GV300CAN @Track Air Interface Protocol

GSM/GPRS/GNSS Tracker

TRACGV300CANAN002

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Contents

0. Revision History

Version	Date	Author	Description of Change
1.01	2017-06-09	Dgreen Lin	1. Initial.
2.00	2017-12-04	Arteezy Xin	1. Added the command **AT+GTSIM**. 2. Used Bit 33 for "No change of SIM card" and Bit 34 for "SIM card change" in the command **AT+GTUDF**. 3. Added the command **AT+GTCDA**. 4. Added **+RESP:GTQDA**. 5. Added the **AT+GTBSE** command. 6. Added the command **AT+GTCLT** and the report message **+RESP:GTCLT**. 7. Added the command **AT+GTTMP** and the report message **+RESP:GTTMP**. 8. Added the command **AT+GTGAM**.
	2017-12-08	Dgreen Lin	1. Added the command **AT+GTUPC**. 2. Added the command **AT+GTPEO**. 3. Added the command **AT+GTOEX**. 4. Added the command **AT+GTIEX**. 5. Added the <*State Mode*> parameter to **AT+GTGEO**. 6. Modified the **AT+GTJBS** function. 7. Added the commands **AT+GTVVS** and **AT+GTAVS**.
2.01	2017-12-27	Dgreen Lin	1. Added the Sub Command 0x1E in the **AT+GTRTO** command. 2. Added **BTI**, **BSC** and **BAU** AT Command in the **AT+GTRTO** command. 3. Added **AT+GTRTO** sub command 0x1E related **+RESP:GTBTI**, **+RESP:GTBSC** and **+RESP:GTBAU** messages. 4. Added <*Start Time*> and <*End Time*> parameters to the **AT+GTGEO** command.
3.00	2018-07-23	Dean Zhu	1. Added <*CAN Chipset Operation Mode*> and <*Car Model ID*> to the **AT+GTRTO** command.
	2018-07-23	Arteezy Xin	1. Added the **+RESP:GTCML** report. 2. Added the **AT+GTFVR** command. 3. Added the parameter <*Update Status Mask*> to the command **AT+GTUPC**.
3.01	2018-09-28	Arteezy Xin	1. Added Sub Command 0x14 in the **AT+GTRTO** command.

			2. Added Sub Command 0x26 in the **AT+GTRTO** command. 3. Added the **+RESP:GTDAV** report.
3.02	2019-01-23	Dean Zhu	1. Added **AT+GTBAS** command to support the function of connecting Bluetooth accessory.
3.03	2019-03-26	Bart Yuan	1. Deleted the parameter <*UART Device Type*> from the message **+RESP:GTERI**.
3.04	2019-04-15	Sneaky Sun	1. Added <*Overspeed Restrict Output*> and <*Debounce Time*> to the **AT+GTOUT** command.
3.05	2019-04-16	Dean Zhu	1. Added the parameter <*Fail Interval*> to the command **AT+GTDOG**.
3.06	2019-04-25	Dean Zhu	1. Added code type 103/113 in the **+RESP:GTCFU** message. 2. Added code type 103 in the **+RESP:GTUFS** message.
3.07	2019-06-10	Bart Yuan	1. Added a new parameter <*Discard Unknown Event*> to the command **AT+GTHBM**.
4.00	2019-07-12	Dean Zhu	1. Added a new parameter <*DDD Download Attempt Times*> to the command **AT+GTDOG**. 2. Added the **AT+GTTTR** command. 3. Added a new update type 2 to **AT+GTCFU** to support THR_100 FOTA upgrade. 4. Added RTO-2B to support search THR_100 version.
4.01	2019-07-15	Dean Zhu	1. Added new type 104, 114 and 303 in **+RESP:GTCFU**.
4.02	2019-10-22	Dean Zhu	1. Added HEX report for **+RESP:GTBTI**, **+RESP:GTBSC** and **+RESP:GTBAU**.
5.00	2019-10-22	Dean Zhu	1. Supported configuration via BLE. 2. Added the parameter <*Wrap Corner Point*> to the command **AT+GTFRI**.
5.01	2019-12-06	Dean Zhu	1. Added accessory type 2 and model 0 to the **AT+GTBAS** command to support WTS300 accessory. 2. Added the parameter <*Low Voltage Threshold*> to the **AT+GTBAS** command. 3. Added the **AT+GTBID** command to support the Bluetooth beacon ID accessories. 4. Added the **+RESP:GTBAA** message to indicate some alarm events (temperature alarm or button event). 5. Added the **+RESP:GTBID** message to indicate

			the number of beacon ID accessories detected by the device.
5.02	2019-12-19	Dean Zhu	1. Added a <*Reserved*> to **+RESP:GTDTT** in hex format. 2. Modified the parameters <*Sensor Rest Duration*> to <*Rest Validity*> and <*Sensor Motion Validity*> to <*Movement Validity*> in **AT+GTAVS**.
5.03	2020-01-07	Dean Zhu	1. Added the parameters <*Inpeo Mask*> and <*Outpeo Mask*> to **AT+GTUDF**.
5.04	2020-02-19	Bart Yuan	1. Extended the value range of <*GNSS Working Mode*> in the command **AT+GTCFG** from 0-2 to 0-4.
6.00	2020-02-30	Aleo Liu Jerry Jiang	1. Added accessory type 6 and model 2 to the **AT+GTBAS** command to support WTH300 accessory. 2. Added temperature and humidity parameters monitoring for WTH300. 3. Added Accessory Type 7 and Accessory Model from 0 to 4 in the **AT+GTBAS** command to support the Technoton accessory. 4. Added the **+RESP:GTBAR** message to report the information of Technoton accessories.
6.01	2020-06-09	Aleo Liu	1. Added the parameter <*Index*> in the command **AT+GTBID**. 2. Added the Beacon ID model 1 to the parameter <*Beacon ID Model*> in the command **AT+GTBID**.
6.02	2020-07-28	Aleo Liu	1. Added the parameters <*Vehicle Speed High Threshold*>, <*Vehicle Speed High Threshold*>, <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*> in the command **AT+GTCLT**. 2. Added accessory type 1 and accessory model 3 to the **AT+GTBAS** command to support the Escort angle sensor.
7.00	2020-09-29	Claire Liu	1. Update version number.

7.01	2020-12-01	Claire Liu	1. Added the parameter <*Organization Unique Identifier*> to the command **AT+GTBID**. 2. Modified the range of parameter <*CAN Chipset Operation Mode*> in the command **AT+GTRTO**. 3. Modified the range of parameter <*Car Model ID*> in the command **+RESP:GTCML**. 4. Added <*Car Sync Status*> to the **+RESP:GTCML** report. 5. Added the parameter <*Electric Report Mask*> to the command **AT+GTCAN**. 6. Added the parameter <*Electric Report Mask*> to the massage **+RESP:GTCAN.**
7.02	2020-12-08	Claire Liu	1. Added the mode 5/6/7/8/9 to <*Command Type*> in the **AT+GTTTR** command.
8.00	2021-05-25	Claire Liu	1. Modified the range of <*Timeout After Ignition Off*> in the **AT+GTIDA** command.
8.01	2021-06-10	Claire Liu	1. Updated version number.
8.02	2021-06-11	Claire Liu	1. Updated version number.
8.03	2021-07-12	Claire Liu	1. Added the mode 2 to the parameter <*Mode*> in the command **AT+GTOWL**.
9.00	2021-10-15	Claire Liu	1. Added the parameter <*RFID Report Mode*> in the command **AT+GTIDA**. 2. Modified the range of parameter <*Report Mode*> in **AT+GTIDA** from 0-3 to 0-7. 3. Added type 2 to <*ID Report Type*> in the message **+RESP:GTIDA.** 4. Added the parameter <*Data Format*> in the command **AT+GTDAT.**
10.00	2022-04-07	Claire Liu	1. Updated version number.
10.01	2022-05-26	Claire Liu	1. Modified the range of parameter <*Total Packets*> in **+RESP:GTALM** from 32 to 37. 2. Modified the range of parameter <*Current Packet*> in **+RESP:GTALC** from 1-25 to 1-29.
10.02	2022-06-13	Claire Liu	1. Added the mode 7 to the parameter <*Report Mode*> in the command **AT+GTSRI**.
10.03	2022-06-24	Claire Liu	1. Added the parameter <*No CAN Interval*> to the command **AT+GTDOG.**
11.00	2022-09-07	Claire Liu	1. Updated version number.
11.01	2022-10-12	Claire Liu	1. Added the parameter <*Feature Switch Mask*> to the command **AT+GTCFG**. 2. Modified the range of parameter <*Max. Tank Volume*> in the command **AT+GTFSC** from 0 -

			10000 to 0 - 6000.
11.02	2023-12-20	Archie Li	1. Added support for Hex CAN.
12.00	2024-07-01	Archie Li	1. Added type 2 to the parameter <*1-wire Device Type*> in **+RESP:GTERI**.

1. Overview

1.1. Scope of This Document

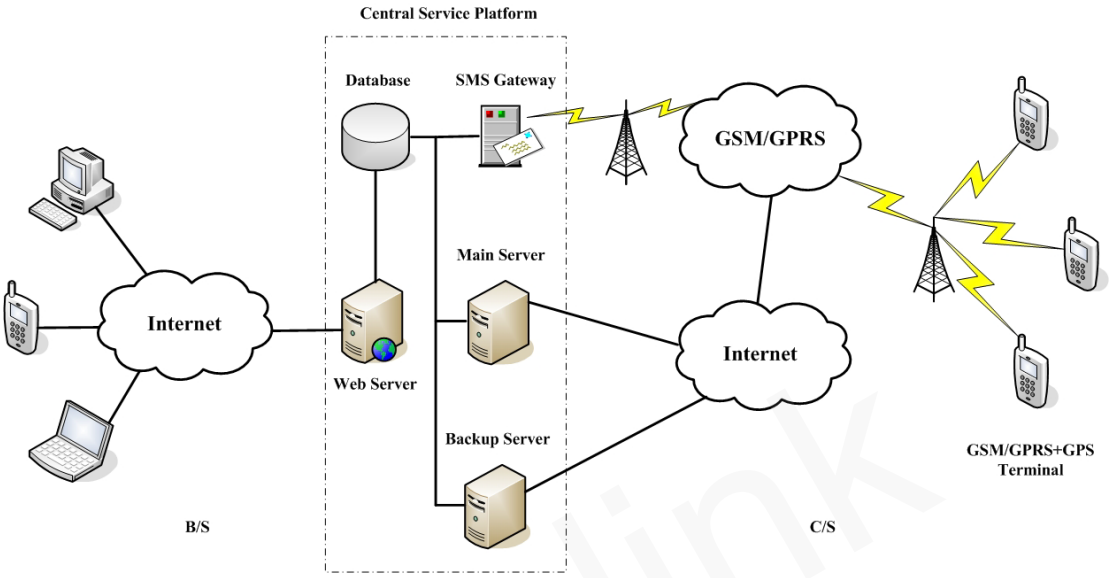
The @Track Air Interface Protocol is a digital communication interface based on printable ASCII characters over SMS or GPRS, which is used for all communications between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms the receipt 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. Terms and Abbreviations

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

2. System Architecture



The backend server needs to be accessible by many 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 terminal.
- ✧ The backend server should be able to support TCP or UDP connection with the terminal. It should be able to receive data from the terminal and send data to the terminal.
- ✧ The backend server should be able to receive and send SMS.

3. Message Description

3.1. Message Format

All 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 descriptions of each message format are 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:

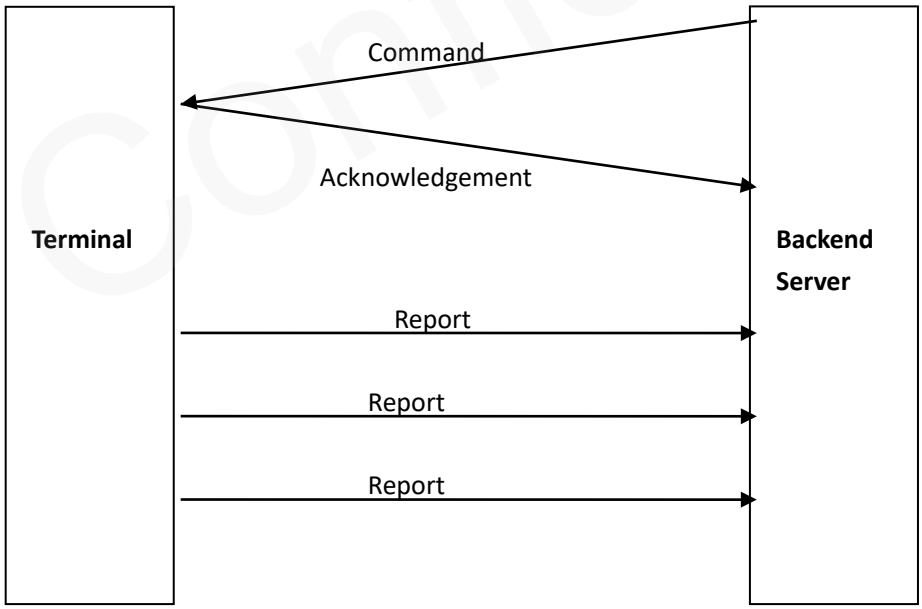


Figure 1: **@Track Protocol Message Flow**

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 GPRS parameters.

➢ **AT+GTBSI=**

Example: **AT+GTBSI=gv300can,cmnet,user,pwd,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	APN	<=40		
3	APN User Name	<=30		
4	APN Password	<=30		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Serial Number	4	0000 – FFFF	
10	Tail Character	1	$	$

✧ <*Password*>: The valid characters for the password include '0'–9', 'a' –'z', and 'A' –'Z'. The default value is "gv300can".

✧ <*APN*>: The access point name (APN).

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

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

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

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

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

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

➢ **+ACK:GTBSI,**

Example: **+ACK:GTBSI,4B0303,867995030096625,,002A,20190409035331,0223$**			
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 shown in the example above, **4B** means **GV300CAN**. 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. And both version numbers are hex digits. For example, **0100** means version **1.00**.

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

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

✧ <*Serial Number*>: A serial number which is the same as the <*Serial Number*> in the corresponding command. It distinguishes which command the ACK message is for.

✧ <*Send Time*>: The local time to send the ACK message.

✧ <*Count Number*>: A self-increasing count number in each acknowledgment message and report message. It begins from 0000 and increases by 1 for each message. And it rolls back after "FFFF".

✧ <*Tail Character*>: A character to indicate the end of the command. 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 method of communication between the backend server and the terminal. When configured correctly, the terminal should be able to report data to the backend server.

➢ **AT+GTSRI=**

Example:

AT+GTSRI=gv300can,3,,1,60.174.225.225,7011,60.174.225.225,7010,18312341234,5,1,0,0,0,,,,,FFFF$ AT+GTSRI=gv300can,3,,1,some.host.name,7011,60.174.225.225,7010,18312341234,5,1,0,0,0,,,,,,FFFF$				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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	<=15		
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	0
12	Protocol Format	1	0|1	0
13	SMS ACK Enable	1	0|1	0
14	Connection Retry Pattern	1	0 – 4	0
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Serial Number	4	0000 – FFFF	
21	Tail Character	1	$	$

✧ <*Report Mode*>: This defines the method of communication 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 the terminal 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. If the terminal 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 the 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 terminals.
- 4: UDP mode. The terminal will send data to the backend server through UDP protocol. Receiving protocol commands via UDP is supported if the GPRS network allows it. It is recommended to enable heartbeat sending and **+RESP:GTPDP** in the case of receiving commands via UDP.
- 5: Forced SMS mode. Only SMS is used for data transmission.
  Note: The messages **+RESP:GTGSM**, **+RESP:GTPHL**, **+RESP:GTALM** and **+DAT** are sent via TCP short connection when the report mode is forced SMS mode.
- 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using UDP protocol. The difference is the terminal will use 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. If the buffer report function is enabled and the device goes into areas without GSM/GPRS network coverage, the device will store all reports locally. If the device goes back to areas with GSM/GPRS network coverage, it will then send all the buffered reports through GPRS.

- 0: Disable the buffer report function.
- 1: Low priority - Enable the buffer report function. In this mode, the device will send the buffered messages after the real-time messages.
- 2: High priority - Enable the buffer report function. In this mode, the device will send all the buffered messages before real-time messages, except **+RESP:GTSOS**, **+RESP:GTPFA**, **+RESP:GTPDP**, **+RESP:GTUPD** and **+RESP:GTHBD**.

✧ <*Main Server IP / Domain Name*>: The IP address or the domain name of the primary server.

✧ <*Main Server Port*>: The port of the primary server.

✧ <*Backup Server IP*>*: The IP ad*dress of the backup server.

✧ <*Backup Server Port*>: The port of the backup server.

- <*SMS Gateway*>: A maximum of 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 the heartbeat message (**+ACK:GTHBD**) when the report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat message will be sent.
- <*SACK Enable*>: This parameter defines whether the backend server should respond to the terminal with a SACK message when it receives a message from the terminal.
  - 0: The backend server does not reply with a SACK message after receiving a message from the terminal.
  - 1: The backend server replies with a SACK message when receiving a message from the terminal.
- <*Protocol Format*>: This field defines the format of the report message sent from the device to the backend server. 0 means "ASCII format", and 1 means "HEX format".
- <*SMS ACK Enable*>: A numeral to indicate whether to send the acknowledgement message to the original number when the command is sent via SMS.
  - 0: The device will send the acknowledgement message to the backend server according to the mode configured by the <*Report Mode*>.
  - 1: The device will send the acknowledgement message to the original number via SMS if the command is received via SMS.
- <*Connection Retry Pattern*>: This defines the method of terminal retrying to establish TCP connection with the backend server when there is no valid connection at present. The 'Pattern' number is a mode and each mode consists of 3 Retry-Periods (unit is 'minute'). 'Period' defines the interval before the next re-connection to the backend server, which starts from Period1. If it is failed to re-connect to the backend server for 5 times at the "Period 1" interval, the terminal will use the next "Period 2" as the interval for re-connection, and then keep retrying with the last one, 'Period 3' as the interval. The retry interval will start from "Period1" again as long as the terminal is connected to the backend server for one time. These patterns have no effect for UDP mode (Ref. <*Report Mode*>).

Retry Pattern	Period 1	Period 2	Period 3
0	3	3	3
1	1/3	1	3
2	1	3	10
3	3	10	20
4	3	30	60

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

- **+ACK:GTSRI,**

Example: **+ACK:GTSRI,4B0303,867995030096625,,002C,20190409035812,022E$**			
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 commands **AT+GTBSI** and **AT+GTSRI** are properly set can the ACK messages and other report messages be received by the backend server.

3.2.1.3. Quick Start Setting

The command **AT+GTQSS** is used to configure the GPRS parameters and backend server information if the length of all the settings is less than 160 bytes. Otherwise, the two commands **AT+GTBSI** and **AT+GTSRI** are used to configure the settings.

- **AT+GTQSS=**

Example: **AT+GTQSS=gv300can,cmnet,user,pwd,3,,1,60.174.225.225,7011,60.174.225.225,7010,1831 2341234,5,1,0,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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 Port	<=5	0 – 65535	
10	Backup Server IP	<=15		
11	Backup Server Port	<=5	0 – 65535	
12	SMS Gateway	<=20		

13	Heartbeat Interval	<=3	0|5 – 360min	0
14	SACK Enable	1	0|1	0
15	Protocol Format	1	0|1	0
16	Reserved	0		
17	Serial Number	4	0000 – FFFF	
18	Tail Character	1	$	$

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

- **+ACK:GTQSS,**

Example: **+ACK:GTQSS,4B0303,867995030096625,,002E,20190409040031,0233$**			
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=gv300can,123456,gv300can,,,,,,,,,,,,,,,,,,,,,,FFFF$** **AT+GTCFG=gv300can,,gv300can,1,123.4,,,7F,1,,3FFF,,0,1,300,0,1,0,,,1,F,0,0,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	New Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
3	Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-'	gv300can

			' _ '	
4	ODO Enable	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	0000 – FFFF	003F
9	Power Saving Mode	1	0 – 2	1
10	Reserved	0		
11	Event Mask	<=4	0000 – FFFF	3FFF
12	Reserved	0		
13	LED On	1	0|1	0
14	Info Report Enable	1	0|1	0
15	Info Report Interval	<=5	30 – 86400sec	300
16	Location by Call	1	0|1|2	0
17	Backup Battery Switch	1	0|1	1
18	Backup Battery Charge Mode	1	0|1	0
19	Reserved	0		
20	Reserved	0		
21	AGPS Mode	1	0|1	0
22	Cell Info Report	4	0000 – FFFF	000F
23	GNSS Lost Time	2	0 – 30min	0
24	GNSS Working Mode	1	0 – 4	0
25	Feature Switch Mask	4	0000 – FFFF	0000
26	Reserved	0		
27	Reserved	0		
28	Serial Number	4	0000 – FFFF	
29	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.
- <*ODO Enable*>: Enable/disable the odograph function of calculating 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 GSM tower data, including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*Reserved*> parameter value "00" or the <*GNSS Trigger Type*> parameter.
  - Bit 4 for <*Mileage*>
  - Bit 5 for <*Send Time*>, the time when the report message is generated.
  - 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*>: The mode of power saving function. If <*Power Saving Mode*> is set to 0, the GNSS will be always on. If <*Power Saving Mode*> is set to 1, the fixed report, geo-fence and speed alarm report functions are suspended when the device is at a standstill or the engine is turned off. If <*Power Saving Mode*> is set to 2, it is mostly like Mode 1 and the difference is that the fixed report will not be suspended and the fix and send interval of it will be set to <*IGF Report Interval*> in **AT+GTFRI** when the engine is off.
  - 0: Disable the power saving function.
  - 1: Mode 1 of the power saving function.
  - 2: Mode 2 of the power saving function.
- <*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 for **+RESP:GTANT**
  - 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 the ignition on/off location report **+RESP:GTIGL** and **+RESP:GTVGL**

  For each bit, set it to 1 to enable the corresponding event report, and 0 to disable the corresponding event report.
- <*LED On*>: It configures the working mode of GNSS LED.
  - 0: Each time the device powers on, GNSS LED will work for 30 minutes and then turn

off.

- 1: GNSS LED turns on as configured.

✧ <*Info Report Enable*>: Enable/disable the device information report (**+RESP:GTINF**). The device information includes state of the device, ICCID, GSM signal strength, voltage of external power supply, battery voltage, charge status, GNSS LED working mode, external GNSS antenna status, the time of last known GNSS fix, status of all digital inputs and outputs, time zone information and daylight saving setting.

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

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

✧ <*Location by Call*>: It configures how to handle the incoming call.

- 0: Just hang up the call.
- 1: Hang up the call and report the current position via **+RESP:GTLBC**.
- 2: Hang up the call and report the current position with a Google Map link via SMS to the phone number of the incoming call.

✧ <*Backup Battery Switch*>: It controls whether to switch on/off the backup battery.

- 0: Switch off the backup battery.
- 1: Switch on the backup battery.

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

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

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

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

✧ <*Cell Info Report*>: A hexadecimal numeral to indicate how to report cell information (**+RESP:GTGSM**).

The 2 high bits represent the GSM working mode.

- 0b00: Do not allow the cell information report.
- 0b01: Allow the cell information report after failing to get GNSS position if cell information is available.
- 0b10: Report the message **+RESP:GTGSM** after getting GNSS position successfully each time if cell information is available.
- 0b11: Report the message **+RESP:GTGSM** no matter whether it is successful to get GNSS position if cell information is available.

The other bits control whether the following events will trigger the report **+RESP:GTGSM**.

- 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.

✧ <*GNSS Lost Time*>: A time parameter to monitor the GNSS signal. If there is no GNSS signal or successful GNSS fix for consecutive <*GNSS Lost Time*>, the device will send the event report message **+RESP:GTGSS** to indicate "GNSS signal lost". When the GNSS signal is recovered or a successful fix is obtained again, the device will send the event report message **+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 if it has reported **+RESP:GTGSS** to indicate "GNSS signal lost" before reboot.

✧ <*GNSS Working Mode*>: The working mode of GNSS chip.

- 0: GPS and GLONASS positioning system. In this mode, the device fixes position(s) with GPS and GLONASS systems. **Note:** If the current GNSS chip does not support GPS and GLONASS combination mode, the device will get position by GPS only.
- 1: GPS positioning system. In this mode, the device fixes position(s) only with GPS system.
- 2: GLONASS positioning system. In this mode, the device fixes position(s) only with GLONASS system.
- 3: Reserved.
- 4: GPS and Beidou positioning system. In this mode, the device fixes position(s) with GPS and Beidou systems. **Note:** If the current GNSS chip does not support GPS and Beidou combination mode, the device will get position by GPS only.

✧ <*Feature Switch Mask*>: Bitwise mask to configure optional operation by bit.

- Bit 0 for Sync speed: Synchronize the <*Speed*> in the GNSS information with the <*Vehicle Speed*> in CANBUS when the <*Speed*> is valid in the parameter <*Report Composition Mask*>.
- Bit 1 for calibration CANBUS speed: Compare the <*Speed*> in the GNSS information with the <*Vehicle Speed*> in CANBUS, if the CANBUS speed is 10km/h greater than GNSS speed, the CANBUS speed will be replaced. The <*Speed*> is valid in the parameter <*Report Composition Mask*>.

Note: If both bit0 and bit1 are enabled, the bit1 has a higher priority.

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

➢ **+ACK:GTCFG**,

Example: **+ACK:GTCFG,4B0303,867995030009362,gv300can,0004,20190412031428,000D$**			
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	$	$

3.2.2.2. Auto-unlock PIN

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

- **AT+GTPIN=**

Example: **AT+GTPIN=gv300can,1,0000,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Enable Auto-unlock PIN	1	0|1	1
3	PIN	4 – 8	'0' – '9'	
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Serial Number	4	0000 – FFFF	
10	Tail Character	1	$	$

- <*Enable Auto-unlock PIN*>: Set it to 1 to enable the auto-unlock PIN function, and 0 to disable the auto-unlock PIN function.
- <*PIN*>: The PIN code used to unlock the SIM PIN.

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

- **+ACK:GTPIN,**

Example:
+ACK:GTPIN,4B0303,867995030009362,gv300can,0006,20190412031520,000F$

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 on. 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 a digital input to trigger the reboot manually.

