial Number*>: WPB100, wTS100 or WTH100 serial number.
- < *Accessory Type*>: The sensor type in the message:
  - 1: Wireless temperature sensor (WTS100)
  - 2: Wireless temperature &humidity sensor (WTH100)
- <*Temperature*>: The real time temperature detected by the sensor.
- <*Humidity*>: The real time humidity detected by the sensor. If <*Accessory Type*> is 2, <*Humidity*> will be present.
- <*RAT*>: Radio Access Technology.
  - 0: Invalid RAT
  - 1: 2G
  - 3: LTE CAT-M1
  - 4: LTE NBIOT
- < *Band*>: 0 mean invalid band, 1-39 means band number and others mean GSM number.

Note: The items denoted with "Optional" are controlled by the parameter <*ERI Mask*>.

➢ **+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,C80303,865284040840609,,10632,1,1,1,0.0,0,109.3,114.015461,22.537331,2022

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0119022455,0460,0000,27BD,0DFC,00,0.0,20220119022455,008D$			
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' '-' '_'	
External Power	<=5	0 – 32000 mV	
Report Type	1	X(0-1)	
Number	<=2	0 – 1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*External Power*>: The value of the external power supply voltage. When the voltage of the external power supply meets the alarm condition as set by the command **AT+GTEPS**, the device will send the current external power supply voltage with the **+RESP:GTEPS** message to the backend server.
- <*Report Type*>: A numeral to indicate the type of the report.
  - 0: Outside the predefined range
  - 1: Inside the predefined range

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✧ <*Number*>: The number of the GNSS position(s) included in the report message. Generally, it is 1.

➢ **+RESP:GTLBC,**

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

Example: **+RESP:GTLBC,C80303,865284040842605,,13800000000,3,0.0,0,109.3,114.015222,22.537112,20220120022952,0460,0000,2493,1490,00,20220120022952,2D13$**			
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' '-' '_'	
Call Number	<=20	phone number	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
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:GTIDA,**

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According to the <*Mode*> of the command **AT+GTIDA**, the report mode for **+RESP:GTIDA** varies. If the <*Mode*> is set to 1 or 2, **+RESP:GTIDA** will be reported according to the configuration of the <*Report Mode*>. If the <*Mode*> is set to 0, **+RESP:GTIDA** will always be reported and the status of ID authorization will not be checked.

Example:
+RESP:GTIDA,C80303,865284040840609,,,AD8D1B7B,1,1,3,0.0,0,196.2,114.016584,22.537741,20220119023754,0460,0000,2493,17FD,00,0.0,,,,,20220119023753,00B5$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
ID	<=20	'0' – '9' 'A' – 'F'	
ID Report Type	1	0|1|2	
Number	1	0 – 1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Reserved			
Reserved			
Reserved			
Reserved			

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

- ✧ <*ID*>: The ID which is read currently.
- ✧ <*ID Report Type*>: A numeral to indicate the type of reported ID.
  - 0: The ID is unauthorized or IDA function is disabled.
  - 1: The ID is authorized.
  - 2: The ID has logged out.

➢ **+RESP:GTGES,**

The device reports **+RESP:GTGES** according to <*Trigger Mode*> and <*Trigger Report*> in **AT+GTGEO** after the ignition is turned off.

Example:
+RESP:GTGES,C80303,865284040840609,,,01,21,50,5,1,1,0.0,0,196.2,114.016584,22.537741,20220119024004,0460,0000,2493,17FD,00,0.0,20220119024004,00CB$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID/Report Type	<=3	X(0-13)X(0-1)	
Trigger Mode	<=3	0|21|22	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Number	<=2	0 – 15	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	

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MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report ID/Report Type*>: It is a hexadecimal value represented by three ASCII bytes. The first two bytes indicates Report ID and the last byte indicates Report Type.
The meaning of this parameter is described as follows.

- Report ID: The ID of Geo Fence in HEX format. The range is 0 to 19.
- Report Type: 0 means "The current Parking-Fence is inactive", and 1 means "The current Parking-Fence is active".

➢ **+RESP:GTGIN**,

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

➢ **+RESP:GTGOT**,

If Polygon Geo-Fence is configured and triggered, the device will send the message **+RESP:GTGOT** to the backend server according to settings when the device leaves the Polygon Geo-Fence.

Example:
+RESP:GTGIN,C80303,865284040840609,,,,1,00000001,,,,,1,1,0.0,0,143.1,114.015519,22.537137,20220119024354,0460,0000,27BD,134D,00,0.0,20220119024354,00F1$
+RESP:GTGOT,C80303,865284040840609,,,,1,00000001,,,,,1,1,0.0,0,111.0,114.015469,22.537205,20220119024209,0460,0000,27BD,134D,00,0.0,20220119024208,00E8$

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

Area Type	1	0|1	
Area Mask	8	00000000-000FFFFF	
Reserved			
Reserved			
Reserved			
Reserved			
Number	1	0 – 1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Checksum	2	0000 – FFFF	
Tail Character	1	$	$

- <*Area Type*>: This message is for polygon or circular area. 0 means “Polygon”, 1 means “Circular”.
- <*Area Mask*>: The bitwise mask for trigger condition composition of the corresponding GEO ID. Each bit, from bit 0 to bit 19, represents the logical state of the corresponding GEO ID to trigger the entering or exiting event. 1 means that the event of the GEO ID set has been triggered and 0 means has not.

  For example, if the Area Mask is 03, it means entering or exiting events of GEO-ID0 and GEO-ID1 occur at the same time

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3.3.2. Device Information Report

If the device information report **+RESP:GTINF** is enabled by <*Enable Info Report*> in the command **AT+GTCFG**, the device will send the device information via the message **+RESP:GTINF** to the backend server periodically.

➢ **+RESP:GTINF,**

Example:
+RESP:GTINF,C80303,865284040842605,GV75M,1A,898604641919C0779899,16,0,1,,0001,4.16,0,0,1,,20210302094833,,,,0000,0000,+0000,0,0,20210302094833,0D14$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
2	Unique ID	15	IMEI	
3	Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
4	Motion Status	2	11|12|21|22|41|42|1A|16	
5	ICCID	20		
6	CSQ RSSI	<=2	0 – 31|99	
7	CSQ BER	<=2	0 – 7|99	
8	External Power Supply	1	0|1	
9	External Power VCC	<=5	0 – 32000mV	
10	INF Expand Mask	4	0000 – FFFF	
11	Backup Battery VCC	<=4	0.00 – 4.50 V	
12	Charging	1	0|1	
13	LED On	1	0|1	
14	Power Saving Mode	1	0 - 2	
15	Reserved	1		
16	Last Fix UTC Time	14	YYYYMMDDHHMMSS	
17	Reserved	1		
18	Reserved	1		
19	Reserved	1		
20	Digital Input	4	0000 – 0F42	
21	Digital Output	4	0000 – 0F03	
22	Time Zone Offset	5	±HHMM	

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23	Daylight Saving		1	0|1	
AC100 Data (Reserved)		AC100 Device Number	<=2	0-19	
		1-wire Device ID	16		
		1-wire Device Type	2		
		1-wire Device Data	<=40		
	Send Time		14	YYYYMMDDHHMMSS	
	Count Number		4	0000 – FFFF	
	Tail Character		1	$	$

- <*Motion Status*>: The motion status of the device.
  - 16 (Tow): The device attached vehicle is ignition off and it is towed.
  - 1A (Fake Tow): The device attached vehicle is ignition off and it might be towed.
  - 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
  - 12 (Ignition Off Motion): The device attached vehicle is ignition off and it is moving before it is considered to be towed.
  - 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
  - 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
  - 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
  - 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.
- <*ICCID*>: The ICCID of the USIM 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 signal. The range is 0-7, and 99 is for unknown strength of signal.
- <*External Power Supply*>: Whether the external power supply is connected or not.
  - 0: Not connected
  - 1: Connected

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- <*External Power Supply VCC*>: The voltage of the external power supply.
- <*INF Expand Mask*>: Bitwise mask to configure the composition of expanded information in **+RESP:GTINF**.
  - Bit 0 for <*AC100 Data*>
  - Bit 1 – 15 Reserved
- <*Backup Battery VCC*>: The voltage of the backup battery. The value of this field is only valid when the external power is not connected.
- <*Charging*>: Whether the backup battery is charging when the main power supply is connected.
  - 0: Not charging
  - 1: Charging
- <*Last Fix UTC Time*>: The UTC time of the latest successful GNSS fix.
- <*Digital Input*>: A bitwise hex integer to represent the logic status of the digital input. For each bit, 0 means "Disable status", and 1 means "Enable status". If EIO100 device is not connected or the mode of **AT+GTURT** is not 17 (for EIO100), the optional Bits will not be included.

Mask Bit	**Item**
Bit 15 (Optional)	Reserved
…(Optional)	Reserved
Bit 11 (Optional)	EIO100 input C
Bit 10 (Optional)	EIO100 input B
Bit 9 (Optional)	EIO100 input A
Bit 8 (Optional)	EIO100 input 9
…	Reserved
Bit 6	Digital input 6
…	Reserved
Bit 3	Reserved
Bit 2	Reserved
Bit 1	Digital input 1
Bit 0	Ignition detection

- <*Digital Output*>: A bitwise hex integer to represent the logic status of the digital output. For each bit, 0 means "Disable status", and 1 means "Enable status". If EIO100 device is not connected or the mode of **AT+GTURT** is not 17 (for EIO100), the optional Bits will not be included.

Mask Bit	**Item**
Bit 15 (Optional)	Reserved
…(Optional)	Reserved
Bit 11 (Optional)	EIO100 output C
Bit 10 (Optional)	EIO100 output B
Bit 9 (Optional)	EIO100 output A
Bit 8 (Optional)	EIO100 output 9
…	Reserved
Bit 2	Reserved

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Bit 1	Digital output 2
Bit 0	Digital output 1

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

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

- 0: Daylight saving is disabled.
- 1: Daylight saving is enabled.

Note: If <INF Expand Mask>is 0000, <AC100 Data (Reserved)> will be a reserved field.

3.3.3. Report for Real Time Querying

3.3.3.1. +RESP:GTGPS

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

➢ **+RESP:GTGPS,**

Example: **+RESP:GTGPS,C80303,865284040842605,GV75M,1,,,007F,,,20210302094834,20210302095122,0D17$**			
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' '-' '_'	
Power Saving Mode	1	0 - 2	
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*>: Please refer to <*Report Composition Mask*> of the **AT+GTCFG** command.

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3.3.3.2. +RESP:GTALM

After the device receives the command **AT+GTRTO** to read all the configurations, it will send all configurations to the backend server via the message **+RESP:GTALM**. This message is only sent via TCP/UDP even if the report mode is forced SMS mode. The **+RESP:GTALM** does not support HEX report.

- **+RESP:GTALM,**

Example:

+RESP:GTALM,C80303,865284040842605,gv75m,22,1,BSI,4gnet,,,,,,01,2,0,,,,,SRI,3,,1,218.17.46.11,932,218.17.46.11,0,15728282634,5,0,0,0,,,CFG,,gv75m,0,0.0,,,7F,0,0,3FFF,,1,0,300,10,,0,0,1F,0,0,,,,,,,0,0,0,,TOW,1,5,1,300,0,0,0,0,1,3,3,600,,,,,,,,EPS,0,250,450,,0,0,0,0,0,0,0,0,,DIS,0,,5,0,1,,1,3,1,,,,,,,,,,,,OUT,0,,0,,,,,IOB,0,0,0,0,0,0,0,0,,,,,1,0,0,0,0,0,0,0,,,,,2,0,0,0,0,0,0,0,,,,,3,0,0,0,0,0,0,0,,,,TMA,+,0,0,0,,,,,,FRI,1,0,,0,0000,0000,,300,1000,1000,,0,300,00000000,,,,20220225090114,3855$

+RESP:GTALM,C80303,865284040842605,gv75m,22,2,GEO,0,1,114.016527,22.538144,500,5,0,0,0,0,0,0,0,,1,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,2,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,3,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,4,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,5,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,6,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,7,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,8,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,9,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,10,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,11,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,12,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,13,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,14,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,15,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,16,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,17,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,18,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,19,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,20220225090114,3856$

+RESP:GTALM,C80303,865284040842605,gv75m,22,3,SPD,1,20,60,6,30,0,0,0,0,,,,,,,,,,SOS,2,1,,0,0,0,0,,,,PIN,0,,,,,,OWH,0,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,DOG,1,60,6,0201,,1,0,,,,20220225090114,3857$

+RESP:GTALM,C80303,865284040842605,gv75m,22,4,IDL,0,2,1,,,,,0,0,0,0,0,,,,HMC,0,00000:00:01,,,,,,,,HBM,0,,,100,0,0,,60,0,0,,,0,0,,0,0,0,0,0,30,50,20,65,URT,3,12,8,1,0,0,,4,00,JDC,0,2,,0,0,,,,,0,0,0,0,,WLT,0,,,,,,,,,,,,,,HRM,,,7F,04FE1FFF,04FE1FFF,7F7F,FF,7F,007D,00000000,,CRA,0,7,1,10,10,10,10,0,0,0,0,,FFC,0,0,0,30,500,500,300,,,,,1,0,0,30,500,500,300,,,,,2,0,0,30,500,500,300,,,,,3,0,0,30,500,500,300,,,,,4,0,0,30,500,500,300,,,,,JBS,0,,10,10,1800,1,30,0,0,5,1,,,,SSR,0,2,1,5,0,0,,,EFS,,,10000,30,10,0,0,10,0,0,300,,10,5,20220225090114,3858$

**+RESP:GTALM,C80303,865284040842605,gv75m,22,5,IDA,0,1,64,,,,,,,,,,,,,,

+RESP:GTALM,C80303,865284040842605,gv75m,22,9,ACD,0,0,0,0,0,0,,,,,PDS,1,7F9,,,,,,IGM,6,0,3,,,4,,,,,ASC,50,10,2,,,,,,,,,BZA,0,,,,0,0,0,,,0,0,0,,,0,0,0,,,0,0,0,,,0,0,0,,,,,,,,SPA,0,50,,60,0,,,70,,60,0,,,90,,60,0,,,110,,60,0,,,,,,,,UFS,0,10,0,,,,,,,UDT,0,,0,0,,00000001,,00086FFF,,,,,,TMP,0,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,1,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,2,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,3,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,4,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,5,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,6,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,7,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,FSC,,0,2,0,100,,0,,,,,,,,,1,2,0,100,,0,,,,,,,,,2,2,0,100,,0,,,,,,,,,3,2,0,100,,0,,,,,,,,,4,2,0,100,,0,,,,,,,,,20220225090114,385D$

+RESP:GTALM,C80303,865284040842605,gv75m,22,10,RMD,0,,,,,,,,,

+RESP:GTALM,C80303,865284040842605,gv75m,22,20,UDF,0,0,0,0,0,0,0,0,0,0,,,0,1,0,0,0,0,0,0,0,,,0,2,0,0,0,0,0,0,0,0,,,0,3,0,0,0,0,0,0,0,0,,,0,4,0,0,0,0,0,0,0,0,,,0,5,0,0,0,0,0,0,0,0,,,0,6,0,0,0,0,0,0,0,0,,,0,7,0,0,0,0,0,0,0,0,,,0,8,0,0,0,0,0,0,0,0,,,0,9,0,0,0,0,0,0,0,0,,,0,10,0,0,0,0,0,0,0,0,,,0,11,0,0,0,0,0,0,0,0,,,0,12,0,0,0,0,0,0,0,0,,,0,13,0,0,0,0,0,0,0,0,,,0,14,0,0,0,0,0,0,0,0,,,0,15,0,0,0,0,0,0,0,0,,,20220225090114,3868$

+RESP:GTALM,C80303,865284040842605,gv75m,22,21,UDF,0,16,0,0,0,0,0,0,0,0,,,0,17,0,0,0,0,0,0,0,0,,,0,18,0,0,0,0,0,0,0,0,,,0,19,0,0,0,0,0,0,0,0,,,0,20,0,0,0,0,0,0,0,0,,,0,21,0,0,0,0,0,0,0,0,,,0,22,0,0,0,0,0,0,0,0,,,0,23,0,0,0,0,0,0,0,0,,,0,24,0,0,0,0,0,0,0,0,,,0,25,0,0,0,0,0,0,0,0,,,0,26,0,0,0,0,0,0,0,0,,,0,27,0,0,0,0,0,0,0,0,,,0,28,0,0,0,0,0,0,0,0,,,0,29,0,0,0,0,0,0,0,0,,,0,30,0,0,0,0,0,0,0,0,,,0,31,0,0,0,0,0,0,0,0,,,20220225090114,3869$

+RESP:GTALM,C80303,865284040842605,gv75m,22,22,SIM,0,,1,,0,0,0,0,,,,,FTP,,0,,,,0,0,0,,,,OEX,0,0,,,,,IEX,,,9,0,A,0,B,0,C,0,,,,,,,,UPC,0,10,0,1,0,http://218.17.46.11:933/GV75/deltabin/75-UPC.ini,1,,0,00000000,,1,FMI,0,0,FFFFFFFF,1,5,1,0,0,,,,,13,0,,,,,33,,0,,,,0,,,,,,GAM,1,1,25,10,60,,,,,,GPJ,0,15,3,,,,,0,0,0,0,,VVS,13500,600,10,,,AVS,120,10,,,,TAP,0,,,1,,,,,WRT,0,0,2,,4,5,,,,,1,0,2,1,4,5,,,,,20220225090114,386A$

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' '-' '_'	
Total Packets	1	22	
Current Packet	1	1 –22	
Configurations	< 1500		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$
Please refer to Chapter 3.3.3.2 List of All Command Configurations			

- <*Total Packets*>: The total number of **+RESP:GTALM** messages.
- <*Current Packet*>: The sequence number of the current packet.
- <*Configurations*>: The current configurations of the device. The 1st message contains configurations of the commands from **BSI** to **FRI**, the 2nd message is the command **GEO**,the 3rd message is for the commands from **SPD** to **DOG**, the 4th is for the commands from **IDL** to **EFS**, the 5th to 8th messages are for the command **IDA**,the 9th message is for the commands from **ACD** to **FSC**, the 10th is the command **RMD**, the 11th to 14th messages are for the command **PEO**,the 15th message is for the commands from **MUT** to **CAN**,the 16th to 19th messages are for the command **CMD**,the 20th to 21th messages are for the command **UDF**,and the last message is for the commands from **SIM** to **WRT**.

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Note: The length of every **+RESP:GTALM** message (including header and tail) should be less than or equal to 1500 characters.

3.3.3.3. +RESP:GTALC

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

- **+RESP:GTALC,**

Example:

+RESP:GTALC,C80303,865284040842605,GV75M,0010,0,1,TOW,0,10,1,300,0,0,0,0,2,3,3,600,,,,,,,,20210302095504,0D1C$

+RESP:GTALC,C80303,865284040842605,GV75M,0800,0,1,GEO,0,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,0,,1,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,2,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,3,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,4,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,5,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,6,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,7,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,8,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,9,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,10,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,11,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,12,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,13,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,14,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,15,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,16,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,17,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,18,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,19,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,0,,20210302095936,0D2A$

**+RESP:GTALC,C80303,865284040842605,GV75M,80000000,1,1,IDA,2,1,64,,,,,,,,

WLT,0,,,,,,,,,,,,,HRM,,,7F,04FE7FFF,04FE7FFF,7F7F,FF,7F,007F,000007F0,,CRA,0,7,1,10,10,10,10,0,0,0,0,,FFC,0,0,0,30,500,500,300,,,,,1,0,0,30,500,500,300,,,,,2,0,0,30,500,500,300,,,,,3,0,0,30,500,500,300,,,,,4,0,0,30,500,500,300,,,,,JBS,0,,10,10,1800,1,30,0,0,5,1,,,,SSR,0,2,1,5,0,0,,,20210302095756,0D25$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Configuration Mask	<=20	0000000000000000 – FFFFFFFFFFFFFFFFFFF	
Next Packet	1	0-1	0
Current Packet	1	1-17	1
BSI	3	BSI	BSI
LTE APN	<=40	‘0’ - ‘9’, ‘a’ - ‘z’, ‘A’ - ‘Z’, ‘-’, ‘.’	
LTE APN User Name	<=30		
LTE APN Password	<=30		
GPRS APN	<=40	‘0’ - ‘9’, ‘a’ - ‘z’, ‘A’ - ‘Z’, ‘-’, ‘.’	
GPRS APN User Name	<=30		
GPRS APN Password	<=30		
Network Mode/APN Authentication Methods	2	00--0x53	00
LTE Mode	1	0-3	2
Manual Netreg	1	0-1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SRI	3	SRI	SRI
Report Mode	1	0 – 7	0
Reserved	0		
Buffer Mode	1	0|1|2	1

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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
Enable SACK	1	0|1|2	0
Protocol Format	1	0|1	0
Enable SMS ACK	1	0|1	0
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv75m
Enable ODO	1	0|1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
Reserved	0		
Reserved	0		
Report Composition Mask	<=4	0 – FFFF	3F
Power Saving Mode	1	0 – 2	1
IGS Composition Mask	<=2	FF	0
Event Mask	<=8	0 – FFFFFFFF	3FFF
Reserved	0		
LED On	1	0|1	0
Enable Info Report	1	0|1	0
Info Report Interval	<=5	30 – 86400sec	300
Location Request Mk	2	High: 0-2 Low: 0-3	00
Reserved	0		
Backup Battery Charge	1	0|1	0