- **AT+GTDOG=**

Example:
AT+GTDOG=gv300can,1,60,30,0200,,1,0,,60,60,5,FFFF$
AT+GTDOG=gv300can,2,60,30,0200,,1,0,,60,60,5,3,FFFF$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2	0
3	Ignition Frequency	<=3	10 – 120 min	60
4	Interval	<=2	1 – 30 day	30
5	Time	4	HHMM	0200
6	Reserved	0		
7	Report Before Reboot	1	0|1	1
8	Input ID	1	0 – 2	0
9	Reserved	0		
10	GSM Interval	4	0|5 – 1440 min	60
11	PDP Interval	4	0|5 – 1440 min	60
12	Fail Interval	4	0|5 – 1440 min	0

13	No CAN Interval	4	0|5 – 1440 min	60
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	$	$

- <*Mode*>: The working mode of the watchdog function.
  - 0: Disable this function.
  - 1: Reboot periodically according to the <*Interval*> and <*Time*> settings.
  - 2: Reboot upon ignition on.
- <*Ignition Frequency*>: If the <*Mode*> is set to 2 and the time interval between two adjacent ignition-ons is greater than the value specified by this parameter, the device will automatically reboot upon ignition on.
- <*Interval*>: The interval for rebooting the device. It is measured in days.
- <*Time*>: It specifies the time at which the reboot operation is performed after 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 it is enabled, the device will initiate a real-time location 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 use manual reboot".
- <*GSM Interval*>: The time interval in minutes for rebooting the device when the device loses GSM signal. 0 means "Do not reboot the device".
- <*PDP Interval*>: The time interval in minutes for rebooting the device when the device cannot send message(s) via GPRS connection successfully. 0 means "Do not reboot the device".
- <*Fail Interval*>: The interval for rebooting the device when the device can not send message successfully. 0 means "Do not reboot the device".
- <*No CAN Interval*>: The time interval in minutes for rebooting the device when the device cannot receive CANBUS messages from CAN100. 0 means "Do not reboot the device". This function only works in the ignition on state.

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

- **+ACK:GTDOG,**

Example: **+ACK:GTDOG,4B0303,867995030009362,gv300can,0008,20190412031645,0010$**			
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. Outside Working Hours

To protect the privacy of the driver when he is off duty, the device could 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=gv300can,1,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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 – 2|9 – C	0
11	Output ID	1	0 – 2|9 – C	0
12	Output Status	1	0|1|2	0
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		
19	Serial Number	4	0000 – FFFF	
20	Tail Character	1	$	$

- <*Mode*>: The working mode of this function.
  - 0: Disable this function.
  - 1: Manual mode. By connecting an external unit to a specified digital input of the device, the driver manually enables time checking. If the device finds the current time is outside the range of working hours, it will hide the location information in the report messages. Otherwise, the device reports the location information normally.
  - 2: Full manual mode. By connecting an external unit to a specified digital input of the device, the driver has full control over the privacy protection. The device will not check the current time against the range of working hours. The device just hides the location information when the specified input is enabled and reports 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 range of working hours. If it is outside the working hours, the device will hide the location information. Otherwise, the location information will be reported normally.
- <*Day of Work*>: It specifies the working days in a week in a bitwise manner.
  - Bit 0 for Monday
  - Bit 1 for Tuesday
  - Bit 2 for Wednesday
  - Bit 3 for Thursday
  - Bit 4 for Friday
  - Bit 5 for Saturday
  - Bit 6 for Sunday

  For each bit, 0 means “off day”, 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 ID of the input used to trigger this function when the <*Mode*> is 1 or 2. The working parameters of the specified input must be set by **AT+GTDIS** first. If an interruptible digital input is used, please connect a slide button instead of tact button to the input for this function.
- <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*>: If this function is enabled and it is currently off duty time, the specified wave will be output at the specified output.

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

- **+ACK:GTOWH,**

Example: **+ACK:GTOWH,4B0303,867995030009362,gv300can,000A,20190412031720,0011$**			
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. 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=gv300can,+,8,30,0,20190412031720,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Sign	1	+|–	+
3	Hour Offset	<=2	0 – 23	0
4	Minute Offset	<=2	0 – 59	0
5	Daylight Saving	1	0|1	0
6	UTC Time	14	YYYYMMDDHHMMSS	
7	Reserved	0		
8	Reserved	0		

9	Reserved	0		
10	Reserved	0		
11	Serial Number	4	0000 – FFFF	
12	Tail Character			

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

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

- **+ACK:GTTMA,**

Example: **+ACK:GTTMA,4B0303,867995030009362,gv300can,000C,20190412031906,0012$**			
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' '-' '_'	
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. The specified logic states selected based on the value of the component <*Mask*> will be preserved or reset according to the <*Mode*>.

- **AT+GTPDS=**

Example: **AT+GTPDS=gv300can,1,3FF,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**

1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2	0
3	Mask	4	0000 – FFFF	0
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
10	Serial Number	4	0000 – FFFF	
11	Tail Character	1	$	$

- <*Mode*>: The working mode of preserving specified logic states of the device.
  - 0: Disable this function.
  - 1: Preserve specified logic states according to the value of <*Mask*>.
  - 2: Reset all the specified logic states listed in <*Mask*> after receiving the command, and then preserve specified logic states according to the value of <*Mask*>.
- <*Mask*>: Bitwise mask to configure which device status will be preserved. Each bit represents a state.
  - Bit 0: State of GEO
  - Bit 1: Reserved
  - Bit 2: State of GNSS antenna
  - 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: Reserved
  - Bit 11: Reserved
  - Bit 12: Reserved
  - Bit 13: State of overspeed output in the command **AT+GTOUT**

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

- **+ACK:GTPDS,**

Example:
+ACK:GTPDS,4B0303,867995030009362,gv300can,000E,20190412032313,0014$

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

3.2.2.7. Over-the-air Configuration Update

The **AT+GTUPC** command is used to download configuration file over the air for the update of the local configuration.

➢ **AT+GTUPC=**

Example: **AT+GTUPC=gv300can,0,10,0,0,168,http://www.queclink.com/configure.ini,1,,0,0,,3,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0'-'9', 'a'-'z', 'A'-'Z'	gv300can
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
Serial Number	4	0000-FFFF	
Tail Character	1	$	$

✧ <*Password*>: The valid characters for the password include '0'- '9', 'a'-'z', and 'A'-'Z'. The default value is "gv300can".

✧ <*Max. Download Retry*>: It specifies the maximum number of retries 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 <*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 it is greater 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 file.
  - Bit 0 for ignition off
  - Bit 1 for ignition on

Note:

1. The maximum number of commands in configuration file is 255. If there are more than 255 commands in the configuration file, the device will fail to download the configuration file.
2. Make sure there is only one command per line in the configuration file and there should be a "\r\n" between two commands.
3. There should be no space before each command.
4. The configuration file should be a plain text file.
5. **+RESP:GTEUC** in hex format has the same message format as **+RESP:GTUPC**.
6. If a non-MT tool generates ini file that contains **AT+GTUPC**, **AT+GTUFS**, **AT+GTUPD** and **AT+GTCFU** commands but not the **AT+GTFVR** command, the upgrade will stop and the error code 302 will be reported.

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

- **+ACK:GTUPC,**

Example:
+ACK:GTUPC,4B0303,867995030009362,gv300can,0010,20190412032522,0016$

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	$	$

3.2.3. Bluetooth Setting

3.2.3.1. Bluetooth Setting

The command **AT+GTBTS** is used to configure Bluetooth settings for the device to report certain events.

➢ **AT+GTBTS=**

Example: **AT+GTBTS=gv300can,1,,GV300CAN_BT,7,3,0,1D07,0003,0,123456,,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1	0
3	Reserved	0		
4	Bluetooth Name	<=16	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	GV300CAN_BT
5	Bluetooth Service	<=2	00 – FF	07
6	Discoverable Mode	1	0 – 3	3
7	Discoverable Time	<=4	0|1 –1440 min	0
8	Bluetooth Report Mask	<=4	0000 – FFFF	1D07
9	Bluetooth Event Mask	<=4	0000 – FFFF	0003
10	Pin Need	1	0|1	0
11	Pin Code	4|6	0000-9999|000000-999999	123456
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		
22	Reserved	0		
23	Serial Number	4	0000 – FFFF	
24	Tail Character	1	$	$

- <*Mode*>: The working mode of the Bluetooth on the device.
  - 0: Disable (turn off) the Bluetooth.
  - 1: Enable (turn on) the Bluetooth.
- <*Bluetooth Name*>: The name of the device for Bluetooth identification.
- <*Bluetooth Service*>: The services which the device provides.
  - Bit 0: Device information service including Manufacturer Name and Model Number.
  - Bit 1: Battery Service including Battery Level.
  - Bit 2: Virtual Serial Port Service. The data will be transmitted over virtual serial port connection in this service.

  Note: Virtual Serial Port Service: About sending AT commands based on Virtual Serial Port Service, it is necessary to add CRLF at the end of each AT command. The number of characters sent by the client could not exceed the maximum MTU 150 bytes each time. If the total data length is greater than 150, it is necessary to split the data and transmit pieces of information. The data length of a single transmission can be customized. When the device fails to analyze the data correctly, it is recommended to reduce MTU appropriately to ensure that data is correctly received.
- <*Discoverable Mode*>: The mode of configuring the Bluetooth to be non-discoverable or discoverable for the period of time specified by <*Discoverable Time*>.
  - 0: Non-discoverable.
  - 1: General discoverable mode: The device will remain discoverable for <*Discoverable Time*> minutes after ignition on.
  - 2: General discoverable mode: The device will remain discoverable for <*Discoverable Time*> minutes after ignition off.
  - 3: General discoverable mode: The device will remain discoverable for <*Discoverable Time*> minutes after power on.
- <*Discoverable Time*>: The time period during which the device will remain discoverable. If it is set to 0, the device will always be discoverable when a specific condition described in

<*Discoverable Mode*> is satisfied.

✧ <*Bluetooth Report Mask*>: Bitwise mask to configure the composition of Bluetooth information in report messages.

- Bit 0 for <*Bluetooth Name*>
- Bit 1 for <*Bluetooth MAC Address*>
- Bit 2 for <*Bluetooth State*>
- Bit 3 … Bit 7 Reserved
- Bit 8 for <*Peer Role*>
- Bit 9 Reserved
- Bit 10 <*Peer Address Type*>
- Bit 11 <*Peer MAC Address*>
- Bit 12 <*Peer Device Name*>
- Bit 13 … Bit 15 Reserved

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 **+RESP:GTBCS**, **+RESP:GTBDS** and **+RESP:GTBDR** report messages.

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

- Bit 0 for **+RESP:GTBCS**
- Bit 1 for **+RESP:GTBDS**

✧ <*Pin Need*>: This parameter defines whether a PIN code for pairing is needed or not. It indicates whether to enable/disable pairing.

- 0: Disable pairing. No PIN code for pairing is needed.
- 1: Enable pairing. PIN code is needed for pairing.

✧ <*Pin Code*>: PIN code to be used during pairing when <*Pin Need*> is enabled.

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

➢ **+ACK:GTBTS,**

Example: **+ACK:GTBTS,4B0303,867995030009362,gv300can,0022,20190412032803,0021$**			
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. Bluetooth Manager Setting

The command **AT+GTBMS** is used to configure the peripherals which the device will connect and read the data from. Once the device connects with the peripheral, it will try to search the Service by UUID and read the data from specified Characteristic. Please make sure <*Mode*> in **AT+GTBTS** is not set to 0 when using this function.

- **AT+GTBMS=**

Example: **AT+GTBMS=gv300can,0,1,BT_SENSOR,000000000000,3,1,0000,1,0000,0,123456,0,0,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Index	1	0 – 9	
3	Mode	1	0|1	0
4	Peripheral Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	BT_SENSOR
5	Peripheral MAC Address	12	000000000000 – FFFFFFFFFFFF	
6	Data Mask	4	0000 – 0003	0003
7	Service UUID Type	1	1|2	1
8	Service UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
9	Characteristic UUID Type	1	1|2	1
10	Characteristic UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
11	Reserved	0		
12	Reserved	0		
13	Data Format	1	0|1	0
14	Send Interval	<=5	0|1 – 86400(×5s)	0

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

- <*Index*>: The index of a specific peripheral stored in the device.
- <*Mode*>: The working mode of the Bluetooth master function.
  - 0: Disable the Bluetooth master function.
  - 1: Enable the Bluetooth master function.
- <*Peripheral Name*>: The name of the peripheral device which GV300CAN will connect.
- <*Peripheral MAC Address*>: The MAC address of the peripheral device which GV300CAN will connect.
- <*Data Mask*>: Bitwise mask to configure the composition of Bluetooth data in report messages.
  - Bit 0 for Service information which includes <*Service UUID Type*> and <*Service UUID*>
  - Bit 1 for Characteristic information which includes <*Characteristic UUID Type*> and <*Characteristic UUID*>
  - Bit 2 ... Bit 7 - Reserved

  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.
- <Service *UUID Type*>: The type of Universally Unique Identifier of Service.
  - 1: 16-bit UUID
  - 2: 128-bit UUID
- <*Service UUID*>: The Universally Unique Identifier for Bluetooth Service. If the parameter field is empty, the current value of this parameter will be cleared.
- <*Characteristic UUID Type*>: The type of Universally Unique Identifier of Characteristic.
  - 1: 16-bit UUID
  - 2: 128-bit UUID
- <*Characteristic UUID*>: The Universally Unique Identifier for Bluetooth Characteristic. If the parameter field is empty, the current value of this parameter will be cleared. The relationship between <*Service UUID*> and <*Characteristic UUID*> is shown in the figure:

Service UUID		Characteristic UUID	
Generic Attribute	0x1801	Service Changed	0x2A05
		Descriptors	0x2902
Generic Access	0x1800	Device Name	0x2A00
		Appearance	0x2A01

		Peripheral Preferred Connection Parameters	0x2A04
Device Information	0x180A	Manufacturer Name String	0x2A29
		Model Number String	0x2A24
		Firmware Revision String	0x2A26
		Software Revision String	0x2A28
		Serial Number String	0x2A25
Battery Service	0x180F	Battery Level	0x2A19
Virtual Serial	0x3430	Virtual Serial Port	0x3431

- <*PIN Need*>: It defines whether a PIN code is needed or not for pairing a peripheral Bluetooth device.
  - 0: Do not need PIN code.
  - 1: Need PIN code for pairing.
- <*PIN Code*>: PIN code for pairing if needed.
- <*Data Format*>: This parameter defines the format of the data in the **+RESP:GTBDR** message.
  - 0: Raw data received from Bluetooth. If the data is not in ASCII format and protocol format is ASCII format, please do not use this mode.
  - 1: Hexadecimal format. For example, if the data is 0x69, it will be shown as 69 in the message.
- <*Send Interval*>: If this parameter is 0, the message **+RESP:GTBDR** will be sent once after the device connects with a Bluetooth peripheral. If this parameter value is not 0, the message **+RESP:GTBDR** will be sent at the interval specified by this parameter after the device connects with a peripheral device.

Note: A master device can only connect seven slave devices at a time.

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

- **+ACK:GTBMS,**

Example: **+ACK:GTBMS,4B0303,867995030009362,gv300can,0032,20190412032850,002B$**			
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	$	$

3.2.3.3. Bluetooth Accessory Setting

The command **AT+GTBAS** is used to connect with Bluetooth accessories. Before using the **AT+GTBAS** function, make sure the <*Mode*> in the command **AT+GTBTS** is enabled.

- **AT+GTBAS=**

Example: **AT+GTBAS=gv300can,0,1,0,TD_100109,FD6D3DE6D704,FF,30,2400,,1,20,30,2,300,,0,0,0,0,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Index	1	0 – 9	0
3	Accessory Type	1	0 – 2|6|7	0
4	Accessory Model	1	0 – 4	0
5	Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
6	Accessory MAC	12	000000000000 – FFFFFFFFFFFF	FFFFFFFFFFFF
7	Accessory Append Mask	<=4	0 – FFFF	1F
8	Read Interval	<=5	10 – 86400sec	30
9	Low Voltage Threshold	<=4	0 – 5000mV	2400
10	Reserved			
11	Reserved (Optional)	0		
12	Reserved (Optional)	0		
13	Reserved (Optional)	0		
14	Reserved (Optional)	0		
15	Reserved (Optional)	0		
16	Reserved			
17	Output ID	1	0 – 2|9 – C	0
18	Output Status	1	0|1|2	0
19	Duration	<=3	0 – 255(×100ms)	0

20	Toggle Times	<=3	0 – 255	0
21	Reserved			
22	Reserved			
23	Serial Number	4	0000 – FFFF	
24	Tail Character	1	$	$

✧ <*Index*>: The index of the Bluetooth accessory.

✧ <*Accessory Type*>: The type of the Bluetooth accessory which is defined in the <*Index*>. The following is supported now:

- 0: No Bluetooth accessory.
- 1: Escort Bluetooth Accessory.
- 2: Beacon temperature sensor. Five reserved parameters are used as follows:

Mode	1	0 – 3	0
Low Temperature	<=3	-40 – 80℃	0
High Temperature	<=3	-40 – 80℃	10
Validity	<=2	1 – 10	2
Send Interval	<=2	30 – 43200	300

The device will report the **+RESP:GTBAA** message to the backend server when the temperature outside or inside the range is detected.

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

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

✧ <*Low Temperature*>: It specifies the lower temperature limit. When the temperature of the sensor is below this value, the device will report the message **+RESP:GTBAA** to the backend server.

✧ <*High Temperature*>: It specifies the upper temperature limit. When the temperature of the sensor is above this value, the device will report the message **+RESP:GTBAA** to the backend server.

✧ <*Validity*>: If the sensor detects the environment temperature which meets the alarm condition and the temperature keeps meeting the alarm condition for <*Validity*> times, the temperature alarm will be triggered.

- 6: Beacon Multi-Functional Sensor.

Temperature Mode	1	0 – 3	0
Low Temperature	<=3	-40 – 80℃	0
High Temperature	<=3	-40 – 80℃	10
Temperature Validity	<=2	1 – 10	2
Temperature Send Interval	<=2	30 – 43200	300
Humidity Mode	1	0 – 3	0
Low Humidity	<=3	0 – 100rh	20
High Humidity	<=3	0 – 100rh	30
Humidity Validity	<=2	1 – 10	2
Humidity Send Interval	<=2	30 – 43200	300

The device will report the **+RESP:GTBAA** message to the backend server when the temperature or humidity reaches alarm conditions.

- <*Temperature Mode*>: The working mode of the temperature alarm.
  - 0: Disable temperature alarm.
  - 1: Report temperature alarm if the current temperature is within the temperature range defined by <*Low Temperature*> and <*High Temperature*>.
  - 2: Report temperature alarm if the current temperature is outside the temperature range defined by <*Low Temperature*> and <*High Temperature*>.
  - 3: Report temperature alarm only once if the current temperature enters or exits the temperature range defined by <*Low Temperature*> and <*High Temperature*>. In this mode, <*Temperature Send Interval*> will be ignored.
- <*Low Temperature*>: It specifies the lower temperature limit.
- <*High Temperature*>: It specifies the upper temperature limit.
- <*Temperature Validity*>: If the sensor detects the environment temperature which meets the alarm condition, it will continuously check the temperature. If the temperature keeps meeting the alarm condition for <*Temperature Validity*> times, the temperature alarm will be triggered.
- <*Humidity Mode*>: The working mode of the humidity alarm.
  - 0: Disable humidity alarm.
  - 1: Report humidity alarm if the current humidity is within the humidity range defined by <*Low Humidity*> and <*High Humidity*>.
  - 2: Report humidity alarm if the current humidity is outside the humidity range defined by <*Low Humidity*> and <*High Humidity*>.
  - 3: Report humidity alarm only once if the current humidity enters or exits the humidity range defined by <*Low Humidity*> and <*High Humidity*>. In this mode, <*Humidity Send Interval*> will be ignored.
- <*Low Humidity*>: It specifies the lower humidity limit.
- <*High Humidity*>: It specifies the upper humidity limit.

- ✧ <*Humidity Validity*>: If the sensor detects the environment humidity which meets the alarm condition, it will continuously check the humidity. If the humidity keeps meeting the alarm condition for <*Humidity Validity*> times, the humidity alarm will be triggered.

- 7: Technoton accessory. Five reserved parameters are used as follows:

IGN Send Interval	<=5	0|10 – 86400sec	30
IGF Send Interval	<=5	0|10 – 86400sec	60
Reserved			
Reserved			
Reserved			

- ✧ <*IGN Send Interval*>: The time interval for sending the **+RESP:GTBAR** report message to the backend server when the ignition is on. Its value range is 0|10 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTBAR**".
- ✧ <*IGF Send Interval*>: The time interval for sending the **+RESP:GTBAR** report message to the backend server when the ignition is off. Its value range is 0|10 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTBAR**".

✧ <*Accessory Model*>: The model of the Bluetooth accessory which is defined in <*Accessory Type*>. The following is supported now:

- The model of Escort Bluetooth Accessory. (<*Accessory Type*> is 1):
  0: TD_BLE fuel sensor
  3: Angle Sensor
- The model of beacon temperature sensor (<*Accessory Type*> is 2):
  0: WTS300
- The model of Beacon Multi-Functional Sensor (<*Accessory Type*> is 6):
  2: WTH300
- The model of for Technoton accessory (<*Accessory Type*> is 7):
  0: DUT-E S7
  1: DFM 100 S7
  2: DFM 250D S7
  3: GNOM DDE S7
  4: GNOM DP S7

✧ <*Accessory Name*>: The name of the Bluetooth accessory.

Note: The WTS300, WTH300 and Technoton accessories do not support connection by name for now.

✧ <*Accessory MAC*>: The MAC address of the Bluetooth accessory. If the MAC address is the default value, the device will search for the Bluetooth accessory by accessory name. The name of the Bluetooth accessory is variable and the MAC address is unique. It is thus recommended to connect Bluetooth accessories using the MAC address.

Note: If both <*Accessory Name*> and <*Accessory MAC*> are set, the device will search for

peripherals by <*Accessory MAC*>. If only <*Accessory Name*> is set, and <*Accessory MAC*> is the default, the device will search for peripherals according to <*Accessory Name*>.

✧ <*Accessory Append Mask*>: If the device is connected with the Bluetooth accessory, and the Bit 8 (for <*Bluetooth Accessory Data*>) of <*ERI Mask*> is set to 1, the device will report **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure the accessory data fields to be reported in the **+RESP:GTERI** and **+RESP:GTBAR** messages.

- Bit 0: <*Accessory Name*>
- Bit 1: <*Accessory MAC*>
- Bit 2: <*Accessory Status*>
- Bit 3: <*Accessory Battery Level*>
- Bit 4: <*Accessory Temperature*>
- Bit 5: <*Accessory Humidity*>

Note: When <*Accessory Type*> is set to 7, Bit3 to Bit5 will be blocked. And when <*Accessory Type*> is set to 1 or 2, Bit 5 will be blocked.

✧ <*Read Interval*>: The interval for reading data from the Bluetooth accessory. This field is only effective when the Bluetooth accessory is a Bluetooth connectable accessory.

✧ <*Low Voltage Threshold*>: It specifies the lower voltage limit. When the voltage of Bluetooth accessory is below this value, the device will report the message **+RESP:GTBAA** to the backend server. 0 means "Disable low voltage detection".

Note: When <*Accessory Type*> is set to 7, the parameter <*Low Voltage Threshold*> will be invalid.

✧ <*Output ID*>: The ID of the output port to output the specified wave shape when the **+RESP:GTBAA** event is detected.

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

➢ **+ACK:GTBAS,**

Example: **+ACK:GTBAS,4B0303,867995030009362,gv300can,0016,20190412032619,0017$**			
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	$	$

3.2.3.4. Bluetooth Beacon ID Setting

The command **AT+GTBID** is used for the device to scan Bluetooth beacon ID accessories. To use this function, the parameter <*Mode*> in the command **AT+GTBTS** must be set to 1.

➢ **AT+GTBID=**

Example: **AT+GTBID=gv300can,,1,0,1F,2400,,1,2,112233445566,223344556677,0,0,30,,,,0,0,0,0,,,FFFF$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Index	1	0 – 1	0
Enable	1	0|1	0
Beacon ID Model	1	0|1	0
Accessory Append Mask	<=2	0 – FF	0A
Low Voltage Threshold	<=4	0 – 5000mV	2400
Reserved	0		
Start Index	<=3	1 – 300	
End Index	<=3	1 – 300	
MAC List	<=12*75		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Organization Unique Identifier	6	000000 – FFFFFF	
Output ID	1	0 – 2|9 – C	0
Output Status	1	0|1|2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	

Tail Character	1	$	$

- <*Index*>: The index of the Bluetooth accessory.
- <*Enable*>: Whether to support the Bluetooth beacon ID accessories.
  - 0: Do not support the Bluetooth beacon ID accessories.
  - 1: Support the Bluetooth beacon ID accessories.
- <*Beacon ID Model*>: The model of the Bluetooth beacon ID accessory. The following is supported now:
  - 0: WKF300. Five reserved parameters are used as follows:

Push Button Event	1	0|1	0
Keyfob Detection Mode	1	0 – 2	0
Keyfob Detection Interval	<=3	30 – 600(s)	30
Reserved	0		
Reserved	0		

- <*Push Button Event*>: If this parameter is set 1 and the button on WKF300 is pushed, the device will report the message **+RESP:GTBAA** to the backend server.
- <*Keyfob Detection Mode*>: It specifies the mode of detecting keyfob.
  - 0: Disable Keyfob detection.
  - 1: Enable Keyfob detection: Allow the device to scan only once. After entering ignition on and moving state, the device will scan Keyfob(s) one time for the time period specified by <*Keyfob Detect Interval*> and then will send the **+RESP:GTBID** message to report information of Keyfob(s). If more than 3 Keyfobs are detected, the **+RESP:GTBID** message contains the information about top 3 Keyfobs with the strongest signal.
  - 2: Enable Keyfob detection: Allow the device to scan continuously. After entering ignition on and moving state, the device will keep scanning Keyfob(s) continuously. If the device detects Keyfob(s) or change of available Keyfob(s), it will send the **+RESP:GTBID** message to report information of Keyfob(s). If more than 3 Keyfobs are detected, the **+RESP:GTBID** message contains the information of top 3 Keyfobs with the strongest signal.
- <*Keyfob Detection Interval*>: The device scans Keyfobs for the time period specified by this parameter.
  - 1: iBeacon E6. Five reserved parameters are used as follows:

Reserved	0		
E6 Detection Mode	1	0 – 2	0
E6 Detection Interval	<=3	30 – 600(s)	30
Reserved	0		
Reserved	0		

- <*E6 Detection Mode*>: It specifies the mode of detecting iBeacon E6.

- 0: Disable detection.
- 1: Enable detection: Allow the device to scan only once. After entering ignition on and moving state, the device will scan E6 one time for the time period specified by <*E6 Detect Interval*> and then will send the **+RESP:GTBID** message to report information of E6. If more than 15 iBeacon E6 are detected, the **+RESP:GTBID** message contains the information about top 15 iBeacon E6.
- 2: Enable detection: Allow the device to scan continuously. After entering ignition on, the device will keep scanning E6 continuously. If the device detects E6 or change of available E6, it will send the **+RESP:GTBID** message to report information of E6. If more than 15 iBeacon E6 are detected, the **+RESP:GTBID** message contains the information of top 15 iBeacon E6.

✧ <*E6 Detection Interval*>: The device scans E6 for the time period specified by this parameter.

✧ <*Accessory Append Mask*>: Bitwise mask to configure the composition of Bluetooth accessory information. In the **+RESP:GTBAA** message, the Bluetooth accessories data items will be reported according to the mask set by this field.

- Bit 0: Reserved
- Bit 1: <*Accessory MAC*>
- Bit 2: Reserved
- Bit 3: <*Accessory Battery Voltage*>. iBeacon E6 is not supported.
- Bit 4: Reserved
- Bit 5: Reserved
- Bit 6: <*Accessory Signal Strength*>

✧ <*Low Voltage Threshold*>: It specifies the lower voltage limit. When the voltage of the Bluetooth accessory is below this value, the device will report the message **+RESP:GTBAA** to the backend server. 0 means “Disable low voltage detection”. iBeacon E6 is not supported.

✧ <*Start Index*>, <*End Index*>*:* The index range of the MAC list to which the MAC addresses are to be updated. For example, if <*Start Index*> is set to 1 and <*End Index*> is set to 2, then the first two MAC addresses in the MAC list will be updated by the MAC addresses provided in the parameter <*MAC List*>. <*Start Index*> and <*End Index*> determine the total number of MAC addresses that will be updated. If either one is empty, there should be no <*MAC List*> following the empty value. A maximum of 75 MAC addresses can be updated each time.

✧ <*MAC List*>: A list of comma-separated MAC addresses to be updated to the MAC list. The number of the MAC addresses is determined by <*Start Index*> and <*End Index*>.

Note: If more accessories are needed, please adjust <*Start Index*> and <*End Index*> for appropriate setup. If some MAC addresses in <*MAC List*> are empty, then the corresponding MAC addresses will be deleted. For example, to delete the 4th, 5th and 6th MAC addresses of the <*MAC List*>, please set <*Start Index*> to 4 and set <*End Index*> to 6 and keep those three MAC addresses of <*MAC List*> empty.

✧ <*Organization Unique Identifier*>: It is the first three bytes of Bluetooth address, which is composed of NAP and UAP. Only one Organization Unique Identifier (OUI) is allowed for each type of Bluetooth accessory. For example, 'AC233F' represents the Bluetooth iBeacon E6. The 'AC23' is NAP, the '3F ' is UAP. If the device detects this OUI, the **+RESP:GTBID** message will be reported. If the value is empty, it means “Disable this function”.

Note: If OUI is enabled, <*MAC List*> will not work even if it has value.

✧ <*Output ID*>: The ID of the output port to output the specified wave shape when the **+RESP:GTBAA** or **+RESP:GTBID** event is detected.

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

➢ **+ACK:GTBID,**

Example: **+ACK:GTBID,4B0303,867995030009362,gv300can,0016,20190412032619,0017$**			
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	$	$

3.2.4. Position Related Report

3.2.4.1. Fixed Report Information

The command **AT+GTFRI** is used to configure the parameters for scheduled report (**+RESP:GTFRI** or **+RESP:GTERI**). It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.

➢ **AT+GTFRI=**

Example: **AT+GTFRI=gv300can,0,,,,,,,,,,,,,,,,FFFF$** **AT+GTFRI=gv300can,1,1,,1,0000,0000,,30,,,,,600,,,,,FFFF$** **AT+GTFRI=gv300can,2,1,,1,0000,0000,,,1000,,,,,,,,FFFF$** **AT+GTFRI=gv300can,3,1,,1,0000,0000,,,,1000,,,,,,,FFFF$** **AT+GTFRI=gv300can,4,1,,1,0000,0000,0,30,1000,1000,,0,600,0,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0 – 5	0
3	Discard No Fix	<=2	0|1	1

4	Reserved	0		
5	Period Enable	1	0|1	1
6	Start Time	4	HHMM	0000
7	End Time	4	HHMM	0000
8	Check Interval	<=5	0 – 86400sec	0
9	Send Interval	<=5	1 – 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	00000000 – FFFFFFFF	00000000
16	Reserved	0		
17	Reserved	0		
18	Wrap Corner Point	1	0|1	0
19	Serial Number	4	0000 – FFFF	
20	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 position reports. Device position will be reported if the calculated time interval between the current time and the time of last report is greater than the <*Send Interval*>, and the length of path between the current position and last position is greater than the <*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 position reports. Device position will be reported if the calculated time interval between the current time and time of last report is greater than the <*Send Interval*>, or the length of path between the current position and the last position is greater than the <*Mileage*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.

✧ <*Discard No Fix*>: Enable/disable report when there is no GNSS fix.

- 0: Enable report.
- 1: Disable report.

✧ <*Period Enable*>: Enable/disable the time range specified by <*Start Time*> and <*End Time*>. If the time range is enabled, the position reporting will be 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 of <*Start Time*>.

✧ <*Check Interval*>: The time interval for updating GNSS position. Its range is 0 – 86400 and the unit is second. If its value is 0, the device will update GNSS position according to the value of <*Send Interval*>. Please make sure the <*Check Interval*> is no greater than <*Send Interval*> so that position data is ready before sending time arrives.

✧ <*Send Interval*>: The time interval for sending the position information. The value range is 5 – 86400 and the unit is second. If <*Report Mode*> in **AT+GTSRI** is set to forced SMS mode, this parameter value should not be less than 15 seconds, otherwise position information will be sent via TCP short connection.

✧ <*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*>: The threshold to determine whether the device is turning around a corner. 0 means "Disable the corner report". For other values, the device will compare the current heading with that of the last known corner. If the difference is greater than or equal to the specific value, the device will send the corner report with **+RESP:GTFRI**.

✧ <*IGF Report Interval*>: The time interval for fixing and sending the position information when <*Power Saving Mode*> in **AT+GTCFG** is set to 0|2 and the engine is off. If <*IGF Report Interval*> is less than 60 seconds, the GNSS will be always on. Its value range is 0|5 – 86400 and the unit is second.

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

✧ <*ERI Mask*>: If the corresponding bit for the peripheral is set to 1, the device will report **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure whether to report the data from peripherals via **+RESP:GTERI**.

- Bit 0 for the <*Digital Fuel Sensor Data*> field in **+RESP:GTERI**
- Bit 1 for the <*1-Wire Data*> field in **+RESP:GTERI**

- 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 **+RESP:GTERI**. If it is set to 1, the data block <*Fuel Sensor Data*> will appear.
- Bit 4 for the <*Volume*> field in **+RESP:GTERI**. If it is set to 1, the data block <*Fuel Sensor Data*> will appear.
- Bit 8 for the <*Bluetooth Accessory Data*> field in **+RESP:GTERI**

✧ <*Wrap Corner Point*>: A numeral to indicate whether to wrap corner point together with other fixed GNSS points and wait until the condition to send **+RESP:GTFRI** reaches according to the value of <*Mode*>.

- 0: Do not wrap corner point and send the corner point immediately when it is found.
- 1: Wrap corner point and wait until the condition to send **+RESP:GTFRI** reaches according to the value of <*Mode*>.

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 the volume of the fuel will be shown as reserved in the message **+RESP:GTERI**. Bit 1 is related to 1-Wire. If the main settings of **AT+GTACD** are non-zero values, the 1-Wire Device Number information will be included in the **+RESP:GTERI** message.

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

➢ **+ACK:GTFRI,**

Example: **+ACK:GTFRI,4B0303,867995030009362,gv300can,0035,20190412034614,0030$**			
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	$	$

3.2.4.2. Frequency Change of Fixed Report Information

The command **AT+GTFFC** is used to change the parameters of fixed report when a 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=gv300can,0,1,0,,,,,,0,30,500,500,300,,0,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Priority	1	0 – 4	0
3	Mode	1	0 – 3	0
4	FRI Mode	1	0 – 5	0
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
10	FRI Check Interval	<=5	0 – 86400sec	0
11	FRI IGN Report Interval	<=5	5 – 86400s	30
12	FRI Report Distance	<=5	50 – 65535m	500
13	FRI Report Mileage	<=5	50 – 65535m	500
14	FRI IGF Report Interval	<=5	0|5 – 86400s	300
15	Reserved	0		
16	Corner Report	<=3	0 – 180	0
17	Reserved			
18	Reserved			
19	Reserved			
20	Reserved			
21	Serial Number	4	0000 – FFFF	
22	Tail Character	1	$	$

✧ <*Priority*>: The priority of the event which triggers parameter change of fixed report. 0 indicates “the highest priority”.

✧ <*Mode*>: It specifies the trigger event for the change of the 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 GSM roaming state. (Please refer to **AT+GTRMD**)
- 3: Change the fixed report parameters when the device enters into unknown GSM roaming state.

✧ <*FRI Mode*>: If the specified event occurs, the working mode of the fixed report will be changed as described below.

- 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 Check Interval*>: The time interval for updating GNSS position. Its range is 0 – 86400 and the unit is second. If its value is 0, the device will update GNSS position according to the value of <*Report Interval*>. Please make sure <*FRI Check Interval*> is no greater than <*FRI IGN Report Interval*> so that the position data is ready before sending time arrives.

✧ <*FRI IGN Report Interval*>: The time interval for sending the position information when the ignition is on. The value range is 5 – 86400 and the unit is second.

✧ <*FRI Report Distance*>: The specified distance for sending the position information when the report mode is fixed distance report. Unit: meter.

✧ <*FRI Report Mileage*>: The specified path length for sending the position information when the report mode is fixed mileage report or optimum report. Unit: meter.

✧ <*FRI IGF Report Interval*>: The time interval for fixing and sending the position information when the ignition is off and <*Power Saving Mode*> in **AT+GTCFG** is set to 0|2. The value range is 0|5 – 86400 and the unit is second.

✧ <*Corner Report*>: The threshold to determine whether the device is turning around a corner. 0 means "Disable the corner report". For other values, the device will compare the current heading with that of the last known corner. If the difference is greater than or equal to the value specified by this parameter, the device will send the corner report with **+RESP:GTFRI**.

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

➢ **+ACK:GTFFC,**

Example: **+ACK:GTFFC,4B0303,867995030009362,gv300can,003B,20190412034649,0031$**			
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. Alarm Settings

3.2.5.1. Geo-Fence Information

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

- **AT+GTGEO=**

Example: **AT+GTGEO=gv300can,0,1,127.130002,61.838299,1000,60,0,0,0,0,0,0,0000,0000,0,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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|1|2	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	Start Time	4	HHMM	0000
15	End Time	4	HHMM	0000
16	State Mode	1	0|1	0

17	Serial Number	4	0000 – FFFF	
18	Tail Character	1	$	$

- <*GEO ID*>: The ID of the Geo-Fence. A total of 20 zones (0 – 19) are supported.
- <*Mode*>: The working mode of the device reporting the Geo-Fence message **+RESP:GTGEO** to the backend server.
  - 0: Disable the zone's Geo-Fence function.
  - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
  - 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
  - 3: Both entering and exiting the zone.
- <*Longitude*>: The longitude of a point which is defined as the center of the circular 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 center of the circular 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 "+".
- <*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 for the Geo-Fence alarm.
- <*Trigger Mode*>: A numeral to indicate the mode of triggering Geo-Fence.
  - 0: Disable auto trigger mode.
  - 21: Automatically set up Geo-Fence after ignition 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 turned off. The device will only report the alarm when exiting the Geo-Fence. The Geo-Fence will be cancelled after the device exits the zone.
  - 22: Manually enable Geo-Fence after ignition 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 turned off. The device will only report the alarm when exiting the Geo-Fence. 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 the trigger mode again, the trigger mode has to be manually set again.
- <*Trigger Report*>: Whether to report the **+RESP:GTGES** message when a specified trigger mode is triggered or when the Geo-Fence is cancelled.
  - 0: Disable the **+RESP:GTGES** report.
  - 1: Enable the **+RESP:GTGES** report.
- <*State Mode*>: 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,4B0303,867995030009362,gv300can,0,FFFF,20190412035049,0033$**			
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 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.5.2. Tow Alarm Configuration

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

- **AT+GTTOW=**

Example: **AT+GTTOW=gv300can,1,10,1,300,0,0,0,0,2,3,2,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Tow Enable	1	0|1	0
3	Engine Off to Tow	<=2	5 – 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|1|2	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	1 – 9	2
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	Serial Number	4	0000 – FFFF	
22	Tail Character	1	$	$

- <*Tow Enable*>: Enable/disable tow alarm (**+RESP:GTTOW**).
  - 0: Disable the tow alarm.
  - 1: Enable the tow alarm.
- <*Engine Off to Tow*>: A time parameter to measure whether the device is considered to be towed after the engine off. If the motion sensor does not detect stillness within the specified time <*Engine Off to Tow*> after engine off, the device is towed.
- <*Fake Tow Delay*>: If the motion sensor detects movement after engine off and stillness is detected, the device enters into a state called fake tow. If the device stays in fake tow until after a period of time specified by the parameter <*Fake Tow Delay*>, it is considered to be towed.
- <*Tow Interval*>: The time interval for sending tow alarm messages.
- <*Tow Output ID*>: The ID of the output port to output the specified wave shape when a tow event is detected.
- <*Tow Output Status*>: Please refer to the parameter <*Output1–2 Status*> in Chapter 3.2.6.1.
- <*Tow Output Duration*>: Please refer to the parameter <*Duration*> in Chapter 3.2.6.1.
- <*Tow Output Toggle Times*>: Please refer to the parameter <*Toggle Times*> in Chapter 3.2.6.1.
- <*Rest Duration*>: A time parameter to measure whether the device enters stillness status. The status of the device will be changed to stillness if stillness is detected by the motion sensor and maintained for the period of time specified by the parameter <*Rest Duration*>.
- <*Motion Duration*>: A time parameter to measure whether the device enters motion status. The status of the device will be changed to motion if motion is detected by the motion sensor and maintained for the period of time specified by the parameter <*Motion Duration*>.
- <*Motion Threshold*>: The threshold for the motion sensor to measure whether the device is moving.

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

- **+ACK:GTTOW,**

Example: **+ACK:GTTOW,4B0303,867995030009362,gv300can,0040,20190412035152,0034$**			
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. Speed Alarm

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

- **AT+GTSPD=**

Example: **AT+GTSPD=gv300can,1,80,120,60,300,0,0,0,0,,,,,,,,,,FFFF$** **AT+GTSPD=gv300can,2,80,120,60,300,0,0,0,0,,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2|3	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|1|2	0

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		
22	Serial Number	4	0000 – FFFF	
23	Tail Character	1	$	$

- ✧ <*Mode*>: The working mode of the speed alarm function.
  - 0: Disable speed alarm.
  - 1: Report speed alarm if the current speed is within the speed range defined by <*Min. Speed*> and <*Max. Speed*>.
  - 2: Report speed alarm if the current speed is outside the speed range defined by <*Min. Speed*> and <*Max. Speed*>.
  - 3: Report speed alarm only one time if the current speed enters or exits the speed range defined by <*Min. Speed*> and <*Max. Speed*>. 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 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,4B0303,867995030082104,,0027,20190415031940,01DA$**			
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. SOS Function

The **AT+GTSOS** command is used to configure an input port for emergency. When an emergency occurs, the end user can use the specified input port to trigger the SOS function and report position message **+RESP:GTSOS** to the backend server. A specified wave shape can be configured to be output at the specified output port.

- **AT+GTSOS=**

Example: **AT+GTSOS=gv300can,1,0,+8613812341234,0,0,0,0,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0 – 2	0
3	Digital Input ID	1	0 – 2|9 – C	0
4	SOS Number	<=20		
5	Output ID	1	0 – 2|9 – C	0
6	Output Status	1	0|1|2	0
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		
13	Serial Number	4	0000 – FFFF	
14	Tail Character	1	$	$

- ✧ <*Mode*>: The working mode of SOS function.
  - 0: Disable SOS function.
  - 1: Send the current position to the backend server via GPRS only.
  - 2: Send the current position to the SOS Number via SMS only.
- ✧ <*Digital Input ID*>: The ID of the digital input port which triggers the SOS function. 0 means "The SOS function is disabled". The digital input port should be configured by the command **AT+GTDIS** first. 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.
- ✧ <*SOS number*>: The emergency phone number.

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

➢ **+ACK:GTSOS,**

Example: **+ACK:GTSOS,4B0303,867995030082104,,0029,20190415032021,01DB$**			
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	$	$

3.2.5.5. Excessive Idling Detection

The command **AT+GTIDL** is used to detect the engine excessive idling (the vehicle stays stationary while the ignition is on). To use this command, it is necessary to connect the ignition signal to the device or enable virtual ignition detection. If the device detects that the vehicle is entering into the idle status, it will report the event message **+RESP:GTIDN** to the backend server. If the vehicle leaves the idle status or ignition off is detected, the device will report the event message **+RESP:GTIDF** to the backend server.

➢ **AT+GTIDL=**

Example: **AT+GTIDL=gv300can,1,2,1,0,,,,0,0,0,0,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can

2	Mode	1	0|1	0
3	Time to Idling	<=2	1 – 30 min	2
4	Time to Movement	1	1 – 5 min	1
5	Debounce Distance	<=4	0|100 – 9999m	0
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Output ID	1	0 – 2|9 – C	0
10	Output Status	1	0 – 2	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Serial Number	4	0000 – FFFF	
18	Tail Character	1	$	$

- <*Mode*>: The working mode of the excessive idling detection function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Time to Idling*>: If it is detected that the vehicle is stationary with the ignition on for the period of time specified by this parameter, it is considered to be in idle status.
- <*Time to Movement*>: If the vehicle moves again and the moving state is maintained for the length of time specified by this parameter after the vehicle enters into idling status, it is considered to leave idling status. If ignition off is detected, the vehicle is considered to leave idling status regardless of the <*Time to Movement*> setting.
- <*Debounce Distance*>: If the vehicle moves more than <*Debounce Distance*> after it enters into idling status, the vehicle will be considered to leave idling status.
- <*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.

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

- **+ACK:GTIDL,**

Example:
+ACK:GTIDL,4B0303,867995030082104,,002A,20190415032114,01DC$

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. 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=gv300can,1,,,100,0,0,,60,0,0,,,0,0,,0,0,0,0,30,50,20,65,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2|3|4	0
3	Reserved	0		
4	Discard Unknown Event	1	0|1	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|1|2	0
19	Duration	<=3	0 – 255(×100ms)	0
20	Toggle Times	<=3	0 – 255	0
21	Cornering and Braking Threshold	<=3	30 – 70	30
22	Cornering and Braking Duration	<=3	40 – 100(*8ms)	50
23	Acceleration Threshold	<=3	15 – 50	20
24	Acceleration Duration	<=3	50 – 250(*8ms)	65
25	Serial Number	4	0000 – FFFF	
26	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the harsh driving behavior monitoring function.

- 0: Disable this function.
- 1: Enable this function: Detection by GNSS only. In this mode, two harsh behaviors are monitored, i.e. harsh braking and harsh accelerating. According to the speed read from GNSS, 3 levels of speed are defined including high speed, medium speed and low speed. For each speed level, 2 thresholds of speed change are defined to determine harsh braking and harsh accelerating. If the change of speed within 5 seconds is greater than the corresponding threshold, the device will report the **+RESP:GTHBM** message to the backend server to indicate the harsh behavior. The same harsh behavior within 30 seconds will only be reported once if only using GNSS to judge harsh driving behavior.
- 2: Enable this function: Detection by motion sensor only. In this mode, three types of harsh behavior can be detected, i.e. harsh braking, harsh accelerating and harsh turning. The device needs GNSS information to get the harsh behavior direction, so it is necessary to keep GNSS always on to collect all the information needed.
- 3: Enable this function: Detection by motion sensor or GNSS. This mode works as both mode 1 and 2 are enabled.
- 4: Enable this function: Detection by motion sensor and GNSS. In this mode, a harsh behavior can be triggered only it is detected by both GNSS and motion sensor.

✧ <*Discard Unknown Event*>: It configures whether to discard the **+RESP:GTHBM** message that indicates unknown harsh behavior.

- 0: Do not discard unknown harsh behavior message.
- 1: Discard unknown harsh behavior message.

✧ <*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 parameter 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 parameter 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 parameter value within 5 seconds, harsh braking is detected at medium speed level. If it 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 parameter value within 5 seconds, harsh acceleration is detected at medium speed level. If it 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 parameter 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 parameter value within 5 seconds, harsh acceleration is detected at low speed level. If it 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 driving behavior is detected. If it is set to 0, there will be no output wave.
- <*Cornering and Braking Threshold*>: The threshold for the motion sensor to measure whether the device is in harsh cornering or harsh braking status.
- <*Cornering and Braking Duration*>: A time parameter to measure whether the device enters harsh cornering or harsh braking status. If the harsh cornering or harsh braking behaviors are maintained for a period of time longer than the time specified by <*Cornering and Braking Duration*>, harsh cornering or harsh braking event will be triggered.
- <*Acceleration Threshold*>: The threshold for the motion sensor to measure whether the device is in harsh acceleration status.
- <*Acceleration Duration*>: The time parameter to measure whether the device enters harsh acceleration status. If the harsh acceleration driving behavior is maintained for a period of time longer than the time specified by <*Acceleration Duration*>, harsh acceleration event will be triggered.

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

- **+ACK:GTHBM,**

Example: **+ACK:GTHBM,4B0303,867995030082104,,002B,20190415032207,01DD$**			
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	$	$

3.2.5.7. Jamming Detection

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

- **AT+GTJDC=**

Example: **AT+GTJDC=gv300can,1,25,,5,10,10,,0,0,0,0,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2	0
3	Signal Threshold	<=2	0 – 31	25
4	Reserved	0		
5	Jamming Cell Number Threshold	<=2	0 – 99	5
6	Enter Jamming Timer Threshold	<=3	0 – 300 sec	10
7	Quit Jamming Timer Threshold	<=4	0-3600sec	10
8	Reserved	0		
9	Output ID	1	0 – 2|9 – C	0

10	Output Status	1	0|1|2	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	$	$

- <*Mode*>: The working mode of the jamming detection function.
  - 0: Disable this function.
  - 1: Enable the jamming detection function: If jamming is detected, the device will report the **+RESP:GTJDR** message only when it enters into "Jamming" state.
  - 2: Enable jamming detection function: If jamming is detected, the device will report the **+RESP:GTJDS** message when it enters into "Jamming" or leaving "Jamming" state.
- <*Signal Threshold*>, <*Jamming Cell Number Threshold*>: The built-in jamming detection algorithm uses these two parameters to measure whether the device is currently being jammed. The smaller the parameter value, the more sensitive the detection.
- <*Enter Jamming Timer Threshold*>: If the device detects jamming, the device will trigger the "Enter jamming" event based on the <*Enter Jamming Timer Threshold*> parameter.
- <*Quit Jamming Timer Threshold*>: If the device leaves the jamming state, the device will trigger the "Quit jamming" event based on the <*Quit Jamming Timer Threshold*> parameter.

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

- **+ACK:GTJDC,**

Example: **+ACK:GTJDC,4B0303,867995030082104,,002C,20190415032244,01DE$**			
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	$	$

3.2.5.8. 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=gv300can,1,,10,10,1800,1,30,0,0,5,1,0,0,0,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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
Enable Siren	1	0|1	1
Release Fuel Cut-off Timer (T5)	4	0 – 1000 (min)	0
Check Jamming in T3	1	0|1	0
Waiting Release Fuel Timer (T6)	5	0 – 65535 (sec)	0
Serial Number	4	0000 – FFFF	
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 and whether jamming state is checked every 2 seconds is determined according to the <*Check Jamming in T3*> parameter.
- <*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*>: Whether the motion sensor needs to measure the motion state 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 state.
  - 0: Disable motion sensor.
  - 1: Enable motion sensor.
- <*GNSS Fix Failure Timeout Timer (T4)*>: It indicates the GNSS timeout length of time.
- <*Enable Siren*>: It defines whether to control siren with the digital output 2 in the current JBS state.
- <*Release Fuel Cut-off Timer (T5)*>: If the device enters into JBS and then cuts off fuel, it will check the current jamming state when the <*Fuel Cut-off Timer (T3)*> condition is met. If the device does not quit the jamming state and the value of <*Release Fuel Cut-off Timer*> is greater than 0, the device will release fuel cut-off and the <*Release Fuel Cut-off Timer*> will start to work. When the <*Release Fuel Cut-off Timer*> condition is met, the device will check the current jamming state. If the device does not quit the jamming state, it will check the condition and decides whether to cut off fuel again. If the device does not quit the jamming state and the value of <*Release Fuel Cut-off Timer*> is 0, the device will maintain fuel cut-off status unless the device quits the jamming state.
- <*Check Jamming in T3*>: It expresses whether the JBS state machine starts T3 timer to check jamming state and starts T6 timer if the device quits jamming state.
  - 0: Do not check jamming state (compatible with old JBS state machines).
  - 1: Check jamming state and start T6 timer.
- <*Waiting Release Fuel Timer (T6)*>: It indicates the length of time to be waited before releasing fuel and quitting JBS state machine.

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

- **+ACK:GTJBS,**

Example: **+ACK:GTJBS,4B0303,867995030082104,,002D,20190415032314,01DF$**			
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	$	$

◆ **Jamming Behavior Setting Reset Mode**

➢ **AT+GTJBS=**

Example: **AT+GTJBS=gv300can,2,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Mode	1	2	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 2: Jamming Behavior Setting Reset Mode.