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Mode			
AGPS Mode	1	0|1	0
GSM Report	<=4	00 – FFFF	1F
Duration of GNSS Signal Loss	2	0 – 30min	0
INF Expand Mask	<=4	0000 – FFFF	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Battery Low Percentage	<=2	0 - 30	0
Enter Movement by Command	1	0|1	0
Power Mode	1	0|1	0
Reserved	0		
TOW	3	TOW	TOW
Enable Tow	1	0|1	0
Engine Off to Tow	<=2	1 – 15min	10
Fake Tow Delay	<=2	0 – 10min	1
Tow Interval	<=5	30 – 86400sec	300
Tow Output ID	1	0 – 2|9-C	0
Tow Output Status	1	0 - 3	0
Tow Output Duration	<=3	0 – 255(×100ms)	0
Tow Output Toggle Times	<=3	0 – 255	0
Rest Duration	<=3	1 – 255(×15sec)	2
Motion Duration	<=2	1 – 10(×100ms)	3
Motion Threshold	1	2 – 9	2
Tow Distance	<=5	0|50-65535m	600
Reserved	0		

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Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0|1|2	0
Min. Threshold	<=5	250 – 32000 mV	250
Max. Threshold	<=5	250 – 32000 mV	250
Reserved	0		
Debounce Time	1	0 – 5(×10s)	0
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0|1	0
Voltage Margin Error	3	0 – 100(×10mv)	0
MPN/MPF Validity Time	1	0 - 255(x1s)	0
Reserved	0		
DIS	3	DIS	DIS
Ignition Detection	1	0	0
Reserved	0		
Debounce Time	<=2	0 – 255(×10ms)	100
Ignition Detection Mode	1	0-4	0
Input ID 1	1	1	1
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=2	0|1 – 12(×2s)	0
Reserved	0		

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Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OUT	3	OUT	OUT
DOS Report	1	0-3	0
Reserved	0		
Long Operation2	<=3	0 – 120min	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB	3	IOB	IOB
IOB ID0	1	0	0
Input Mask	<=4	0000 – 0F42	0
Trigger Mask	<=4	0000 – 0F42	0
Input Sample Period	<=2	0|1 – 12(×2s|x4s)	0
Output ID	1	0 – 2|9 – C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		

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Reserved	0		
Reserved	0		
IOB ID1	1	1	1
Input Mask	<=4	0000 – 0F0F	0
Trigger Mask	<=4	0000 – 0F0F	0
Input Sample Period	<=2	0|1 – 12(×2s|x4s)	0
Output ID	1	0 – 2|9 – C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID2	1	2	2
Input Mask	<=4	0000 – 0F42	0
Trigger Mask	<=4	0000 – 0F42	0
Input Sample Period	<=2	0|1 – 12(×2s|x4s)	0
Output ID	1	0 – 2|9 – C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved			
IOB ID3	1	3	3
Input Mask	<=4	0000 – 0F42	0
Trigger Mask	<=4	0000 – 0F42	0
Input Sample Period	<=2	0|1 – 12(×2s|x4s)	0

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Output ID	1	0 – 2|9 – C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved			
TMA	3	TMA	TMA
Sign	1	+|–	+
Hour Offset	<=2	0 – 23	
Minute Offset	<=2	0 – 59	
Daylight Saving	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 5	0
Discard No Fix	<=2	0|1	1
Reserved	0		
Enable Period	1	0|1	1
Begin Time	4	HHMM	0000
End Time	4	HHMM	0000
Reserved	0		
IGN Report Interval	<=5	5 – 86400sec	30
Distance	<=5	300 – 65535m	1000
Mileage	<=5	300 – 65535m	1000
Reserved	0		

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Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0|5-86400sec	600
ERI Mask	8	00000000-FFFFFFFF	00000000
Reserved	0		
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0|5 – 86400sec	0
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0

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Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID2	1	2	2
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID3	1	3	3
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0

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Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID4	1	4	4
…			
GEO ID19	2	19	19
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
SPD	3	SPD	SPD
Mode	1	0|1|2|3|4	0
Min. Speed	<=3	0 – 400km/h	0
Max. Speed	<=3	0 – 400km/h	0
Validity	<=4	0 – 3600sec	60
Send Interval	<=4	30 – 3600sec	300
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		

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Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 4	0
Digital Input ID	1	0|1|6|9-C	0
Reserved	0		
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
Enable Auto-unlock PIN	1	0|1	1
PIN	1	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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OWH	3	OWH	OWH
Mode	1	0|1|2|3	0
Day of Work	<=2	0 – 7F	1F
Working Hours Start1	4	HHMM	0900
Working Hours End1	4	HHMM	1200
Working Hours Start2	4	HHMM	1300
Working Hours End2	4	HHMM	1800
Reserved	0		
Reserved	0		
Digital Input ID	1	0|1|6|9-C	0
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0|1|2	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
Input ID	1	0|1|6	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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IDL	3	IDL	IDL
Mode	1	0|1	0
Idling Detection Time	2	1 – 30 min	2
Idling End Time	1	1 – 5 min	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Debounce Option	1	0 - 1	0
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Enable Hour Meter	1	0|1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
Mode	1	0 – 4	0
Reserved	0		

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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 – 100km/h	0
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100km/h	0
ΔVla	<=3	0 – 100km/h	0
Reserved	0		
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Turn and Brake Threshold	<=3	30 -70	30
Turn and Brake Duration	<=3	40-100(*8ms)	50
Acceleration Threshold	<=3	15-50	20
Acceleration Duration	<=3	50-250(*8ms)	65
URT	3	URT	URT
Working Mode	1	0|2 – 9 |12|17|22	0
Baudrate Index	<=2	1 – 12	5
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 2	0
Enable Sleep	1	0|1	0
Reserved (Optional)	0		
Reserved (Optional)	0		

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Reserved (Optional)	0		
JDC	3	JDC	JDC
Mode	1	0|1|2	0
Jamming Level	1	1|2|3	2
Reserved			
Enter Jamming Timer Threshold	<=4	0 - 3600(sec)	0
Quit Jamming Timer Threshold	<=4	0 - 3600(sec)	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Output ID	1	0 – 2|9 – C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Home MCC List	<= 3 * 20		
WLT	3	WLT	WLT
Number Filter	1	0|1|4|5	0
Phone Number Start	1|2	1-10	1
Phone Number End	1|2	1-10	1
White Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HRM	3	HRM	HRM
Reserved	0		
Reserved	0		

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+ACK Mask	<=2	0 – FF	7F
+RSP Mask	<=8	0 – FFFFFFFF	3FE1FFF
+EVT Mask	<=8	0 – FFFFFFFF	3FE1FFF
+INF Mask	<=8	0 – FFFFFFFF	FF7F
+HBD Mask	<=2	0 – FF	FF
+DAT Mask	<=8	0 – FFFFFFFF	7F
+CRD Mask	<=4	0-FFFF	7D
+CAN Mask	<=8	0 – FFFFFFFF	7FF
Reserved	0		
CRA	3	CRA	CRA
Mode	1	0/1	0
G-Sensor Sensitivity	<=2	1 – 99(*0.1g)	7
Report ACC	1	0|1	0
GPS Data Pre-Crash	<=2	0-10	10
GPS Data Post-Crash	<=2	0-10	10
Sample Period Pre-Crash	<=2	1-10	10
Sample Period Post-Crash	<=2	1-10	10
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	0
Duration	<=3	0～255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
FFC	3	FFC	FFC
Priority	1	0	0
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300

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

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FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300
Reserved			
Reserved			
Reserved			
Reserved			
Priority	1	4	4
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	1-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300
Reserved			
Reserved			
Reserved			
Reserved			
JBS	3	JBS	JBS
Mode	1	0|1	0
Reserved	0		
Siren On Timer (T1)	5	1 – 65535 (×100ms)	10
Siren Off Timer (T2)	5	1 – 65535 (×100ms)	10
Ready Fuel Release Timer (T3)	5	1 – 65535 (sec)	1800
Check Speed	1	0|1	1
Speed Limit	3	0 – 999km/h	30
Output 1 Init State	1	0|1	0
Motion Sensor	1	0|1	0
GNSS Fix Failure Timeout Timer (T4)	3	1 – 100 (min)	5

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Enable Siren	1	0|1	1
Reserved	0		
Reserved	0		
Reserved	0		
SSR	3	SSR	SSR
Mode	1	0|1	0
Time to Stop	2	(0 – 30 min)| (0 – 1800 sec)	2 min
Time to Start	1	(0 – 5 min) | (0 – 300 sec)	1 min
Start Speed	2	1 – 10 Km/h	5
Long Stop	<=5	0 – 43200 min	0
Time Unit	1	0|1	0
Reserved	0		
Reserved	0		
EFS	3	EFS	EFS
Reserved	0		
Reserved	0		
Ex Full Value	<= 5	0 – 65535	9999
Ex Fuel Sensor Delay	<=3	0 – 600 sec	30
Ex Fuel Loss Alarm	<=2	0 – 50 %	10
Refuel Alarm	<=3	0-100%	0
Ex Unsolicited Enable	1	0 | 1	0
Ex Detection Frequency	<=3	5 – 600 sec	10
Ex Filter Factor	1	0 – 9	0
Report Sensor Data	1	0 | 1	0
Ex Detection Frequency IGF	<=4	30-1800s	300
Reserved	0		
IGN Sample Count	<=2	3 – 30	10
Ex Fuel Loss Alarm IGN	<=3	0 – 100 %	5
IDA	3	IDA	IDA
Mode	1	0|1|2	0

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Start Index	<=2	1 – 250	1
End Index	<=2	1 – 250	1
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0 | 15 – 600sec	30
Report Mode	1	0 – 7	0
ID Validity Time	<=3	15 – 600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
RFID Report Mode	1	0-1	0
RFID Report Format	1	0-1	0
Reserved	0		
Reserved	0		
ACD	3	ACD	ACD
iButton Timer	<=2	1 – 10(s)	0
Output ID	1	0-2	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Temperature Timer	<=3	10– 255(s)	0
Reserved			
Reserved			
Reserved			
Reserved			
PDS	3	PDS	PDS
Mode	1	0|1|2	1

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Mask	4	0000-7FF	7FF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IGM	3	IGM	IGM
Input ID	1	6	6
Enable	1	0|1	0
Report Mode	1	0 - 3	0
Reserved	0		
Reserved	0		
Sample Period	<=2	0|1 – 12(×2s)	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ASC	3	ASC	ASC
Brake Speed Threshold	<=3	30 – 400km/h	50
Delta Speed Threshold	<=2	5 – 72km/h	10
Delta Heading Threshold	1	0 – 5°	2
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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Reserved	0		
BZA	3	BZA	BZA
Output ID	1	0|1|2	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 2 Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 3 Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 4 Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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Reserved	0		
Reserved	0		
SPA	3	SPA	SPA
Mode	1	0|12	0
Speed Threshold 1	<=3	0 – 400km/h	50
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 2	<=3	0 – 400km/h	70
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 3	<=3	0 – 400km/h	90
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 4	<=3	0 – 400km/h	110
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UFS	3	UFS	UFS
Retry Times	1	0 – 3	0
Timeout	2	1-30min	10
Protocol Type	1	0	0
Server User Name	<=6	‘_’, ‘a-z’, ‘A-Z’,'0' – '9', ‘-’	
Server Password	<=6	‘_’, ‘a-z’, ‘A-Z’,'0' – '9', ‘-’	
Server URL	<=100	Legal URL	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UDT	3	UDT	UDT
Mode	1	0|1	0
Reserved	0		
IGN Send Interval	<=3	0|5-250	0
Enable IGF Sending	1	0|1	0
Reserved	0		
Event Mask	<=8	0-FFFFFFFF	1
Reserved	0		
Report Composition Mask	<=8	0-FFFFFFFF	00086FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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TMP	3	TMP	TMP
Alarm ID	1	0-3	
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
RMD	3	RMD	RMD
Mode	1	0/1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Home Operator List	<=6*10		
Reserved	0		

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Reserved	0		
Roaming Operator List	<=6*100		
Reserved	0		
Reserved	0		
Black Operator List	<=6*20		
Reserved	0		
Reserved	0		
Known Roaming Event Mask	<=6	000000 – FFFFFF	27DEF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	<=6	000000 – FFFFFF	27DEF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	
Duration	<=3	0～255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
FSC	3	FSC	FSC
Reserved	0		
Table ID	1	0 – 4	1
Sensor Type	<= 1	2|4| 6|8	2
Enable	1	0|1	0
Max. Tank Volume	<= 5	0 –10000	100
Reserved	0		
Num of Node	<= 2	0|2 – 11	0

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Node 1 Value	< = 5	0～99999	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	< = 5	0～99999	
Node N Percentage	<= 2	0 – 100	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PEO	3	PEO	PEO
GEO ID	1	0 – 19	0
Mode	1	0 – 3	0
Start Point	2	1-10	1
End Point	2	3-10	3
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
…			
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Check Interval	<=5	0|5 – 86400sec	0
Output ID	1	0 – 2|9-C	0
Output Status	1	0 - 3	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		

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Reserved	0		
Reserved	0		
CMS	3	CMS	3
Camera ID	1	0-3	
Number	<=2	1-10	1
Interval	<=2	1-60s	5
Photo Compression Ratio	<=3	20-250	150
Photo Resolution	1	1-3	2
Digital Input ID	1	0|1|6	0
Attribute Mask	<=4	0000 - FFFF	0x0003
Server Type	1	0|1	0
EHD Support	1	0|1	0
Output ID	1	0 – 2	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CAN	3	CAN	3
Mode	1	0|1	0
CAN Report Interval	<=5	0|5 – 86400sec	0
CAN Report Interval IGF	<=5	0|5 – 86400sec	0
CAN Report Mask	8	0 - FFFFFFFF	C00FFFFF
Additional Event	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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FTP	3	FTP	FTP
Server Address	<=60		
Server Port	<=5	0 – 65535	0
Full Name	<=60		
User Name	<=10		
Login Password	<=10		0
Transfer Mode	1	0|1	0
Oper Type	1	0|1	0
Report FTP	1	0|1	0
File Name Prefix	<=20		
Reserved	0		
Reserved	0		
CMD	3	CMD	CMD
Mode	1	0-1	0
Stored Cmd ID	3	0 – 31	
Command String	200		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UDF	3	UDF	UDF
Mode	1	0-2	0
Group ID	<=2	0 – 31	
Input ID mask	<=16	0-FFFFFFFFFFFFFFFF	
Debounce Time	<=5	0-86400(s)	0
Inzizo Mask	<=5	00000-FFFFF	0
Outzizo Mask	<=5	00000-FFFFF	0
Stocmd ID Mask	<=8	0-FFFFFFFF	
Stocmd Ack	1	0|1	0
Inpeo Mask	<=5	0-FFFFF	0

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Outpeo Mask	<=5	0-FFFFF	0
Reserved			
Reserved			
SIM	3	SIM	SIM
Mode	1	0|1|2|3	0
ICCID	20		
Operation Mask	<=8	0-FFFFFFFF	0
Reserved	0		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OEX	3	OEX	OEX
Output Expansion Type	1	0	0
DOS Report	1	0 – F	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IEX	3	IEX	IEX
Reserved	0		
Reserved	0		
Input ID	1	9	
Sample Period	<=2	0|1 – 12(×4s)	0
Input ID	1	A	
Sample Period	<=2	0|1 – 12(×4s)	0

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Input ID	1	B	
Sample Period	<=2	0|1 – 12(×4s)	0
Input ID	1	C	
Sample Period	<=2	0|1 – 12(×4s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UPC	3	UPC	UPC
Max. Download Retry	1	0 – 3	0
Download Timeout	<=2	5 – 30 min	10
Download Protocol	1	0	0
Enable Report	1	0|1	0
Update Interval	<=4	0 – 8760 hour	0
Download URL	<=100	URL	
Mode	1	0|1	0
Reserved	0		
Extended Status Report	1	0|1	0
Identifier Number	8	00000000 – FFFFFFFF	0
Reserved	0		
Update Status Mask	1	0 – F	3
GAM	3	GAM	GAM
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60

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Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GPJ	3	GPJ	GPJ
Mode	1	0|1	0
CW Threshold	<=2	0-31	15
BB Threshold	<=2	0-15	3
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0 - 3	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
VVS	3	VVS	VVS
Ignition On Voltage	<=5	250 – 28000 mV	13500
Voltage Offset	<=4	200 – 2000 mV	600
Debounce	<=3	5 – 255sec	10
Reserved	0		
Reserved	0		
AVS	3	AVS	AVS
Sensor Rest Duration	<=3	1 – 255 sec	120
Sensor Motion Validity	<=3	1 – 255 sec	10
Reserved	0		
Reserved	0		
Reserved	0		

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GDO	3	GDO	GDO
Time of First Active Phase (ON Time)	1	0 - 100	0
Cycle Time (Total Time)	0	0 - 100	30
Incremental Step	0	0 - 100	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TAP	3	TAP	TAP
Camera ID	1	0-3	0
Reserved	0		
Reserved	0		
Photo Resolution	1	1-3	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GDO	GDO	GDO	GDO
Time of First Active Phase (ON Time)	<=3	0 - 100	0
Cycle Time (Total Time)	<=3	0 - 100	30
Incremental Step	<=3	0 - 100	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
WRT	3	WRT	WRT
Accessory Type ID	1	0|1	1

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Sample Interval	<=3	0|3 – 255(×10s)	0
Temperature Threshold	<=2	2 – 30(×1°C)	2
Humidity Threshold	<=3	1 – 100(×1%)	1
Pair Count	<=2	0 – 10	4
Pair Time	<= 2	1 – 30min	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

Note: AT+GTIDA settings will be reported in separately packets, and each packet contains maximum 64 IDs.

3.3.3.4. +RESP:GTCID

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

➢ **+RESP:GTCID,**

Example: **+RESP:GTCID,C80303,863835020303983,,89860114830029286188,20210302095937,0623$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ICCID	20		
Send Time	14	YYYYMMDDHHMMSS	

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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 signal level, it will send the signal level to the backend server via the message **+RESP:GTCSQ**.

➢ **+RESP:GTCSQ,**

Example: **+RESP:GTCSQ,C80303,865284040842605,GV75M,16,0,20210302100215,0D2C$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CSQ RSSI	<=2	0 – 31|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 signal. The range is 0-7, and 99 is for unknown strength of signal.

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 via the message **+RESP:GTVER**.

➢ **+RESP:GTVER,**

Example: **+RESP:GTVER,C80303,865284040842605,GV75M,GV75M,0101,0101,,BG96,BG96MAR04A03M1G,20210302100310,0D2E$**			
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' '-' '_'	
Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Software Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Reserved	0		
Modem Hardware Version	<=20		
Modem Software Version	<=50		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

✧ <*Software Version*>: The software version of the device. 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 of the device. 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 via the message **+RESP:GTBAT**.

➢ **+RESP:GTBAT,**

Example: **+RESP:GTBAT,C80303,865284040842605,GV75M,1,,,4.16,1,0,20210302100655,0D37$**

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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' '-' '_'	
External Power Supply	1	0|1	
External Power VCC	<=5	0 – 32000mV	
Reserved	0		
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0|1	
LED On	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.8. +RESP:GTIOS

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

- **+RESP:GTIOS,**

Example: **+RESP:GTIOS,C80303,865284040842605,GV75M,,,,00,00,20210319024734,0012$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Digital Input	<=4	00 – 0F42	
Digital Output	<=4	00 – 0F03	

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

3.3.3.9. +RESP:GTTMZ

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

- **+RESP:GTTMZ,**

Example: **+RESP:GTTMZ,C80303,865284040842605,GV75M,+0000,0,20210302101208,0D3E$**			
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' '-' '_'	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.10. +RESP:GTAIF

After the device receives the command **AT+GTRTO** to get information including APN, ICCID, RSSI, cell ID, IP, DNS server and network type, it will send the information via the message **+RESP:GTAIF** to the backend server. The **+RESP:GTAIF** does not support HEX report.

- **+RESP:GTAIF,**

Example: **+RESP:GTAIF,C80303,865284040842605,GV75M,jyy,,,,,,898604641919C0779899,16,0,0DFC,10.196.21.38,,,,,,1,20210302101250,0D40$**			
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' '-' '_'	
LTE APN	<=47		
LTE APN User Name	<=30		
LTE APN Password	<=30		
GPRS APN	<=47		
GPRS APN User Name	<=30		
GPRS APN Password	<=30		
ICCID	20		
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
Cell ID	<=8		
IP Address	7	0.0.0.0	
Reserved	0		
Reserved	0		
Reserved			
Reserved			
Reserved			
Network Type	1	0,1,3	
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 signal. The range is 0-7, and 99 is for unknown strength of signal.

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- <*Cell ID*>: The ID of the serving cell in hex format.
- <*IP Address*>: The IP address of the device.
- <*Main DNS*>: The main DNS server.
- <*Backup DNS*>: The backup DNS server.
- <*Network Type*>: The type of the mobile network the device is currently registered to.
  - 0: Unregistered.
  - 1: 2G
  - 3: 4G

3.3.3.11. +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 via the message **+RESP:GTALS**. Configuration information varies with different AT Commands. For example, to get FRI configuration, set **AT+GTRTO=gv75m,2,FRI,,,,,0015$**.

- **+RESP:GTALS,**

Example: **+RESP:GTALS,C80303,865284040842605,GV75M,FFC,0,0,0,30,500,500,300,,,,,1,0,0,30,500,500,300,,,,,2,0,0,30,500,500,300,,,,,3,0,0,30,500,500,300,,,,,4,0,0,30,500,500,300,,,,,20210302101349,0D42$**			
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 AT Command	3	'a' – 'z' 'A' – 'Z' '	
Mode	1	0 – 4	
Discard No Fix	<=2	0|1	
Reserved	0		
Enable Period	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	$	$

3.3.3.12. +RESP:GTGSV

After the device receives the command **AT+GTRTO** to get the satellite information, it will send the satellite information via the message **+RESP:GTGSV** to the backend server.

- **+RESP:GTGSV,**

Example: **+RESP:GTGSV,C80303,865284040842605,gv75m,12,1,27,4,0,7,31,8,39,9,33,14,25,16,18,21,32,22,31,26,0,27,41,30,22,20210302101349,0488$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device name	20		
SV Count	2	0-32	
SV ID	2	> =0	
SV Power	2	> =0	
…			
SV ID	2	> =0	
SV Power	2	> =0	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

- ✧ <*SV Count*>: The number of satellites the device finds.
- ✧ <*SV ID*>: Satellite ID. If there is no satellite, the field will be omitted.
- ✧ <*SV Power*>: Satellite power. If there is no satellite, the field will be omitted.