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

➢ **+ACK:GTJBS,**

Example: **+ACK:GTJBS,4B0303,867995030082104,,001A,20190415081650,021C$**			
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	$	$

3.2.5.9. GNSS Jamming Status Report

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

➢ **AT+GTGPJ=**

Example: **AT+GTGPJ=gv300can,1,15,3,,,,,0,0,0,0,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0'–'9' 'a'–'z' 'A'–'Z'	gv300can
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 – 2|9 – C	0
10	Output Status	1	0|1|2	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
14	Serial Number	4	0000–FFFF	
15	Tail Character	1	$	$

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

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

✧ <*CW Threshold*>: Narrowband continuous wave (CW) jamming detection threshold (unit =

dB).

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

➢ **+ACK:GTGPJ**

Example: **+ACK:GTGPJ,4B0303,867995030082104,,0034,20190415081739,021D$**			
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	$	$

3.2.5.10. Start/Stop Report

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

➢ **AT+GTSSR=**

Example: **AT+GTSSR=gv300can,1,2,1,5,0,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1	0
3	Time to Stop	2	1 – 30 min	2
4	Time to Start	1	1 – 5 min	1
5	Start Speed	2	1 – 10 Km/h	5
6	Long Stop	3	0 – 43200 min	0
7	Reserved	0		
8	Reserved	0		

9	Reserved	0		
10	Serial Number	4	0000 – FFFF	
11	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 stationary after it enters into Start status and stays in that status for the period of time specified by this parameter, the vehicle is considered to quit Start status.
- <*Time to Start*>: If it is detected that the vehicle is moving with ignition on for the period of time specified by this parameter, it is considered to be in Start status.
- <*Start Speed*>: The speed threshold to determine whether the vehicle is started or not. If the built-in motion sensor detects the device is moving with the ignition on, the device will start to check the speed from GNSS. If the device speed stays 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 with the <*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 is abnormal for more than 1 minute, the built-in motion sensor will be used to detect the Start/Stop status.
- <*Long Stop*>: After the vehicle enters into Stop status and stays in Stop status for the length of time specified by this parameter, the message **+RESP:GTLSP** will be sent. 0 means "Disable this feature".

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

- **+ACK:GTSSR,**

Example: **+ACK:GTSSR,4B0303,867995030082104,,0035,20190415081805,021F$**			
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	$	$

3.2.5.11. Buzzer Alarm

The **AT+GTBZA** command is used to set the buzzer alarm. There are four kinds of alarms. Each alarm outputs a different sound with the buzzer, and all the alarms are settable in this command. Before using those alarms, the output ID which connects to the buzzer should be configured and enabled.

- **AT+GTBZA=**

Example: **AT+GTBZA=gv300can,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,10,20,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Output ID	1	0|2	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Alarm 1 Output Status	1	0|1	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|1	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|1	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|1	0
22	Duration	<=3	0 – 255(×100ms)	0

23	Toggle Times	<=3	0 – 255	0
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
32	Serial Number	4	0000 – FFFF	
33	Tail Character	1	$	$

✧ <*Output ID*>: A numeral to indicate the ID of an output port which connects to a buzzer.

- 0: Disable buzzer.
- 1: Reserved.
- 2: Connect Output 2 to the external buzzer.

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

➢ **+ACK:GTBZA,**

Example: **+ACK:GTBZA,4B0303,867995030082104,,0036,20190415081919,0221$**			
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	$	$

3.2.5.12. Overspeed Alarm with Buzzer Notification

The **AT+GTSPA** 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 with the alarm type.

- **AT+GTSPA=**

Example: **AT+GTSPA=gv300can,1,50,,60,0,,,70,,60,0,,,90,,60,0,,,110,,60,0,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2	0
3	Speed Threshold 1	<=3	0 – 400km/h	50
4	Reserved	0		
5	Validity	<=4	0 – 3600sec	60
6	Alarm Type	1	0|1 – 4	0
7	Reserved	0		
8	Reserved	0		
9	Speed Threshold 2	<=3	0 – 400km/h	70
10	Reserved	0		
11	Validity	<=4	0 – 3600sec	60
12	Alarm Type	1	0|1 – 4	0
13	Reserved	0		
14	Reserved	0		
15	Speed Threshold 3	<=3	0 – 400km/h	90
16	Reserved	0		
17	Validity	<=4	0 – 3600sec	60
18	Alarm Type	1	0|1 – 4	0
19	Reserved	0		
20	Reserved	0		
21	Speed Threshold 4	<=3	0 – 400km/h	110
22	Reserved	0		
23	Validity	<=4	0 – 3600sec	60
24	Alarm Type	1	0|1 – 4	0
25	Reserved	0		
26	Reserved	0		

27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
32	Reserved	0		
33	Serial Number	4	0000 – FFFF	
34	Tail Character	1	$	$

- <*Mode*>: The working mode of the overspeed alarm function.
  - 0: Disable this function.
  - 1: Strict mode. In this mode, the device will check the speed and trigger the buzzer alarm during the acceleration or slowdown process.
  - 2: Warning mode. In this mode, the device will only check the speed and trigger the buzzer alarm during the acceleration process.
- <*Speed Threshold*>: It defines the speed threshold to trigger the buzzer alarm.
- <*Validity*>: If the speed meets the alarm condition and is maintained for the period of 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,4B0303,867995030082104,,0037,20190415082014,0222$**			
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	$	$

3.2.5.13. Roaming Detection Configuration

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

- **AT+GTRMD=**

Example:
AT+GTRMD=gv300can,1,,,,,1,3,46000,46002,46003,,,2,2,46007,,,1,1,46001,,,3FFF,,,3FFF,,,,,0,0,0,0,,,FFFF$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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	
8	Home Operator End	<=2	1 – 10	
9	Home Operator List	<=6*10		
10	Reserved	0		
11	Reserved	0		
12	Roaming Operator Start	<=3	1 – 150	
13	Roaming Operator End	<=3	1 – 150	
14	Roaming Operator List	<=6*150		
15	Reserved	0		
16	Reserved	0		
17	Black Operator Start	<=2	1 – 20	
18	Black Operator End	<=2	1 – 20	
19	Black List Operator	<=6*20		
20	Reserved	0		
21	Reserved	0		
22	Known Roaming Event Mask	<=6	000000 – FFFFFF	3FFF
23	Reserved	0		
24	Reserved	0		

25	Unknown Roaming Event Mask	<=6	000000 – FFFFFF	3FFF
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|1|2	0
32	Duration	<=3	0 – 255(×100ms)	0
33	Toggle Times	<=3	0 – 255	0
34	Reserved	0		
35	Reserved	0		
36	Serial Number	4	0000 – FFFF	
37	Tail Character	1	$	$

- <*Mode*>: The working mode of the roaming detection function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Operator Start*>: A numeral to indicate the first index of the whitelist operator numbers to be input. For example, if it is **1**, the device will update the white list of operators from the **1**st one. If it is empty, there should be no whitelist operator number.
- <*Operator End*>: A numeral to indicate the last index of the whitelist operator numbers to be input. For example, if it is **2**, the device will update the whitelist of operators until the **2**nd one. If it is empty, there should be no whitelist operator number.
- <*Home Operator List*>: A white list of PLMN codes for network operators. The PLMN code comprises of mobile country code (MCC) and mobile network code (MNC), both of which consist of 3 digits. The last digit of MNC can be omitted (e.g. “46001F” or “46001” represents the PLMN of “CHINA UNICOM”). The operators in this list will be considered as in “Home” state. And two adjacent operator numbers are separated with ‘**,**’. The number of the operators in the list 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 as 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 as in “Blocking Report” state. In this state, the

device works normally but all reports will be buffered.

Note: Operators that are not in <*Home Operator List*>, <*Roaming Operator List*> and <*Black List Operator*> will be considered as in "Unknown Roaming" state.

✧ <*Known Roaming Event Mask*>: Bitwise mask to configure which event report should be sent to the backend server when GSM roaming state is detected. If the roaming state indicates "Known Roaming", the <*Known Roaming Event Mask*> will be valid. If the roaming state indicates "Unknown Roaming", 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 for **+RESP:GTANT**
- 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**
- Bit 13 for the ignition on/off location report **+RESP:GTIGL** and **+RESP:GTVGL**

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 is detected, the specified wave will be output at the specified output.

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 operators 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.

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

➢ **+ACK:GTRMD,**

Example: **+ACK:GTRMD,4B0303,867995030082104,,0038,20190415082214,0223$**			
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:

Only an AT command string of no more than 250 bytes could be accepted by the device in the case of sending the command via Manage Tool (there is no such size limit in the case of sending the command via GPRS).

As the **AT+GTRMD** contains a large amount of configuration information in PLMN code list, make sure the command length does not exceed 250 bytes through proper <*Start Index*> and <*End Index*> settings. Also a color alert will occur on Command Text Box which turns yellow if there is a command of over 250 bytes to be sent with Manage Tool.

3.2.5.14. Crash Detection and Acceleration Report

The command **AT+GTCRA** is used to configure parameters for crash detection and acceleration report. If the detection condition for crash event is matched, the device will report the **+RESP:GTCRA** event message and data packets **+RESP:GTCRD** to the backend server. If configured to report accelerations to the backend server, the device will report **+RESP:GTACC** with 75 groups of tri-axial acceleration data to the backend server.

- **AT+GTCRA=**

Example: **AT+GTCRA=gv300can,1,5,1,,,,,0,0,0,0,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1	0
3	Sensitivity	1	1 – 9	5
4	Report ACC	1	0|1	0
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|1|2	

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

✧ <*Mode*>: The working mode of the crash detection and acceleration report function.
- 0: Disable this function.
- 1: Enable this function.

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

✧ <*Report ACC*>: A numeral to indicate whether to report the acceleration data to the backend server.
- 0: Disable reporting.
- 1: Enable reporting. The device will report 75 groups of tri-axial acceleration data to the backend server via the message **+RESP:GTACC**.

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

➢ **+ACK:GTCRA,**

Example: **+ACK:GTCRA,4B0303,867995030082104,,0039,20190415082250,0225$**			
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	$	$

3.2.5.15. Binding SIM Card

The **AT+GTSIM** command is used to bind SIM card function. If the current SIM card is replaced by another SIM card, then the digital output will be triggered.

➢ **AT+GTSIM=**

Example: AT+GTSIM=gv300can,1,898600200917f2005357,,,0,0,0,0,,,,,FFFF$				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2	0
3	ICCID	20		
4	Reserved	0		
5	Reserved	0		
6	Output ID	1	0 – 2|9 – C	0
7	Output Status	1	0 – 2	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		
14	Serial Number	4	0000 – FFFF	
15	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.

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

✧ <*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,4B0303,867995030082104,,003B,20190415082340,0235$			
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	$	$

3.2.5.16. 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 about the location of the terminal, and could be sent to the backend server.)

➢ **AT+GTPEO=**

Example: **AT+GTPEO=gv300can,0,1,1,3,121.412240,31.187801,121.412248,31.187891,121.412258,31.187991,60,0,0,0,0,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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
6	Longitude	<=11	-180 – 180	
7	Latitude	<=10	-90 – 90	
8	Check Interval	<=5	0|5 – 86400sec	0
9	Output ID	1	0 – 2|9 – C	0
10	Output Status	1	0 – 2	
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		

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

- <*GEO ID*>: The ID of the Geo-Fence. A total of 20 zones (0 - 19) are supported.
- <*Mode*>: The working mode of the device reporting the polygon Geo-Fence message to the backend server.
  - 0: Disable the zone's Geo-Fence function.
  - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
  - 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
  - 3: Report the polygon Geo-Fence message upon both entering and exiting the zone.
- <*Start Point*>: The start point of the polygon GEO-Fence formed by a set of points.
- <*End Point*>: The end point of the polygon GEO-Fence formed by 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 "+".
- <*Check Interval*>: The interval of GNSS checking position information against polygon Geo-Fence alarm.

Note: If more sets of <*Longitude*> and <*Latitude*> are needed, please adjust <*Start Point*> and <*End Point*> for appropriate setup. If some sets of <*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 those three sets of <*Longitude*> and <*Latitude*> empty.

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

- **+ACK:GTPEO,**

Example: **+ACK:GTPEO,4B0303,867995030082104,,0,0042,20190415082634,023C$**			
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	$	$

Note: Make sure the total size of the command is no more than 160 bytes if it is sent via SMS.

3.2.6. IO Application

3.2.6.1. Digital Output

The **AT+GTOUT** command is used to output a specified wave shape from the digital output ports. A total of three wave shapes are supported as shown below. If set to wave shape 1, the device will maintain the 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.

Wave Shape 1:

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

Figure 2: Wave Shape 1

Wave Shape 2:

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

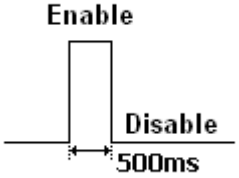


Figure 3: Wave Shape 2

Wave Shape 3:

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

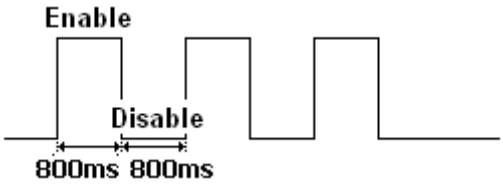


Figure 4: Wave Shape 3

Wave Shape 4:

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

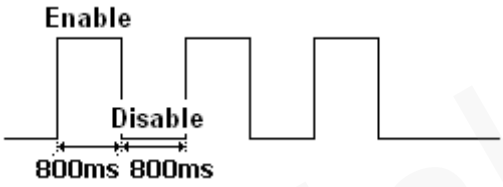


Figure 5: Wave Shape 4

➢ **AT+GTOUT=**

Example: **AT+GTOUT=gv300can,1,0,0,0,0,0,,,,1,,,,60,20,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Output1 Status	1	0 – 2	0
3	Duration	<=3	0 – 255(×100ms)	0
4	Toggle Times	<=3	0 – 255	0
5	Output2 Status	1	0 – 2	0
6	Duration	<=3	0 – 255(×100ms)	0
7	Toggle Times	<=3	0 – 255	0
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	DOS Report	1	0 – 3	0
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		

15	Overspeed Restrict Output	2	0|1 – 60km/h	0
16	Debounce Time	3	5 – 120s	5
17	Reserved	0		
18	Serial Number	4	0000 – FFFF	
19	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-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 2**, **Figure 3** and **Figure 4**. Unit: 100ms.
- <*Toggle Times*>: Please refer to **Figure 2**, **Figure 3** and **Figure 4**.
- <*DOS Report*>: A bitwise value to control how to report the message **+RESP:GTDOS**. Each bit represents an output. If the bit value is 1, the device will report the message **+RESP:GTDOS** when the status of the represented output with wave shape 1 changes.
  - Bit 0: Output 1
  - Bit 1: Output 2
- <*Overspeed Restrict Output*>: Digital output will not be triggered when GNSS speed is over the set speed. The unit is km/h. 0 means "Disable this parameter".

  Note:
  - In order to make sure this parameter works normally after device reboot, Bit 13 in the parameter <*Mask*> of the command **AT+GTPDS** must be set to 1 when <*Overspeed Restrict Output*> is a non-zero value.
  - This function works only in the power saving mode 0 or the ignition state.
  - OUTPUT ID only supports Output1 and Output 2.
  - Positioning failure blocks the output by default.
  - When <*Over Speed Restrict Output*> is issued, the Debounce time is re-timed from the time the command is issued.
  - If **AT+GTOUT** is issued continuously, it will overwrite the previous **AT+GTOUT** command.
- <*Debounce Time*>: If the speed is lower than <*Overspeed Restrict Output*> for the length of time specified by <*Debounce Time*>, **AT+GTOUT** will be executed.

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

- **+ACK:GTOUT,**

Example: **+ACK:GTOUT,4B0303,867995030082104,,0046,20190415083817,0244$**			
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. Digital Input Port Setting

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

- **AT+GTDIS=**

Example: **AT+GTDIS=gv300can,0,1,,0,1,0,0,0,2,0,0,0,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Ignition Detection	1	0	0
3	Sample Period	<=2	0|1 – 12(×2s)	1
4	MPF Debounce Time	<=2	0|1 – 12(×2s)	0
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	Input ID 2	1	2	2
11	Enable	1	0|1	0
12	Debounce Time	<=2	0 – 20(×10ms)	0
13	Validity Time	<=2	0|1 – 12(×2s)	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		
22	Serial Number	4	0000 – FFFF	
23	Tail Character	1	$	$

- <*Ignition Detection*>: The ID of the ignition detection port.
- <*Input ID 1*>: The digital input 1.
- <*Input ID 2*>: The digital input 2.
- <*Sample Period*>: The sampling period of the non-interruptible input port.
- <*Enable*>: Enable/disable the interrupt input.
  - 0: Disable the interrupt input.
  - 1: Enable the interrupt input.
- <*Ignition Detection Mode*>: A numeral to define the ignition detection mode.
  - 0: Hard-wired ignition detection mode.
  - 1: Motion status to simulate ignition status. In this mode, movement state will trigger behaviors which should be triggered by ignition-on state, including (1) Enable the odograph function to calculate the total mileage, (2) GNSS chip works in "always on" mode, (3) The fixed report, geo-fence (**AT+GTGEO** and **AT+GTPEO**) and speed alarm (**AT+GTSPD**) report functions are resumed, and non-movement state will trigger behaviors which should be triggered by ignition-off state, including (1) Disable the odograph function to calculate the total mileage, (2) GNSS chip works in "only on when needed" mode, (3) The fixed report, geo-fence (**AT+GTGEO** and **AT+GTPEO**) and speed alarm (**AT+GTSPD**) report functions are suspended when the <*Power Saving Mode*> is set to mode 1.
  - 2: External power voltage mode (virtual ignition detection). Ignition state is binding with the voltage of external power. Please use command **AT+GTVVS** to configure the threshold of parameter and enable the function of **AT+GTEPS**.
  - 3: Reserved.
  - 4: Accelerometer mode (virtual ignition detection). Ignition state is binding with the state of accelerometer. Please use the command **AT+GTAVS** to configure the threshold of parameter.

Note: The priority level of the hard-wired ignition detection mode is the highest. This means even if <*Ignition Detection Mode*> is not set to 0, hard-wired line has connected to the terminal, then the terminal will only measure the ignition state by hard-wired ignition detection mode.

If virtual ignition detection function is enabled and the corresponding bits of <*Event Mask*> in the command **AT+GTCFG** are set to 1, **+RESP:GTVGN**, **+RESP:GTVGF** and **+RESP:GTVGL** will

be reported to the backend server.

- ✧ <*Debounce Time*>: The debounce time for interruptible input.
- ✧ <*Validity Time*>: The validity time of the input port. 0 means "Do not check the validity time". The input needs to stay in a new state for the time period specified by this parameter before the device accepts the new state as valid.
- ✧ <*MPF Debounce Time*>: The debounce time for the **+RESP:GTMPF** report message.

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

➢ **+ACK:GTDIS,**

Example: **+ACK:GTDIS,4B0303,867995030082104,,0047,20190415083853,0246$**			
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	$	$

3.2.6.3. Input/Output Port Binding

The **AT+GTIOB** command is used to configure the user-defined output port actions triggered by input ports. If the IO combination is set and the corresponding condition is met, the device will output a specified wave shape at a specified output port. Otherwise, the device will restore the initial status of the specified output port. And the device will report the message **+RESP:GTIOB** to the backend server if the logic status of the bound input port changes.

➢ **AT+GTIOB=**

Example: **AT+GTIOB=gv300can,0,1,2,0,0,0,0,0,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	IOB ID	1	0 – 3	
3	Input Mask	<=4	0000 – 0F07	0
4	Trigger Mask	<=4	0000 – 0F07	0

5	Input Sample Period	<=2	0|1 – 12(×2s|×4s)	0
6	Output ID	1	0 – 2|9 – C	0
7	Output Status	1	0|1|2	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		
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	$	$

- <*IOB ID*>: The ID of the user-defined IO binding.
- <*Input Mask*>: Bitwise mask to configure the combination of input ports. Each of the non-reserved bits represents one digital input port. Set a bit to 1 to enable its corresponding input port and 0 to disable its corresponding input port.
  - Bit 0: Ignition detection
  - Bit 1: Digital input 1
  - Bit 2: Digital input 2
  - Bit 3 - 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- Bit15: Reserved
- <*Trigger Mask*>: Bitwise mask to configure the trigger condition which is composed of a set of specified input ports. The value of each bit indicates the logic status of the corresponding input port to trigger the IOB event. Set a bit to 1 to use “Enable status” as the trigger condition and 0 to use “Disable status” as the trigger condition. Only if the logic status of all the input ports in one IO binding meets the trigger condition will the IOB event be triggered.
  - Bit 0: Ignition detection
  - Bit 1: Digital input 1
  - Bit 2: Digital input 2
  - Bit 3 – 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 time period for checking the status of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use separate sample periods to check the input port status even for the same input port.
- <*Output ID*>: The ID of the output port to output specified wave when the trigger condition is met. 0 means "No wave will be output".

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

- **+ACK:GTIOB,**

Example: **+ACK:GTIOB,4B0303,867995030082104,,3,004E,20190415084645,0251$**			
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	$	$

3.2.6.4. 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 matches the predefined alarm condition, the device will report an alarm message **+RESP:GTEPS** to the backend server to notify the status of the external power supply.

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

- **AT+GTEPS=**

Example: **AT+GTEPS=gv300can,2,11000,13000,0,0,0,0,0,0,1,0,0,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2	0

3	Min. Threshold	<=5	250 – 32000 mV	250
4	Max. Threshold	<=5	250 – 32000 mV	250
5	Sample Period	<=2	0|1 – 12(×2s)	0
6	Debounce Time	1	0 – 5 (×1s)	0
7	Output ID	1	0 – 2|9 – C	
8	Output Status	1	0|1|2	
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	Debounce Voltage Threshold	3	0 – 100 (×100mv)	0
14	Reserved	0		
15	Serial Number	4	0000 – FFFF	
16	Tail Character	1	$	$

- <*Mode*>: The working mode of the external power supply monitoring function.
  - 0: Disable the external power supply monitoring function.
  - 1: Enable the external power supply monitoring function: 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 voltage limit of the external power supply to trigger the alarm.
- <*Max. Threshold*>: The upper voltage limit of the external power supply to trigger the alarm.
- <*Sample Period*>: The sampling period to measure the external power supply.
- <*Debounce Time*>: The debounce time for external power voltage to avoid excessive voltage drop in 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 fixed report message.
  - 1: Report external power supply voltage with 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 <*Max. Threshold*> parameters. If the current voltage detected falls within the <*Voltage Margin Error*> of the <*Min. Threshold*> or the <*Voltage Margin Error*> of <*Max. Threshold*>,

it will not be processed. For example, if the <*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 be processed when it meets the condition (5900mv < current voltage < 6100mv) or (11900mv < current voltage < 12100mv). The <*Voltage Margin Error*> parameter improves the performance of **+RESP:GTEPS** report.

✧ <*Debounce Voltage Threshold*>: This parameter will be used together with <*Debounce Time*>. If the voltage drops or bursts dramatically greater than <*Debounce Voltage Threshold*>, the device will start to debounce voltage for the period of time specified by <*Debounce Time*>.

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

➢ **+ACK:GTEPS,**

Example: **+ACK:GTEPS,4B0303,867995030082104,,0050,20190415084722,0254$**			
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	$	$

3.2.6.5. Analog Input Port Setting

The command **AT+GTAIS** is used to configure the parameters of the analog input port.

Make sure there is analog signal connected to the analog input port before enabling this function for that port.

➢ **AT+GTAIS=**

Example: **AT+GTAIS=gv300can,1,1,250,2700,1,,0,0,0,0,1,,,,,,,,,,,,,10,30,10,20,,0,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2|3|4|5	0
3	Range Switch	1	0|1	1
4	Min. Threshold	<=5	0 – 30000 mV	0
5	Max. Threshold	<=5	0 – 30000 mV	0

6	Sample Rate	<=2	0|1 – 12(×2s)	0
7	Reserved	0		
8	Output ID	1	0 – 2|9 – C	0
9	Output Active	1	0|1|2	0
10	Duration	<=3	0 – 255(×100ms)	0
11	Toggle Times	<=3	0 – 255	0
12	Sync with FRI	1	0|1	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		
22	Reserved	0		
23	Reserved	0		
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Fuel Data Debounce	2	0 – 150	10
28	Fuel Sensor Delay	<=3	0 – 600 sec	30
29	Fuel Loss Alarm	<=2	0 – 50	10
30	Fuel Sensor Sample Count	<=3	0 – 150	20
31	Reserved	0		
32	Voltage Margin Error	3	0 – 100(×10mv)	0
33	Serial Number	4	0000 – FFFF	
34	Tail Character	1	$	$

- <*Mode*>: The working mode of the analog input alarm (**+RESP:GTAIS**).
  - 0: Disable analog input alarm.
  - 1: Enable analog input alarm: If the current input voltage is within the range of (<*Min. Threshold*>, <*Max. Threshold*>), the alarm will be triggered.
  - 2: Enable analog input alarm: If the current input voltage is outside the range of (<*Min. Threshold*>, <*Max. Threshold*>), the alarm will be triggered.
  - 3: Connect with a fuel level sensor to support fuel level reporting and monitoring.
    Note: If the <*Mode*> is set to 3, please do not choose the wave shape 1 as the specified output port's wave.
  - 4: No alarm mode. The range of the voltage defined by <*Min. Threshold*> and <*Max. Threshold*> will be ignored, and no alarm will be triggered.
  - 5: Voltage processed mode. The range of the voltage will be ignored, and no alarm will be triggered. However, the voltage will be processed before being reported.
- <*Range Switch*>: The analog input voltage switches between the following two ranges.
  - 0: 0 – 12V
  - 1: 0 – 30V
- <*Min. Threshold*>: This parameter specifies the lower voltage limit for the analog input port to trigger the alarm when the <*Mode*> is set to 1 or 2.
- <*Max. Threshold*>: This parameter specifies the upper voltage limit for the analog input port to trigger the alarm when the <*Mode*> is set to 1 or 2.
- <*Sample Rate*>: The sampling period of the analog input port.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when the analog input alarm is triggered. If it is set to 0, there will be no output wave.
- <*Output Active*>: It configures the final status of the output port.
  - 0: Disable the active status.
  - 1: Enable the active status.
- <*Toggle Times*>: The rise and fall times of the square-wave.
- <*Sync with FRI*>: The device can send the analog input voltage periodically along with fixed report message. Set this field to 1 to enable it, and 0 to disable it. If the analog input port is used to work with a fuel sensor and the <*Sync with FRI*> is enabled, the device will report the fuel level together with the fixed report message.
- <*Fuel Data Debounce*>: The number of the data samples abandoned for calculating the fuel level.
- <*Fuel Sensor Delay*>: After the ignition is turned on, the fuel sensor will need to wait for the length of time specified by this parameter before it can report correct fuel level.
- <*Fuel Loss Alarm*>: If the difference between the current fuel level (after the ignition is turned on) and the last measured fuel level (before the previous ignition is turned off) is greater than this parameter value, an unusual fuel consumption alarm is sent via the event message **+RESP:GTFLA**.
- <*Fuel Sensor Sample Count*>: This parameter defines the total number of sample readings from the fuel sensor for calculating the current fuel level. And the value must be greater than <*Fuel Data Debounce*>.
- <*Voltage Margin Error*>: This parameter will be used together with <*Min. Threshold*> and <*Max. Threshold*>. It indicates the <*Voltage Margin Error*> of the parameters <*Min.*

Threshold> and <*Max. Threshold*>. If the current voltage detected falls within the range of the <*Voltage Margin Error*> of the <*Min. Threshold*> or the <*Voltage Margin Error*> of <*Max. Threshold*>, it will not be processed. For example, if the <*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 be processed when it meets the condition (5900mv < current voltage < 6100mv) or (11900mv < current voltage < 12100mv). The parameter improves the performance of the **+RESP:GTAIS** report.