3.3.3.13. +RESP:GTUVN

After the device receives the command **AT+GTRTO** to get the version number of the UFSxxx fuel sensor, it will send the information to the backend server via the message **+RESP:GTUVN**.

- ➢ **+RESP:GTUVN,**

Example: **+RESP:GTUVN,C80303,869158008709145,gv75m,2,02,B,,,,,20210302101525,2153$**			
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' '-' '_'	
Sensor Protocol Version	1		
Sensor SW Version	2		
Sensor HW Version	1		
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Sensor Protocol Version*>: The protocol version of the UFSxxx fuel sensor.
- ✧ <*Sensor SW Version*>: The SW version of the UFSxxx fuel sensor.
- ✧ <*Sensor HW Version*>: The HW version of the UFSxxx fuel sensor.

3.3.3.14. +RESP:GTATI

After the device receives the command **AT+GTRTO** to get the basic device information, it will

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send the information to the backend server via the message **+RESP:GTATI.**

➢ **+RESP:GTATI,**

Example: **+RESP:GTATI,C80303,865284040842605,GV75M,12081,0A0101,010201,BG96,BG96MAR04A03M1G,20210302101715,0D48$**			
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' '-' '_'	
ATI Mask	<=8	'0' – '9' 'A' – 'F'	
Firmware Version	6	'0' – '9' 'A' – 'F'	
Hardware Version	4	'0' – '9' 'A' – 'F'	
Bootloader Version	6	'0' – '9' 'A' – 'F'	
Modem Hardware Version	<=20		
Modem Software Version	<=50		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<ATI Mask>*: This mask is set by **AT+GTRTO** command and used to control parameter fields in the **+RESP:GTATI** message.

✧ *<Firmware Version>*: The firmware version of the device. The first two characters indicate the branch number, the middle two characters indicate the major version and the last two characters indicate the minor version. For example, 000101 means version R00A01V01.

✧ *<Hardware Version>*: The hardware version of the device. The first two characters indicate the major version and the last two characters indicate the minor version. For example, 0101 means version 1.01.

✧ *<Bootloader Version>*: The bootloader version of the device. The first two characters indicate the branch number, the middle two characters indicate the major version and the last two characters indicate the minor version. For example, 000101 means version R00A01V01.

✧ *<Modem Hardware Version>*: It gives the modem hardware information of this device.

✧ *<Modem Software Version>*: It gives the modem software version information of this device.

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3.3.3.15. +RESP:GTCVN

After the device receives the command **AT+GTRTO** to get the version number of the CAN100, it will send the information to the backend server via the message **+RESP:GTCVN**.

➢ **+RESP:GTCVN,**

Example: **+RESP:GTCVN,C80303,865284040842605,gv75m,2.2.1d,,,,,20210302102015,2166$**			
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' '-' '_'	
CAN100 SW Version	<=7	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<CAN100 SW Version>*: The SW version of the CAN100 device.

3.3.3.16. +RESP:GTWRT

After the device receives the command **AT+GTRTO** to read the paired RF433 accessories information, it will send the paired RF433 accessories information to the backend server via the message **+RESP:GTWRT**.

➢ **+RESP: GTWRT,**

Example: **+RESP:GTWRT,C80303,gv75m,,0,,,0000,,0,20210302102016,20210302102015,11F0$**			
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' '-' '_'	

Accessory number	<=2	0 – 10	
Accessory Type	1	1|2	
Accessory Serial Number	5	00001 – FFFFE	
.....			
Accessory Type	1	1|2	
Accessory Serial Number	5	00001 – FFFFE	
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-stops-charging report

+RESP:GTBPL: Backup battery low

+RESP:GTSTT: Device motion status indication when the motion status changes

+RESP:GTPDP: DS connection establishment report

+RESP:GTIGN: Ignition on report

+RESP:GTIGF: Ignition off report

+RESP:GTIDN: Enter into idling status

+RESP:GTIDF: Leave idling status

+RESP:GTGSS: GNSS signal status

+RESP:GTSTR: Vehicle enters into Start status

+RESP:GTSTP: Vehicle enters into Stop status

+RESP:GTLSP: Vehicle enters into Long Stop status

+RESP:GTFLA: Unusual fuel consumption alarm

+RESP:GTDOS: Status of wave shape 1 output changes

+RESP:GTRMD: The report for entering or leaving roaming state

+RESP:GTTMP: Temperature alarm

+RESP:GTPHL: Report location information before reporting photo data

+RESP:GTFTP: Report location information after transferring a file to FTP server

+RESP:GTEXP: Report information about UFSxxx fault code.

+RESP:GTUPC: Report information about UPC

+RESP:GTCRA: Crash report

+RESP:GTASC: Report calibration data.

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+RESP:GTIGS: Report the statistical information during the trip
+RESP:GTJDS: Jamming detection status
+RESP:GTGPJ: GPS jamming status
+RESP:GTVGN: Virtual ignition on report
+RESP:GTVGF: Virtual ignition off report
+RESP:GTWPB: Report the button alarm event message of WPB100 accessory.
+RESP:GTLBA: Reporting the low power alarm event message of the RF433 accessories (less than 2.4V).
+RESP:GTGSM: The report for the information of the serving cell and the neighbour cells.

In **+RESP:GTMPN**, **+RESP:GTMPF**, **+RESP:GTBTC**, **+RESP:GTSTC**, **+RESP:GTBPL**, **+RESP:GTSTT**, **+RESP:GTIGN**, **+RESP:GTIGF**, **+RESP:GTIDN**, **+RESP:GTIDF**, **+RESP:GTGSS**, **+RESP:GTSTR**, **+RESP:GTSTP**, **+RESP:GTLSP**, **+RESP:GTFLA**, **+RESP:GTTMP**, **+RESP:GTWPB**, **+RESP:GTLBA** and **+RESP:GTDOS,+RESP:GTJDS, +RESP:GTGPJ** event reports, the last known GNSS information and the current cell information are included.

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

Example:
+RESP:GTPNA,C80303,865284040842605,gv75m,20210302074033,0CE6$
+RESP:GTPFA,C80303,865284040842605,gv75m,20210302074510,0CEA$
+RESP:GTPDP,C80303,865284040842605,gv75m,20210302111826,0D49$

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	$	$

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

Example:
+RESP:GTMPN,C80303,865284040842605,gv75m,1,0.0,281,110.4,114.015400,22.537185,20210302091219,0460,0000,2493,16FA,00,20210302091218,0D06$
+RESP:GTMPF,C80303,865284040842605,gv75m,1,0.0,281,104.9,114.015325,22.537184,20210

302092228,0460,0000,2493,16EF,00,20210302092228,0D0A$ +RESP:GTBTC,C80303,865284040842605,GV75M,0,0.0,281,124.1,114.015514,22.537215,2021 0302094834,0460,0000,2493,16FA,00,20210302100527,0D32$ +RESP:GTCRA,C80303,865284040842605,GV75M,0,0.0,0,112.8,114.015479,22.537140,202103 02120504,0460,0000,27BD,0DFC,00,20210302120743,0D7A$			
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' '-' '_'	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTSTC**,

Example: +RESP:GTSTC,C80303,865284040842571,,,0,0.0,0,314.9,114.016398,22.539816,202201060648 35,0000,0000,0000,0000,00,20220106065030,14B8$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	

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Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTBPL,**

Example: **+RESP:GTBPL,C80303,865284040847182,,3.50,1,0.0,0,102.6,114.015355,22.537230,20220118065559,0460,0000,27BD,0DFC,00,20220118065559,022B$**			
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' '-' '_'	
Backup Battery VCC	<=4	0.00 – 4.50 V	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	

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Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTSTT,**

Example:
+RESP:GTSTT,C80303,865284040840609,,21,1,0.0,0,120.5,114.015554,22.537334,20220119034146,0460,0000,27BD,0DFC,00,20220119034147,01CB$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion Status	2	11|12|21|22|41|42|16	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	

LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Motion Status*>: The motion status 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 considered to be towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
- 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
- 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
- 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

➢ **+RESP:GTIGN,**

Example: **+RESP:GTIGN,C80303,865284040840609,,8,1,0.0,0,120.5,114.015554,22.537334,20220119034146,0460,0000,27BD,0DFC,00,,0.0,20220119034147,01CC$**			
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' '-' '_'	
Duration of Ignition Off	<=6	0 – 999999 sec	
GNSS 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	-180 - 180	

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Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	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 turned off. If it is greater than 999999 seconds, it will be reported as 999999 seconds.
- ✧ <*Hour Meter Count*>: If the hour meter count function is enabled by the command **AT+GTHMC**, total hours the meter has counted when the engine is on will be reported in this field. If the function is disabled, this field will be empty. It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00.

➢ **+RESP:GTVGN,**

Example: **+RESP:GTVGN,C80303,865284040840609,,00,2,18,1,0.0,0,132.7,114.015557,22.537348,20220119062140,0460,0000,27BD,134F,00,,0.0,20220119062140,0351$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	2	00	
Reprot Type	1	0 – 4	
Duration of Ignition Off	<=6	0 – 999999 sec	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	

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Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS 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	$	$

✧ <*Report Type*>: It indicates the trigger source of the ignition event.
- 0: Reserved
- 1: Sensor state mode
- 2: External power voltage mode (virtual ignition detection)
- 3: Reserved
- 4: Accelerometer mode (virtual ignition detection)

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

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

➢ **+RESP:GTIGF,**

Example: **+RESP:GTIGF,C80303,865284040840609,,3,1,0.0,0,120.8,114.015555,22.537334,20220119034138,0460,0000,27BD,0DFC,00,,0.0,20220119034139,01C5$**			
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' '-' '_'	
Duration of Ignition On	<=6	0 – 999999 sec	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	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 turned on. If it is greater than 999999 seconds, it will be reported as 999999 seconds.
- <*Hour Meter Count*>: If the hour meter count function is enabled by the command **AT+GTHMC**, total hours the meter has counted when the engine is on will be reported in this field. If the function is disabled, this field will be empty. It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00.

➢ **+RESP:GTVGF,**

Example: **+RESP:GTVGF,C80303,865284040840609,,00,2,16,1,0.0,0,137.9,114.015580,22.537366,20220119062156,0460,0000,27BD,134F,00,,0.0,20220119062156,0356$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF,	

		X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	2	00	
Reprot Type	1	2|4|7	
Duration of Ignition On	<=6	0 – 999999 sec	
GNSS 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	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	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	$	$

✧ <*Report Type*>: It indicates which mode triggers the virtual ignition event.

- 0: Reserved
- 1: Reserved
- 2: External power voltage mode (virtual ignition detection)
- 3: Reserved
- 4: Accelerometer mode (virtual ignition detection)
- 5: Reserved
- 6: Reserved
- 7: Combined detection mode

✧ <*Duration of Ignition On*>: Duration since last time the ignition is on. If it is greater than

999999 seconds, it is reported as 999999 seconds.

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

➢ **+RESP:GTIDN,**

Example: **+RESP:GTIDN,C80303,865284040840609,,,,1,0.0,0,120.5,114.015554,22.537334,20220119034716,0460,0000,27BD,0DFC,00,0.0,20220119034717,01E1$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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➢ **+RESP:GTIDF,**

Example: **+RESP:GTIDF,C80303,865284040840609,,11,11,1,0.0,0,120.5,114.015554,22.537334,20220119034727,0460,0000,27BD,0DFC,00,0.0,20220119034728,01E5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion State	2	11|12|1A|16|22	
Duration of Idling Status	<=6	0 – 999999 sec	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	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 Status*>: The current motion status when the vehicle leaves idling status.

✧ <*Duration of Idling Status*>: The period of time that the vehicle has been in idling status. If it is greater than 999999 seconds, it will be reported as 999999 seconds.

➢ **+RESP:GTGSS,**

Example:

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+RESP:GTGSS,C80303,865284040840609,,0,00,21,,0,0.0,0,162.4,114.015361,22.537203,20220119034808,0460,0000,27BD,0DFC,00,20220119034908,01F0$			
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' '-' '_'	
GNSS Signal Status	1	0 | 1	
Satellite Number	2	0 0- 24	
Motion Status	2	11|12|21|22|41|42|16	
Reserved	0		
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*GNSS Signal Status*>: 0 means “GNSS signal lost or no successful GNSS fix”, and 1 means “GNSS signal recovered and successful GNSS fix”.
- <*Satellite Number*>: The number of visible satellites when fix succeeds. If fix fails, the parameter is empty.
- <*Motion Status*>: The current motion status 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 considered to be towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
- 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
- 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
- 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

- **+RESP:GTSTR**,
- **+RESP:GTSTP**,
- **+RESP:GTLSP**,

Example:
+RESP:GTSTR,C80303,865284040840609,,,,0,0.0,0,162.4,114.015361,22.537203,20220119034808,0460,0000,27BD,111F,00,0.0,20220119035509,020F$
+RESP:GTSTP,C80303,865284040840609,,,,0,0.0,0,162.4,114.015361,22.537203,20220119034808,0460,0000,27BD,111F,00,0.0,20220119035509,0212$
+RESP:GTLSP,C80303,865284040840609,,,,2,0.0,0,645.4,114.015037,22.537776,20220119035544,0460,0000,27BD,111F,00,0.0,20220119035544,0215$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	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:GTFLA,**

Example: **+RESP:GTFLA,C80303,865284040840609,,,66,33,1,0.0,0,645.4,114.015339,22.537264,20220119055739,0460,0000,27BD,1346,00,20220119055739,029B$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Last Fuel Level	<=4	0 - 100	
Current Fuel Level	<=4	0 - 100	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	

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Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Last Fuel Level*>: The fuel level saved before last ignition off when the fuel loss alarm event occurs.
- ✧ <*Current Fuel Level*>: The fuel level when the fuel loss alarm event occurs.

➢ **+RESP:GTDOS,**

Example: **+RESP:GTDOS,C80303,865284040842605,gv75m,1,1,5,0.0,281,109.7,114.015398,22.537154,20210302094613,0460,0000,2493,16FA,00,20210302094612,0D12$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Wave1 Output ID	1	1-2|9-C	
Wave1 Output Active	1	0 - 3	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	

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Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Wave1 Output ID*>: The ID of the wave shape 1output.
- ✧ <*Wave1 Output Active*>: The status of wave shape 1 output. Please refer to <Output Status> in AT+GTOUT.

➢ **+RESP:GTTMP,**

Example: **+RESP:GTTMP,C80303,865284040840609,,,10735,01,1,1,0.0,0,101.0,114.015388,22.537149,20220119070619,0460,0000,27BD,134F,00,0.0,,,,00,03,,,,28CE9C8D0B000081,,25,20220119070619,03FB$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
T,Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
External Power VCC	<=5	0 – 32000 mV	
Report ID/Report Type	2	X(0-3)X(0-1)	
Number	<=2	0 – 15	
GNSS Accuracy	<=2	0	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	

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Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Reserved	0		
Reserved	0		
Digital Input	<=4	00 – 0F42	
Digital Output	<=4	00 – 0F03	
Reserved	0		
Reserved	0		
Reserved	0		
Temperature Sensor device ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Temperature Sensor Device Data	<=3	-55 – 125℃	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report ID/Report Type*>: It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

- Report ID: The ID of temperature alarm. The range is 0 – 3.
- Report Type: 0 means "Outside the predefined temperature range". 1 means "Inside the predefined temperature range".

✧ <*Temperature Sensor Device ID*>: The ID of the temperature sensor.

<*Temperature Sensor Device Data*>: The current temperature the sensor detects.

If the roaming state of the device changes, the **+RESP:GTRMD** message will report the current roaming state. The message is defined as an event message.

➢ **+RESP:GTRMD,**

Example:
+RESP:GTRMD,C80303,865284040840609,,2,1,0.0,0,645.4,114.015339,22.537264,20220119055857,0460,0000,27BD,1346,00,20220119055858,02A4$

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

Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Roaming State	1	0-3	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

➢ **+RESP:GTPHL**,

This message is used to report location information before reporting photo data, and is only sent via data service even if the report mode is forced SMS mode.

Example:
+RESP:GTPHL,C80303,865284040840609,,0,,20220119075716,1,0.0,0,116.7,114.015443,22.537174,20220119075716,0460,0000,27BD,134F,00,,,,,20220119075716,04DC$

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' '-' '_'	
Camera ID	1	0-3	
Reserved	0		
Photo Time	14	YYYYMMDDHHMMSS	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

➢ **+RESP:GTFTP,**

Example: **+RESP:GTFTP,C80303,865284040840609,,,123_0_20220119075222.jpg,1,0.0,0,116.7,114.015443,22.537174,20220119075515,0460,0000,27BD,134F,00,20220119075515,04D2$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved	0		
File Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '.'	
GNSS Accuracy	<=2	0	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*File Name*>: The name of the file transferred to FTP server. The suffix is ".jpg".

➢ **+RESP:GTEXP,**

This message is used to report the HW fault code for UFSxxx sensor.

Example:
+RESP:GTEXP,C80303,865284040840609,,4,,,0001,1,0.0,0,645.4,114.015339,22.537264,20220119060514,0460,0000,27BD,0DFC,00,20220119060514,02B0$

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''-''_'	

Digital Fuel Sensor Type	1	2|4	
Reserved			
Reserved Parameters	<=3		
HW Fault Code	2	0 – FFFF	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Digital Fuel Sensor Type*>: For details, please refer to <*Digital Fuel Sensor Type*> in **AT+GTURT**.

✧ <*HW Fault Code*>: The fault code for UFSxxx sensor.

For DUT-E:

- Bit 0: Sensor is not calibrated (the difference between calibration frequencies of signal generator for minimum and maximum fuel levels is 100 Hz).
- Bit 1: Sensor is not calibrated for maximum fuel level.
- Bit 2: Signal generator is not functioning. Possible short circuit in measuring probe tubes.
- Bit 3: The difference between calibration values for minimum and maximum fuel levels in the sensor is less than 5 Hz.
- Bit 4: EEPROM error. Hardware failure of the sensor.
- Bit 5: Current frequency of the signal generator is more than fixed one when calibrating for minimum fuel level (the difference is more than 100 Hz).
- Bit 6 - 15: Reserved.

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For UFSxxx:

- 1: The detector of the fuel sensor is not connected or the signal extension cable is broken.
- 2: The detector of the fuel sensor is detached from the fuel tank.
- 3: The input power source is too low.
- 4: Abnormal reset of the system.
- 5: The value of analog output is abnormal.
- 6 : The current fuel level is in the blind zone.

➢ **+RESP:GTUPC,**

Example: **+RESP:GTUPC,C80303,865284040840609,,0,100,http://218.17.46.11:9359/865284049248242.ini,20220119060659,02B4$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9','a'-'z','A'-'Z'	
Command ID	<=2		
Result	3	100|101|102|103|200|201|202|300|301|302|304|305|306	
Download URL	<=100	Complete URL	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

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

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

- 100: The update command is starting.
- 101: The update command is confirmed by the device.
- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.
- 303: Reserved.
- 304: <*Command Mask*><*GEO ID mask*><*Stocmd ID Mask*> or <*Group ID Mask*>

check failed.

- 305: the update process is interrupted by reboot.
- 306:The update process is interrupted by md5 verification error.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name.

➢ **+RESP:GTIGS,**

This message is used to report statistical information during trip. A trip is considered to be from Ignition on to Ignition off. The message is reported after the ignition is turned off.

Example: **+RESP:GTIGS,C80303,865284040840609,,0F,4,20220119061158,20220119061202,1,0.0,0,0.0,114.015525,22.537333,20220119061202,1,0.0,0,137.2,114.015525,22.537334,20220119061202,0460,0000,27BD,0DFC,00,0.0,,20220119061202,0313$**			
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' '-' '_'	
IGS Composition Mask	2	00 - FF	
Duration of Ignition On	<=6	0 – 999999 sec	
Ignition On Time	14	YYYYMMDDHHMMSS	
Ignition Off Time	14	YYYYMMDDHHMMSS	
GNSS Accuracy (Highest Speed Point)	<=2	0	0
Speed (Highest Speed Point)	<=5	0.0 – 999.9 km/h	
Azimuth (Highest Speed Point)	<=3	0 – 359	
Altitude (Highest Speed Point)	<=8	(–)xxxxx.x m	
Longitude (Highest Speed Point)	<=11	-180 - 180	
Latitude (Highest Speed Point)	<=10	-90 - 90	
GNSS UTC Time (Highest Speed Point)	14	YYYYMMDDHHMMSS	

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GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*IGS Composition Mask*>: Bitwise mask to configure the composition of the **+RESP:GTIGS** message. (Please refer to <*IGS Composition Mask*> in **AT+GTCFG**)
- <*Duration of Ignition On*>: Duration since last time the ignition is turned on. If it is greater than 999999 seconds, it will be reported as 999999 seconds.
- <*GNSS Accuracy (Highest Speed Point)*>: The GNSS accuracy of the highest speed position.
- <*Speed (Highest Speed Point)*>: The speed of the highest speed position. Unit: km/h.
- <*Azimuth (Highest Speed Point)*>: The azimuth of the highest speed position.
- <*Altitude (Highest Speed Point)*>: The height of the highest speed position above sea level.
- <*Longitude (Highest Speed Point)*>: The longitude of the highest speed position.
- <*Latitude (Highest Speed Point)*>: The latitude of the highest speed position.
- <*GNSS UTC Time (Highest Speed Point)*>: The UTC time of the highest speed position.
- <*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.
- <*Hour Meter Count*>: If the hour meter count function is enabled by the command **AT+GTHMC**, total hours the meter has counted when the engine is on will be reported in this field. If the function is disabled, this field will be empty. It is formatted with 5 hour digits, 2

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minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00.

Note: If it is outside the working hours range, the Highest Speed Point will still be reported, regardless of the <*+EVT Mask*> setting in **AT+GTHRM**.

- **+RESP:GTASC,**

Example: **+RESP:GTASC,C80303,865284040840609,,0,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,1,0.0,0,645.4,114.015339,22.537264,20220119060837,0460,0000,27BD,0DFC,00,20220119060837,02D5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Calibration state	1	0 – 2	
X_Forward	<=5	-1.00 – 1.00	
Y_Forward	<=5	-1.00 – 1.00	
Z_Forward	<=5	-1.00 – 1.00	
X_Side	<=5	-1.00 – 1.00	
Y_Side	<=5	-1.00 – 1.00	
Z_Side	<=5	-1.00 – 1.00	
X_Vertical	<=5	-1.00 – 1.00	
Y_Vertical	<=5	-1.00 – 1.00	
Z_Vertical	<=5	-1.00 – 1.00	
GNSS Accuracy	<=2	0 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

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MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4|8	XXXXXXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <Calibration State>: The status of the self-calibration for acceleration data.
  - 0: Uncalibrated.
  - 1: Reserved.
  - 2: Calibrated successfully.
- ✧ <X_Forward>, <Y_Forward>, <Z_Forward>: The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is Xnew = <X_Forward> * X + <Y_Forward> * Y + <Z_Forward> * Z.
- ✧ <X_Side>, <Y_Side>, <Z_Side>: The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in Side direction Ynew is Ynew = <X_Side> * X + <Y_Side> * Y + <Z_Side> * Z.
- ✧ <X_Vertical>, <Y_Vertical>, <Z_Vertical>: The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in Vertical direction Znew is Znew = <X_Vertical> * X + <Y_Vertical> * Y + <Z_Vertical> * Z.

➢ **+RESP:GTLBA**

Example: **+RESP:GTLBA,C80303,865284040840609,,1,000F1,1,0.0,0,175.4,114.015414,22.537617,20220119033406,0460,0000,27BD,0DFC,00,20220119033406,019E$**			
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' '-' '_'	
Access.ory Type	1	1|2|3	
Accessory Serial Number	5	00001 – FFFFE	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Accessory Type*>: The sensor type in the message:

- 1: Wireless temperature sensor(WTS100)
- 2: Wireless temperature &humidity sensor(WTH100)
- 3: Wireless panic button(WPB100)

Note: The message **+RESP: GTLBA** will be reported according to the parameter <*Sample Interval*> when the parameter <*Accessory Type*> is 1 or 2. Another will be reported according to the trigger event of the button.

➢ **+RESP:GTWPB**

Example: **+RESP:GTWPB,C80303,865284040840609,,000F5,1,0.0,0,175.4,114.015414,22.537617,20220119032855,0460,0000,27BD,134D,00,20220119032855,018B$**			
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' '-' '_'	
Accessory Serial Number	5	00001 – FFFFE	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	

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Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTJDS,**

Example: **+RESP:GTJDS,C80303,865284040840609,,2,1,0,0.0,0,116.7,114.015443,22.537174,20220119080524,0460,0000,27BD,0DFC,00,20220119080527,050C$**			
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' '-' '_'	
Jamming Status	1	1|2	
Jamming Net	1	1|2|3	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	

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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 state.
- 2: Enter the jamming state.

✧ <*Jamming Net*>: The network that is jammed.
- 1: 2G
- 2: 3G
- 3: 4G

➢ **+RESP:GTGPJ,**

Example:
+RESP:GTGPJ,C80303,865284040842605,GV75M,19,1,2,0.0,0,139.8,114.015418,22.537187,20211111060441,0460,0000,27BD,0DFC,00,20211111140441,16B7$

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' '-' '_'	
CW Jamming Value	1	0-255	
GPS Jamming State	1	0-3	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	

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GNSS 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	$	$

- ✧ *<CW Jamming Value>*: Current continuous wave jamming value.
- ✧ *<GPS Jamming State>*: Current jamming state.
  - 0: Unknown or feature disabled.
  - 1: (Ok) no significant jamming.
  - 2: (Warning) interference visible but fix OK.
  - 3: (Critical) interference visible and no fix.

➢ **+RESP:GTGSM,**

Example:
+RESP:GTGSM,C80303,865284040840609,GIR,0460,0000,27BD,12CD,15,,0460,0000,27BD,0DFC,20,,0460,0000,27BD,134D,16,,,,,,,,,,,,,,,,,,0460,0000,27BD,134F,23,,20220119062240,035B$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Fix Type	3	SOS|RTL|LBC|TOW|FRI|GIR|ERI	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4		
Cell ID1	4 – 8		
RX Level1	2	0-63	
Reserved	0		
MCC2	4	0XXX	

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MNC2	4	0XXX	
LAC2	4		
Cell ID2	4 – 8		
RX Level2	2	0-63	
Reserved	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		
Cell ID3	4 – 8		
RX Level3	2	0-63	
Reserved	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
Cell ID4	4 – 8		
RX Level4	2	0-63	
Reserved	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	4 – 8		
RX Level5	2	0-63	
Reserved	0		
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4		
Cell ID6	4 – 8		
RX Level6	2	0-63	
Reserved	0		
MCC	4	0XXX	

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MNC	4	0XXX	
LAC	4		
Cell ID	4 – 8		
RX Level	2	0-63	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Fix Type*>: A string to indicate the type of GNSS fix this cell information is for.
  "SOS": This cell information is for SOS request.
  "RTL": This cell information is for RTL request.
  "LBC": This cell information is for LBC request.
  "TOW": This cell information is for TOW request.
  "FRI": This cell information is for FRI request.
  "GIR": This cell information is for sub command "**C**" in the **AT+GTRTO** command.
  "ERI": This cell information is for ERI request.
- <*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 value coded in 1 dB steps:
  0: -110 dBm
  1 to 62: -109 to -48 dBm
  63: -47 dBm
- <*MCC*>: MCC of the serving cell.
- <*MNC*>: MNC of the serving cell.
- <*LAC*>: LAC in hex format of the serving cell.
- <*Cell ID*>: Cell ID (in hex format) of the serving cell.
- <*RX Level*>: The signal strength of the serving cell.

Note:

1. It may include information of several neighbor cells (or even no neighbor cell information). If no neighbor cell is found, all the fields of the neighbor cell will be empty.
2. "ffff" in the fields <*LAC(i)*> and <*Cell ID(i)*> indicates the device does not know the value.
3. This message cannot be sent via SMS.
3. This report cannot be sent via SMS.

- **+RESP:GTEUC,**

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Example: **+RESP:GTEUC,C80303,865284040840609,,0,100,http://218.17.46.11:9359/865284049248242.ini,00000000,,,,,20220119080911,051A$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9', 'a' – 'z', 'A' – 'Z'	
Command ID	<=3		
Result	3	100|101|102|103|200|201|202|300|301|302|304|305|306	
Download URL	<=100	Complete URL	
Identifier Number	8	000000000 – FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the response code is 301. It indicates wrong format of command ID when the response code is 302. It is empty when the response code is 304 or 305.
- <*Result*>: A numeral to indicate whether the configuration is updated successfully.
  - 100: The update command is starting.
  - 101: The update command is confirmed by the device.
  - 102: The update command is refused by the device.
  - 103: The update process is refused because the battery is low.
  - 200: The device starts to download the package.
  - 201: The device finishes downloading the package successfully.
  - 202: The device fails to download the package.
  - 300: The device starts to update the device configuration.
  - 301: The device finishes updating the device configuration successfully.
  - 302: The device fails to update the device configuration.
  - 303: Reserved
  - 304: <*Command Mask*> or <*GEO ID Mask*> check fails.
  - 305: The update process is interrupted by abnormal reboot.
  - 306: The update process is interrupted by md5 verification error.
- <*Download URL*>: The complete URL to download the configuration. It includes the file name.
- <*Identifier Number*>: Please refer to the parameter <*Identifier Number*> in the command **AT+GTUPC**.

3.3.5. Data Report

The following reports are triggered when certain data needs to be sent.

+RESP:GTPHD: It reports photo data.

+RESP:GTFSD: It reports fuel sensor data.

➢ **+RESP:GTPHD,**

This message is used for reporting photo data and is only sent via data service even if the report mode is forced SMS mode.

Example: **+RESP:GTPHD,C80303,864292043422052,gv75m,0,,20200528135656,10,2,912,DLaqcO3…,,,,,20200528135656,0155$**			
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' '-' '_'	
Camera ID	1	0-3	
Reserved	0		
Photo Time	14	YYYYMMDDHHMMSS	
Total Frames	<=3		
Current Frame Index	<=3		
Photo Data Length	<=3		
Photo Data	<=684		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

✧ <*Total Frames*>: The total frames of one picture.

✧ <*Current Frame Index*>: The index of the current frame.

✧ <*Photo Data Length*>: The length of picture data in the current frame.

➢ **+RESP:GTFSD**,

This message is used for reporting fuel sensor data.

Example: **+RESP:GTFSD,C80303,865284040842605,,39,*QL,407D,01,00000,0132,0014,00000,0229#,,,,,20210303062931,0199$**			
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' '-' '_'	
Data Length	2		
Sensor Data	<=128	ASCII Code	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

✧ <*Data Length*>: The length of <*Sensor Data*>.

✧ <*Sensor Data*>: The fuel data obtained from fuel sensor. It starts with '*' and ends with '#'.

3.3.6. Buffer Report

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

✧ HSPA context activation for the TCP or UDP connection fails.

✧ Establishment of the TCP connection with the backend server fails.

These messages will be sent to the backend server when the connection to the server is recovered. The buffer reports are saved to the built-in non-volatile memory in case the device is reset. The device can buffer up to 10000 messages (160 bytes per message).

Detailed information of buffer report is as follows.

✧ Only **+RESP** messages except **+RESP:GTALM**, **+RESP:GTALC** and **+RESP:GTPDP** are buffered.

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

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other content including the original sending time and count number remains unchanged.

- ✧ Buffered messages will be sent only via HSPA by TCP or UDP protocol. They cannot be sent via SMS. If the current report is forced SMS mode, the buffered message will not be sent until the report mode is changed to TCP or UDP.
- ✧ The buffered messages will be sent after real time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 1.
- ✧ The buffered messages will be sent before real time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 2. The SOS message has the highest priority and is sent before the buffered messages.

Example:

The following is an example of a buffered message:

+BUFF:GTFRI,C80303,865284040842605,,,10,1,1,0.0,0,119.9,114.015466,22.537155,20210303055440,0460,0000,2493,17FD,00,0.0,,,,0,210000,,,,20210303055440,014A$

3.3.7. Report with Google Maps Hyperlink

If <*Location Request Mask*> in the command **AT+GTCFG** is set to 20, the device will send its current location to the incoming SMS number via SMS with a Google Maps hyperlink.

➢ **Google Maps Hyperlink**

Example:
LBC:gv75m
http://maps.google.com/maps?q=22.537124,114.015443
F1 D2020/07/30 T04:00:23 B0% I1 S0.00

Parameter	Length (Byte)	Range/Format	Default
Type Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
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	
GNSS Fix	<=3	F0|F1 – F50	
GNSS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Battery Percentage	<=6	B0-B100	
Ignition Status	2	I0|I1	
Speed	<=6	V0.0 – S999.9 km/h	

- ✧ <*Type Name*>: A string that includes the device name and GPS positioning type ("SOS",

"LBC")

- ✧ <*Google Maps Hyperlink*>: A string of a Google Maps hyperlink.
- ✧ <*GNSS Fix*>: The accuracy of the location information. F0 means "No GNSS fix".
- ✧ <*Battery Percentage*>: The percentage of the backup battery.
- ✧ <*Ignition Status*>: The status of ignition. 0 means "Ignition off", and 1 means "Ignition on".
- ✧ <*Speed*>: The current speed. Unit: km/h.

Note: The SOS event type is only sent to the SMS gateway by **GTSRI** configration.

3.3.8. Transparent Data Transmission

The device supports transparent data transfer between the backend server and the peripheral device connected to its second serial port. The device supports bi-directional data transmission. In both directions, the data is transparent to the device.

a) Transfer data from the peripheral device to the backend server
If the peripheral device supports **AT+GTDAT** command, it can transfer data via this command. The peripheral device can send the command **AT+GTDAT** with the data to the serial port. According to the <*Command Type*> of **AT+GTDAT**, the device wraps the corresponding data format into the backend server with the **+RESP:GTDAT** message either in short format or in long format.
b) Transfer data from the backend server to the peripheral device
If the backend server needs to send data to the peripheral device, it can send the command **AT+GTDAT** with the data to gv75m and gv75m will pick out the pure data and send it to the second serial port. The peripheral device can thus get the data from the serial port.

Data to the backend server

- ➢ **+RESP:GTDAT (Short Format),**

Example: **+RESP:GTDAT,C80303,865284040842605,GV75M,data,20210302122842,0D97$**			
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' '-' '_'	
Data to the Backend Server	<=1280	ASCII Code	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ➢ **+RESP:GTDAT (Long Format),**

Example:

+RESP:GTDAT,C80303,865284040842605,GV75M,0,,,data,0,0.0,0,75.4,114.014936,22.537098,20210302122102,0460,0000,27BD,0DFC,00,,,,,20210302122926,0D98$			
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' '-' '_'	
Report Type	1	0|1|2	
Reserved	0		
Reserved	0		
Data to the Backend Server	<=1280	ASCII Code	
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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✧ <*Report Type*>: The value of <*Report Type*> is determined by the <*Working Mode*> of **AT+GTURT**.

- 0: Disable the serial port.
- 1: **AT+GTDAT**
- 2: Reserved

Data to the serial port starts with a new line and is terminated with '\r\n'.

Example: **data to the serial port**

3.3.9. Data Transmission Based on Specified Terminator Character or Data Length

The device supports data transfer from the peripheral device to the backend server. According to the <*Working Mode*> of the command **AT+GTURT**, there are two ways for the peripheral to communicate with the device.

Data to the backend server

➢ **+RESP:GTDTT (Short Format)**

Example: **+RESP:GTDTT,C80303,865284040842605,GV75M,,,0,4,DATA,20210302123800,0D9F$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Data Type	1	0-1	
Data Length	<=4	1-1280	
Data to the Backend Server	<=1280		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTDTT (Long Format)**

Example: **+RESP:GTDTT,C80303,865284040842605,GV75M,,,0,4,data,0,0.0,0,75.4,114.014936,22.537098,20210302122102,0460,0000,27BD,0DFC,00,,,,,20210302124009,0DB1$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Data Type	1	0-1	
Data Length	4	1-1280	
Data to the Backend Server	<=1280		
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

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Tail Character	1	$	$

- <*Data Type*>: 0 means binary data, and 1 means binary data written in hexadecimal ASCII format.
- <*Data Length*>: It expresses the length of <*Data to the Backend Server*>.
- <*Data to the Backend Server*>: It is hexadecimal data when the <*Mode*> of the **AT+GTURT** is 7, and pure HEX data as input through UART when the <*Mode*> is 6 or 8.

3.3.10. UART Data Transfer

If the parameter <*Mode*> in **AT+GTUDT** is enabled, the device will send the message **+RESP:GTUDT** to the serial port according to send interval. If the GEO-Fence event occurs, the device can also send the message **+RESP:GTUDT** to the serial port.

- **+RESP:GTUDT,**

Example: **+RESP:GTUDT,C80303,0101,0101,,865284040842605,gv75m,1,2,1,2,0.0,0,89.3,114.015232,22.537149,20210121072137,0460,0000,2493,17FE,00,0.0,,,,,4,1,,,0000,0000,1A,90,4.16,0,00002,,00000,,20210121072137,0025$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Firmware Version			
Hardware Version			
Reserved			
Unique ID	15	IMEI	
Device Name			
Report Type	1	0|1|2	
Report ID	<=5	0 – FFFFF	
Number	1	1	
GNSS Accuracy	<=2	0|1-50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 - 180	

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Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Reserved			
HMC	11	HHHHH:MM:SS	
Reserved			
Reserved	0		
GSV Number	<=2	00-FF	
GEO-Fence State	1	0|1	
Reserved	0		
Reserved	0		
Digital Input	2	0000 – 0F42	
Digital Output	2	0000 – 0F03	
Motion Status	1	0x11|0x12|0x16|0x1A|0x41|0x42|0x21|0x22	
External Power VCC	<=5	0 – 32000 mV	
Backup Battery Level	<=4	0.00 – 4.50 V	
Charging	1	0|1	
GEO Status Mask	5	00000 – FFFFF	
PEO-Fence State	1	0|1	
PEO Status Mask	5	00000 – FFFFF	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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- <*Report Type*>: A numeral to indicate the type of the report.
  - 0: Timer event triggered.
  - 1: GEO-Fence event triggered.
  - 2: PEO-Fence event triggered.
- <*Report ID*>: The Geo-fence ID which triggers the **+RESP:GTUDT** report. It is fence ID mask in HEX format.
- <*GEO-Fence State*>: The activated GEO-Fence state. 0 means "Outside the GEO-Fence", and 1 means "Inside the GEO-Fence".
- <*GEO Status Mask*>: Bit 0 – Bit 19 represent the status of GEO 0 – 19 respectively. 0 means "Outside the GEO fence" or "The status is unknown", while 1 means "Inside the GEO fence".
- <*PEO-Fence State*>: The activated PEO-Fence state. 0 indicates "Outside the PEO fence", and 1 indicates "Inside the PEO fence".
- <*PEO Status Mask*>: Bit 0 - Bit 19 represent the status of PEO 0 to 19 respectively. 0 means "Outside the PEO fence" or "The status is unknown", and 1 means "Inside the PEO fence".

3.3.11. Crash Data Packet

The **+RESP:GTCRD** message contains 10s tri-axial acceleration data before crash and after crash. When a crash is detected, tri-axial acceleration data before crash will be reported to backend server in several frames. And the device will continue to record tri-axial data after crash and report the data to backend server in several frames.

➢ **+RESP:GTCRD,**

Example:

+RESP:GTCRD,C80303,865284040842605,GV75M,1,10,8,FFB3FFE4FFA8FFA7FFD9FF9DFFB6FFDAFF8BFFC0FFE3FF96FFC3FFEFFF9CFFBBFFE8FFF0FFA2FFEF0000FFC60006000BFFE800050000FFE800020005FFE200000001FFE7FFFC000BFFE8FFFD0009FFEBFFE7000BFFE7FFE10008FF22002EFFE80FFFC0026FFC2FFAFFFAC0034FFF4FFDA002BFFD1FFF1FFDCFF0A0000FF49FF62008EFF44FF4E0037FF68FF890024FF4FFF700042FF4CFF7A003CFF0EFF950037FF46FFA40035FF87FF960012FF6DFF9EFFF5FF51FFA20001FF89FF9B0010FF8BFFAC0006FF79FFA7FFF2FF8EFF9F0004FF94FFA40002FFB1FFB6FFF0FFEEFFBFFFFFFFEFFCEFFFF0005FFD8FFEC0004FFD4FFF3000DFFD2FFF30007FFCAFFF3FFF5FFC8FFF4FFEDFFAF0001FF87FF4D0016FF4AFFA70023FF75FF920025FF39FF7D0011FF61FF890021FF56FF920015FF41FF8D0017FF43FF8B0008FF4EFF8F0002FF44FF78FFE6FF47FF77FFEDFF74FF96FFF6FF9FFFC6FFF5000CFFF6000E0023000A000300360015FFF400390016FFEF003C00070001001FFFDFFFF8FFD1FF96001BFF7EFF6CFFF9FF97FFA1005AFFCAFF720024FF2DFF73001EFF14FFA0FFDEFF4EFF86FFFDFF15FF770003FEFBFF98FFF3FF67FF8EFFDAFF7EFF83FFD7FF8EFF78FFE0FF9CFF92FFEFFFBAFFB9FFFBFFC8FFCDFFFCFFCEFFCA0005FFCAFFBD0008FFCAFFB50008FFB8FFBB000AFFA6FFBAFFFFFF93FFBDFFF9FF8BFFD1FFEFFF94FFC6FFDBFF93FFBCFFE9FF8CFFBBFFEFFF8CFFB6FFF4FF94FFB1FFF8FF9EFFB0FFFAFFA5FFB00001FFABFFB40006FFB4FFBAFFFEFFBDFFC40006FFC8FFCEFFFBFFCCFFD70000FFEAFFE5FFFCFFE3FFEDFFF80003,20210302120402,0D6B$

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'	
Data Type	1	0/1	
Total Frame	1|2	1-10	
Frame Number	1|2	1 -10	
Data	1000	'0'-'9' 'a'-'f'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Data Type*>: It indicates the data reported to the backend server is recorded before or after crash.
  - 0: Before crash
  - 1: After crash
- <*Total Frame*>: The total number of messages that are sent to the backend server for the crash event.
- <*Frame Number*>: A numeral to indicate the sequence of the current message.
- <*Data*>: There are at most 1,000 ASCII characters in a message with 12 characters as a group. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data. The ASCII "0001" means HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" means HEX value 0xFFFD which is the compliment of -3, so it means the acceleration is -3.

Example:

+RESP:GTCRD,250301,359231038715676,,0,3,1,000100010055…,20160330120443,005C$

This is the earliest XYZ-axis acceleration data:

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

Decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;

+RESP:GTCRD,250301,359231038715676,,1,3,3,...ffffff10052,20160330115736,005A$

This is the latest XYZ-axis acceleration data:

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

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

Note: Acceleration of gravity (+g) is 128 in decimal format and –g is -128. The linearized acceleration data 2048 represents +16g and -2048 represents -16g.