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

- **+ACK:GTAIS,**

Example: **+ACK:GTAIS,4B0303,867995030082104,,0053,20190415085602,0260$**			
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	$	$

3.2.6.6. Output Expansion

The **AT+GTOEX** command is used to output wave shape 1 on EIO100 output.

- **AT+GTOEX=**

Example: **AT+GTOEX=gv300can,,,2,9,1,0,0,B,1,0,0,,,1,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Reserved	0		
Reserved	0		
Output Number	1	1 – 4	
Output ID	1	9 – C	
Status	1	0 – 1	0

Duration	1	0	0
Toggle Times	1	0	0
Reserved	0		
Reserved	0		
DOS Report	1	0 – F	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Output Number*>: The total number of configured EIO100 outputs. In one set of 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,4B0100,862170013988157,,FFFF,20110101000045,0008$**			
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	$	$

3.2.6.7. 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 is changed on one of EIO100 input ports, the device will report the message **+RESP:GTDIS** to the backend server.

➢ **AT+GTIEX=**

Example: **AT+GTIEX=gv300can,,,1,9,0,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Reserved	0		
Reserved	0		
Input Number	1	1 – 4	
Input ID	1	9 – C	
Sample Period	<=2	0|1 – 12(×4s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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 for reading EIO100 input status.

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

➢ **+ACK:GTIEX,**

Example:

+ACK:GTIEX,4B0303,867995030082104,,0054,20190415085637,0261$			
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	$	$

3.2.6.8. Gradual Digital Output Configuration

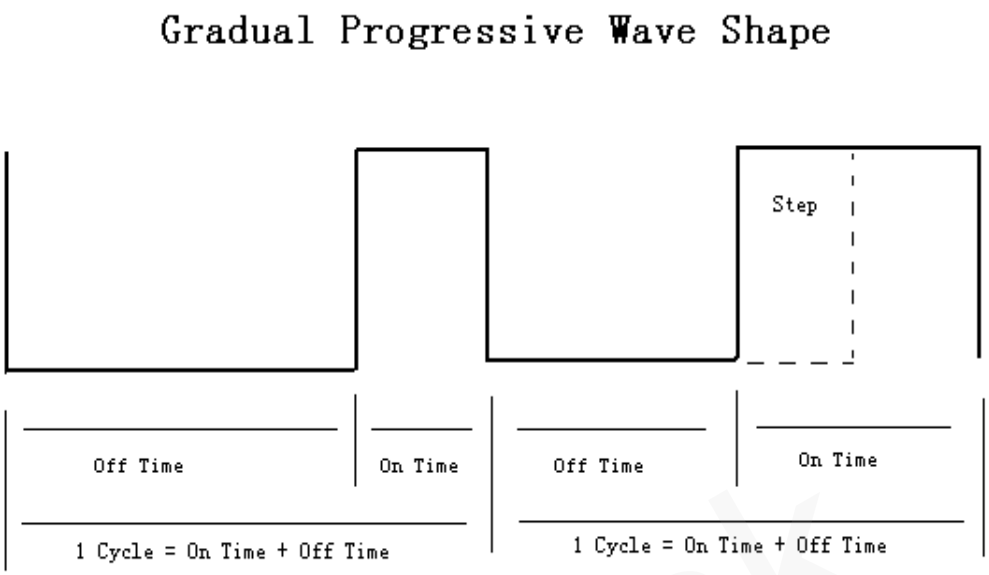
The **AT+GTGDO** command is used to configure specified gradual progressive wave shape from the digital output ports.

For progressive output, an increment step is added to the ON time until the ON 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 Time + Incremental Step ≥ Cycle Time is reached, 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 figure below 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, an incremental step will be added to the ON time at the end of a cycle before the start of the next.



➢ **AT+GTGDO=**

Example: **AT+GTGDO=gv300can,0,30,1,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Time of First Active Phase*>: Time (in units 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 units 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 parameter <*Time of First Active Phase*> cannot be greater than the parameter <*Cycle Time*>.

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

➢ **+ACK:GTGDO,**

Example: **+ACK:GTGDO,4B0303,867995030082104,,0055,20190415085724,0262$**			
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. 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**.

➢ **AT+GTVVS=**

Example: **AT+GTVVS=gv300can,13500,600,10,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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 voltage 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 in order to make the ignition judgment more precise.
- <*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,4B0303,867995030082104,,0056,20190415085745,0263$**			
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 Setting

The command **AT+GTAVS** is used to configure parameters for detecting virtual ignition status based on motion status. It will work when hard-wired ignition line is not connected and

Accelerometer Virtual Ignition mode is enabled by **AT+GTDIS**.

➢ **AT+GTAVS=**

Example: **AT+GTAVS=gv300can,20,30,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Rest Validity	<=3	1 – 255 sec	20
Movement Validity	<=3	1 – 255 sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Rest Validity*>: 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 <*Rest Validity*>.

✧ <*Movement 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 <*Movement Validity*>.

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

➢ **+ACK:GTAVS,**

Example: **+ACK:GTAVS,4B0303,867995030082104,,0057,20190415085816,0264$**			
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. Serial Port Application

3.2.8.1. 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 the serial port communication.

➢ **AT+GTURT=**

Example: **AT+GTURT=gv300can,1,12,8,1,0,0,0,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Working Mode	1	0 – 4|6 – 9|17|24	0
Baudrate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 4	0
Sleep Enable	1	0|1|2|3	0
Input ID of Wakeup	0	0|1	0
Reserved (Optional)	0		
Reserved (Optional)	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Working Mode*>: It configures the working mode of **AT+GTURT**.

- 0: Disable UART.
- 1: Use UART to transfer data via **AT+GTDAT** and other protocol commands. When the **AT+GTDAT** command is executed, the device will respond with the execution result to the secondary serial port. “OK” is returned when the command is executed successfully, and “Error” is returned when the command fails to be executed.
- 2: Used for Garmin function.
- 3: Used for specific RFID card reader to communicate with UART of the terminal. If <*RFID Type*> indicates Old RFID card reader, digital input port setting should be configured by the **AT+GTDIS** command before using this function. The terminal will

report the card ID received from the card reader to the backend server via the message **+RESP:GTIDA**.

RFID Type	<=5	0 – 255	0
Reserved	0		

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

Digital Fuel Sensor Type	1	0 – 6	0
Reserved	0		

Note: Different fuel sensors support different baud rates, so make sure that the baud rate set is suited for the sensor.

- 6: Used to transfer data from auxiliary serial port to the backend server. When the serial port receives a special byte defined in <*Terminator Character*>, two reserved parameters are used as follows. When the size of the data received exceeds 1280 bytes, it will also compose responses and send them to the server.

Format	1		0
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** (short format) is packed in hexadecimal ASCII format codes. Two reserved parameters are used as follows.

Interval	<=4	1 – 3600sec	
Length	<=4	1 – 640	

- 8: Used for transparent transfer based on received data length and data-receiving interval. The data in **+RESP:GTDTT** (short format) is packed in raw HEX codes. Two reserved parameters are used as follows.

Interval	<=4	1 – 3600sec	
Length	<=4	1 – 1280	

- 9: Used for camera.
- 17: Used for EIO100 device. In this mode, the baud rate can be set to any value based on <*Baudrate Index*>.
- 24: Used for THR_100. In this mode, configure the following settings: 38400 baud rate, 8 bits, no parity, and 1 stop bit. And sleep mode should be set to 2 or 3 to disable serial port sleep.

✧ <*Baudrate Index*>: The index of the supported baud rate of the serial port. All supported baud rates are listed below:

Baudrate Index	Baud Rate
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 parameter value can be 7 or 8.
- <*Stop Bits*>: Stop Bits of the UART. The parameter value can be 1, 2 or 3.
  - 1: 1 Stop Bits.
  - 2: 2 Stop Bits.
  - 3: 1.5 Stop Bits.
- <*Parity Bits*>: Parity Bits of the UART. The parameter value can be 0, 1, 2, 3, or 4.
  - 0: None Parity.
  - 1: Odd Parity.
  - 2: Even Parity.
  - 3: Space Parity.
  - 4: Mark Parity.
- <*Sleep Enable*>: The device supports the sleep mode which helps reduce power consumption. When the device enters into the sleep mode, the response to the serial port will be very slow unless the device is waked up. This parameter is used to enable/disable the sleep mode of the device.
  - 0: Disable the device sleep mode and enable auto online mode.
  - 1: Enable the device sleep mode and enable auto online mode.
  - 2: Disable the device sleep mode and disable auto online mode.
  - 3: Enable the device sleep mode and disable auto online mode.

  If the device sleep mode is enabled, the external device must have the ability to wake up the device from the sleep mode by the digital input specified by the parameter <*Input ID for Wakeup*>. If the <*Working Mode*> of **AT+GTURT** is 3 and the <*RFID Type*> is 4 (DR100), the value 3 for the <*Sleep Enable*> parameter will not be supported.
- <*Input ID for Wakeup*>: The ID of the digital input used to wake up the device from the low power mode for serial port communication.
  - 0: Do not use digital input 1 to wake up the device. The digital input 1 is used as an interrupt port.
  - 1: The Old RFID uses digital input 1 to wake up the device. The parameter of the digital input 1 should be set by the command **AT+GTDIS** and the <*Validity Time*> of digital input 1 must be set to 0.
- <*Digital Fuel Sensor Type*>: The type of the digital fuel sensor connected with serial port.
  - 0: EPSILON ES2 or ES4
  - 1: LLS 20160
  - 2: DUT-E
  - 3: QFS100
  - 4: UFSxxx
  - 5: Reserved

- 6: DUT-E SUM

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

- 0: Old RFID. 9600 baud rate, 8 data bits, 1 stop bit, and no parity.
- 1: Reserved.
- 2: MR2. 9600 baud rate, 8 data bits, 1 stop bit, and no parity.
- 3: VD RFID: 9600 baud rate, 8 data bits, 1 stop bit, and no parity.
- 4: DR100: 19200 baud rate, 8 data bits, 1 stop bit, and no parity.
- 5: Reserved.

✧ <*Format*>: It controls the format of data transfer from auxiliary serial port to backend server when <*Working Mode*> is 6.

- 0: Short format.
- 1: Long format.

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

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

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

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

➢ **+ACK:GTURT,**

Example: **+ACK:GTURT,4B0303,867995030082104,,0058,20190415085902,0265$**			
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	$	$

3.2.8.2. Transparent Data Transmission

The command **AT+GTDAT** is used to transfer data between the backend server and the equipment connected to the secondary serial port of the device. Data to the backend server is wrapped into the message **+RESP:GTDAT** and sent to the backend server while data to the

equipment is directly output to the secondary serial port unrestricted by the @Track protocol. All data is transparent to the device.

Before using this command, the **AT+GTURT** command should be used to set the parameters of the secondary serial port.

➢ **AT+GTDAT=**

Example: **AT+GTDAT=gv300can,0,,data to the backend server,1,,,,FFFF$** **AT+GTDAT=gv300can,1,,data to the serial port,1,,,,FFFF$** **AT+GTDAT=gv300can,2,,data to the backend server,1,,,,FFFF$** **AT+GTDAT=gv300can,3,,data to the serial port,1,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Command Type	1	0|1|2|3|4|5	
Reserved	0		
Data	<=245	ASCII Code	
Need Ack	1	0|1	
Data Format	1	0|1	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Command Type*>: The command type which indicates how to send the data.
- 0: Send message to the backend server with **+RESP:GTDAT (Short Format)**.
- 1: Send the raw data directly to the serial port.
- 2: Send message to the backend server with **+RESP:GTDAT (Long Format)**.
- 3: Send the raw data directly to the serial port without CRLF.
- 4: Send the raw data directly to the Bluetooth.
- 5: Send the raw data directly to the Bluetooth without CRLF.

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

✧ <*Need ACK*>: Need to report **+ACK:GTDAT** or not.
- 0: Do not need the ACK report.
- 1: Need the ACK report.

✧ <*Data Format*>: This parameter defines the format of the data sent to the serial port.
- 0: Raw data format. For example, if the data is 31, it shown in HEX will be shown as 0X33 and 0X31 in the serial port.

- 1: Hexadecimal format. For example, if the data is 313233, it shown in HEX will be shown as 0X31 0X32 and 0X33 in the serial port.

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

➢ **+ACK:GTDAT,**

Example: **+ACK:GTDAT,4B0303,867995030082104,,0059,20190415090053,0267$**			
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	$	$

3.2.8.3. 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=gv300can,,,9999,30,10,,1,10,0,0,300,,10,5,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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
Reserved	0		
Unsolicited Enable Ex	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	<=2	30 – 1800s	300
Reserved	0		
IGN Sample Count	<=2	3 – 30	10
Ex Fuel Loss Alarm IGN	<=3	0 – 100 %	5
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Ex Full Value*>: The value read from the sensor when the fuel tank is full.
  Note: This value needs to be set for only UFSxxx and DUT-E SUM now, while it is ignored by the other sensors. The unit for UFSxxx is 0.1mm. Set the unit of DUT-E sensors connected to DUT-E SUM to liter. If the **AT+GTEFS** command is executed and <*Ex Full Value*> is not set to the default value, DUT-E can use <*Ex Full Value*> to calculate the percentage of fuel level.
- <*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 off and the last measured fuel level is greater than this value, an abnormal fuel consumption alarm is sent with event message **+RESP:GTFLA**. 0 means "Disable this function".
- <*Unsolicited Enable Ex*>: If enabled, the device will not send command to the fuel sensor, and the sensor must be set to periodical data output. QFS100 and UFS100 do not support this function.
- <*Ex Detection Frequency*>: If <*Unsolicited Enable Ex*> is disabled, the device will send READ command to the fuel sensor and read the data based on this parameter setting.
- <*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 fuel sensor to the backend server with **+RESP:GTFSD**. Only report of the raw data from UFSxxx is

supported now.

- 0: Do not report raw data from fuel sensor.
- 1: Report raw data from fuel sensor.

✧ <*Ex Detection Frequency IGF*>: If <*Unsolicited Enable Ex*> is disabled, the device will send READ command to the fuel sensor and read the data at this frequency while 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*>.

✧ <*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 feature".

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

➢ **+ACK:GTEFS,**

Example: **+ACK:GTEFS,4B0303,867995030082104,,005A,20190415090124,0269$**			
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	$	$

3.2.8.4. Fuel Sensor Calibration Table

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

➢ **AT+GTFSC=**

Example: **AT+GTFSC=gv300can,,1,20,1,100,,3,16000,0,10000,50,250,100,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Reserved			

3	Table ID	1	0 – 4	1
4	Sensor Type	<= 2	0 – 6|20 – 21	20
5	Enable	1	0|1	0
6	Max. Tank Volume	<= 5	0 – 6000	100
7	Reserved			
8	Num of Node	<= 2	0|2 – 11	0
9	Node 1 Value	<= 5	0 – 99999(mV)	
10	Node 1 Percentage	<= 2	0 – 100	
11	⋮			
12	Node N Value	<= 4	0 – 99999(mV)	
13	Node N Percentage	<= 2	0 – 100	
14	Reserved			
15	Reserved			
16	Reserved			
17	Reserved			
18	Reserved			
19	Reserved			
20	Reserved			
21	Reserved			
22	Serial Number	4	0000 – FFFF	
23	Tail Character	1	$	$

✧ <*Enable*>: Enable/disable the current calibration table. If the table is disabled, the calculation of the fuel level will be linearized.

✧ <*Sensor Type*>: The sensor type for the currently set table.

- 0: EPSILON ES2 or ES4
- 1: LLS 20160
- 2: DUT-E
- 3: QFS100
- 4: UFSxxx
- 5: Reserved
- 6: DUT-E SUM
- 20: ADC1
- 21: Reserved

✧ <*Num of Node*>: The number of nodes in the blue-colored part of the table above.

- ✧ <*Node N Value*>: The value of the current node.
- ✧ <*Node N Percentage*>: The percentage value of this node. The percentage value 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,4B0303,867995030082104,,006F,20190415090442,0273$**			
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	$	$

3.2.8.5. 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=gv300can,1,,0,1,,1,,FFFFF,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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	00000000 – FFFFFFFF	1
Reserved	0		

Report Composition Mask	8	00000000 – FFFFFFFF	00087FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: Enable/disable data transfer via the report message **+RESP:GTUDT** to the serial port.
  - 0: Disable the data transfer.
  - 1: Enable the data transfer.
- <*IGN Send Interval*>: The time interval for sending related information when the ignition is on. The value range is 0|5-250 and the unit is second. 0 means "Disable the information transfer".
- <*Enable IGF Sending*>: Whether to send the related information when the ignition is off. If enabled, it works according to <*IGF Report Interval*> and <*Mode*> of **AT+GTFRI**.
  - 0: Disable related information report when the ignition is off.
  - 1: Enable related information report when the ignition is off.
- <*Event Mask*>: Bitwise mask to configure the event triggered for which **+RESP:GTUDT** will be sent to the serial port.
  - Bit 0 for activated GEO.
  - Bit 1-31 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, Reserved
  - Bit 8 for Mileage, Reserved
  - Bit 9 for HMC, Reserved.
  - Bit 10 for GSV, External GNSS Antenna
  - Bit 11 for GEO State
  - Bit 12 for Analog Input

- Bit 13 for Digital Input, Motion Status
- Bit 14 for External Power VCC, Backup Battery Level, Charging
- Bit 15 for GEO Status Mask
- Bit 16 Reserved
- Bit 17 Reserved
- 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,4B0303,867995030082104,,0071,20190415090509,0274$**			
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	$	$

3.2.8.6. Camera Setting Command

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

➢ **AT+GTCMS=**

Example: **AT+GTCMS=gv300can,0,1,5,150,2,0,3,0,0,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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 – 2	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|1|2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
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 picture(s). Picture quality is better with a smaller compression ratio.
- <*Photo Resolution*>: The resolution of the picture(s).
  - 1: 160*120
  - 2: 320*240
  - 3: 640*480
- <*Digital Input ID*>: The input ID used to trigger photographing.
- <*Attribute Mask*>: The <*Attribute Mask*> in the message **+RESP:GTPHL** and **+RESP:GTPHD** in HEX format.

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

- <*Server Type*>: The server that picture is transferred to.
  - 0: Backend server

- 1: FTP server

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

Note: The output settings are used to output special wave when the camera is photographing or trying to photograph and data is being transmitted between camera and the device. Only Wave Shape 1 is supported.

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

➢ **+ACK:GTCMS,**

Example: **+ACK:GTCMS,4B0303,867995030082104,,0072,20190415090550,0275$**			
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	$	$

3.2.8.7. Take-Picture Command

The **AT+GTTAP** command is used for real-time photographing.

➢ **AT+GTTAP=**

Example: **AT+GTTAP=gv300can,0,,,2,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Camera ID	1	0 – 3	
Reserved	0		
Reserved	0		
Photo Resolution	1	1 – 3	
Reserved	0		

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

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

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

➢ **+ACK:GTTAP,**

Example: **+ACK:GTTAP,4B0303,867995030082104,,0073,20190415090625,0276$**			
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	$	$

3.2.8.8. UFSxxx FOTA Upgrade

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

➢ **AT+GTUFS=**

Example: **AT+GTUFS=gv300can,0,10,0,,,http://220.178.67.210:8208/GV300/deltabin/csb_des_07_build1116.bin,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Retry Times	1	0 – 3	0

Timeout	2	10 – 30min	10
Protocol Type	1	0	0
Reserved	0		
Reserved	0		
Server URL	100	Legal URL	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Retry Times*>: It specifies the maximum time 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 a 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,4B0303,867995030082104,,0076,20190415090736,0277$**			
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	$	$

3.2.8.9. FTP Server Information

The command **AT+GTFTP** is used to configure the FTP server information as to where and how to upload pictures. If the terminal is configured correctly and the <*Server Type*> in the command **AT+GTCMS** is 1, it will be able to transfer pictures to FTP server.

➢ **AT+GTFTP=**

Example: **AT+GTFTP=gv300can,116.228.146.250,21,SW_RD/Projects/,,,0,0,1,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Server Address	<=60		
Server Port	<=5	0 – 65535	0
Full Name	<=60		
User Name	<=20		
Login Password	<=20		
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		
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. To restore the default path after a path is set, set it to"\".
✧ <*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 transferring picture.
- 0: Passive mode.
- 1: Active mode.

✧ <*Oper Type*>: The transfer mode to transfer picture after transfer fails.
- 0: Resume transferring the failed picture.

- 1: Restart transferring the failed picture from the beginning.

✧ <*Report FTP*>: Whether to report **+RESP:GTFTP** to the backend server after transferring a file.

- 0: Disable the **+RESP:GTFTP** report after transferring a file.
- 1: Enable the **+RESP:GTFTP** report after transferring a file.

✧ <*File Name Prefix*>: The file name prefix of a picture. <*File Name Prefix*> cannot 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,4B0303,867995030082104,,0077,20190415090833,027A$**			
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	$	$

3.2.8.10. 1-Wire Device Settings

The command **AT+GTACD** is used to configure the parameters of 1-Wire devices which include an iButton and temperature sensors. When the iButton is connected, a specified wave shape can be configured for a 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=gv300can,1,0,0,0,0,0,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	iButton Timer	<=2	0|1 – 10(s)	0
3	Output ID	1	0 – 2	0

4	Output Status	1	0|1|2	0
5	Duration	<=3	0 – 255(×100ms)	0
6	Toggle	<=3	0 – 255	0
7	Temperature Timer	<=3	0|10 – 255(s)	0
8	Reserved			
9	Reserved			
10	Reserved			
11	Reserved			
12	Serial Number	4	0000 – FFFF	
13	Tail Character	1	$	$

- <*iButton Timer*>: The time interval for searching the iButton ID.
  Note: The sequence of iButton ID is in reverse order of the ID on iButton. The ID structure is composed of <1 byte family ID> + <6 byte serial number> + <1 byte CRC>. Thus, the first byte of the ID number represents 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 interval for reading the temperature sensor value. If more than one temperature sensor connects to 1-Wire, the device will read the temperature from the temperature sensors one by one at the interval specified by <*Temperature Timer*>. 0 means "Temperature detection is disabled".

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

- **+ACK:GTACD,**

Example: **+ACK:GTACD,4B0303,867995030082104,,0078,20190415090934,027C$**			
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	$	$

3.2.8.11. ID Authentication

The command **AT+GTIDA** is used to protect against unauthorized use. This is achieved through an iButton reader for driver identification and connecting an external relay to cut off the starter or the fuel pump. To use this command, both the iButton reader and the external relay (Normally Closed relay recommended) must be connected to the device. When the device reads an ID, it will report the event message **+RESP:GTIDA** to the backend server. If the ID is in the white list of the ID numbers, it will be authorized until next time the ignition is turned off. After the ignition is turned off again, the authentication will last for a short period of time (settable). Within this period of time, the driver can turn on the engine again without the need to re-identify himself.

- **AT+GTIDA=**

Example: **AT+GTIDA=gv300can,1,1,1,D2C4FBC5,30,0,30,,,,0,0,0,0,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0|1|2	0
3	Start Index	<=2	1 – 250	
4	End Index	<=2	1 – 250	
5	ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
6	Timeout After Ignition Off	<=3	0 – 3600sec	30
7	Report Mode	1	0 – 7	0
8	ID Validity Time	<=3	15 – 600sec	30
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Output ID	1	0 – 2	0
13	Output Status	1	0|1|2	0
14	Duration	<=3	0 – 255(×100ms)	0
15	Toggle Times	<=3	0 – 255	0
16	RFID Report Mode	1	0 – 1	0
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Serial Number	4	0000 – FFFF	

21	Tail Character	1	$	$

- <*Mode*>: The working mode of the ID authentication function.
  - 0: Disable this function.
  - 1: Enable this function: Only authorized ID can unlock the vehicle.
  - 2: Enable this function: Any ID 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 <*Start Index*> is set to 1 and <*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 List*>. At most 8 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 are determined by <*Start Index*> and <*End Index*>.
- <*Timeout After Ignition Off*>: If the ignition is turned off, the ID will still be authorized for a short time. In this period, re-authentication is not needed. 0 means "Lock the vehicle when the ignition is turned off".
- <*Report Mode*>: The mode of reporting ID.
  - Bit 0: Report the ID which is authorized.
  - Bit 1: Report the ID which is unauthorized.
  - Bit 2: Report the ID which has logged out. (If authorized ID meets the trigger conditions <*ID Validity Time*> and <*Timeout after Ignition Off*>, then the **+RESP:GTIDA** report will be sent to indicate the log-out event).