3.3.12. Crash GPS Information Report

The **+RESP:GTCRG** report contains 10s GPS information before and after crash. When crash is

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

➢ **+RESP:GTCRG**

Example:
+RESP:GTCRG,C80303,868446036599153,gv75m,0,10,1,1,0.0,0,100.2,114.015294,22.537137,20190826015242,2,1,0.0,0,100.2,114.015294,22.537137,20190826015243,3,1,0.0,0,100.2,114.015294,22.537137,20190826015244,4,1,0.0,0,100.2,114.015294,22.537137,20190826015244,5,1,0.0,0,100.2,114.015294,22.537137,20190826015245,6,1,0.0,0,100.2,114.015294,22.537137,20190826015246,7,1,0.0,0,100.2,114.015294,22.537137,20190826015247,8,1,0.0,0,100.2,114.015294,22.537137,20190826015248,9,1,0.0,0,100.2,114.015294,22.537137,20190826015249,10,1,0.0,0,100.2,114.015294,22.537137,20190826015250,20190826095251,1489$

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'	
Data Type	1	0/1	0
GPS Valid Time Number	2	0 – 10	
GPS Point Index	<=2	1	
GPS Accuracy	<=2	0/1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
.....			
GPS Point Index	<=2	10	
GPS Accuracy	<=2	0/1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	

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Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Data Type>: The data reported to backend server is recorded before or after crash.
- 0: Before crash.
- 1: After crash.

✧ <GPS Valid Time Number>: The number of the successfully fixed GPS positions included in the report.

<GPS Point Index>: The index of GPS point.

3.3.13. Acceleration Data Packet

The device will report the message every 3 seconds, and record 25 XYZ-axis acceleration data per second.

➢ **+RESP:GTACC,**

Example:
+RESP:GTACC,C80303,864394040188247,gv75m,00180003FF7E00180003FF7E00180003FF7F00180003FF7F00180003FF7E00180003FF7E00180003FF7E00180002FF7E00180003FF7F00180003FF7E00180003FF7E00180003FF7F00180003FF7E00180002FF7F00180003FF7E00180003FF7F00180003FF7E00180003FF7E00180003FF7F00180003FF7E00180003FF7F00180003FF7E00180003FF7F00180003FF7E00180003FF7F00180003FF7E00180003FF7F00180003FF7E00180002FF7F00180003FF7E00180002FF7E00180003FF7F00180003FF7E00180003FF7E00180003FF7E00180002FF7E00190003FF7E00180002FF7F00190002FF7F00190003FF7D00180002FF7E00190002FF7F00180002FF7F00180002FF7E00190002FF7F00190002FF7F00190002FF7F00190002FF7E00190002FF7E00180002FF7F00180002FF7F00180002FF7F00180002FF7F00180002FF7E00190002FF7F00190002FF7F00190002FF7E00180002FF7F00190002FF7E00190002FF7F00190002FF7F00180002FF7F00190002FF7F00180002FF7F00190002FF7F00180002FF7F00190002FF7F00190002FF7F00180002FF7F00190002FF7F00180002FF7F00180002FF7F00180002FF7F00180002FF7F00180002FF7F,,,,20200730141356,0AAE$

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'	
Data	12*75	'0'-'9' 'a'-'f'	
Reserved	0		

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

✧ <*Data*>: There are 12*75 ASCII characters in the message with 12 characters in a group. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data. The ASCII "0001" represents HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" represents HEX value 0xFFFD which is the complement of -3, so it means the acceleration is -3.

Example:

+RESP:GTACC,D60100,864292043426376,,000100010055…,,,,20200623030021,863D$

This is the earliest XYZ-axis acceleration data:

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

Decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;

+RESP:GTACC,D60100,864292043426376,,fffffff10052…,,,,20200623030022,863E$

This is the latest XYZ-axis acceleration data:

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

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

Note: Acceleration of gravity (+g) is 128 in decimal format and –g is -128. The linearized acceleration data 2048 represents +16g and -2048 represents -16g.

3.3.14. CANBUS Device Information Report

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

➢ **+RESP:GTCAN,**

Example:
+RESP:GTCAN,C80303,865284040842605,,0,1,FFFFFFFF,,2,H779133,50.56,1705,40,90,,L87.40,3960,32,2.14,1.17,0.97,7436.45,4365,BF,FFFF,3F,1F,3.56,1.11,,,1,0.0,0,119.9,114.015466,22.537155,20210303060111,0460,0000,27BD,0DFC,00,20210303060112,014E$

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' '-' '_'	
Report Type	1	0|1|2	
CANBUS Device State	1	0|1	
CANBUS Report Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' – '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0|1|2	
Total Distance	<=12	H(0 – 99999999)/I(0.0 – 2147483647.9)	
Total Fuel Used	<=9	0.00 – 999999.99l	
Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 – 455Km/h	
Engine Coolant Temperature	<=4	-40 – +215 ℃	
Fuel Consumption	<=5	0.0 – 999.9L/100km | Inf | NaN	
Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100.00)	
Range	<=8	0 – 99999999	
Accelerator Pedal Pressure	<=3	0 – 100%	
Total Engine Hours	<=8	0.00 – 99999.99h	
Total Driving Time	<=8	0.00 – 99999.99h	
Total Engine Idle Time	<=8	0.00– 99999.99h	
Total Idle Fuel Used	<=9	0.00 –999999.99l	
Axle Weight 2nd	<=5	0 – 65535kg	
Tachograph Information	4	00-FFFF	
Detailed Information/Indicators	4	00-FFFF	
Lights	2	0-FF	
Doors	2	0-FF	
Total Vehicle Overspeed	<=8	0.00 – 99999.99h	

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Time			
Total Vehicle Engine Overspeed Time	<=8	0.00 – 99999.99h	
Reserved	0		
Reserved	0		
GNSS 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	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	<=8	XXXX	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Report Type*>: A numeral to indicate the report type.
  - 0: Periodic report
  - 1: Real time report
  - 2: Ignition on/off report
- <*CANBUS Device State*>: A numeral to indicate the state of communication between the device and the external CANBUS device.
  - 0: Abnormal. The device fails to receive data from the external CANBUS device.
  - 1: Normal. The device is able to receive data from the external CANBUS device.
- <*CANBUS Report Mask*>: Please refer to the <*CAN Report Mask*> in **AT+GTCAN**.
- <*VIN*>: Reserved in CAN100 device.
- <*Ignition Key*>: A numeral to indicate the ignition/engine status.
  - 0: Ignition off
  - 1: Ignition on
  - 2: Engine on
- <*Total Distance*>: Total distance the vehicle has travelled. The number is always growing. The

unit is hectometer (H) or distance impulse (I) (if distance from dashboard is not available).

- <*Total Fuel Used*>: The number of liters of fuel used since vehicle manufacture or device installation. The unit is liter.
- <*Fuel Level*>: The level of fuel in vehicle tank. The unit is liter (L) or percentage (P).
- <*Range*>: The number of hectometers to drive on remaining fuel. The unit is hectometer.
- <*Vehicle Speed*>: The vehicle speed based on wheel. The unit is km/h.
- <*Engine RPM*>: The revolutions per minute. The unit is rpm.
- <*Accelerator Pedal Pressure*>: The unit is percentage.
- <*Engine Coolant Temperature*>: The unit is Celsius. Negative value is preceded by negative sign (-), e.g., "-2". When the value is positive, no extra character is inserted, e.g., "20".
- <*Fuel Consumption*>: The fuel consumption is calculated based on the values read from vehicle.

  Note: The CAN100 device cannot get this value and the value is invalid.
- <*Total Engine Hours*>: Time of engine running since vehicle manufacture or device installation. The unit is hour.
- <*Total Driving Time*>: Time of engine running (non-zero speed) since vehicle manufacture or device installation. The unit is hour.
- <*Total Engine Idle Time*>: Time of engine running during idling status (vehicle at rest) since vehicle manufacture or device installation. The unit is hour.
- <*Total Idle Fuel Used*>: The number of liters of fuel used since vehicle manufacture or device installation. The unit is liter.
- <*Axle Weight 2nd*>: Weight of vehicle's second axle. The unit is kg.
- <*Tachograph Information*>: Two bytes. The high byte describes driver 2, while the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Validity mark (0 – valid driver data; 1 – no valid data)

R: Reserved

C: Driver card (1 – card inserted; 0 – no card inserted)

T2-T0: Driving time related states:

- 0: Normal/no limits reached
- 1: 15 min before 4½ h
- 2: 4½ h reached
- 3: 15min before 9h
- 4: 9h reached
- 5: 15min before 16h (without 8h rest during the last 24h)
- 6: 16h reached
- 7: Other limit

W1-W0: Driver working states:

- 0: Normal/no limits reached
- 1: Rest - sleeping
- 2: Driver available – short break
- 3: Drive – behind the wheel

- <*Detailed Information/Indicators*>: A hexadecimal number. Each bit contains information of

one indicator.

- Bit 0: FL – Fuel Low Indicator (1 – indicator on; 0 – off)
- Bit 1: DS – Driver Seatbelt Indicator (1 – indicator on; 0 – off)
- Bit 2: AC – Air Conditioning (1 – on; 0 - off)
- Bit 3: CC – Cruise Control (1 – active; 0 - disabled)
- Bit 4: B – Brake pedal (1 – pressed; 0 – released)
- Bit 5: C – Clutch Pedal (1 – pressed; 0 – released)
- Bit 6: H – Handbrake (1 – pulled-up; 0 – released)
- Bit 7: CL – Central Lock (1 – locked; 0 – unlocked)
- Bit 8: R – Reverse Gear (1 – on; 0 – off)
- Bit 9: RL – Running Lights (1 – on; 0 – off)
- Bit 10: LB – Low Beams (1 – on; 0 – off)
- Bit 11: HB – High Beams (1 – on; 0 – off)
- Bit 12: RFL – Rear Fog Lights (1 – on; 0 – off)
- Bit 13: FFL – Front Fog Lights (1 – on; 0 – off)
- Bit 14: D – Doors (1 – any door opened; 0 – all doors closed)
- Bit 15: T – Trunk (1 – opened; 0 – closed)

✧ <*Lights*>: A hexadecimal number. Each bit contains information of one particular light.

- Bit 0: Running Lights (1 – on; 0 – off)
- Bit 1: Low Beam (1 – on; 0 – off)
- Bit 2: High Beam (1 – on; 0 – off)
- Bit 3: Front Fog Light (1 – on; 0 – off)
- Bit 4: Rear Fog Light (1 – on; 0 – off)
- Bit 5: Hazard Lights (1 – on; 0 – off)
- Bit 6: Reserved
- Bit 7: Reserved

✧ <*Doors*>: A hexadecimal number. Each bit contains information of one door.

- Bit 0: Driver Door (1 – opened; 0 – closed)
- Bit 1: Passenger Door (1 – opened; 0 – closed)
- Bit 2: Rear Left Door (1 – opened; 0 – closed)
- Bit 3: Rear Right Door (1 – opened; 0 – closed)
- Bit 4: Trunk (1 – opened; 0 – closed)
- Bit 5: Hood (1 – opened; 0 – closed)
- Bit 6: Reserved
- Bit 7: Reserved

✧ <*Total Vehicle Overspeed Time*>: The total time when the vehicle speed is greater than the limit defined in CAN100's configuration.

✧ <*Total Vehicle Engine Overspeed Time*>: The total time when the vehicle engine speed is greater than the limit defined in CAN100's configuration.

3.3.15. UFSxxx FOTA Upgrade Report

The device will send the message **+RESP:GTUFS** to the backend server during the upgrade process.

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➢ **+RESP:GTUFS,**

Example: **+RESP:GTUFS,C80303,862170011507322,,200,1,20210303062945,0014$**			
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' '-' '_'	
Code	3		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Code*>: Information code.

- 100: Confirm ok. Start upgrade.
- 101: Mode error. UART does not work for UFSxxx. Stop upgrade.
- 102: The upgrade process is refused because of low power or an incorrect URL.
- 200: Start to download package.
- 201: Package download succeeds.
- 202: Package download fails.
- 300: Start upgrade.
- 301: Upgrade succeeds. The reserved parameter is used as follows.

New Version	2		0

- 302: Upgrade fails.

3.4. Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server in the case of communication via TCP/UDP. The heartbeat package is sent to the backend server at the interval specified by <*Heartbeat Interval*> in the **AT+GTSRI** command.

➢ **+ACK:GTHBD,**

Example: **+ACK:GTHBD,C80303,865284040842605,,20210303065932,01A0$**

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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 with an acknowledgement to the device.

➢ **+SACK:GTHBD,**

Example: **+SACK:GTHBD,C80303,11F0$** **+SACK:GTHBD,,11F0$**			
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 supports. 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.

Note: If server acknowledgement is enabled in the **AT+GTSRI** command, the backend server should reply to the device whenever it receives a message from the device.

3.5. Server Acknowledgement

➢ **+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.

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4. HEX Format Report Message

From this version, the @Track 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 uses 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 mask settings 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

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

➢ **AT+GTHRM=**

Example: **AT+GTHRM=gv75m,,,FF, 00FEDFFF,00FEDFFF,7F7F,FF,7F,,7FF,,0018$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv75m
2	Reserved	0		
3	Reserved	0		
4	+ACK Mask	<=2	0 – FF	7F

5	+RSP Mask	<=8	0 – FFFFFFFF	6FE1FFF
6	+EVT Mask	<=8	0 – FFFFFFFF	6FE1FFF
7	+INF Mask	<=8	0 – FFFFFFFF	FF7F
8	+HBD Mask	<=2	0– FF	FF
9	+DAT Mask	<=8	0 – FFFFFFFF	7F
10	+CRD Mask	<=4	0-FFFF	7D
11	+CAN Mask	<=8	0 – FFFFFFFF	7FF
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

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

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

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	*<RFID Length>*
Bit 26	*<EIO100 IO Status>*
Bit 25	*<CAN Data>*

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Bit 24	*<RFID>*
Bit 23	*<Total Hour Meter Count>*
Bit 22	*<Current Hour Meter Count>*
Bit 21	*<Total Mileage>*
Bit 20	*<Current Mileage>*
Bit 19	*<Satellite Information>*
Bit 18	*<Motion Status>*
Bit 17	*<Digital IO Status>*
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	*<External Power Supply Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<Device Name>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<MCC/MNC/LAC/Cell ID/Reserved>*
Bit 2	*<Altitude>*
Bit 1	*<Azimuth>*
Bit 0	*<Speed>*

- *<CAN Data>*: Please refer to the **+RESP:GTCAN** report in hex format. *<CAN Data>* includes fields from *<CANBUS Device State>* to *<Total Vehicle Engine Overspeed Time>*. These fields can be analyzed in the same way as in the **+RESP:GTCAN** report.
- *<+EVT Mask>*: Component mask of the event report message.

Mask Bit	Item
Bit 31	Reserved

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Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	*<RFID Length>*
Bit 26	*<EIO100 IO Status>*
Bit 25	*<CAN Data>*
Bit 24	*<RFID>*
Bit 23	*<Total Hour Meter Count>*
Bit 22	*<Current Hour Meter Count>*
Bit 21	*<Total Mileage>*
Bit 20	*<Current Mileage>*
Bit 19	*<Satellite Information>*
Bit 18	*<Motion Status>*
Bit 17	*<Digital IO Status>*
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	*<External Power Supply Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<Device Name>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<MCC/MNC/LAC/Cell ID/Reserved>*
Bit 2	*<Altitude>*
Bit 1	*<Azimuth>*

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Bit 0	<*Speed*>

✧ <*+INF Mask*>: Component mask of the information report message. Bit 8 – Bit 15 indicate which groups of items are included when the device reports the message **+RESP:GTINF**.

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

✧ <*INF Expansion Mask*>: Component mask of the information report message. Bit 0 – Bit 15 indicate which groups of items are included when the device reports the message **+RESP:GTINF**.

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

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Bit 9	Reserved
Bit 8	**+RESP:GTWRT**
Bit 7	Reserved
Bit 6	Reserved
Bit 5	*<AC100 Data>*
Bit 4	Reserved
Bit 3	Reserved
Bit 2	**+RESP:GTCVN**
Bit 1	**+RESP:GTUVN**
Bit 0	**+RESP:GTGSV**

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

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

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

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

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

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

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

✧ *<+CAN Mask>*: Component mask of the CANBUS information packet in HEX format.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved

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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	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<Device Name>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<MCC/MNC/LAC/Cell ID/Reserved>*
Bit 2	Reserved
Bit 1	Reserved
Bit 0	Reserved

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

- **+ACK:GTHRM,**

Example: **+ACK:GTHRM,C80303,865284040842605,gv75m,0015,20220120031619,2DA3$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**

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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 7F 24 C8 03 02 03 05 67 76 37 35 6D 00 00 00 00 00 17 07 E6 01 14 03 1B 34 2D A8 6A 52 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
ID	1		
Serial Number	2	0000 – FFFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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✧ <*Message Type*>: It indicates the ID of the command that the device receives.

Command	ID	ID HEX
AT+GTBSI	0	00
AT+GTSRI	1	01
AT+GTQSS	2	02
AT+GTCFG	4	04
AT+GTTOW	5	05
AT+GTEPS	6	06
AT+GTDIS	7	07
AT+GTOUT	8	08
AT+GTIOB	9	09
AT+GTTMA	10	0A
AT+GTFRI	11	0B
AT+GTGEO	12	0C
AT+GTSPD	13	0D
AT+GTSOS	14	0E
Reserved	15	0F
AT+GTRTO	16	10
AT+GTSIM	19	13
AT+GTUPD	21	15
AT+GTPIN	22	16
AT+GTDAT	23	17
AT+GTOWH	24	18
AT+GTDOG	25	19
Reserved	26	1A
AT+GTJDC	27	1B
AT+GTIDL	28	1C
AT+GTHBM	29	1D
AT+GTHMC	30	1E
AT+GTURT	32	20
AT+GTWLT	34	22

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AT+GTHRM	35	23
AT+GTFFC	36	24
AT+GTJBS	37	25
AT+GTSSR	38	26
AT+GTEFS	41	29
AT+GTIDA	43	2B
AT+GTACD	44	2C
AT+GTPDS	45	2D
AT+GTCRA	46	2E
AT+GTBZA	47	2F
AT+GTSPA	48	30
Reserved	49	31
AT+GTUDT	50	32
AT+GTTMP	51	33
AT+GTFSC	52	34
AT+GTRMD	53	35
AT+GTPEO	54	36
AT+GTCMS	55	37
AT+GTTAP	56	38
AT+GTCAN	57	39
Reserved	58	3A
AT+GTUFS	59	3B
AT+GTFTP	60	3C
AT+GTCMD	61	3D
AT+GTUDF	62	3E
AT+GTASC	63	3F
Reserved	…	…
AT+GTGPJ	65	41
Reserved	…	…
AT+GTOEX	68	44

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AT+GTIEX	69	45
AT+GTUPC	70	46
Reserved	…	…
AT+GTGDO	76	4C
Reserved	…	…
AT+GTIGM	90	5A
AT+GTVVS	91	5B
AT+GTAVS	92	5C
Reserved	…	…
AT+GTWRT	104	68

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

IMEI	**86**	**71**	**62**	**02**	**00**	**13**	**20**	**7**
HEX	**56**	**47**	**3E**	**02**	**00**	**0D**	**14**	**07**

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

Device Name	**G**	**V**	**7**	**5**	**W**			
HEX	**47**	**56**	**37**	**35**	**57**	**00**	**00**	**00**

- <*ID*>: The ID of sub-command of **AT+GTRTO** or the ID of **AT+GTIOB**, **AT+GTGEO** or **AT+GTTMP**. For others, set it to 0.
- <*Send Time*>: The local time to send the acknowledgement message. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

Send Time	**2016**		**01**	**31**	**06**	**29**	**11**
HEX	**07**	**EB**	**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:GTPNL**, **+RESP:GTTOW**, **+RESP:GTDIS**, **+RESP:GTIOB**, **+RESP:GTFRI**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTDOG**, **+RESP:GTIGL**, **+RESP:GTVGL**, **+RESP:GTHBM** and **+RESP:GTEPS** use the format as shown below.

- **+RSP,**

Example:
2B 52 53 50 07 04 FE 1F FF 00 63 C8 03 02 03 05 67 76 37 35 6D 00 00 00 64 00 00 00 00 00 02 11 08 10 01 01 00 00 00 00 00 01 28 06 CB BC 42 01 57 E3 EB 07 E6 01 14 03 2C 2F 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 07 E6 01 14 03 2C 30 2D C3 8E 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Report ID/Report Type	1		

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Number	1	1 – 15	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 –FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		(empty)
RFID Length	1	0-28	
RFID	<=28	00-FF	
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 a specific location report message.

Message	**ID**	**ID HEX**
Reserved	0	00
+RESP:GTTOW	1	01
Reserved	2	02
+RESP:GTLBC	3	03

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+RESP:GTEPS	4	04
+RESP:GTDIS	5	05
+RESP:GTIOB	6	06
+RESP:GTFRI	7	07
Reserved	8	08
+RESP:GTSPD	9	09
+RESP:GTSOS	10	0A
+RESP:GTRTL	11	0B
+RESP:GTDOG	12	0C
Reserved	13	0D
Reserved	14	0E
+RESP:GTHBM	15	0F
+RESP:GTIGL	16	10
+RESP:GTIDA	17	11
+RESP:GTERI	18	12
Reserved	19	13
+RESP:GTGIN	20	14
+RESP:GTGOT	21	15
Reserved	…	…
+RESP:GTVGL	26	1A

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

IMEI	**86**	**71**	**62**	**02**	**00**	**13**	**20**	**7**
HEX	**56**	**47**	**3E**	**02**	**00**	**0D**	**14**	**07**

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

Device Name	**G**	**V**	**7**	**5**	**W**			

HEX	47	56	37	35	57	00	00	00

✧ <*EIO100 Input Status*>: The status of EIO100 inputs. For each bit, 0 means "Disable status", and 1 means "Enable status". If EIO100 device is not connected or the mode of **AT+GTURT** is not 17 (for EIO100), it is "00".

- Bit 0: for EIO100 input 9
- Bit 1: for EIO100 input A
- Bit 2: for EIO100 input B
- Bit 3: for EIO100 input C
- Bit 4 – 7: Reserved

✧ <*Digital Input Status*>: The status mask of ignition detection and digital input1 and digital input6 compose the byte.

Input Status Mask	ID
Ignition Detection	0x01
Digital Input1	0x02
...	Reserved
Digital Input6	0x40

✧ <*EIO100 Output Status*>: The status of EIO100 outputs. For each bit, 0 means "Disable status", and 1 means "Enable status". If EIO100 device is not connected or the mode of **AT+GTURT** is not 17 (for EIO100), it is "00".

- Bit 0: for EIO100 output 9
- Bit 1: for EIO100 output A
- Bit 2: for EIO100 output B
- Bit 3: for EIO100 output C
- Bit 4 – 7: Reserved

✧ <*Digital Output Status*>: The status mask of digital output1 status and digital output2 compose the byte.

Output Status Mask	ID
Digital Output1	0x01
Digital Output2	0x02

✧ <*Report ID/Report Type*>: The high nibble is for <*Report ID*> and the low nibble is for <*Report Type*>.

✧ <*Speed*>: 3 bytes in total. The first 2 two bytes are for the integer part of the speed and the last byte is for the fractional part. The fractional part has 1 digit.

✧ <*Longitude*>: The longitude of the current position. 4 bytes in total. The device converts the longitude to an integer with 6 implicit decimals and reports 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. 4 bytes in total. The device converts the

latitude to an integer with 6 implicit decimals and reports 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**

- <*Altitude*>: The altitude from GNSS. If the altitude is negative, it is represented in 2's complement format. Unit: meter.
- <*GNSS UTC Time*>: The UTC time read from the GNSS chip. 7 bytes in total. The first 2 bytes are for year, and the remaining 5 bytes are for month, day, hour, minute and second respectively.

GNSS UTC Time	**2016**		**07**	**14**	**08**	**24**	**13**
HEX	**07**	**E0**	**07**	**0E**	**08**	**18**	**0D**

- <*Current Mileage*>: 3 bytes in total. The first 2 bytes are for the integer part of the current mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Current Mileage	**0**		**0**
HEX	**00**	**00**	**00**

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

Total Mileage	**0**				**0**
HEX	**00**	**00**	**00**	**00**	**00**

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

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

- <*RFID Length*>: This is the length of the <*RFID*>. It is controlled by Bit 27 (for <*RFID Length*>) in <*+RSP Mask*>, and the default value of Bit 27 in <*+RSP Mask*>is 0.
- <*RFID*>: It is the card ID of RFID that is supported by the device. If Bit 27 (for <*RFID Length*>) in <*+RSP Mask*> is set to 1, the length of this field is defined by <RFID Length>. If Bit 27 (for <*RFID Length*>) in <*+RSP Mask*>is set to 0, its length is always 4 bytes.

RFID	**0**			
HEX	**00**	**00**	**00**	**00**

Note: If the device does not get the card ID and Bit 27 (for <*RFID Length*>) in <*+RSP Mask*> is 1, the <*RFID Length*> will be 0 and the <*RFID*> will be empty.

The location report message **+RESP:GTLBC** uses the format below.

- **+RSP,**

Example:
2B 52 53 50 03 04 FE 1F FF 00 63 C8 03 02 03 05 67 76 37 35 6D 00 00 00 64 00 00 00 00 00 02 11 08 10 70 17 75 60 84 70 4F 01 01 00 00 00 00 00 01 28 06 CB BC 42 01 57 E3 EB 07 E6 01 14 03 2C 2F 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 07 E6 01 14 03 2C 30 2D C3 8E 27 0D 0A

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

Message Header	4	+RSP	+RSP
Message Type	1	03	03
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Report ID/Report Type	1		
Number Length/Number Type	1		
Phone Number	<=10		
Number	1	1 – 15	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	

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MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
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 total length of the fields <*Number Length/Number Type*> and <*Phone Number*>. <*Number Type*> indicates whether there is a '+' sign before the phone number. 1 means "with the sign", and 0 means "without the sign".

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

✧ <*Phone Number*>: Not more than 10 bytes. In each byte, the high nibble and low nibble represent one digit of the phone number respectively. If there is no more digit for the last low nibble to represent, fill in 0xF.

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

The location report message **+RESP:GTSOS** uses the format below.

➢ **+RSP,**

Example:
2B 52 53 50 0A 06 FE 1F FF 00 64 C8 03 02 03 05 67 76 37 35 6D 00 00 00 64 00 00 00 02 00 02 11 08 10 00 01 01 00 00 00 00 00 01 28 06 CB BD 1D 01 57 E6 5B 07 E6 01 14 03 28 3A 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 07 E6 01 14 03 28 3A

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2D BE DB 51 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Report ID/Report Type	1		
Reserved	1	00	00
Number	1	1 – 15	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	

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

The location report message **+RESP:GTIDA** uses the format below.

- **+RSP,**

Example:
**2B 52 53 50 11 06 FE 1F FF 00 C2 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3A CB 00 00 00 03 11 04 00 08 35 41 30 31 39 37 46 41 01 01 02 00 00 00 00 00 00 57 06 CB BC 72 01 57 E3 29 07 E6 01 13 09 09 26 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 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 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FE 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 –03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Report ID/Report Type	1	00	00
ID Length	1	1-20	
ID	<=20	00 - FF	
ID Report Type	1	0|1|2	
Number	1	1 – 15	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	

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Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*ID*>: The ID which is currently read.
- <*ID Report Type*>: The type of reported ID.
  - 0: The ID is unauthorized.
  - 1: The ID is authorized.
  - 2: The ID has logged out.

The location report message **+RESP:GTERI** uses the format below.

- **+RSP,**

Example:

**2B 52 53 50 12 06 FE 1F FF 00 00 00 02 00 BE C8 03 02 03 06 67 76 37 35 6D 00 00 00 64 00 00 00 01 00 03 21 0C 10 00 00 01 01 00 00 00 00 00 00 AD 06 CB BB CE 01 57 E4 C4 07 E6 01 13 09 01 37 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

External Power Supply Voltage		2		
EIO100 Input Status		1	00 – 0F	
Digital Input Status		1	00 – 42	
EIO100 Output Status		1	00 – 0F	
Digital Output Status		1	00 – 03	
Motion Status		1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View		1		
Report ID/Report Type		1		
UART Device Type		1	0|1|2|5|7	
Digital Fuel Sensor Data (Optional)	Digital Fuel Sensor Data	2		
AC100 Data (Optional)	AC100 Device Number	1	0 - 8	
	1-wire Device ID	8		
	1-wire Device Type	1		
	Device Data Length	1		
	1-wire Device Data	N		
Fuel Sensor Data (Optional)	Sensor Number	1	0 –99	
	Sensor Type	1	2|4|6	
	Reserved	1	0x00	
	Percentage (Optional)	2	0 – 100	
	Volume (Optional)	2	0 – 10000	
Satellite Data (Optional)	SV Count	1		
	SV ID	1		
	SV Power	1		
	…			
	SV ID	1		
	SV Power	1		

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RF433 Accessory Data (Optional)	Accessory number	1	0 – 10	
	Accessory Serial Number	5	0 -FFFFF	
	Accessory Type	1	1|2	
	Temperature	1	-20 - 60(×1°C)	
	Humidity (Optional)	1	0 – 100(×1%)	
RAT and Band Data (Optional)	RAT	1	0|1|3|4	
	Band	2	0-39|850|900|1800|1900	
Number		1	1 – 15	
GNSS Accuracy		1	0|1 – 50	
Speed		3	0.0 – 999.9km/h	
Azimuth		2	0 – 359	
Altitude		2		
Longitude		4		
Latitude		4		
GNSS UTC Time		7	YYYYMMDDHHMMSS	
MCC		2	0000 – FFFF	
MNC		2	0000 – FFFF	
LAC		2	0000 – FFFF	
Cell ID		4	00000000 – FFFFFFFF	
Reserved		1	00	00
Current Mileage		3	0.0 –65535.0 km	
Total Mileage		5	0.0 – 4294967.0 km	
Current Hour Meter Count		3	HHMMSS	
Total Hour Meter Count		6	HHHHHHHHMMSS	
CAN Data		<=95		
RFID Length		1	0-28	
RFID		<=28	00-FF	
Send Time		7	YYYYMMDDHHMMSS	
Count Number		2	0000 – FFFF	

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Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*UART Device Type*>: The type of the device connected to the serial port.
  - 0: No device connected
  - 1: Digital fuel sensor
  - 2: AC100 1-wire bus
  - 5: CANBUS device
  - 7: RF433 accessory
- ✧ <*Digit Fuel Sensor Data*>: The raw data read from the digital fuel sensor. If Bit 0 of <*ERI Mask*> in **AT+GTFRI** is enabled, this field will be displayed. Otherwise, this field will not be displayed.
- ✧ <*SV Count*>: The number of satellites the device finds.
- ✧ <*SV ID*>: Satellite ID. If there is no satellite, the field will be omitted.
- ✧ <*SV Power*>: Satellite power. If there is no satellite, the field will be omitted.
- ✧ <*AC100 Device Number*>: The number of 1-wire devices connected to AC100. If it is 0, the fields <*1-wire Device ID*>, <*1-wire Device Type*>, <*Device Data Length*> and <*1-wire Device Data*> will not be displayed. If there are more than one 1-wire devices connected, the fields <*1-wire Device ID*>, <*1-wire Device Type*>, <*Device Data Length*> and <*1-wire Device Data*> will repeat to show the information of all connected 1-wire devices. If Bit 1 of <*ERI Mask*> in **AT+GTFRI** is enabled, the whole part <*AC100 Data*> will be displayed. Otherwise, the <*AC100 Data*> will not be displayed.
- ✧ <*1-wire Device ID*>*:* It indicates the device ID read from the 1-wire device.
- ✧ <*1-wire Device Type*>: It indicates the type of the 1-wire device.
  - 1: Temperature sensor.
- ✧ <*Device Data Length*>: It indicates the length of <*1-wire Device Data*>.
- ✧ <*1-wire Device Data*>: It indicates the data read from the 1-wire devices. If the device is a temperature sensor, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix A). To get the real temperature in degrees Celsius, please convert the data to a decimal value according to the calculation in Appendix A first and then multiply the decimal value by 0.0625.
- ✧ <*RAT*>: Radio access technology.
  - 0: Invalid RAT
  - 1: 2G
  - 3: LTE CAT-M1
  - 4: LTE NBIOT
- ✧ < *Band*>: 0 mean invalid band,1-39 means band number and others mean GSM number.

Note:

1. The key word (optional) means the item is controlled by the parameter <ERI Mask>.
2. The values of <Axle #> <Load Truck> <Load Trailer> <Total Truck> and <Total Trailer> need to be multiplied by 0.01.

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3. If the target RF433 accessory has not been detected, the <Temperature> in <RF433 Accessory Data> field will be set to -127(HEX for 0X81), the <Humidity> will be set to 255(HEX for 0XFF). Location report for **+RESP:GTGIN** and **+RESP:GTGOT** uses this format.

The location report messages **+RESP:GTGIN** and **+RESP:GTGOT** use the format below.

- **+RSP,**

Example:
2B 52 53 50 14 06 FE 1F FF 00 C1 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3A AB 00 01 00 03 21 09 01 01 00 00 00 00 00 00 00 01 01 02 00 00 00 00 00 00 A5 06 CB BC 31 01 57 E4 B7 07 E6 01 13 09 0C 3B 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 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 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FE 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 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 00 00 00 00 07 E6 01 13 09 0C 3B 05 F5 41 78 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		

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Area Type	1	0|1	
Mask Group	1	01-1F	
Area Mask Group 1	8	64bit 0000000000000001-00000000FFFFF (GEOID 0 - 19)	
Number	1	1 – 15	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Area Type>*: This indicates polygon or circle area, and 0 means polygon.

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- <*Group Mask*>: The bitwise mask to confirm the reported <GEO ID Group>. For GV75M, only bit 0 is valid and it should be set to 1.
- <*Area Mask Group 1*>: The bitwise mask for trigger condition composition of the corresponding GEO ID. For GV75M, only the lowest 20 bits are valid. Each bit, from bit 0 to bit 19, represents the logical state of the corresponding GEO ID to trigger the entering or exiting event. 1 means that the event of the GEO ID set has been triggered and 0 means has not.

4.4. Information Report +INF

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

- **+INF,**

Example:
2B 49 4E 46 01 7F 7F 00 63 67 76 37 35 6D 00 00 00 C8 03 02 03 06 01 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 03 00 11 00 0A 00 07 E6 01 13 09 0D 35 00 00 00 3F 00 1E 00 1E 00 00 00 00 00 00 90 3A EB 00 00 00 89 86 04 03 10 20 80 50 55 88 0C 63 00 00 00 07 E6 01 13 09 0D 35 05 FD 89 6E 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+INF	+INF
Message Type	1		
Report Mask	2	0000 – FFFF	
INF Expansion Mask	2	0000 - FFFF	(empty)
Length	2		
Unique ID	8	IMEI/Device Name	
Device Type	1	C8	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	**+RESP:GTVER**
Reserved	2	0000	
Reserved	2	0000	
Reserved	1	00	**+RESP:GTIOS**

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Reserved	1	00	
Reserved	1	00	
Reserved	1	00	
Reserved	2	0000	
Reserved	2	0000	
EIO100 IO Status	2	0000 – 0F0F	
Digital Input Status	1	00 – 42	
Digital Output Status	1	00 – 03	
Reserved	1	00	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	**+RESP:GTGPS**
Reserved	1	00	
Satellites in View	1		
Power Saving Enable/OWH Mode/Outside Working Hours/AGPS	1		
Last Fix UTC Time	7	YYYYMMDDHHMMSS	
Reserved	1	00	
FRI Discard No Fix	1	0|1	
Response Report Item Mask	2		
IGN Interval	4	00000000|00000005-00015180	
IGF Interval	4	00000000|00000005-00015180	
Reserved	4	00000000	
Reserved	1	00	
Main Supply/Backup Battery On/Charging/LED State/Backup Battery Charge Mode	1		**+RESP:GTBAT**
External Power Supply VCC	2	0	
Backup Battery VCC	2	0 – 4500mV	

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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/Enable Daylight Saving	1		**+RESP:GTTMZ**
Time Zone Offset	2	HHMM	
Fix Type ID	1		**+RESP:GTGSM**
Cell Number	1		
MCC	2		
MNC	2		
LAC	2		
Cell ID	4		
Reserved	1		
RX Level	1		
…			
MCC	2		
MNC	2		
LAC	2		
Cell ID	4		
Reserved	1		
RX Level	1		
SV Count	1		**+RESP:GTGSV**
SV ID	1		
SV Power	1		
…			
SV ID	1		
SV Power	1		
Sensor Protocol Version	1		**+RESP:GTUVN**
Sensor SW Version	2		
Sensor HW Version	1		

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CAN100 SW Version Length	1	0-10	**+RESP:GTCVN**
CAN100 SW Version	<=10		
AC100 Device Number	1	0 - 19	AC100 Data
1-wire Device ID	8		
1-wire Device Type	1	00 – FF	
Device Data Length	1	00 – FF	
1-wire Device Data	<= 20		
Accessory Number	1	0 – 10	**+RESP:GTWRT**
Accessory Type	1	1|2	
Accessory Serial Number	5	00001 – FFFFE	
…			
Accessory Type	1	1|2	
Accessory Serial Number	5	00001 – FFFFE	
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 a specific information report message.

Message	ID	ID HEX
+RESP:GTINF	1	01
+RESP:GTGPS	2	02
+RESP:GTCID	4	04
+RESP:GTCSQ	5	05
+RESP:GTVER	6	06
+RESP:GTBAT	7	07
+RESP:GTIOS	8	08
+RESP:GTTMZ	9	09
+RESP:GTGSM	10	0A
+RESP:GTGSV	11	0B

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+RESP:GTUVN	12	0C
+RESP:GTCVN	13	0D
+RESP:GTWRT	30	1E

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

IMEI	**86**	**71**	**62**	**02**	**00**	**13**	**20**	**7**
HEX	**56**	**47**	**3E**	**02**	**00**	**0D**	**14**	**07**

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

Device Name	**G**	**V**	**7**	**5**	**W**			
HEX	**47**	**56**	**37**	**35**	**57**	**00**	**00**	**00**

- <*Device Type*>: If <*Message Type*> is 6 (**+RESP:GTVER**) in the message, Bit 2 (<*Device Type*>) in <*+INF Mask*> will be forced to 1, and thus the field always appears in the hex report of **+RESP:GTVER**.
- <*Protocol Version*>: If <*Message Type*> is 6 (**+RESP:GTVER**) in the message, Bit 3 (<*Protocol Version*>) in <*+INF Mask*> will be forced to 1, and thus the field always appears in the hex report of **+RESP:GTVER**.
- <*Firmware Version*>: If <*Message Type*> is 6 (**+RESP:GTVER**) in the message, Bit 4 (<*Firmware Version*>) in <*+INF Mask*> will be forced to 1, and thus the field always appears in the hex report of **+RESP:GTVER**.
- <*EIO100 IO Status*>: The status of EIO100 inputs and outputs. For each bit, 0 means "Disable status", and 1 means "Enable status". If EIO100 device is not connected or the mode of **AT+GTURT** is not 17 (for EIO100), it is always "0000".
  - Bit 0: for EIO100 output 9
  - Bit 1: for EIO100 output A
  - Bit 2: for EIO100 output B
  - Bit 3: for EIO100 output C
  - Bit 4 – 7: Reserved
  - Bit 8: for EIO100 input 9
  - Bit 9: for EIO100 input A
  - Bit 10: for EIO100 input B
  - Bit 11: for EIO100 input C
  - Bit 12 – 15: Reserved
- <*Enable Power Saving/OWH Mode/Outside Working Hours/AGPS*>: Bit 5 and Bit 6 are for <*Enable Power Saving*>, Bit 4 and Bit 3 are for <*OWH Mode*>, Bit 2 is for <*Outside Working*

Hours>, and Bit 0 is for <*AGPS*>. <*Outside Working Hours*> is used to indicate whether the device is currently outside working hours. 1 means "Outside working hours".

- <*Main Supply/Backup Battery On/Charging/LED State/Backup Battery Charge Mode*>: The highest bit, or Bit 7, is for <*Main Supply*> which indicates whether the external power supply is connected to the device. Bit 6 is for <*Backup Battery On*> which indicates whether the backup battery is working. Bit 5 is for <*Charging*> which indicates whether the backup battery is currently charging. Bit 4 is for <*LED State*> which indicates 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/Enable Daylight Saving*>: Bit 1 is for <*Daylight Saving Enable*> which indicates whether the daylight saving function is currently enabled. Bit 0 is for <*Time Zone Offset Sign*> which indicates positive or negative offset of the local time from UTC. 1 means "negative offset".
- <*Fix Type ID*>: The ID of fix type. It indicates what kind of GNSS fix this cell information is for.
  "INF": This cell information is for INF request.
  "SOS": This cell information is for SOS request.
  "RTL": This cell information is for RTL request.
  "LBC": This cell information is for LBC request.
  "TOW": This cell information is for TOW request.
  "FRI": This cell information is for FRI request.
  "GIR": This cell information is for sub command "**C**" in the **AT+GTRTO** command.
  "ERI": This cell information is for ERI request.

Fix Type	ID
INF	0
SOS	1
RTL	2
LBC	3
TOW	4
FRI	5
GIR	6
ERI	7

- <*Cell Number*>: The number of cells. It also indicates the number of cell information groups. One cell information group consists of MCC, MNC, LAC, and Cell ID.
- <*Sensor Protocol Version*>: The protocol version of the UFSxxx fuel sensor. The value is in ASCII format.
- <*Sensor SW Version*>: The software version of the UFSxxx fuel sensor. The value is in ASCII

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format.

- ✧ <*Sensor HW Version*>: The hardware version of the UFSxxx fuel sensor. The value is in ASCII format.
- ✧ <*CAN100 SW Version Length*>: The length of CAN100 SW Version. The value is in pure HEX format.
- ✧ <*CAN100 SW Version*>: The Software Version of CAN100 device. The value is a string which does not include '\0', and it is in ASCII format.

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:GTSTR**, **+RESP:GTSTP**, **+RESP:GTLSP**, **+RESP:GTLBA**, **+RESP:GTCRA** and **+RESP:GTWPB** use the format below.

➢ **+EVT,**

Example:
2B 45 56 54 08 04 FE 1F FF 00 62 C8 03 02 03 05 67 76 37 35 6D 00 00 00 62 00 00 00 00 00 02 11 07 01 02 00 00 00 00 00 02 E7 06 CB BA C2 01 57 E4 10 07 E6 01 14 03 2E 1C 01 CC 00 00 24 93 00 00 16 FA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 07 E6 01 14 03 2E 1C 2D CB 01 99 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	

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EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		(empty)
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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✧ <*Message Type*>: The ID of a specific event report message.

Message	ID	ID HEX
+RESP:GTPNA	1	01
+RESP:GTPFA	2	02
+RESP:GTMPN	3	03
+RESP:GTMPF	4	04
Reserved	5	05
+RESP:GTBPL	6	06
+RESP:GTBTC	7	07
+RESP:GTSTC	8	08
+RESP:GTSTT	9	09
Reserved	10	0A
Reserved	11	0B
+RESP:GTPDP	12	0C
+RESP:GTIGN	13	0D
+RESP:GTIGF	14	0E
+RESP:GTUPD	15	0F
+RESP:GTIDN	16	10
+RESP:GTIDF	17	11
+RESP:GTDAT	18	12
Reserved	19	13
Reserved	20	14
+RESP:GTGSS	21	15
+RESP:GTFLA	22	16
+RESP:GTSTR	23	17
+RESP:GTSTP	24	18
+RESP:GTCRA	25	19
Reserved	26	1A
+RESP:GTDOS	27	1B
+RESP:GTGES	28	1C

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+RESP:GTLSP	29	1D
+RESP:GTTMP	30	1E
+RESP:GTDTT	31	1F
+RESP:GTJDS	32	20
+RESP:GTRMD	33	21
+RESP:GTPHL	34	22
+RESP:GTEXP	35	23
Reserved	36	24
+RESP:GTUFS	37	25
+RESP:GTFTP	38	26
+RESP:GTGPJ	39	27
+RESP:GTUPC	40	28
Reserved	⋮	⋮
+RESP:GTVGN	45	2D
+RESP:GTVGF	46	2E
Reserved	⋮	⋮
+RESP:GTIGS	51	33
Reserved	⋮	⋮
+RESP:GTASC	53	35
Reserved	⋮	⋮
+RESP:GTLBA	60	3C
+RESP:GTWPB	61	3D

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

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

IMEI	**86**	**71**	**62**	**02**	**00**	**13**	**20**	**7**
HEX	**56**	**47**	**3E**	**02**	**00**	**0D**	**14**	**07**

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

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the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	G	V	7	5	W			
HEX	**47**	**56**	**37**	**35**	**57**	**00**	**00**	**00**

✧ <*RFID Length*>: This is the length of the <*RFID*>. It is controlled by Bit 27 (for <*RFID Length*>) in <*+RSP Mask*>, and the default value of Bit 27 in <*+RSP Mask*>is 0.