  For each bit, set it to 1 to enable the report, and 0 to disable the report. If <*Report Mode*> is 0, no **+RESP:GTIDA** message will be reported.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when the driver ID is authorized.
- <*ID Validity Time*>: The ID will remain authorized for the period of time specified by this parameter when the ID is valid.
- <*RFID Report Mode*>: The report mode for the <*RFID*> of **+RSP** or **+EVT** message in HEX format.
  - 0: Report the latest RFID number after getting the card ID.
  - 1: Report the latest RFID number when the ignition was turned on and the card was authorized, or the ignition was turned off and the time does not exceed <*Timeout after Ignition Off*>.

    Note: The **+RESP:GTIDA** and IGF/IGN/VGF/VGN will always be reported with RFID number after getting the card ID.

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

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

- **+ACK:GTIDA,**

Example: **+ACK:GTIDA,4B0303,867995030082104,,007E,20190415091013,027D$**			
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	$	$

3.2.8.12. Temperature Alarm

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

- **AT+GTTMP=**

Example: **AT+GTTMP=gv300can,0,1,28131A4103000056,,,-20,50,,,2,10,,,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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		
Validity	<=2	1 – 10	2

Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 2|9 – C	0
Output Status	1	0 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Alarm ID*>: The ID of the temperature alarm. A total of four samples (0-3) are supported.
- <*Mode*>: The working mode of the temperature alarm.
  - 0: Disable temperature alarm.
  - 1: Report temperature alarm if the current temperature is within the temperature range defined by <*Low Temperature*> and <*High Temperature*>.
  - 2: Report temperature alarm if the current temperature is outside the temperature range defined by <*Low Temperature*> and <*High Temperature*>.
  - 3: Report temperature alarm only once if the current temperature enters/exits the temperature range defined 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.
- <*Validity*>: If the temperature sensor detects the environment temperature which 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 <*Validity*> times, the temperature alarm will be triggered.
- <*Send Interval*>: After <*Validity*> checking, the device will report temperature alarm every <*Send Interval*> times of temperature reading based on reading timer of temperature sensor. If <*Send Interval*> is set to 0, it will only report the temperature alarm once.

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

- **+ACK:GTTMP,**

Example:

+ACK:GTTMP,4B0303,867995030082104,,3,0088,20190415091107,0281$			
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	$	$

3.2.8.13. CANBUS Device Configuration

This command **AT+GTCAN** is used to configure the parameters for reporting CANBUS device information (**+RESP:GTCAN**) which mainly includes vehicle speed, engine speed, engine coolant temperature and other information.

- **AT+GTCAN=**

Example: **AT+GTCAN=gv300can,1,0,0,FFFFFFFF,0,7FFFFF,0,003F,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Mode	1	0|1	0
CAN Report Interval	<=5	0|1 – 86400sec	0
CAN Report Interval IGF	<=5	0|1 – 86400sec	0
CAN Report Mask	8	0 – FFFFFFFF	C03FFFFF
Additional Event	1	0|1	0
CAN Report Expansion Mask	8	0 – FFFFFFFF	007FFFFF
GNSS Assisted Mode	1	0|1	0
Electric Report Mask	4	0 – FFFF	003F
Reserved	0		
Serial Number	4	0000 – FFFF	

Tail Character	1	$	$

- <*Mode*>: It specifies whether to enable/disable the CAN function.
  - 0: Disable the CAN function.
  - 1: Enable the 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|1 – 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|1 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTCAN** in ignition off state".
- <*Additional Event*>: It configures whether to send the **+RESP:GTCAN** report message triggered by additional event.
  - 0: Ignore all additional events.
  - 1: Send the **+RESP:GTCAN** report message triggered by ignition on/off event.
- <*GNSS Assisted Mode*>: It specifies whether to use GNSS to calculate total distance when the communication between the device and CAN Chipset is abnormal.
  - 0: Disable this function.
  - 1: Enable this function. In the case of abnormal communication between the device and CAN Chipset, the device will use GNSS to calculate total distance and report the <*Total Distance*> field in **+RESP:GTCAN**. This function works only when the unit of total distance is hectometer.
- <*CAN Report Mask*>: Bitwise mask to configure the composition of the **+RESP:GTCAN** report message.

Mask Bit	Item	Description
Bit 31	<*GSM Information*>	Including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*Reserved*> parameter value "00"
Bit 30	<*GNSS Information*>	Including <*GNSS Accuracy*>, <*Speed*>, <*Heading*>, <*Altitude*>, <*Longitude*>, <*Latitude*> and <*GNSS UTC Time*>
Bit 29	<*CAN Report Expansion Mask*>	If this bit is set to 1, the parameter <*CAN Report Expansion Mask*> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <*CAN Report Expansion Mask*> in **AT+GTCAN** is not valid.
Bit 28	<*Electric Report Mask*>	If this bit is set to 1, the parameter <*Electric Report Mask*> in **AT+GTCAN** will be valid. If this bit is set to 0, the parameter <*Electric Report Mask*> in **AT+GTCAN** will not be valid.
Bit 27	Reserved	
Bit 26	Reserved	

Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	*<Total Distance Impulses>*	Vehicle total distance measured in impulses (if distance from dashboard is not available)
Bit 21	*<Total Vehicle Engine Overspeed Time>*	Total time when the vehicle speed is greater than the limit defined in CAN Chipset's configuration
Bit 20	*<Total Vehicle Overspeed Time>*	The total time when the vehicle engine speed is greater than the limit defined in CAN Chipset's 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 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 idle 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>*	Accelerator pedal pressure
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 Percentages)

Bit 7	<*Fuel Consumption*>	The fuel consumption of the engine
Bit 6	<*Engine Coolant Temperature*>	Engine coolant temperature
Bit 5	<*Engine RPM*>	Revolutions per minute of the engine
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

Note: Bit 22 in <*CAN Report Mask*> is only valid for the <*Total Distance Impulses*> field in the hex format report of **+RESP:GTCAN**. Bit 30 and Bit 31 are only valid for <*GNSS Information*> and <*GSM Information*> respectively in ASCII format report of **+RESP:GTCAN**.

Note: Bit 30 and Bit 31 of the parameter <*CAN Report Mask*> will automatically disabled in the message **+RESP:GTERI**.

✧ <*CAN Report Expansion Mask*>: Bitwise mask to configure the composition of expanded CANBUS information in the **+RESP:GTCAN** report message.

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<*Rapid Accelerations*>	Number of total rapid accelerations since installation (calculation based on CAN Chipset's settings of speed increase time and value).
Bit 21	<*Rapid Brakings*>	Number of total rapid brakings since installation (calculation based on CAN Chipset's settings of speed decrease time and value)
Bit 20	<*Expansion Information*>	A hexadecimal number. Each bit contains information of one indicator.

Bit 19	*<Registration Number>*	The vehicle registration number
Bit 18	*<Tachograph Driver 2 Name>*	The name of tachograph driver 2
Bit 17	*<Tachograph Driver 1 Name>*	The name of tachograph driver 1
Bit 16	*<Tachograph Driver 2 Card Number>*	The card number of tachograph driver 2
Bit 15	*<Tachograph Driver 1 Card Number>*	The card number of tachograph driver 1
Bit 14	*<Total Brake Applications>*	Count of brake pedal applications (braking process initiated by brake pedal)
Bit 13	*<Total Accelerator Kick-Down Time>*	Total time when accelerator pedal is pressed over 90%
Bit 12	*<Total Cruise Control Time>*	Total time when the vehicle speed is controlled by cruise control module
Bit 11	*<Total Effective Engine Speed Time>*	Total time when the vehicle engine speed is effective
Bit 10	*<Total Accelerator Kick-downs>*	Count of accelerator pedal kick-downs (with the pedal pressed over 90%)
Bit 9	*<Pedal Braking Factor>*	It measures how often the driver brakes with brake pedal or with engine and stores both counts (always increasing). Decreasing speed with brake pedal pressed causes an increase of pedal braking factor.
Bit 8	*<Engine Braking Factor>*	It measures how often the driver brakes with brake pedal or with engine and stores both counts (always increasing). Decreasing speed with no pedal pressed causes an increase of engine braking factor.
Bit 7	*<Analog Input Value>*	The value of analog input
Bit 6	*<Tachograph Driving Direction>*	Vehicle driving direction from tachograph
Bit 5	*<Tachograph Vehicle Motion Signal>*	Vehicle motion signal from tachograph
Bit 4	*<Tachograph Overspeed Signal>*	Vehicle overspeed signal from tachograph
Bit 3	*<Axle Weight 4th>*	Weight of vehicle's fourth axle
Bit 2	*<Axle Weight 3rd>*	Weight of vehicle's third axle

Bit 1	*<Axle Weight 1st>*	Weight of vehicle's first axle
Bit 0	*<Ad-Blue Level>*	The level of Ad-Blue

✧ *<Electric Report Mask>*: Bitwise mask to configure the composition of electric bus information in the **+RESP:GTCAN** report message.

Mask Bit	Item	Description
Bit 15	Reserved	
Bit 14	Reserved	
Bit 13	Reserved	
Bit 12	Reserved	
Bit 11	Reserved	
Bit 10	Reserved	
Bit 9	Reserved	
Bit 8	Reserved	
Bit 7	Reserved	
Bit 6	Reserved	
Bit 5	*<Remaining Power>*	The remaining power of the vehicle
Bit 4	*<Single Discharge Capacity>*	The capacity of single discharge
Bit 3	*<Single Charge Capacity>*	The capacity of single charge
Bit 2	*<Total power recovered>*	Total power recovered
Bit 1	*<Charging Times>*	The charging times of the vehicle
Bit 0	*<Total Voltage>*	Total voltage

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

➢ **+ACK:GTCAN,**

Example: **+ACK:GTCAN,4B0303,867995030082104,,008A,20190415091138,0282$**			
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	$	$

3.2.8.14. CANBUS Alarm Setting

The **AT+GTCLT** command is used to set alarm threshold of CANBUS data. The **AT+GTCLT** can support 20 CANBUS alarm groups at most. Each CAN alarm trigger condition consists of <*Alarm Mask 1*>, <*Alarm Mask 2*> and <*Alarm Mask 3*>. For the CAN alarm trigger event information, please refer to the <*Detailed Information / Indicators*>, <*Lights*>, <*Doors*> and <*Engine RPM*> of the **+RESP:GTCAN** message. If <*Alarm Mask 1*>, <*Alarm Mask 2*> and <*Alarm Mask 3*> meet each trigger condition at the same time, and the trigger event duration time is longer than <*Debounce Time*>, the **+RESP:GTCLT** alarm message will be sent.

Note: The **AT+GTCLT** and **AT+GTCAN** commands are used together. Only when all of <*Alarm Mask 1*>, <*Alarm Mask 2*> and <*Alarm Mask 3*> meet trigger condition and the trigger event duration time is longer than <*Debounce Time*> will the **+RESP:GTCLT** alarm message be sent.

- **AT+GTCLT=**

Example: **AT+GTCLT=gv300can,0,1,0,FFFFF,0,0,0,30,8,1FFFFF,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0'–'9' 'a'–'z' 'A'–'Z'	gv300can
Group ID	<=2	0 –19	0
Mode	1	0|1	0
Debounce Time	<=3	0 – 255(×1s)	0
CAN Data Mask	8	0 – FFFFFFFF	000FFFFF
Alarm Mask 1	<=8	0 – FFFFFFFF	0
Alarm Mask 2	<=8	0 – FFFFFFFF	0
Alarm Mask 3	<=8	0 – FFFFFFFF	0
High RPM Threshold	<=3	1 – 100(x100 rpm)	30
Low RPM Threshold	<=3	0 – 99(x100 rpm)	8
CAN Report Expansion Mask	8	0 – FFFFFFFF	001FFFFF
Reserved	0		
Vehicle Speed High	<=3	1 – 455Km/h	60

Threshold			
Vehicle Speed Low Threshold	<=3	0 – 454Km/h	15
Output ID	1	0 – 2|9 – C	0
Output Status	1	0|1|2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Serial Number	4	0000–FFFF	
Tail Character	1	$	$

- <*Group ID*>: The ID of the CANBUS alarm group. A total of 20 groups are supported.
- <*Mode*>: The CANBUS alarm working mode for each group.
  - 0: Disable the CAN alarm function.
  - 1: Enable the CAN alarm function.
- <*Debounce Time*>: The debounce time for CANBUS alarm trigger event.
- <*CAN Data Mask*>: Bitwise mask to configure the CAN data composition of the **+RESP:GTCLT** report message. (<*CAN Data Mask*> just works in **+RESP:GTCLT** ASCII message.)

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	<*CAN Report Expansion Mask*>	If this bit is set to 1, the parameter <*CAN Report Expansion Mask*> in **AT+GTCLT** is valid. If this bit is set to 0, the parameter <*CAN Report Expansion Mask*> in **AT+GTCLT** is not valid.
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<*Total Distance Impulses*>	Vehicle total distance measured in impulses (if distance from dashboard is not available)
Bit 21	<*Total Vehicle Engine Overspeed Time*>	The total time when the vehicle engine speed is greater than the limit defined in CAN Chipset configuration

Bit 20	*<Total Vehicle Overspeed Time>*	The total time when the vehicle speed is greater than the limit defined in CAN Chipset 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 a 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>*	The pressure applied on acceleration 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 of the engine
Bit 6	*<Engine Coolant Temperature>*	The temperature of the engine coolant
Bit 5	*<Engine RPM>*	Revolutions per minute of the engine
Bit 4	*<Vehicle Speed>*	Vehicle road speed
Bit 3	*<Total Fuel Used>*	The 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

✧ *<CAN Report Expansion Mask>*: Bitwise mask to configure the composition of expanded CANBUS information of the **+RESP:GTCLT** report.

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	*<Engine Torque>*	The engine torque. Unit: percentage.
Bit 22	*<Rapid Accelerations>*	The number of total rapid accelerations since installation (calculation based on CAN Chipset's settings of speed increase time and value)
Bit 21	*<Rapid Brakings>*	The number of total rapid brakings since installation (calculation based on CAN Chipset's settings of speed decrease time and value)
Bit 20	*<Expansion Information>*	A hexadecimal number. Each bit represents information of one indicator.
Bit 19	*<Registration Number>*	The vehicle registration number
Bit 18	*<Tachograph Driver 2 Name>*	The name of tachograph driver 2
Bit 17	*<Tachograph Driver 1 Name>*	The name of tachograph driver 1
Bit 16	*<Tachograph Driver 2 Card Number>*	The card number of tachograph driver 2
Bit 15	*<Tachograph Driver 1 Card Number>*	The card number of tachograph driver 1
Bit 14	*<Total Brake Applications>*	Counts of applying brake pedal (braking process initiated by brake pedal)

Bit 13	<*Total Accelerator Kick-down Time*>	Total time when accelerator pedal is pressed over 90%
Bit 12	<*Total Cruise Control Time*>	Total time when the vehicle speed is controlled by cruise-control module
Bit 11	<*Total Effective Engine Speed Time*>	Total time when the vehicle engine speed is effective
Bit 10	<*Total Accelerator Kick-downs*>	Counts of accelerator pedal kick-downs (with the pedal pressed over 90%)
Bit 9	<*Pedal Braking Factor*>	It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes increase of pedal braking factor.
Bit 8	<*Engine Braking Factor*>	It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with no pedal pressed causes increase of engine braking factor.
Bit 7	<*Analog Input Value*>	Analog input value
Bit 6	<*Tachograph Driving Direction*>	Vehicle driving direction from tachograph
Bit 5	<*Tachograph Vehicle Motion Signal*>	Vehicle motion signal from tachograph
Bit 4	<*Tachograph Overspeed Signal*>	Tachograph overspeed signal for the vehicle
Bit 3	<*Axle Weight 4th*>	Weight of vehicle's fourth axle
Bit 2	<*Axle Weight 3rd*>	Weight of vehicle's third axle
Bit 1	<*Axle Weight 1st*>	Weight of vehicle's first axle
Bit 0	<*Ad-Blue Level*>	The level of Ad-Blue

✧ <*Alarm Mask 1*>: Bitwise setting of the alarm mask. The alarm mask information is based on <*Detailed Information / Indicators*> and <*Expansion Information*> of the **+RESP:GTCAN** message. Please see the following alarm mask table.

Note: In the CAN Chipset firmware versions 2.0.xx and 2.1.xx, this parameter is 16-bit long (Bit 0 – Bit 15), which has been extended to 32 bits since the CAN Chipset version 2.2.0. And HEX format CAN chip does not support Bit 16.

Bit	**Alarm Mask 1**

Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	OLL – oil level low indicator (1 – on, 0 – off or not available)
Bit 27	SC – service call indicator (1 – on, 0 – off or not available)
Bit 26	AIR – airbags indicator (1 – on, 0 – off or not available)
Bit 25	CHK –"check engine" indicator (1 – on, 0 – off or not available)
Bit 24	ESP – ESP failure indicator (1 – on, 0 – off or not available)
Bit 23	ABS – ABS failure indicator (1 – on, 0 – off or not available)
Bit 22	EH – engine hot indicator (1 – on, 0 – off or not available)
Bit 21	OP – oil pressure indicator (1 – on, 0 – off or not available)
Bit 20	BF – brake system failure indicator (1 – on, 0 – off or not available)
Bit 19	BAT– battery indicator (1 – on, 0 – off or not available)
Bit 18	CLL – coolant level low indicator (1 – on, 0 – off or not available)
Bit 17	BFL – brake fluid low indicator (1 – on, 0 – off or not available)
Bit 16	W – webcast (1 – on, 0 – off or not available)
Bit 15	T – trunk (1 – opened, 0 – closed)
Bit 14	D – doors (1 – any door opened, 0 – all doors closed)
Bit 13	FFL – front fog lights (1 – on, 0 – off)
Bit 12	RFL – rear fog lights (1 – on, 0 – off)
Bit 11	HB – high beams (1 – on, 0 – off)
Bit 10	LB – low beams (1 – on, 0 – off)
Bit 9	RL – running lights (1 – on, 0 – off)
Bit 8	R – reverse gear (1 – on, 0 – off)
Bit 7	CL – central lock (1 – locked, 0 – unlocked)
Bit 6	H – handbrake (1 – pulled-up, 0 – released)
Bit 5	C – clutch pedal (1 – pressed; 0 – released)
Bit 4	B – brake pedal (1 – pressed; 0 – released)
Bit 3	CC – cruise control (1 – active, 0 - disabled)
Bit 2	AC – air conditioning (1 – on, 0 - off)

Bit 1	DS – driver seatbelt indicator (1 – indicator on, 0 – off).
Bit 0	FL – fuel low indicator (1 – indicator on, 0 – off).

✧ <*Alarm Mask 2*>: Bitwise setting of the alarm mask. The alarm mask information is based on <*Lights*> and <*Doors*> of the **+RESP:GTCAN** message. Please see the following alarm mask table.

Bit	**Alarm Mask 2**
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Hood (1 – opened, 0 – closed)
Bit 20	Trunk (1 – opened, 0 – closed)
Bit 19	Rear Right Door (1 – opened, 0 – closed)
Bit 18	Rear Left Door (1 – opened, 0 – closed)
Bit 17	Passenger Door (1 – opened, 0 – closed)
Bit 16	Driver Door (1 – opened, 0 – closed)
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved

Bit 6	Reserved
Bit 5	Hazard Lights (1 – on, 0 – off)
Bit 4	Rear Fog Light (1 – on, 0 – off)
Bit 3	Front Fog Light (1 – on, 0 – off)
Bit 2	High Beam (1 – on, 0 – off)
Bit 1	Low Beam (1 – on, 0 – off)
Bit 0	Running Lights (1 – on, 0 – off)

✧ <*Alarm Mask 3*>: Bitwise setting of the alarm mask. The alarm mask information is based on <*Engine RPM*> and <*Vehicle Speed*> of the **+RESP:GTCAN** message. Please see the following alarm mask table.

Bit	**Alarm Mask 3**
Bit 31	Reserved
……	……
Bit 7	Over Vehicle Speed High Threshold Event (1 – Triggered, 0 – not triggered).
Bit 6	Under Vehicle Speed High Threshold Event (1 – Triggered, 0 – not triggered).
Bit 5	Over Vehicle Speed Low Threshold Event (1 – Triggered, 0 – not triggered).
Bit 4	Under Vehicle Speed Low Threshold Event (1 – Triggered, 0 – not triggered).
Bit 3	Over High RPM Event (1 – Triggered, 0 – not triggered).
Bit 2	Under High RPM Event (1 – Triggered, 0 – not triggered).
Bit 1	Over Low RPM Event (1 – Triggered, 0 – not triggered).
Bit 0	Under Low RPM Event (1 – Triggered, 0 – not triggered).

✧ <*High RPM Threshold*>: This is the threshold of the high engine RPM. If the current engine RPM is more than or equal to the value of <*High RPM Threshold*>, it will trigger Over High RPM Event.

✧ <*Low RPM threshold*>: This is the threshold of the low engine RPM. If the current engine RPM is less than <*Low RPM threshold*>, it will trigger Under Low RPM Event.

✧ <*Vehicle Speed High Threshold*>: This parameter is for high threshold of CANBUS speed alarm. If the current CANBUS speed is higher than or equal to the value of <*Vehicle Speed High Threshold*> and last for <*Debounce Time*>, it will trigger Over Vehicle Speed High Threshold Event. On the contrary, if the current CANBUS speed is lower than <*Vehicle Speed High Threshold*> and last for <*Debounce Time*>, it will trigger Under Vehicle Speed High

Threshold Event.

✧ <*Vehicle Speed Low Threshold*>: This parameter is for low threshold of CANBUS speed alarm. If the current CANBUS speed is higher than or equal to the value of <*Vehicle Speed Low Threshold*> and last for <*Debounce Time*>, it will trigger *Over Vehicle Speed Low Threshold Event*. On the contrary, if the current CANBUS speed is lower than <*Vehicle Speed Low Threshold*> and last for <*Debounce Time*>, it will trigger Under Vehicle Speed Low Threshold Event.

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

➢ **+ACK:GTCLT,**

Example: **+ACK:GTCLT,4B0303,867995030082104,,19,00A3,20190415091245,0296$**			
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''-''_'	
Group ID	<=2	0 – 19	0
Serial Number	4	0000–FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000–FFFF	
Tail Character	1	$	$

3.2.8.15. CAN Chipset / THR_100 FOTA Upgrade

The command **AT+GTCFU** is used to upgrade the firmware in CAN Chipset over the air.

➢ **AT+GTCFU=**

Example: **AT+GTCFU=gv300can,0,10,0,,,http://qlinkhf.f3322.org:10028/GV300CAN/deltabin/CL_v2.3.3_sn253472_asc.frm,0,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Retry Times	1	0 – 3	0
Timeout	2	10 – 30min	10
Protocol Type	1	0	0

Reserved	0		
Reserved	0		
Server URL	100	Legal URL	
Update Type	1	0|1|2	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 time 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.
- <*Update Type*>: It specifies the update type in CAN Chipset or THR_100 over the air.
  - 0: Firmware update
  - 1: Configuration update
  - 2: THR_100 update

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

➢ **+ACK:GTCFU,**

Example: **+ACK:GTCFU,4B0303,867995030082104,,FFFF,20190415091334,0297$**			
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	$	$

3.2.8.16. Configuration of DR100 Accessory

The command **AT+GTCDA** is used for setting DR100 accessory.

➢ **AT+GTCDA=**

Example: **AT+GTCDA=gv300can,1,6,FFFFFFFFFFFF,,,2,quec32_,st32,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Read Mode	1	0 – 3	0
Data Block	<=2		6
Key	12	'0' – '9' | 'A' – 'F'	FFFFFFFFFFFF
Reserved	0		
Reserved	0		
Prefix Number	<= 2	0 – 10	
Prefix String <n>	<= 15	ASCII (not including '=' and ',')	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character			

✧ <*Read Mode*>: It configures the mode of DR100 reading card data.
- 0: Do not check prefix string, and output card ID directly.
- 1: Do not check prefix string, and output card memory data directly.
- 2: Check prefix string with card memory data and output card ID.
- 3: Check prefix string with card memory data and output card memory data.

✧ <*Data Block*>: It specifies which block of DR100 memory will be used to save the card key.
Note: The range of blocks for saving card key is 0~62 and block (4n-1) such as block 3, 7, 11 and so on cannot be used to save card key.

✧ <*Key*>: It is used as card key for checking with.

✧ <*Prefix Number*>: It specifies the number of prefix string groups.

✧ <*Prefix String <n>*>: The prefix string is used for card memory data check. If the card memory data does not contain prefix string, the DR100 will not respond to the current card reading

action.

Note: The <*Prefix String <n>*> parameter value cannot contain '=' or ',' character.

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

- **+ACK:GTCDA,**

Example: **+ACK:GTCDA,4B0303,867995030082104,,00A6,20190415091448,029E$**			
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	$	$

3.2.8.17. Transparent THR_100 Transmission

The command **AT+GTTTR** is used to transfer data between the backend server and the terminal that connects with THR_100 via the secondary serial port. Data to the backend server is wrapped into the message **+RESP:GTTTR** and sent to the backend server.

Before using this command, please use the **AT+GTURT** command to set the correct parameters of the secondary serial port first.

- **AT+GTTTR=**

Example: **AT+GTTTR=gv300can,0,0001,1,2,20190712000000,20190712235900,,,FFFF$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Command Type	1	0 – 9	
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		

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

✧ <*Command Type*>: Command type to indicate which message that server delivers to the device.

- 0: DDD file request. Five reserved parameters are used as follows.

Request ID	4	0000 – FFFF	
Report Mode	1	0|1	
Read file type	1	1 – 7	
Start Time	14	YYYYMMDDHHMMSS	
End Time	14	YYYYMMDDHHMMSS	

- 1: Send authorization APDU to the device. Two reserved parameters are used as follows.

Sequence number of APDU	4	0001 – FFFF	
APDU DATA	<=512		

- 2: DDD file request cancel. Cancel the older request.
- 3: Debug mode. Read the state of THR_100. Please do not send this command during the interaction of DDD file.
- 4: To restart TachoReader manually.
- 5: Inquiry Tachograph model.
- 6: Inquiry status of the device.
- 7: Inquiry Tachograph driver 1 id, name and surname.
- 8: Inquiry special status.
- 9: Remote start the long press. After sending it, there will be corresponding effect on the LED.