✧ <*RFID*>: It is the card ID of RFID that is supported by the device. If Bit 27 (for <*RFID Length*>) in <*+RSP Mask*> is set to 1, the length of this field is defined by <RFID Length>. If Bit 27 (for <*RFID Length*>) in <*+RSP Mask*>is set to 0, its length is always 4 bytes.

RFID	**0**			
HEX	**00**	**00**	**00**	**00**

Note: If the device does not get the card ID and Bit 27 (for <*RFID Length*>) in <*+RSP Mask*> is 1, the <*RFID Length*> will be 0 and the <*RFID*> will be empty.

The event report message **+RESP:GTBPL** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 06 04 FE 1F FF 00 64 C8 03 02 03 05 67 76 37 35 6D 00 00 00 64 00 00 00 00 00 02 11 07 0D 48 01 02 00 00 00 00 00 02 E7 06 CB BA C2 01 57 E4 10 07 E6 01 14 03 39 27 01 CC 00 00 24 93 00 00 16 FA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 07 E6 01 14 03 39 27 2E 3F 4E CA 0D 0A

Parameter	**Length (Byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1	06	06
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 –42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	

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Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Backup Battery VCC	2	0 – 4500 mV	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		(empty)
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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The event report messages **+RESP:GTIGN** and **+RESP:GTIGF** use the format below. For these two messages, the <*Current Mileage*> and <*Total Mileage*> fields will always be present regardless of the <*+EVT Mask*> setting.

- **+EVT,**

Example:
2B 45 56 54 0E 06 FE 1F FF 00 BB C8 03 02 03 06 67 76 37 35 6D 00 00 00 64 29 B0 00 00 00 03 11 04 00 00 04 31 01 01 00 00 00 00 00 00 5A 06 CB BD BF 01 57 E3 1A 07 E6 01 13 08 2F 38 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 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 00 00 00 00 00 00 00 FE 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 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 07 E6 01 13 08 2F 39 05 95 69 F4 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1	0E	0E
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	

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GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		(empty)
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report messages **+RESP:GTVGN** and **+RESP:GTVGF** use the format below. For these two messages, the <*Current Mileage*> and <*Total Mileage*> fields will always be present regardless of the <*+EVT Mask*> setting.

- **+EVT,**

Example:
2B 45 56 54 2E 00 FE 1F FF 00 66 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 2B 0B 00 00 11 0B 00 02 00 00 00 10 01 01 00 00 00 00 00 00 69 06 CB BC EC 01 57 E3 83 07 E6 01 13 09 38 24 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 09 38 24 06 F1 57 85 0D 0A

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Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1	2D	2D
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0 – 100	
External Power Supply Voltage	2		
Analog Input Mode	2		(empty)
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in View	1		
Reserved	1	00	
Reprot Type	1	0-4	
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	

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Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=400		(empty)
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTUPD** uses the format below. For this message, the <*Protocol Version*> and <*Firmware Version*> will always be present regardless of the <*+EVT Mask*> setting.

- **+EVT,**

Example:
2B 45 56 54 0F 00 FE DF FF 00 67 C8 03 02 03 05 67 76 37 35 6D 00 00 00 61 00 00 00 00 00 00 00 00 00 11 1C 01 2C 00 01 00 00 00 00 00 00 00 3F 06 FC 5A 68 01 E5 BC 50 07 DF 0A 0A 07 07 09 04 60 00 01 D5 D6 08 06 52 81 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 14 03 2C 30 00 25 8E AD 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1	0F	0F
Report Mask	4	00000000 – FFFFFFFF	

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Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Code	2		
Retry	1		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00

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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	
CAN Data	<=95		(empty)
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTIDF** uses the format below.

- **+EVT,**

Example:
**2B 45 56 54 11 06 FE 1F FF 00 BB C8 03 02 03 06 67 76 37 35 6D 00 00 00 64 29 B0 00 00 00 03 11 04 00 00 03 B8 01 01 00 00 00 00 00 00 5A 06 CB BD BF 01 57 E3 1A 07 E6 01 13 08 2F 39 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

EIO100 Output Status	1	00 – 03	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Duration of Idling	4		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTDAT** uses the format below.

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➢ **+EVT,**

Example: **2B 45 56 54 12 00 FE 1F FF 00 65 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 2B E1 00 00 11 0B 00 03 31 32 33 01 02 00 00 00 00 00 00 65 06 CB BC E3 01 57 E3 5C 07 E6 01 13 09 3A 1D 01 CC 00 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 09 3A 1D 07 02 8F 0A 0D 0A**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1	12	12
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Data Length	2		
Data			
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	

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Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		(empty)
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Data Length*>: It indicates the length of the <*Data*> parameter.

The event report message **+RESP:GTGSS** uses the format below.

➢ **+EVT,**

Example:
**2B 45 56 54 15 06 FE 1F FF 00 BC C8 03 02 03 06 67 76 37 35 6D 00 00 00 64 29 EF 00 00 00 03 1A 0A 00 00 00 00 00 01 00 00 00 00 00 00 00 82 06 CB BC F9 01 57 E4 20 07 E6 01 13 08 32 2A 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
GNSS Signal Status	1	0 | 1	
Reserved	4	00000000	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	

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Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

The event report message **+RESP:GTFLA** uses the format below.

➢ **+EVT**,

Example:
2B 45 56 54 16 00 FE 1F FF 00 63 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3B 0A 01 00 21 0B 00 13 04 01 01 00 00 00 00 00 00 8B 06 CB BD 15 01 57 E4 77 07 E6 01 13 09 2C 23 01 CC 00 00 24 93 00 00 18 75 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 09 2C 23 06 B3 99 23 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	

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Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Reserved	1	00	
Last Fuel Level	1	0 - 100	
Current Fuel Level	1	0 - 100	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	

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Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*Last Fuel Level*>: The fuel level saved before last ignition off when the fuel loss alarm event occurs.
- ✧ <*Current Fuel Level*>: The fuel level when the fuel loss alarm event occurs.

The event report message **+RESP:GTDOS** uses the format below.

- ➢ **+EVT**,

Example:
**2B 45 56 54 1B 06 FE 1F FF 00 B9 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3B 22 00 00 00 00 11 05 01 00 01 01 00 00 00 00 00 00 87 06 CB BC B0 01 57 E4 53 07 E6 01 13 09 1E 35 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Wave1 Output ID	1	1-2|9-C	
Wave1 Output Active	1	0 - 3	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	

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Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTGES** uses the format below.

- **+EVT,**

Example:
**2B 45 56 54 1C 06 FE 1F FF 00 C2 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3A 6C 00 00 00 03 11 09 00 01 15 00 00 01 F4 00 00 00 05 01 02 00 00 00 00 00 00 A5 06 CB BC 31 01 57 E4 B7 07 E6 01 13 09 0D 0A 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Trigger GEO ID	2	0-19	
Enable Trigger GEO	1	0|1	
Trigger Mode	1	0|21|22	
Radius	4	50 – 6000000m	
Check Interval	4	0|5 – 86400sec	
Number	1	1	
GNSS Accuracy	1	0|1	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Trigger GEO ID*>: The ID of Geo-Fence. The range is 0 – 19.

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✧ <*Enable Trigger GEO*>: The current parking-fence is active or inactive.

- 0: The current parking-fence is inactive.
- 1: The current parking-fence is active.

The event message **+RESP:GTTMP** uses the format below.

➢ **+EVT**,

Example:
**2B 45 56 54 1E 06 FE 1F FF 00 C4 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 29 B7 00 00 00 03 11 03 00 01 28 CE 9C 8D 0B 00 00 81 00 00 1A 01 03 00 00 00 00 00 00 65 06 CB BC 9C 01 57 E3 BD 07 E6 01 13 07 09 00 01 CC 00 00 27 BD 00 00 13 4F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Temperature Alarm ID	1	0 – 3	
Temperature Status	1	0|1	
Temperature Sensor Device ID	8	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	1	00	00
Temperature Sensor Device Data	2	-55 – 125℃	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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- <*Temperature Alarm ID*>: The ID of temperature alarm.
- <*Temperature Status*>: The status of the current temperature. 0 means "Outside the predefined temperature range". 1 means "Inside the predefined temperature range".
- <*Temperature Sensor Device ID*>: The ID of the temperature sensor.
- <*Temperature Sensor Device Data*>: The current temperature the sensor detects.

The event report message **+RESP:GTDTT** uses the format below.

- **+EVT**,

Example: **2B 45 56 54 1F 00 FE 1F FF 00 66 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 2B F1 00 00 11 0B 00 00 03 31 32 33 01 01 00 00 00 00 00 00 65 06 CB BC E3 01 57 E3 5C 07 E6 01 13 0A 03 30 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 0A 03 30 07 09 E9 76 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Reserved	1	00	00

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Data Length	2		
Data			
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Data Length*>: It indicates the length of the <*Data*> parameter.

The event report message **+RESP:GTRMD** uses the format below.

➢ **+EVT**,

Example:

| 2B 45 56 54 21 06 FE 1F FF 00 B8 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3B 22 00 01 00 00 21 0B 02 01 01 00 00 00 00 00 00 8B 06 CB BD 15 01 57 E4 77 07 E6 01 13 09 25 03 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTPHL** uses the format below, and is only sent via GPRS even if the report mode is forced SMS mode.

- **+EVT**,

Example:
**2B 45 56 54 22 06 FE 1F FF 00 C3 C8 03 02 03 06 67 76 37 35 6D 00 00 00 64 29 B0 00 00 00 03 11 0A 00 03 00 08 00 07 E6 01 13 07 14 35 01 01 00 00 00 00 00 00 74 06 CB BD 55 01 57 E3 DE 07 E6 01 13 07 14 34 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Attribute Mask	2	0000 – FFFF	
Attribute Length	2		
Camera ID	1	0-3	
Photo Time	7	YYYYMMDDHHMMSS	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	

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MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Attribute Length*>: The total length of attribute parameters which include <*Camera ID*> and <*Photo Time*>.

The event report message **+RESP:GTEXP** uses the format below.

➢ **+EVT**,

Example:
**2B 45 56 54 23 06 FE 1F FF 00 BB C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3B 2A 00 01 00 00 21 0B 04 00 00 01 01 01 00 00 00 00 00 00 8B 06 CB BD 15 01 57 E4 77 07 E6 01 13 09 22 2B 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Digital Fuel Sensor Type	1	2|4	
Reserved	1		
Reserved	1		
HW Fault Code	1		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	

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Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTUFS** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 25 00 FE 1F FF 00 63 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 2C 00 00 00 11 0B 00 C8 00 01 01 00 00 00 00 00 00 65 06 CB BC E3 01 57 E3 5C 07 E6 01 13 0A 09 29 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 0A 09 2E 07 27 B9 58 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		

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EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Code	2		
Reserved	1	00	00
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	

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

The event report message **+RESP:GTFTP** uses the format below.

- **+EVT**,

Example:
**2B 45 56 54 26 06 FE 1F FF 00 D0 C8 03 02 03 06 67 76 37 35 6D 00 00 00 64 29 B0 00 00 00 03 11 0A 31 32 33 5F 30 5F 32 30 32 32 30 31 31 39 30 37 34 34 32 33 2E 6A 70 67 00 01 01 00 00 00 00 00 00 74 06 CB BC D2 01 57 E3 D6 07 E6 01 13 07 35 38 01 CC 00 00 27 BD 00 00 13 4F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Satellites in View	1		
File Name	<=40		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*File Name*>: The file name of picture(s). The value is a string which ends with '\0', and is in ASCII format.

The event report message **+RESP:GTUPC** uses the format below.

➢ **+EVT**,

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Example: **2B 45 56 54 28 00 FE 1F FF 00 90 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3B 0A 01 00 21 0B 00 00 65 2C 68 74 74 70 3A 2F 2F 32 31 38 2E 31 37 2E 34 36 2E 31 31 3A 39 33 35 39 2F 38 36 35 32 38 34 30 34 39 32 34 38 32 34 32 2E 69 6E 69 01 01 00 00 00 00 00 00 8B 06 CB BD 24 01 57 E4 4E 07 E6 01 13 09 33 13 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 09 33 14 06 C7 2E 42 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Command ID	1		
Result	2	100|101|102|103|200|201|202|300|301|302|304|305|306	
URL Length	1		
Download URL	<=100	Complete URL	

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Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=99		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Command ID*>: The command ID in the update configuration file. It is 0 before the device starts to update device configuration. It indicates the total number of the commands updated successfully when the result code is 301. It indicates the command ID with wrong format when the result code is 302.
- <*Result*>: A numeral to indicate whether the configuration is updated successfully.
  - 100: The update command is starting.
  - 101: The update command is confirmed by the device.
  - 102: The update command is refused by the device.

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- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.
- 303: Reserved.
- 304: <*Command Mask*><*GEO ID mask*><*Stocmd ID Mask*> or <*Group ID Mask*> check failed.
- 305: the update process is interrupted by reboot.
- 306:The update process is interrupted by md5 verification error.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name and ends with 0x00.

The event report message **+RESP:GTIGS** uses the format below.

➢ **+EVT,**

Example:
**2B 45 56 54 33 06 FE 1F FF 00 E1 C8 03 02 03 06 67 76 37 35 6D 00 00 00 64 29 B0 00 00 00 03 11 04 0F 00 00 04 31 07 E6 01 13 08 1E 04 07 E6 01 13 08 2F 39 01 00 00 00 00 00 00 00 06 CB BD BF 01 57 E3 1A 07 E6 01 13 08 2F 38 01 01 00 00 00 00 00 00 5A 06 CB BD BF 01 57 E3 1A 07 E6 01 13 08 2F 38 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 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 00 00 00 00 00 00 00 00 00 00 00 00 00 FE 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
IGS Composition Mask	1	00-FF	
Duration of Ignition On	4	0 – 999999 sec	
Ignition On Time	7	YYYYMMDDHHMMSS	
Ignition Off Time	7	YYYYMMDDHHMMSS	
GNSS Accuracy (Highest Speed Point)	1	0 – 50	0
Speed (Highest Speed Point)	3	0.0 – 999.9 km/h	
Azimuth (Highest Speed Point)	2	0 – 359	
Altitude (Highest Speed Point)	2		
Longitude (Highest Speed Point)	4		
Latitude (Highest Speed Point)	4		
GNSS UTC Time (Highest Speed Point)	7	YYYYMMDDHHMMSS	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	

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Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		(empty)
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTJDS** uses the format below.

- **+EVT,**

Example:

**2B 42 56 54 20 06 FE 1F FF 00 B9 C8 03 02 03 06 67 76 37 35 6D 00 00 00 64 29 DF 00 00 00 03 11 0A 01 01 01 02 00 00 00 00 00 00 89 06 CB BD E3 01 57 E4 1C 07 E6 01 13 08 1E 02 01 CC 00 00 24 93 00 00 16 FA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Battery Level	1	0~100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Jamming Status	1	1|2	
Jamming Net	1	1-3	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	

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CAN Data	<=99		
RFID Length	1	0-28	
RFID	<=28	00-FF	
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 state
- 2: Enter the jamming state

✧ <*Jamming Net*>: The network that is jammed.
- 1: 2G
- 2: 3G
- 3: 4G

Event report **+RESP:GTGPJ** uses this format.

➢ **+EVT,**

Example:
**2B 45 56 54 27 06 FE 1F FF 00 B9 C8 03 02 03 06 67 76 37 35 6D 00 00 00 62 29 A8 00 00 00 03 11 0A 0E 01 01 02 00 00 00 00 00 00 74 06 CB BD 55 01 57 E3 DE 07 E6 01 13 07 0F 2D 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Voltage			
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
CW Jamming Value	1	0-255	
GPS Jamming State	1	0-3	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=99		
RFID Length	1	0-28	

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RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ *<CW Jamming Value>*: Current continuous wave jamming value.
- ✧ *<GPS Jamming State>*: Current jamming state.
  - 0: Unknown or feature disabled.
  - 1: (Ok) no significant jamming.
  - 2: (Warning) interference visible but fix OK.
  - 3: (Critical) interference visible and no fix.

The event report message **+RESP:GTASC** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 35 00 FE 1F FF 00 6A C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3B 1A 01 00 21 0B 00 00 00 00 00 00 00 00 00 00 01 01 00 00 00 00 00 00 8B 06 CB BD 24 01 57 E4 4E 07 E6 01 13 09 35 11 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 09 35 11 06 E4 84 46 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0 – 100	
External Power Supply Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	

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Digital Output Status	1	00 – 07	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Calibration State	1	0|1|2	
X_Forward	1	-100 – 100	
Y_Forward	1	-100 – 100	
Z_Forward	1	-100 – 100	
X_Side	1	-100 – 100	
Y_Side	1	-100 – 100	
Z_Side	1	-100 – 100	
X_Vertical	1	-100 – 100	
Y_Vertical	1	-100 – 100	
Z_Vertical	1	-100 – 100	
Number	1	1	
GNSS Accuracy	1	0 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

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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

- <*X_Forward*>, <*Y_Forward*>, <*Z_Forward*>: The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is Xnew = <*X_Forward*> * X + <*Y_Forward*> * Y + <*Z_Forward*> * Z.
- <*X_Side*>, <*Y_Side*>, <*Z_Side*>: The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in Side direction Ynew is Ynew = <*X_Side*> * X + <*Y_Side*> * Y + <*Z_Side*> * Z.
- <*X_Vertical*>, <*Y_Vertical*>, <*Z_Vertical*>: The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in Vertical direction Znew is Znew = <*X_Vertical*> * X + <*Y_Vertical*> * Y + <*Z_Vertical*> * Z.

The event report message **+RESP:GTLBA** uses the format below.

- **+EVT,**

Example:

2B 45 56 54 3C 06 FE 1F FF 00 BD C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3A EB 00 00 00 03 11 0A 01 30 30 30 46 31 01 01 00 00 00 00 00 00 A8 06 CB BC 44 01 57 E4 D1 07 E6 01 13 09 17 20 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 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 00 00 00 00 00 00 00 00 00 FE 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 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 09 17 20 06 28 18 7F 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0 – 100	

External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in View	1		
Accessory Type	1	0X01 | 0x02 | 0x03	
Accessory Serial Number	5	00001 – FFFFE	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

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Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	
RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTWPB** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 3D 06 FE 1F FF 00 BC C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 3A E3 00 00 00 03 11 0A 30 30 30 46 35 01 01 00 00 00 00 00 00 E5 06 CB BC 65 01 57 E5 76 07 E6 01 13 09 1A 33 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0 0F FF FF 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 00 00 00 00 00 00 FE 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 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 01 13 09 1A 33 06 32 0F AE 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	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0 – 100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		

Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 42	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in View	1		
Accessory Serial Number	5	00001 – FFFFE	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
CAN Data	<=95		
RFID Length	1	0-28	

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RFID	<=28	00-FF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

4.6. Data Report +DAT

The data report messages **+RESP:GTEHD** and **+RESP:GTFSD** use the format below, and **+RESP:GTEHD** and **+RESP:GTCRG** is only sent via network even if the report mode is forced SMS mode.

- **+DAT,**

Example:
2B 44 41 54 02 00 00 00 7F 00 4E C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 27 2A 51 4C 2C 35 30 38 4A 2C 30 34 2C 30 32 30 30 30 2C 30 32 30 30 2C 30 37 30 39 2C 30 31 32 35 35 2C 30 32 39 30 23 07 E6 01 13 09 1F 18 06 43 B7 A0 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+DAT	+DAT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Attribute Mask	2	0000 – FFFF	**+RESP:GTPHD/ +RESP:GTEHD**
Attribute Length	2		
Camera ID	1	0-3	
Photo Time	7	YYYYMMDDHHMMSS	
Total Frames	2		
Current Frame Index	2		
Photo Data Length	2		

Photo Data	<=1000		
Data Length	2		+RESP:GTFSD
Sensor Data	<=128		
Data Type	1	0/1	+RESP:GTCRG
GPS Valid Time Number	1	0 – 10	
GPS Point Index	1	1	
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9 km/h	
Azimuth	2	0 – 359	
Altitude	2	(–)xxxxx.x m	
Longitude	4	(–)xxx.xxxxxx	
Latitude	4	(–)xx.xxxxxx	
GPS UTC Time	7	YYYYMMDDHHMMSS	
.....			
GPS Point Index	1	10	
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9 km/h	
Azimuth	2	0 – 359	
Altitude	2	(–)xxxxx.x m	
Longitude	4	(–)xxx.xxxxxx	
Latitude	4	(–)xx.xxxxxx	
GPS UTC Time	7	YYYYMMDDHHMMSS	
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 a specific data report message.

Message	**ID**
+RESP:GTPHD	1
+RESP:GTFSD	2

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+RESP:GTEHD	3
+RESP:GTCRG	4

- ✧ <*Report Mask*>: Please refer to the <*+DAT Mask*> in **AT+GTHRM**.
- ✧ <*Attribute Length*>: The total length of attribute parameters which include <*Camera ID*> and <*Photo Time*>.
- ✧ <*Data Type*>: The data reported to backend server is recorded before or after crash.
- ✧ 0: Before crash.
- ✧ 1: After crash.
- ✧ <*GPS Valid Time Number*>: The number of the successfully fixed GPS positions included in the report.
- ✧ <*GPS Point Index*>: The index of GPS point.