  Note: Please do not issue the query command when requesting DDD file.

✧ <*Request ID*>: Authorized request's identifier. It is different to set the request each time.

✧ <*Report Mode*>: It indicates how the DDD file is reported to the end user.

- 0: Through the message **+RESP:GTTRD**.
- 1: Through FTP, and the command **AT+GTFTP** should be set.

✧ <*Read file Type*>: The DDD file needs to be read.

- Bit 0: request to read TACHOGRAPH memory.
- Bit 1: request to read driver card in slot 1.

- Bit 2: request to read driver card in slot 2.

✧ <*Start Time*>: Date and time at the beginning of the file to read from Tachograph. The value will transform in Unix Timestamp. If the memory of the Tachograph is not read, the data can be any value. If this parameter is not set, the memory of the Tachograph will be read from the date of the last reading. If this parameter is an invalid value, the memory of the tachograph will be read from the data, when previous read is performed.

✧ <*End Time*>: Date and time at the end of the file to read from Tachograph. The value will transform in Unix Timestamp. If the memory of the Tachograph is not read, the data can be any value. If this parameter is not set or invalid value, the memory of the Tachograph will be read from the current date.

Note: If <*Start Time*> and <*End Time*> are set to the future time, the memory of the Tachograph will be read from the date of the last reading.

✧ <*Sequence Number of APDU*>: The serial number of reply APDU, it should keep the same as that sent from the terminal to server.

✧ <*APDU Data*>: It is the APDU Data for THR_100. The value is in ASCII Hexadecimal Format.

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

➢ **+ACK:GTTTR,**

Example: **+ACK:GTTTR,4B0303,867995030082104,,FFFF,20190415091334,0297$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Command Type	1	0 – 9	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.9. Other Settings

3.2.9.1. Real Time Operation

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

➢ **AT+GTRTO=**

Example: AT+GTRTO=gv300can,1,,0,,,,FFFF$				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Sub Command	1	0 – 0x2B	
3	AT Command | Configuration Mask | Bluetooth Command | ATI Mask | Satellite information Mask | CAN Chipset Operation Mode	3|16-24|3|8|2|1	"SRI"|0000000000000000 – FFFFFFFFFFFFFFFF|"BTI"|00000000 – FFFFFFFF|00 – FF|0-2	
4	Output Direction | Car Model ID	1|1 – 5	0 – 3|1 – 65535	
5	BMS Index (Optional)	1	0 – 9	
6	Reserved	0		
7	Reserved	0		
8	Serial Number	4	0000 – FFFF	
9	Tail Character	1	$	$

✧ <*Sub Command*>: The valid values are listed below.

- 0: ***GNSS***. 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**.
- 3: ***REBOOT***. Reboot the device.
- 4: ***RESET***. Reset all parameters to factory settings and clear all buffered messages. Parameters configured by **AT+GTBSI**, **AT+GTSRI**, **AT+GTCFG**, **AT+GTTMA**, **AT+GTPIN** and **AT+GTBSE** will not be reset.
- 5: ***PWROFF***. Power off the device.
- 6: ***CID***. Get the ICCID of the SIM card which is being used by the device via the message **+RESP:GTCID**.
- 7: ***CSQ***. Get the current GSM 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 the 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 the message **+RESP:GTGSM**.
- D: ***DELBUF***. Delete all the buffered reports.
- E: ***GSV*****.** Request the device to report the GNSS satellites information via the message **+RESP:GTGSV**.
- F: Reserved.
- 10: ***CAN***. Get CAN information via the message **+RESP:GTCAN**. The <*Mode*> of the **AT+GTCAN** command needs to be enabled in advance.
- 11: ***UVN***. Get the version number information of UFSxxx fuel sensor via the message **+RESP:GTUVN**. Only when the working mode of **AT+GTURT** is 4 and the <*Digital Fuel Sensor Type*> is 4 will the **+RESP:GTUVN** report be valid.
- 12: ***CVN***. Get the version number information and serial number of CAN Chipset via the message **+RESP:GTCVN**. It works only when the mode of **AT+GTCAN** is enabled.
- 13: Reserved.
- 14: ***BLE***. Commands for Bluetooth.
- 15: Reserved.
- 16: ***GTS***. Get the device state via the message **+RESP:GTGTS**.
- 1C: ***ATI.*** Get basic device information via the message **+RESP:GTATI**.
- 1D: ***QDA***. Get DR100 accessory information via the message **+RESP:GTQDA**.
- 1E: ***BLE***. Commands for Bluetooth (obsolete later, not recommended).
- 22: ***CAN Chipset Operation***. Set car model to CAN Chipset or read car model from CAN Chipset. It works only when the mode of **AT+GTCAN** is enabled.
- 2B: ***TVN.*** Get the version number information of THR_100 via the message **+RESP:GTTVN**.

✧ <*AT Command / Configuration Mask / Bluetooth Command / ATI Mask / Satellite Information Mask / CAN Chipset Operation Mode*>:

- AT Command: To get a single AT command's configuration when <*Sub Command*> is set to 2, please follow the format in the following example. **Example:** To get the configuration of **AT+GTFRI**, set AT+GTRTO=gv300can,2,FRI,,,,,0015$, and get it via **+RESP:GTALS**.
- Configuration Mask: If <*Sub Command*> is set to 2, configuration information for a specific configuration mask can be obtained via the message **+RESP:GTALC**. The configuration mask must be 16 bytes. If it is less than 16 bytes, '0' should be added to the high bytes of the configuration mask.

  The full Configuration Mask is '5F3A3BFBFFB'.

Configuration Mask Table:

Mask Bit	Item
Bit 89	BID
Bit 71 - Bit 88	Reserved
Bit 70	Reserved
Bit 69	Reserved
Bit 68	BAS

Bit 67	Reserved
Bit 66	Reserved
Bit 65	Reserved
Bit 64	Reserved
Bit 63	Reserved
Bit 62	AVS
Bit 61	VVS
Bit 60	GDO
Bit 59	PEO
Bit 58	BSE
Bit 57	UPC
Bit 56	GAM
Bit 55	BMS
Bit 54	BTS
Bit 53	UDF
Bit 52	CMD
Bit 51	IEX
Bit 50	OEX
Bit 49	Reserved
Bit 48	OWL
Bit 47	CRA
Bit 46	JBS
Bit 45	TMP
Bit 44	CAN
Bit 43	CLT
Bit 42	FSC
Bit 41	Reserved
Bit 40	FFC
Bit 39	RMD
Bit 38	GPJ

Bit 37	SPA
Bit 36	BZA
Bit 35	Reserved
Bit 34	FVR
Bit 33	PDS
Bit 32	ACD
Bit 31	IDA
Bit 30	FTP
Bit 29	SSR
Bit 28	URT
Bit 27	UDT
Bit 26	CMS
Bit 25	HRM
Bit 24	WLT
Bit 23	JDC
Bit 22	SIM
Bit 21	HBM
Bit 20	HMC
Bit 19	IDL
Bit 18	AIS
Bit 17	DOG
Bit 16	OWH
Bit 15	PIN
Bit 14	EFS
Bit 13	SOS
Bit 12	SPD
Bit 11	GEO
Bit 10	FRI
Bit 9	TMZ
Bit 8	IOB

Bit 7	OUT
Bit 6	DIS
Bit 5	EPS
Bit 4	TOW
Bit 3	CFG
Bit 2	Reserved
Bit 1	SRI
Bit 0	BSI

- Bluetooth Command: It specifies the Bluetooth command to be executed when <*Sub Command*> is set to 14.
  "**BTI**": Request the device to report the Bluetooth information and list of paired device via the **+RESP:GTBTI** message.
  "**BSC**": Request the device to report the information of Bluetooth device(s) it has found via the **+RESP:GTBSC** message.
  "**BAU**": Request the device to report all the primary Service UUIDs and Characteristic UUIDs in the peer device defined in the <*BMS Index (Optional)*> via the **+RESP:GTBAU** message.
- 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 1 – **Bit 7**	Reserved for SW
Bit 8	MCU Version
Bit 9	MCU Boot Version
Bit 10 – **Bit 11**	Reserved for MCU
Bit 12	Hardware Version
Bit 13 – **Bit 15**	Reserved for HW
Bit 16	Reserved
Bit 17	Reserved
Bit 18	Flash ID
Bit 19	Sensor ID
Bit 20 – **Bit 31**	Reserved

- Satellite Information Mask: If <*Sub Command*> is set to E, please get the satellite

information message according to the following bitwise mask. The satellite information mask must be 2 bytes. If it is less than 2 bytes, add '0' in the high bytes of the satellite information mask. If this field is reserved, the device will report **+RESP:GTGSV**.

Bit 2	Reserved
Bit 1	**+RESP:GTRSV**
Bit 0	**+RESP:GTGSV**

- CAN Chipset Operation Mode: If the sub command is 22, this parameter will work as follows.

  0: Read the current car model and report it via the message **+RESP:GTCML**.

  1: Set car model. Please use <*Car Model ID*> parameter to set car model.

  2: Start CAN chipset automatic synchronization.

  Note: The entire synchronization takes about 10-30s, and the CAN chipset will restart immediately after the end of the synchronization regardless of the result. If automatic sync is enabled, please wait for the synchronization to finish before reading the current car model. If automatic synchronization has not ended, it will ignore subsequent synchronization command.

✧ <*Output Direction / Car Model ID*>: The <*Output Direction*> 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: Output the message to the backend server.
- 1: Output the message to the USB port.
- 2: Reserved.
- 3: If the command is received via SMS, the message will be output to the original SMS number; otherwise the message will be output to the backend server.

Car Model ID: This parameter will work only when the <*Sub Command*> is 22 and the <*CAN Chipset Operation Mode*> is 1. This parameter is car model ID described in supported car models list.

✧ <*BMS Index*>: Valid value range is 0–9. It indicates the index of connection in **AT+GTBMS**.

Note: The maximum length of the message reported via SMS is 160 bytes.

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

➢ **+ACK:GTRTO,**

Example: **+ACK:GTRTO,4B0303,867995030082104,,RTL,00A7,20190415091527,029F$**			
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 use time of the device with each actuation of ignition on. To use this command, it is necessary to connect the ignition signal to the device or enable virtual ignition detection. When the device sends a **+RESP:GTFRI**, **+RESP:GTIGN** or **+RESP:GTIGF** message, the <*Hour Meter Count*> will be included in the report.

➢ **AT+GTHMC=**

Example: **AT+GTHMC=gv300can,1,12345:12:34,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Hour Meter Enable	1	0|1	0
3	Initial Hour Meter Count	11	00000:00:00 – 99999:00:00	00000:00:00
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Serial Number	4	0000 – FFFF	
13	Tail Character	1	$	$

✧ <*Hour Meter Enable*>: Enable/disable the hour meter count function. If the hour meter

count function is enabled, the hour meter count will be increased when the device detects the vehicle ignition is turned on.

- 0: Disable the hour meter counter function.
- 1: Enable the hour meter counter 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. If 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,4B0303,867995030082104,,00A8,20190415091621,02A3$**			
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	$	$

3.2.9.3. White List

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

➢ **AT+GTWLT=**

Example: **AT+GTWLT=gv300can,5,1,2,13812341234,13912341234,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Call Filter	1	0|1|4|5	0
3	Start Index	<=2	1 – 10	
4	End Index	<=2	1 – 10	
5	Phone Number List	<=20*10		

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

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

- Bit 0: White list for location by call.
- Bit 1: Reserved.
- Bit 2: White list for sending AT commands via SMS.

For each bit, set it to 1 to enable the corresponding mode, and 0 to disable the corresponding mode. If the values of Bit 0, Bit 1 and Bit 2 are all 0, it means "Disable the White List function and allow any phone number to perform the location by call / sending AT commands via SMS function".

✧ <*Start Index*>, <*End Index*>: The index range of the white list to which the phone 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 phone numbers in the white list will be updated by the numbers provided in the parameter <*Phone Number List*>. The <*Start Index*> and <*End Index*> determine the total number of phone numbers that will be updated. If either one is empty, there should 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 numbers will be deleted. For example, to delete the 4th, 5th and 6th numbers of the <*Phone Number List*>, please set <*Start Index*> to 4 and set <*End Index*> to 6 and keep those three phone numbers of <*Phone Number List*> empty.

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

➢ **+ACK:GTWLT,**

Example: **+ACK:GTWLT,4B0303,867995030082104,,00A9,20190415091714,02A4$**			
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 size of the command is not greater than 160 bytes if the command is sent via SMS.

3.2.9.4. 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=gv300can,1,0,AT+GTRTO=gv300can,0,,,,,,FFFF$,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv300can
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*>: The working mode of storing the 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,4B0303,867995030082104,,00CC,20190415091813,02C4$**

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	$	$

3.2.9.5. 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=gv300can,0,1,3FFFFFFFF,1,FFFFF,FFFFF,FFFFFFFF,1,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv300can
2	Mode	1	0 – 2	0
3	Group ID	<=2	0 – 31	
4	Input ID Mask	<=16	0 – FFFFFFFFFFFFFFFF	
5	Debounce Time	<=5	0 – 86400(s)	0
6	Inzizo Mask	<=4	0 – FFFFF	0
7	Outzizo Mask	<=4	0 – FFFFF	0
8	Stocmd ID Mask	<=8	0 – FFFFFFFF	
9	Stocmd ACK	1	0|1	0
10	Inpeo Mask	<=5	00000 – FFFFF	0
11	Outpeo Mask	<=5	00000 – FFFFF	0
12	Reserved			
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 of input events and stored commands to be executed.

- 1: Enable the group of input events and stored commands to be executed.
- 2: Delete the group of input events and stored commands to be executed.

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

✧ <*Input ID Mask*>: 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, and 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**	Attached to the GPRS network
5	**Bit 4**	Not attached to the GPRS network
6	**Bit 5**	Registered on the GSM network
7	**Bit 6**	Not registered on the GSM network
8	**Bit 7**	Network roaming
9	**Bit 8**	Network non-roaming
10	**Bit 9**	SIM card is locked.
11	**Bit 10**	GNSS is on.
12	**Bit 11**	GNSS is off.
13	**Bit 12**	The device is stationary.
14	**Bit 13**	The device is moving.
15	**Bit 14**	Reserved
16	**Bit 15**	Reserved
17	**Bit 16**	Reserved
18	**Bit 17**	Reserved
19	**Bit 18**	Digital input 2 is low.
20	**Bit 19**	Digital input 2 is high.
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**	GNSS external antenna is inserted.
26	**Bit 25**	GNSS external antenna is not inserted.
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 message needs to be sent.
31	**Bit 30**	Driver authorized
32	**Bit 31**	Driver unauthorized
33	**Bit 32**	No change of SIM card
34	**Bit 33**	SIM card change

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

✧ <*Inzizo Mask*>: Bitwise mask to indicate the input event 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
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*>: Bitwise mask to indicate the input event 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 command which will be executed after the state of the group becomes TRUE (i.e. all the input events included in the group happen.).
- <*Stocmd ACK*>: A numeral to indicate whether to return an acknowledgement message after a stored command is executed.
  - 0: Do not send an acknowledgement message when a stored command is executed.
  - 1: Send an acknowledgement message when a stored command is executed.

- <*Inpeo Mask*>: The bitwise mask to indicate 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*>: The bitwise mask to indicate 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
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 the stored commands to be executed in a group is five.

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

➢ **+ACK:GTUDF,**

Example: **+ACK:GTUDF,4B0303,867995030082104,,00F0,20190415091918,02E4$**			
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. MS Band Selection

The command **AT+GTBSE** is used to set MS preferred band.

➢ **AT+GTBSE=**

Example: **AT+GTBSE=gv300can,1,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Preferred Band	2	0 – 12	12
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Preferred Band*>: It is used to set MS preferred band.

- 0: Band 900
- 1: Band 1800
- 2: Band 1900
- 3: Dual Band (900/1800)
- 4: Band 850
- 5: Dual Band (850/1900)
- 6: Dual Band (850/1800)
- 7: Dual Band (900/1900)
- 8: Triple Band (850/900/1800)
- 9: Triple Band (900/1800/1900)
- 10: Triple Band (850/900/1900)
- 11: Triple Band (850/1800/1900)
- 12: Quad Band (850/900/1800/1900)

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

➢ **+ACK:GTBSE,**

Example: **+ACK:GTBSE,4B0303,867995030082104,,00F2,20190415092000,02E6$**			
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	$	$

3.2.9.7. SMS Sending

The command **AT+GTSMS** is used to send SMS text to a target phone number.

➢ **AT+GTSMS=**

Example: **AT+GTSMS=gv300can,,,0,"http://www.queclink.com",13812341234,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Reserved	0		
Reserved	0		
SMS Message Format	1	0	0
SMS Text	<=160		
Target Number	<=20		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*SMS Message Format*>: It defines the format of the SMS content.
- 0: ASCII Format.

✧ <*SMS Text*>: A string including quotes. This string will be sent to the <*Target Number*> via SMS. This field cannot be empty and the parameter value cannot be a string which represents a command of this protocol.

✧ <*Target Number*>: The phone number that the SMS text will be sent to. This field cannot be empty.

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

- **+ACK:GTSMS,**

Example: **+ACK:GTSMS,4B0303,867995030082104,,00F3,20190415092053,02E7$**			
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	$	$

3.2.9.8. Operator List Configuration

The command **AT+GTOWL** is used to configure a white or forbidden list of operators to allow GPRS connection.

- **AT+GTOWL=**

Example: **AT+GTOWL=gv300can,1,1,1,46000,60,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
2	Mode	1	0 – 2	0
3	Start Index	<=3	1 – 100	
4	End Index	<=3	1 – 100	
5	Operator List	<=6*100		
6	TCP Connection Timeout	2	30 – 90(min)	60
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Serial Number	4	0000 – FFFF	

12	Tail Character	1	$	$

- <*Mode*>: The working mode of this function.
  - 0: Disable this function.
  - 1: White list configuration. The parameter <*Operator List*> is white list.
  - 2: Forbidden list configuration. The parameter <*Operator List*> is forbidden list.
- <*Start Index*>: A numeral to indicate the first index of the list operator numbers to be input. For example, if it is **1**, the device will update the list operators from the **1**st one. If it is empty, there should be no list number.
- <*End Index*>: A numeral to indicate the last index of the list operator numbers to be input. For example, if it is **2**, the device will update the list operators until the **2**nd one. If it is empty, there should be no list number.
- <*Operator List*>: A white list of PLMN codes for network operators. The PLMN code comprises of mobile country code (MCC) and mobile network code (MNC), each of which consists of 3 digits. The last digit of MNC can be omitted (e.g. "46001F" or "46001" represents the PLMN of "CHINA UNICOM"). The operators in this list will be considered as in "Home" state. And two adjacent operator codes 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 codes (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.
- <*TCP Connection Timeout*>: The timeout period for the terminal to establish connection to the TCP server.

Note: In order to prevent conflicts, please do not use **AT+GTOWL** command and **AT+GTRMD** command to configure the same operator.

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

- **+ACK:GTOWL,**

Example: **+ACK:GTOWL,4B0303,867995030082104,,00F6,20190415092223,02EA$**			
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	$	$

3.2.9.9. GNSS-Assisted Motion Measurement

The command **AT+GTGAM** is used for assisting in measuring motion with GNSS if the sensor detects stationary state when GNSS is always on.

➢ **AT+GTGAM=**

Example: **AT+GTGAM=gv300can,1,1,25,10,60,60,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
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
GNSS Fix Failure Timeout	<=4	5 – 1800s	60
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 status 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 to be in moving state.

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

✧ <*GNSS Fix Failure Timeout*>: If the time of GNSS fix 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: **+ACK:GTGAM,4B0303,867995030082104,,00F7,20190415092255,02EC$**			
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	$	$

3.2.9.10. Configuration File Version

The command **AT+GTFVR** is used to record information of the configuration file generated by Manage Tool for **AT+GTUPC**.

➢ **AT+GTFVR=**

Example: **AT+GTFVR=gv300can,password,0000,00000000000000000000000000100000,0000000000000000,0000000000000000,0000000000000000,1,0000000000000000,,,,20190415172349,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
2	Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
3	Configuration Version	4	0000 – 9999	
4	Command Mask	<=32	00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
5	GEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
6	Stocmd ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	

7	Group ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
8	Digital Signature	32	'0'-'9' 'a'-'z' 'A'-'Z'	
9	PEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Generation Time	14	YYYYMMDDHHMMSS	
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	$	$

- <*Configuration Name*>: The name of the configuration file.
- <*Configuration Version*>: The version number of the configuration file. The first two characters indicate the major version number, and the last two characters indicate the minor version number.
- <*Command Mask*>: A hex value to indicate which AT command is included in this configuration file. Each bit corresponds to an AT command.

Mask Bit	Item
Bit 0	BSI
Bit 1	SRI
Bit 2	QSS
Bit 3	CFG
Bit 4	DIS
Bit 5	TMA
Bit 6	FRI
Bit 7	GEO
Bit 8	SPD
Bit 9	Reserved
Bit 10	OWH
Bit 11	DOG
Bit 12	WLT
Bit 13	PDS
Bit 14	CMD
Bit 15	UDF

Bit 16	Reserved
Bit 17	Reserved
Bit 18	Reserved
Bit 19	Reserved
Bit 20	FVR
Bit 21	TOW
Bit 22	EPS
Bit 23	IDL
Bit 24	HMC
Bit 25	HBM
Bit 26	HRM
Bit 27	CRA
Bit 28	SSR
Bit 29	Reserved
Bit 30	Reserved
Bit 31	Reserved
Bit 32	OUT
Bit 33	SOS
Bit34	IOB
Bit 35	GPJ
Bit 36	Reserved
Bit 37	FFC
Bit 38	RMD
Bit 39	PEO
Bit 40	JDC
Bit 41	BZA
Bit 42	SPA
Bit 43	JBS
Bit 44	BTS
Bit 45	BMS

⋮	Reserved
Bit 50	VVS
Bit 51	AVS
Bit 52	Reserved
Bit 53	Reserved
Bit 54	PIN
Bit 55	GAM
Bit 56	AIS
Bit 57	Reserved
Bit 58	Reserved
Bit 59	URT
Bit 60	IDA
Bit 61	ACD
Bit 62	EFS
Bit 63	TMP
Bit 64	UDT
Bit 65	FSC
Bit 66	CMS
Bit 67	Reserved
Bit 68	Reserved
Bit 69	CAN
Bit 70	FTP
Bit 71	Reserved
Bit 72	OEX
Bit 73	IEX
Bit 74	BSE
Bit 75	SIM
Bit 76	Reserved
Bit 77	CLT
Bit 78	Reserved

⋮	Reserved
Bit 81	GDO
⋮	Reserved
Bit 102	Reserved
Bit 103	OWL
⋮	Reserved
Bit 122	BAS
⋮	Reserved
Bit 126	BID

✧ <*GEO ID Mask*>: Bitwise mask to indicate the GEO-fence.

ID	Mask Bit	Item
1	**Bit 0**	Indicate the Geo 0
2	**Bit 1**	Indicate the Geo 1
3	**Bit 2**	Indicate the Geo 2
4	**Bit 3**	Indicate the Geo 3
5	**Bit 4**	Indicate the Geo 4
6	**Bit 5**	Indicate the Geo 5
7	**Bit 6**	Indicate the Geo 6
8	**Bit 7**	Indicate the Geo 7
9	**Bit 8**	Indicate the Geo 8
10	**Bit 9**	Indicate the Geo 9
11	**Bit 10**	Indicate the Geo 10
12	**Bit 11**	Indicate the Geo 11
13	**Bit 12**	Indicate the Geo 12
14	**Bit 13**	Indicate the Geo 13
15	**Bit 14**	Indicate the Geo 14
16	**Bit 15**	Indicate the Geo 15
17	**Bit 16**	Indicate the Geo 16
18	**Bit 17**	Indicate the Geo 17
19	**Bit 18**	Indicate the Geo 18
20	**Bit 19**	Indicate the Geo 19
⋮	⋮	Reserved
Reserved	**Bit 63**	Reserved

✧ <*Stocmd ID Mask*>: Please refer to the <*Stored cmd ID*> in the command **AT+GTCMD**.

Bit	Stored cmd ID
Bit 0	1

Bit 1	2
Bit 2	3
Bit 3	4
Bit 4	5
Bit 5	6
Bit 6	7
Bit 7	8
Bit 8	9
Bit 9	10
Bit 10	11
Bit 11	12
Bit 12	13
Bit 13	14
Bit 14	15
Bit 15	16
Bit 16	17
Bit 17	18
Bit 18	19
Bit 19	20
⋮	⋮
Bit 31	31

✧ <*Group ID Mask*>: Please refer to the <*Group ID*> in the command **AT+GTUDF**.

Bit	Group ID
Bit 0	1
Bit 1	2
Bit 2	3
Bit 3	4
Bit 4	5
Bit 5	6
Bit 6	7
Bit 7	8
Bit 8	9
Bit 9	10
Bit 10	11
Bit 11	12
Bit 12	13
Bit 13	14
Bit 14	15
Bit 15	16
Bit 16	17
Bit 17	18

Bit 18	19
Bit 19	20
⋮	⋮
Bit 31	31

✧ <*Digital Signature*>: The parameter is used to confirm the validity of subsequent commands.

✧ <*PEO ID Mask*>: Bitwise mask to indicate PEO fence.

ID	Mask Bit	Item
1	**Bit 0**	Indicate the PEO 0
2	**Bit 1**	Indicate the PEO 1
3	**Bit 2**	Indicate the PEO 2
4	**Bit 3**	Indicate the PEO 3
5	**Bit 4**	Indicate the PEO 4
6	**Bit 5**	Indicate the PEO 5
7	**Bit 6**	Indicate the PEO 6
8	**Bit 7**	Indicate the PEO 7
9	**Bit 8**	Indicate the PEO 8
10	**Bit 9**	Indicate the PEO 9
11	**Bit 10**	Indicate the PEO 10
12	**Bit 11**	Indicate the PEO 11
13	**Bit 12**	Indicate the PEO 12
14	**Bit 13**	Indicate the PEO 13
15	**Bit 14**	Indicate the PEO 14
16	**Bit 15**	Indicate the PEO 15
17	**Bit 16**	Indicate the PEO 16
18	**Bit 17**	Indicate the PEO 17
19	**Bit 18**	Indicate the PEO 18
20	**Bit 19**	Indicate the PEO 19
⋮	⋮	Reserved
Reserved	**Bit 63**	Reserved

✧ <*Generation Time*>: The time when the configuration file is generated.