4.7. Heartbeat Data +HBD

➢ **+HBD**,

Example:
2B 48 42 44 FF 20 C8 03 02 03 05 67 76 37 35 6D 00 00 00 07 E6 01 14 03 31 28 2D CF 8B 29 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

IMEI	86	71	62	02	00	13	20	7
HEX	56	47	3E	02	00	0D	14	07

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

Device Name	G	V	7	5	W			
HEX	47	56	37	35	57	00	00	00

If the mask of <*UID*> in <*+HBD Mask*> of **AT+GTHRM** is set to 0, the heartbeat message will not report device name or IMEI information. If the mask of <*UID*> is set to 1, then the heartbeat message will report device name or IMEI information according to the mask of <*Device Name*>.

4.8. Crash Data Packet

➢ **+CRD**,

Example:

2B 43 52 44 00 7F 02 7F C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 0A 02 02 58 00 00 00 00 FF 82 00 00 00 00 FF 82 00 00 FF FE FF 81 00 00 FF FD FF 81 00 00 FF FD FF 81 00 00 00 00 FF 81 00 00 00 00 FF 82 00 00 00 00 FF 82 00 00 FF FE FF 81 00 00 FF FE FF 81 00 00 FF FE FF 81 00 00 FF FE FF 81 00 00 FF FE FF 7D 00 00 FF FE FF 81 00 00 FF FE FF 81 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 00 00 FF 82 00 01 00 00 FF 80 00 01 00 00 FF 80 00 01 00 00 FF 80 00 01 00 00 FF 81 00 00 00 01 FF 81 00 00 00 01 FF 81 00 00 00 01 FF 81 00 00 FF FE FF 80 00 00 FF FE FF 80 00 01 00 00 FF 80 00 00 00 00 FF 80 00 00 00 00 FF 81 00 00 00 00 FF 81 00 00 00 00 FF 81 00 00 FF FE FF 82 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 00 00 FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 00 01 FF FE FF 81 00 01 FF FE FF 81 00 00 00 00 FF 81 00 00 00 00 FF 81 00 01 FF FE FF 7D 00 01 FF FE FF 7D 00 00 FF FE FF 80 00 00 00 00 FF 81 00 00 00 00 FF 81 00 01 00 00 FF 80 00 01 00 00 FF 80 00 00 FF FE FF 82 00 00 FF FE FF 82 00 00 00 00 FF 80 00 00 00 00 FF 80 00 00 00 00 FF 80 00 00 00 00 FF 81 00 00 FF FE FF 82 00 02 FF FE FF 7D 00 02 FF FE FF 7D 00 02 FF FE FF 7D 00 00 FF FE FF 81 00 00 00 00 FF 80 00 00 00 00 FF 81 00 00 00 00 FF 81 00 00 00 00 FF 81 00 00 00 00 FF 80 00 00 00 00 FF 80 00 00 00 00 FF 80 00 00 00 00 FF 81 00 01 00 00 FF 81 00 01 00 00 FF 81 00 00 FF FE FF 80 FF FB 00 00 FF 80 00 02 00 00 FF 80 00 02 00 00 FF 80 00 00 00 00 FF 81 00 00 00 00 FF 81 00 01 FF FE FF 80 00 01 FF FE FF 80 00 01 FF FE FF 80 00 00 FF FE FF 80 00 01 FF FE FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 00 00 FF FE FF 81 00 00 FF FE FF 81 00 00 00 00 FF 81 00 00 00 00 FF 80 00 00 00 00 FF 80 00 00 FF FE FF 80 00 00 FF FE FF 80 07 E6 01 13 09 33 2C 06 CE F9 C4 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+CRD	+ CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Data Type	1	0|1	
Total Frames	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*>: Please refer to the <*+CRD Mask*> in **AT+GTHRM**.
- <*Unique ID*>: If Bit 1 of <*+CRD Mask*> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

- <*Data Type*>: Whether the data reported to the backend server is recorded before or after crash.
  - 0: Before crash
  - 1: After crash
- <*Total Frames*>: The total number of the messages that are sent to the backend server for the crash event.
- <*Frame Number*>: A numeral to indicate the sequence of the current message.
- <*Data*>: There are 500 bytes in one frame with 6 bytes in a group. The first 2 bytes of these 6 numbers represent X axis acceleration data, the middle 2 bytes represent Y axis acceleration data and the last 2 bytes are for Z axis acceleration data.

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4.9. Acceleration Data Packet

➢ **+ACC,**

Example:
2B 41 43 43 C8 03 02 56 34 54 04 08 2A 3C 05 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 83 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 83 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E2 00 12 FF 82 FF E3 00 12 FF 83 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 82 FF E2 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 83 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 12 FF 82 FF E3 00 11 FF 82 FF E3 00 11 FF 82 07 E6 01 14 06 0C 39 34 AB 9A D6 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+ACC	+ACC
Device Type	1	C8	C8
Protocol Version	2	0000–FFFF	
Unique ID	8	IMEI	
Data	6*75		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

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

✧ <*Data*>: There are 6*75 bytes in one message with 6 bytes in a group. The first 2 bytes of these 6 numbers represent X axis acceleration data, the middle 2 bytes represent Y axis acceleration data and the last 2 bytes are for Z axis acceleration data.

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4.10. CANBUS Device Information Report

CANBUS device information report message **+RESP:GTCAN** uses the format below.

➢ **+CAN,**

Example:
2B 43 41 4E 01 00 00 07 F0 00 92 C8 03 02 03 06 67 76 37 35 6D 00 00 00 00 01 C0 0F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 02 00 0B E3 7D 00 00 00 32 38 06 A9 00 28 00 5A FE 00 00 00 00 00 57 28 00 00 00 00 00 00 00 0F 78 00 20 00 00 00 02 0D 00 00 00 01 10 00 00 00 00 61 00 00 1D 0C 2D 11 0D 00 BF FF FF 3F 1F 02 00 00 00 00 00 00 AB 06 CB BC FD 01 57 E4 B7 07 E6 01 13 08 17 01 07 E6 01 13 08 17 02 05 4A A7 E9 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+CAN	+CAN
Message Type	1		
Report Mask	4	0x00000000 – 0xFFFFFFFF	
Length	2		
Device Type	1	C8	C8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Report Type	1	0|1|2	
CANBUS Device State	1	0|1	
CANBUS Report Mask	4	0x00000000 - 0xFFFFFFFF	
VIN	17		
Ignition Key	1	0|1|2	
Total Distance	4	0– 2147483648	
Total Fuel Used	5	0.00 – 999999.99	
Engine RPM	2	0 – 16383 rpm	
Vehicle Speed	2	0 - 400Km/h	
Engine Coolant Temperature	2	-40 – +215 ℃	
Fuel Consumption	3	0.0 – 999.9L/100km | Inf |	

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		NaN	
Fuel Level (Liter)	5	L(0.00 – 999999.99)	
Fuel Level (Percentage)	5	P(0.00 – 99.99)	
Range	4	0 – 99999999	
Accelerator Pedal Pressure	2	0 – 100	
Total Engine Hours	5	0.00 – 99999.99h	
Total Driving Time	5	0.00 – 99999.99h	
Total Engine Idle Time	5	0.00 – 99999.99h	
Total Idle Fuel Used	5	0.00 –999999.99l	
Axle Weight 2nd	2	0 – 65535kg	
Tachograph Information	2	00-FFFF	
Detailed Information/Indicators	2	00-FFFF	
Lights	1	0x00-0xFF	
Doors	1	0x00-0xFF	0
Total Vehicle Overspeed Time	5	0 – 99999.99h	
Total Vehicle Engine Overspeed Time	5	0 – 99999.99h	
Total Distance Impulses	4	0– 2147483648	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	

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Reserved	1	00	00
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Character	2	0x0D 0x0A	0x0D 0x0A

- <*Message Type*>: The ID of the CAN report message.

Message	**ID**
+RESP:GTCAN	1

- <*Report Mask*>: Please refer to the <*+CAN Mask*> in **AT+GTHRM**.
- <*Length*>: The length of the whole message from header to the tail characters.
- <*Unique ID*>: If Bit 1 of <*+CAN Mask*> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	**86**	**71**	**62**	**02**	**00**	**13**	**20**	**7**
HEX	**56**	**47**	**3E**	**02**	**00**	**0D**	**14**	**07**

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

Device Name	**G**	**V**	**3**	**0**	**0**	**W**		
HEX	**47**	**56**	**33**	**30**	**30**	**57**	**00**	**00**

- <*Report Type*>: A numeral to indicate the report type.
  - 0: Periodic report
  - 1: Real time report
  - 2: Ignition on/off report
- <*CANBUS Device State*>: A numeral to indicate the status of communication between the device and the external CANBUS device.
  - 0: Abnormal. The device fails to receive data from the external CANBUS device.
  - 1: Normal. The device is able to receive data from the external CANBUS device.
- <*CANBUS Report Mask*>: Please refer to the <*CAN Report Mask*> in **AT+GTCAN**.
- <*VIN*>: Reserved in CAN100 device.
- <*Total Distance*>: The total distance the vehicle has travelled. The number is always growing. The unit is hectometer. If it is 0, the distance is not available.
- <*Total Fuel Used*>: 5 bytes in total. The first 4 bytes are for the integer part of the total fuel used and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Engine Coolant Temperature*>: The engine coolant temperature of the vehicle. 2 bytes in total. If this value is negative, it is represented in 2's complement format.

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- <*Fuel Level (Liter)*>: 5 bytes in total. The first 4 bytes are for the integer part of the fuel level (liter) and the last byte is for the fractional part. The fractional part has 2 digits. This field is controlled by Bit 6 in <*CANBUS Report Mask*>.
- <*Fuel Level (Percentage)*>: 5 bytes in total. The first 4 bytes are for the integer part of the fuel level (percentage) and the last byte is for the fractional part. The fractional part has 2 digits. This field is controlled by Bit 6 in <*CANBUS Report Mask*>.
- <*Fuel Consumption*>: 3 bytes in total. The first 2 bytes are for the integer part of the fuel consumption and the last byte is for the fractional part. The fractional part has 1 digit.
  Note: The CAN100 device cannot get this value and the value is invalid.
- <*Total Engine Hours*>: 5 bytes in total. The first 4 bytes are for the integer part of the total engine hours and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Driving Time*>: 5 bytes in total. The first 4 bytes are for the integer part of the total driving time and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Engine Idle Time*>: 5 bytes in total. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Idle Fuel Used*>: 5 bytes in total. The first 4 bytes are for the integer part of the total idle fuel used and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Axle Weight 2nd*>: Weight of vehicle's second axle. The unit is kg.
- <*Tachograph Information*>: Two bytes. The high byte describes driver 2, and the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Validity mark (0 – valid driver data; 1 – no valid data)

R: Reserved

C: Driver card (1 – card inserted; 0 – no card inserted)

T2-T0: Driving time related states:

- 0: Normal/no limits reached
- 1: 15 min before 4½ h
- 2: 4½ h reached
- 3: 15min before 9h
- 4: 9h reached
- 5: 15min before 16h (without 8h rest during the last 24h)
- 6: 16h reached
- 7: Other limit

W1-W0: Driver working states

- 0: Rest – sleeping
- 1: Driver available – short break
- 2: At work – loading, unloading, working in an office
- 3: Driver – behind the wheel

- <*Detailed Information/Indicators*>: A hexadecimal number. Each bit contains information of one indicator.
  - Bit 0: FL – Fuel Low Indicator (1 – indicator on; 0 – off).
  - Bit 1: DS – Driver Seatbelt Indicator (1 – indicator on; 0 – off).
  - Bit 2: AC – Air Conditioning (1 – on; 0 - off).

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- Bit 3: CC – Cruise Control (1 – active; 0 - disabled).
- Bit 4: B – Brake Pedal (1 – pressed; 0 – released).
- Bit 5: C – Clutch Pedal (1 – pressed; 0 – released).
- Bit 6: H – Handbrake (1 – pulled-up; 0 – released)
- Bit 7: CL – Central Lock (1 – locked; 0 – unlocked)
- Bit 8: R – Reverse Gear (1 – on; 0 – off)
- Bit 9: RL – Running Lights (1 – on; 0 – off)
- Bit 10: LB – Low Beams (1 – on; 0 – off)
- Bit 11: HB – High Beams (1 – on; 0 – off)
- Bit 12: RFL – Rear Fog Lights (1 – on; 0 – off)
- Bit 13: FFL – Front Fog Lights (1 – on; 0 – off)
- Bit 14: D – Doors (1 – any door opened; 0 – all doors closed)
- Bit 15: T – Trunk (1 – opened; 0 – closed)

✧ <*Lights*>: A hexadecimal number. Each bit contains information of one particular light.

- Bit 0: Running Lights (1 – on; 0 – off)
- Bit 1: Low Beam (1 – on; 0 – off)
- Bit 2: High Beam (1 – on; 0 – off)
- Bit 3: Front Fog Light (1 – on; 0 – off)
- Bit 4: Rear Fog Light (1 – on; 0 – off)
- Bit 5: Hazard Light (1 – on; 0 – off)
- Bit 6: Reserved
- Bit 7: Reserved

✧ <*Doors*>: A hexadecimal number. Each bit contains information of one door.

- Bit 0: Driver Door (1 – opened; 0 – closed).
- Bit 1: Passenger Door (1 – opened; 0 – closed).
- Bit 2: Rear Left Door (1 – opened; 0 – closed)
- Bit 3: Rear Right Door (1 – opened; 0 – closed).
- Bit 4: Trunk (1 – opened; 0 – closed).
- Bit 5: Hood (1 – opened; 0 – closed).
- Bit 6: Reserved
- Bit 7: Reserved

✧ <*Total Vehicle Overspeed Time*>: 5 bytes in total. The first 4 bytes are for the integer part of the total vehicle overspeed time and the last byte is for the fractional part. The fractional part has 2 digits.

✧ <*Total Vehicle Engine Overspeed Time*>: 5 bytes in total. The first 4 bytes are for the integer part of the total vehicle engine overspeed time and the last byte is for the fractional part. The fractional part has 2 digits.

✧ <*Total Distance Impulses*>: Vehicle distance in impulses. The number is always growing. The unit is imp. If it is 0, the distance in impulse is not available.

✧ <*Send Time*>: The local time to send the acknowledgement message. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

Send Time	**2016**		**01**	**31**	**06**	**29**	**11**
HEX	**07**	**E0**	**01**	**1F**	**06**	**1D**	**0B**

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4.11. Basic Device Information +ATI

➢ **+ATI,**

Example: **2B 42 54 49 00 41 C8 03 02 03 06 56 34 54 04 08 2A 3C 05 00 01 30 81 0A 01 05 01 01 01 02 01 04 42 47 39 36 0F 42 47 39 36 4D 41 52 30 34 41 30 34 4D 31 47 07 E5 04 01 02 0C 05 1D F6 F6 4F 0D 0A**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Message Header	4	+ATI	+ ATI
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
ATI Mask	4	00000000 – FFFFFFFF	
Firmware Version	3	'0' – '9' 'A' – 'F'	
Hardware Version	2	'0' – '9' 'A' – 'F'	
Bootloader Version	3	'0' – '9' 'A' – 'F'	
Modem Hardware Version Length	1	0 – 20	
Modem Hardware Version	<=20		
Modem Software Version Length	1		
Modem Software Version	<=50		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <ATI Mask>: This mask is set by **AT+GTRTO** command and used to control parameter fields in **+ATI** message.

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4.12. Buffer Report in HEX Format

When HEX format reports are buffered in the memory, the device will replace the second byte of the reports 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 reports is the same.

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Appendix A: Two's Complement

For a positive value, the two's complement is itself. Take 17 as an example. Its hex format is 0x11 and the two's complement for it is 0x11. For a negative value, the following gives detailed calculations.

-X is a negative value.
Firstly, get to know the number of bits for the negative value N, then the two's complement for it is:

2^N - X

For example, to use 16 bits to represent -100, the two's complements for it should be:

2^16 – 100 = 65436 = 0xFF9C

Above is two's complement for -100 in hex format.

On the contrary, the two's complement can also be converted to the hex value that it represents in a similar way.

1. Get to know the number of bits for the two's complement.
2. Get the sign of the value, positive or negative. If the highest bit is 1, it is a negative value. If the highest bit is 0, it is a positive value.
3. If it is a positive value, there is no need for conversion. It is the value.
4. If it is a negative value, get the real value through the following calculation:

   -(2^N – X)

   Where:

   N is the number of bits for the two's complement.

   X is the value that is converted from the two's complement directly.

For example, if the number of bits for the two's complement is 16 and the two's complement is 0xFF9C, then it is a negative value as the highest bit is 1, and the detailed calculation for it is:

-(2^16 – 0XFF9C) = -100

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Appendix B: Message Index

- **Command and ACK**

AT+GTBSI
+ACK:GTBSI
AT+GTSRI
+ACK:GTSRI
AT+GTQSS
+ACK:GTQSS
AT+GTCFG
+ACK:GTCFG
AT+GTOUT
+ACK:GTOUT
AT+GTDIS
+ACK:GTDIS
AT+GTIGM
+ACK:GTIGM
AT+GTIOB
+ACK:GTIOB
AT+GTEPS
+ACK:GTEPS
AT+GTGDO
+ACK:GTGDO
AT+GTFRI
+ACK:GTFRI
AT+GTFCC
+ACK:GTFCC
AT+GTGEO
+ACK:GTGEO
AT+GTTOW
+ACK:GTTOW
AT+GTSPD
+ACK:GTSPD
AT+GTSOS
+ACK:GTSOS
AT+GTIDL
+ACK:GTIDL
AT+GTHBM
+ACK:GTHBM
AT+GTTMA
+ACK:GTTMA
AT+GTOWH

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+ACK:GTOWH
AT+GTDOG
+ACK:GTDOG
AT+GTPIN
+ACK:GTPIN
AT+GTRTO
+ACK:GTRTO
AT+GTURT
+ACK:GTURT
AT+GTDAT
+ACK:GTDAT
AT+GTHMC
+ACK:GTHMC
AT+GTWLT
+ACK:GTWLT
AT+GTSSR
+ACK:GTSSR
AT+GTIDA
+ACK:GTIDA
AT+GTPDS
+ACK:GTPDS
AT+GTACD
+ACK:GTACD
AT+GTEFS
+ACK:GTEFS
AT+GTIDA
+ACK:GTIDA
AT+GTBZA
+ACK:GTBZA
AT+GTSPA
+ACK:GTSPA
AT+GTMUT
+ACK:GTMUT
AT+GTTMP
+ACK:GTTMP
AT+GTUDT
+ACK:GTUDT
AT+GTFSC
+ACK:GTFSC
AT+GTPEO
+ACK:GTPEO
AT+GTRMD
+ACK:GTRMD
AT+GTCMS

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+ACK:GTCMS
AT+GTTAP
+ACK:GTTAP
AT+GTCAN
+ACK:GTCAN
AT+GTFTP
+ACK:GTFTP
AT+GTSIM
+ACK:GTSIM
AT+GTUFS
+ACK:GTUFS
AT+GTCMD
+ACK:GTCMD
AT+GTUDF
+ACK:GTUDF
AT+GTOEX
+ACK:GTOEX
AT+GTIEX
+ACK:GTIEX
AT+GTUPC
+ACK:GTUPC
AT+GTCRA
+ACK:GTCRA
AT+GTGAM
+ACK:GTGAM
AT+GTJDC
+ACK:GTJDC
AT+GTASC
+ACK:GTASC
AT+GTJBS
+ACK:GTJBS
AT+GTGPJ
+ACK:GTGPJ
AT+GTWRT
+ACK:GTWRT
AT+GTVVS
+ACKVVS
AT+GTAVS
+ACK:GTAVS

✧ **Position Related Report**

+RESP:GTTOW
+RESP:GTEPS
+RESP:GTDIS

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+RESP:GTIOB
+RESP:GTFRI
+RESP:GTSPD
+RESP:GTSOS
+RESP:GTRTL
+RESP:GTLBC
+RESP:GTDOG
+RESP:GTIGL
+RESP:GTHBM
+RESP:GTIDA
+RESP:GTGES
+RESP:GTGIN
+RESP:GTGOT

✧ **Device Information Report**

+RESP:GTINF

✧ **Report for Querying**

+RESP:GTGPS
+RESP:GTALL
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTIOS
+RESP:GTTMZ
+RESP:GTAIF
+RESP:GTALS
+RESP:GTALC
+RESP:GTGSV
+RESP:GTUVN
+RESP:GTCVN
+RESP:GTATI
+RESP:GTWRT

✧ **Event Report**

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN
+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT

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+RESP:GTPDP
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF
+RESP:GTGSM
+RESP:GTGSS
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTDOS
+RESP:GTTMP
+RESP:GTRMD
+RESP:GTPHL
+RESP:GTUFS
+RESP:GTFTP
+RESP:GTEXP
+RESP:GTUPC
+RESP:GTCRA
+RESP:GTIGS
+RESP:GTJDS
+RESP:GTGPJ
+RESP:GTASC
+RESP:GTLBA
+RESP:GTWPB
+RESP:GTCRA
+RESP:GTCRG

✧ **Transparent Data Transmission**

+RESP:GTDAT (Short Format)
+RESP:GTDAT (Long Format)
+RESP:GTDTT (Short Format)
+RESP:GTDTT (Long Format)
+RESP:GTUDT
+RESP:GTPHD

✧ **CANBUS Device Information Report**

+RESP:GTCAN

✧ **Heartbeat**

+ACK:GTHBD
+SACK:GTHBD

✧ **Server Acknowledgement**

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+SACK

✧ **Hex Format Report Message**

+ACK

+RSP

+EVT

+INF

+HBD

+DAT

+CAN

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