Note: The **AT+GTFVR** command must be the first command in the configuration file.

3.3. Report

This section defines the formats of the report messages. Due to the size limit of an SMS message (max. 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 the 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 a digital inputs is detected, the device will send the message **+RESP:GTDIS** to the backend server.

- **+RESP:GTIOB,**

If the IO combination is set and the corresponding condition appears, 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 speed of the device 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 a specified 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 or ignition off.

- **+RESP:GTHBM,**

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

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

Example:
+RESP:GTTOW,4B0303,867995030082104,,,00,1,1,0.0,0,33.8,117.129452,31.839348,20190416064818,0460,0000,550B,B969,00,0.0,20190416064819,070A$

+RESP:GTDIS,4B0306,867995030082104,,,21,1,0,0.0,0,106.8,117.129342,31.838523,20190429091709,0460,0000,550B,B969,00,0.0,20190429103648,1283$

+RESP:GTIOB,4B0303,867995030082104,,,01,1,1,0.0,181,71.6,117.129286,31.839147,20190416080038,0460,0000,550B,B969,00,0.0,20190416080040,0807$

+RESP:GTSPD,4B0303,867995030082104,,,00,1,1,0.0,358,4.2,117.129181,31.838515,20190416080347,0460,0000,550B,B969,00,0.0,20190416080348,081A$

+RESP:GTRTL,4B0303,867995030082104,,,00,1,1,0.0,358,4.2,117.129181,31.838515,20190416080712,0460,0000,550B,B969,00,0.0,20190416080714,0832$

+RESP:GTDOG,4B0303,867995030082104,,,01,1,1,0.0,358,4.2,117.129181,31.838515,20190416080858,0460,0000,550B,B969,00,0.0,20190416080900,083F$

+RESP:GTIGL,4B0303,867995030082104,,,00,1,1,0.0,181,71.6,117.129286,31.839147,20190416080042,0460,0000,550B,B969,00,0.0,20190416080043,080A$

+RESP:GTHBM,4B0303,867995030082104,,,05,1,0,0.0,0,47.3,117.129238,31.838810,20190416081110,0460,0000,550B,B969,00,0.0,20190416081112,0851$

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(0-4|9-C)X(0-7)	
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	
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	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:

- The ID of digital input port which triggers the report messages **+RESP:GTDIS** and **+RESP:GTSOS**. The range is 1-2 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 type of <*Ignition Detection Mode*> which indicates the trigger source of the message **+RESP:GTVGL**. The value range is 0 – 4. For other messages, it will always be 0.
- The speed level at which the harsh behavior is detected in the message **+RESP:GTHBM**. The value 3 indicates “high speed”, 2 indicates “medium speed” and 1 indicates “low speed”. If the <*Mode*> is set to 2, the value is always 0 which indicates unknown speed.

For other messages, <*Report ID*> will always be 0.

<*Report Type*> has different meanings in different messages:

- 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 of the predefined speed range.
  1: Inside of 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: Reboot message for input triggered reboot
  4: Reboot message for GSM watchdog

5: Reboot message for GPRS watchdog
6: Reboot message for Report watchdog
7: Reboot message for CAN watchdog

- 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
  5: Unknown harsh behavior
- In the ignition message **+RESP:GTIGL**
  0: Ignition off
  1: Ignition on

For other messages, <*Report Type*> will always be 0.

- <*Number*>: The number of the GNSS position(s) included in the report message. Generally, it is 1.
- <*GNSS Accuracy*>: A numeral to indicate the GNSS fix status and HDOP of the GNSS position. 0 indicates the current GNSS fix fails and the last known GNSS position is used. A non-zero value (1 - 50) indicates the current GNSS fix is successful and represents the HDOP of the current GNSS position.
- <*Speed*>: The current speed. Unit: km/h.
- <*Azimuth*>: The heading 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 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 message **+RESP:GTFRI** to the backend server according to the working mode.

Example:
+RESP:GTFRI,4B0303,867995030082104,,,10,1,1,0.0,0,47.3,117.129238,31.838810,20190416081145,0460,0000,550B,B969,00,0.0,,,,0,210100,,,,20190416081146,0856$

+RESP:GTFRI,4B0303,867995030082104,,,10,2,1,0.0,0,47.3,117.129238,31.838810,20190416081255,0460,0000,550B,B969,00,1,0.0,0,47.3,117.129238,31.838810,20190416081310,0460,0000,550B,B969,00,0.0,,,,0,210100,,,,20190416081311,085F$

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 Voltage	<=5	250 – 32000mV	
Report ID / Report Type	2	X(1-5)X(0-6)	
Number	<=2	1 – 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	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
GNSS Trigger Type	1	0-4	
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input VCC	<=5	0 – 30000 mV	
Reserved	0		
Backup Battery Percentage	<=3	0 – 100	
Device Status	6|10	0000000000 – 0F0FFFFFFF | 000000 –FFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*External Power Voltage*>: The voltage of the external power supply. If the device is configured to report the external power supply voltage periodically with fixed report using the command **AT+GTEPS**, the device will send the current voltage along with the **+RESP:GTFRI** message to the backend server. If the device 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 the following meanings.
  - 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 the following meanings.
  - 0: Normal fixed report
  - 1: Corner report which indicates that the device just turns around a corner
  - 2: FRI report frequency change which indicates that the terminal enters into Geo-Fence or roaming status
  - 3: Corner report when FRI report frequency changes
  - 4: Mileage report when fixed report is mode 5
  - 5: Reserved
  - 6: Mileage report when fixed report is mode 5 and **AT+GTFFC** works

  Note: In the case of multi-position report, the actual report type is determined by the report type of last position.
- <*Number*>: The number of the GNSS position(s) included in the report message. In the message **+RESP:GTFRI**, it may include one or several GNSS positions depending on the settings of <*Send Interval*> and <*Check Interval*>. If there are multiple positions in one **+RESP:GTFRI** report message, the items in the green part of the table above will repeat for each position that is reported.
- <*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 hour meter count function is disabled, this field will be empty.
- <*Backup Battery Percentage*>: The current volume of the backup battery in percentage.
- <*Device Status*>: The state of the device. From left to right, the first two characters indicate EIO100 inputs status, the second two characters indicate EIO100 outputs 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 treated as being towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
- 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
- 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
- 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

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 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 11	Reserved
Bit 10	Digital input 2
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

✧ <*GNSS Trigger Type*>: The trigger type of GNSS point has the following meanings.

- 0: Time point
- 1: Corner point
- 2: Distance point
- 3: Mileage point

- 4: Optimum point (time & mileage)

Note: <*GNSS Trigger Type*> is controlled by <*Report Composition Mask*> in **AT+GTCFG**. If the bit 3 in <*Report Composition Mask*> is unchecked, <*GNSS trigger point*> will be hidden. <*GNSS trigger point*> will also be influenced by **AT+GTOWH** if it is used.

- **+RESP:GTERI,**

If the bit value in <*ERI Mask*> in the **AT+GTFRI** command is set to 1, the device will send the message **+RESP:GTERI** to the backend server instead of **+RESP:GTFRI**.

Example:

/*1wire bus connected with no device*/

+RESP:GTERI,4B0306,867995030009362,,00000002,,10,1,1,0.0,0,40.4,117.129326,31.839245,20190522064211,0460,0000,550B,B969,00,0.0,,,65,210100,,0,20190522064211,04FF$

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

+RESP:GTERI,4B0306,867995030009362,,00000002,,10,1,1,0.0,0,40.4,117.129326,31.839245,20190522064320,0460,0000,550B,B969,00,0.0,,,65,210100,,1,FD0000034129ED28,2,01A2,20190522064321,0520$

/*1wire bus connected with two devices*/

+RESP:GTERI,4B0306,867995030009362,,00000002,,10,1,1,0.0,0,40.4,117.129326,31.839245,20190522064541,0460,0000,550B,B969,00,0.0,,,65,210100,,2,3C00000340FD1128,2,019E,FD0000034129ED28,2,01AC,20190522064542,0541$

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' '-' '_'	
ERI Mask	8	00000000 – FFFFFFFF	
External Power Supply	<=5	0 – 32000 mV	
Report ID / Report Type	2	X(1-5)X(0-6)	
Number	<=2	1 – 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	
MCC		4	0XXX	
MNC		4	0XXX	
LAC		4	XXXX	
Cell ID		4	XXXX	
GNSS Trigger Type		1	0-4	
Mileage		<=9	0.0 – 4294967.0 km	
Hour Meter Count		11	HHHHH:MM:SS	
Analog Input		<=5	0 – 30000 mV	
Backup Battery Percentage		<=3	0 – 100	
Device Status		6|10	0000000000 – 0F0FFFFFFF | 000000 – FFFFFF	
Reserved		1		
Digital Fuel Sensor Data (Optional)		<= 20		
1-Wire Data (Optional)	1-wire Device Number	<= 2	0 – 19	
	1-wire Device ID	16		
	1-wire Device Type	2	00 – FF	
	1-wire Device Data	<= 40		
CAN Data (Optional)		<=1000		
Fuel Sensor Data (Optional)	Sensor Number	<=3	0 – 100	
	Sensor Type	<= 2	0 –6|20 – 21	
	Percentage (Optional)	<= 5	0 – 100.0	
	Volume (Optional)	<= 5	0 – 10000.0	
Bluetooth Accessory Data (Optional)	Bluetooth Accessory Number	<=2	0 – 10	

	Index	1	0 – 9	
	Accessory Type	1	0 – 2|6|7	
	Accessory Model	1	0 - 4	
	Raw Data	<=5		
	Accessory Append Mask	<=4	0 – FFFF	
	Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
	Accessory MAC	12	000000000000 – FFFFFFFFFFFF	
	Accessory Status	1	0 – 1	
	Accessory Battery Level	<=4	0 – 5000	
	Accessory Temperature	<=2	-70 – 255	
	Accessory Humidity	<=2	0 – 100%(rh)	
Send Time		14	YYYYMMDDHHMMSS	
Count Number		4	0000 – FFFF	
Tail Character		1	$	$

- <*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.
- <*1-Wire Device Number*>: The number of devices connected to 1-wire. 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 appear repeatedly to show the information of all connected 1-wire devices. If Bit 1 of <*ERI Mask*> in **AT+GTFRI** is enabled, the information contained in the <*1-wire Device Data*> field will be displayed; otherwise, the <*1-Wire Data*> related information 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
  - 2: iButton sensor.

  Note: The message **+RESP:GTERI** will report iButton information only when the **AT+GTIDA**

function is enabled in the authorized state.

- <*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 corresponding information will be displayed, including the data obtained from CAN chipset.
- <*Bluetooth Accessory Number*>: It indicates the number of accessories connected with the device.
- <*Index*>: The Index of the Bluetooth accessory.
- <*Accessory Type*>: The type of the Bluetooth accessory.
  - 0: No Bluetooth accessory
  - 1: Fuel sensor
  - 2: Beacon temperature sensor
  - 6: Beacon Multi-Functional Sensor
  - 7: Technoton accessory
- <*Accessory Model*>: The model of the Bluetooth accessory.
- <*Raw Data*>: This data read from Bluetooth accessory. It varies depending on <*Accessory Type*> and <*Accessory Model*>.
  - WTS300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate battery voltage, the unit is millivolt. And the 2 lower bytes of the hexadecimal value indicate temperature, the high byte is the integer part and the low byte is the fractional part. Temperature is equal to the low byte divided by 256 plus the high byte, the unit is Celsius. If this value is negative, it is represented in 2's complement format.
  - WTH300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate temperature. And the 2 lower bytes of the hexadecimal value indicate humidity. The high byte is the integer part and the low byte is the fractional part. Temperature is equal to the low byte divided by 256 plus the high byte, and the unit is Celsius. Humidity is equal to the low byte divided by 256 plus the high byte, and the unit is RH.
  - Escort Angle Sensor: It is a four-byte hexadecimal value. The first byte in higher 2-byte of the hexadecimal value is reserved byte, the value is 00. The second byte in higher 2-byte of the hexadecimal value indicate Event Notification of Angle sensor. And the 2 lower bytes of the hexadecimal value indicate Tilt Angle of sensor. The specific definitions are as follows:

Reserved	1	00	00
Event Notification	1	00 – FF	
Tilt Angle	2	0000 – FFFF	

- <*Accessory Name*>: The name of the Bluetooth accessory.
- <*Accessory MAC*>: The MAC address of the Bluetooth accessory.

- ✧ <*Accessory Status*>: It indicates the connection status of Bluetooth accessory.
  - 0: Disconnected.
  - 1: Connected.
- ✧ <*Accessory Battery Level*>: It indicates the remaining level of the battery in Bluetooth accessory.
- ✧ <*Accessory Temperature*>: It indicates the temperature measured by Bluetooth accessory.
- ✧ <*GNSS Trigger Type*>: The trigger type of GNSS point has the following meanings.
  - 0: Time point
  - 1: Corner point
  - 2: Distance point
  - 3: Mileage point
  - 4: Optimum point (time & mileage)

Note: <*GNSS Trigger Type*> is controlled by <*Report Composition Mask*> in **AT+GTCFG**. If the bit 3 in <*Report Composition Mask*> is unchecked, <*GNSS trigger point*> will be hidden. <*GNSS trigger point*> will also be influenced by **AT+GTOWH** if it is used.

Note: The word "Optional" indicates the item that is controlled by the parameter <*ERI Mask*> of the **AT+GTFRI** command.

➢ **+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.

➢ **+RESP:GTAIS,**

If the analog input alarm is enabled by the command **AT+GTAIS**, the device will send the message **+RESP:GTAIS** to the backend server when the analog input voltage enters the alarm range.

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

Example:
+RESP:GTEPS,4B0303,867995030082104,,12376,01,1,1,0.0,291,56.8,117.129157,31.839334,20190415111105,0460,0000,550B,B969,00,0.0,20190415111107,02F4$
+RESP:GTAIS,4B0303,867995030082104,,11,10,1,1,0.0,0,47.3,117.129238,31.838810,20190416084415,0460,0000,550B,B969,00,0.0,20190416084416,0903$

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 / Analog Input VCC	<=5	250 – 32000mV / 0 – 30000 mV	

Report ID / Report Type	2	X(0-1)X(0-1)	
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	
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	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*External Power Voltage*>: The value of the external power voltage. If the voltage of the external input meets the alarm condition as set by the command **AT+GTEPS** or **AT+GTAIS**, the device will send the current external input voltage via **+RESP:GTEPS** or **+RESP:GTAIS** to the backend server.
- <*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 the follow meanings:
  - 0: The ID of analog input port which triggers the report message **+RESP:GTEPS**.
  - 1: The ID of analog input port which triggers the report message **+RESP:GTAIS**.

  <*Report Type*> has the follow meanings:
  - 0: Outside the predefined range.
  - 1: Inside the predefined range.
- <*Number*>: The number of the GNSS position(s) included in the report message. Generally, it is 1.

➢ **+RESP:GTLBC,**

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

Example:
+RESP:GTLBC,4B0303,867995030082104,,18019927387,1,0.0,0,-0.3,117.129246,31.839335,20190416084855,0460,0000,550B,B969,00,0.0,20190416084856,092C$

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	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

➢ **+RESP:GTGEO,**

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

Example:

+RESP:GTGEO,4B0303,867995030082104,,,01,1,1,0.0,0,-0.3,117.129246,31.839335,20190416085354,0460,0000,550B,B969,00,0.0,20190416085354,094A$			
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(0-3)	
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	
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	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: The ID of Geo Fence in HEX format. The range is 0x0 - 0x13.
- Report Type: 0 means “Exit from the Geo-Fence”; 1 means “Enter the Geo-Fence”.

➢ **+RESP:GTGES,**

The device reports **+RESP:GTGES** according to the settings of the parameters <*Trigger Mode*> and <*Trigger Report*> in the **AT+GTGEO** command.

Example:
+RESP:GTGES,4B0306,867995030082104,,,01,21,50,30,1,1,0.0,4,40.8,117.129209,31.838645,20190428071559,0460,0000,550B,B969,00,0.0,20190428071601,0DA2$

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(0-3)	
Trigger Mode	<=3	0|21|22	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
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	
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	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ <*Report Type*>: The current Parking-fence is active or inactive.

- 0: The current Parking-fence is inactive.
- 1: The current Parking-fence is active.

➢ **+RESP:GTIDA,**

If <*Mode*> is set to 1, **+RESP:GTIDA** will be reported as described in <*Mode*>.

If <*Mode*> is set to 0, the device will report **+RESP:GTIDA** without checking the status of ID authorization.

Example:
+RESP:GTIDA,4B0303,867995030082104,,,2AF77376,1,1,0,0.0,0,107.7,117.129430,31.839143,20190416054114,0460,0000,550B,B969,00,0.0,,,,,20190416054116,0633$

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	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	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	

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

✧ <*ID*>: The ID which is currently read.

✧ <*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 been logged out.

➢ **+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 enabled, 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,4B0303,867995030082104,,,,0,01,,,,,1,1,0.0,0,-0.3,117.129246,31.839335,20190416090757,0460,0000,550B,B969,00,0.0,20190416090758,099B$
+RESP:GTGOT,4B0303,867995030082104,,,,0,01,,,,,1,1,0.0,0,-0.3,117.129246,31.839335,20190416091057,0460,0000,550B,B969,00,0.0,20190416091058,09AC$

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	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	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Area Type*>: This message is for polygon or circular area. 0 means “Polygon”.
- <*Area Mask*>: It indicates the report message is for a single polygon or multiple polygons overlapping.
  - Bit 0: for Polygon ID 0.
  - Bit 1: for Polygon ID 1.
  - ...
  - Bit 19: for Polygon ID 19.

  For example, if the Area Mask is 03, it means the overlapping of Polygon ID 0 and Polygon ID 1.

3.3.2. Device Information Report

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

➢ **+RESP:GTINF,**

Example: **+RESP:GTINF,4B0303,867995030082104,,21,898602a21247f6090710,28,0,1,12346,,0.00,0,0,,1,20190416090748,,23,,01,01,+0000,0,20190416090751,0999$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11|12|16|1A|21|22|41|42	
ICCID	20		
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7	
External Power Supply	1	0|1	
External Power Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery Voltage	<=4	0.00 – 4.20 V	
Charging	1	0|1	
LED On	1	0|1	
Reserved	0		
External GNSS Antenna	1	0|1|3	
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Analog Input VCC	<=5	0 – 30000 mV	
Reserved	0		
Digital Input	<=4	0000 – 0F0F	
Digital Output	<=4	0000 – 0F07	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ <*Motion Status*>: The current motion status of the device.
- 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 deemed to be towed.
- 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.
- 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 SIM card.

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

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 – 30	-109 – -53
31	>-51
99	Unknown

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

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

✧ <*Backup Battery Voltage*>: The voltage of the backup battery. The value of this field is only valid when the external power is not connected.

✧ <*Charging*>: Whether the backup battery is charging when the main power supply is connected.
- 0: Not charging
- 1: Charging

✧ <*Backup Battery Switch*>: Battery supply switch status.
- 0: Switch off the backup battery
- 1: Switch on the backup battery

✧ <*External GNSS Antenna*>: The status of the external GNSS antenna.
- 0: The external GNSS antenna of the device is working.
- 1: The external GNSS antenna of the device is detected in open circuit state.
- 3: The external GNSS antenna of the device is in unknown state.

✧ <*Last Fix UTC Time*>: The UTC time of the latest successful GNSS fix.

✧ <*Analog Input VCC*>: The voltage of the analog input.

✧ <*Digital Input*>: A bitwise hex integer to represent the logical 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 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 3	Reserved
Bit 2	Digital input 2
Bit 1	Digital input 1
Bit 0	Ignition detection

✧ <*Digital Output*>: A bitwise hex integer to represent the logical 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 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
Bit 1	Digital output 2
Bit 0	Digital output 1

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

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

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

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 message **+RESP:GTGPS**.

➢ **+RESP:GTGPS,**

Example:

+RESP:GTGPS,4B0303,867995030082104,,,,,003F,,1,20190416091236,20190416091237,09B5$			
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		
Report Composition Mask	4	0000 – FFFF	
Reserved	0		
External GNSS Antenna	1	0|1|3	
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*> in the **AT+GTCFG** command.

3.3.3.2. +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=gv300can,2,FRI,,,,,0015$**.

➢ **+RESP:GTALS,**

Example: **+RESP:GTALS,4B0303,867995030082104,,FRI,1,0,,0,0000,0000,30,30,1000,1000,,0,600,00000002,,,,20190416091332,09BD$**			
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 – 5	0
Discard No Fix	<=2	0|1	1
Reserved	0		
Period Enable	1	0|1	1
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
Check Interval	<=5	0 – 86400sec	0
Send Interval	<=5	1 – 86400sec	30
Distance	<=5	50 – 65535m	1000
Mileage	<=5	50 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0|5 – 86400sec	600
ERI Mask	8	00000000 – FFFFFFFF	00000000
Reserved	0		
Reserved	0		
Wrap Corner Point	1	0|1	0
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

For example, here is the message context about **GEO**, **IDA**, **CMD**, **UDF**, **PEO** and **BID**.

Example:

+RESP:GTALS,4B0501,867995030131778,,1,1,GEO,0,0,,,50,0,0,0,0,0,0,0,0000,0000,0,1,0,,,50,0,0,0,0,0,0,0000,0000,0,2,0,,,50,0,0,0,0,0,0,0,0000,0000,0,3,0,,,50,0,0,0,0,0,0,0,0000,0000,0,4,0,,,50,0,0,0,0,0,0,0,0000,0000,0,5,0,,,50,0,0,0,0,0,0,0,0000,0000,0,6,0,,,50,0,0,0,0,0,0,0,0000,0000,0,7,0,,,50,0,0,0,0,0,0,0,0000,0000,0,8,0,,,50,0,0,0,0,0,0,0,0000,0000,0,9,0,,,50,0,0,0,0,0,0,0,0000,0000,0,10,0,,,50,0,0,0,0,0,0,0,0000,0000,0,11,0,,,50,0,0,0,0,0,0,0,0000,0000,0,12,0,,,50,0,0,0,0,0,0,0,0000,0000,0,13,0,,,50,0,0,0,0,0,0,0,0000,0000,0,14,0,,,50,0,0,0,0,0,0,0,0000,0000,0,15,0,,,50,0,0,0,0,0,0,0,0000,0000,0,16,0,,,50,0,0,0,0,0,0,0,0000,0000,0,17,0,,,50,0,0,0,0,0,0,0,0000,0000,0,18,0,,,50,0,0,0,0,0,0,0,0000,0000,0,19,0,,,50,0,0,0,0,0,0,0,0000,0000,0,2019122401

5339,0018$			
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	<=2	1 - 10	
Current Packet	<=2	1 – 10	
Sub AT Command	3	'a' – 'z' 'A' – 'Z'	
Configurations	< 1500		
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.3. +RESP:GTALM

After the device receives the command **AT+GTRTO** to read all the configurations, it will subpackage the configuration information into several **+RESP:GTALM** messages. The **+RESP:GTALM** message does not support the HEX report.

- **+RESP:GTALM,**

Example:

+RESP:GTALM,4B0306,867995030082104,gv300can,28,1,BSI,cmnet,,,,,,,SRI,3,,1,60.174.225.171,10030,0.0.0.0,0,,0,0,0,0,0,,,,,,CFG,gv300can,gv300can,0,0.0,,,007F,0,,3FEF,,0,1,60,0,1,0,,,0,001F,0,0,,,,TOW,0,10,1,300,0,0,0,0,2,3,2,,,,,,,,,EPS,0,250,250,0,0,0,0,0,0,0,0,0,,DIS,0,1,0,0,1,0,0,0,2,,0,0,0,,,,,,,,,OUT,0,,,,5,5,,IOB,0,000,000,0,0,0,0,0,,,,,1,000,000,0,0,0,0,0,,,,,2,000,000,0,0,0,0,0,,,,,3,000,000,0,0,0,0,0,,,,,TMA,+0000,0,,,,,FRI,0,1,,1,0000,0000,0,30,1000,1000,,0,600,00000000,,,,20190429011108,03BB$

+RESP:GTALM,4B0306,867995030082104,gv300can,28,2,GEO,0,0,,,50,0,0,0,0,0,0,0,0000,0000,0,1,0,,,50,0,0,0,0,0,0,0,0000,0000,0,2,0,,,50,0,0,0,0,0,0,0,0000,0000,0,3,0,,,50,0,0,0,0,0,0,0,0000,0000,0,4,0,,,50,0,0,0,0,0,0,0,0000,0000,0,5,0,,,50,0,0,0,0,0,0,0,0000,0000,0,6,0,,,50,0,0,0,0,0,0,0,0000,0000,0,7,0,,,50,0,0,0,0,0,0,0,0000,0000,0,8,0,,,50,0,0,0,0,0,0,0,0000,0000,0,9,0,,,50,0,0,0,0,0,0,0000,0000,0,10,0,,,50,0,0,0,0,0,0,0,0000,0000,0,11,0,,,50,0,0,0,0,0,0,0,0000,0000,0,12,0,,,50,0,0,0,0,0,0,0,0000,0000,0,13,0,,,50,0,0,0,0,0,0,0,0000,0000,0,14,0,,,50,0,0,0,0,0,0,0,0000,0000,0,15,0,,,50,0,0,0,0,0,0,0,0000,0000,0,16,0,,,50,0,0,0,0,0,0,0,0000,0000,0,17,0,,,50,0,0,0,0,0,0,0,0000,0000,0,18,0,,,50,0,0,0,0,0,0,0,0000,0000,0,19,0,,,50,0,0,0,0,0,0,0,0000,0000,0,20190429011108,03BC$

+RESP:GTALM,4B0306,867995030082104,gv300can,28,3,SPD,0,0,0,60,300,0,0,0,0,,,,,,,,,,SOS,0,0,,0,0,0,0,,,,EFS,,,9999,30,10,,0,10,,0,300,,10,5,PIN,1,,,,,,OWH,0,1F,0900,1200,1300,1800,,,0,

```
0,0,0,0,,,,,DOG,0,60,30,0200,,1,0,,60,60,0,20190429011108,03BD$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,4,AIS,0,1,0,0,0,,0,0,0,0,0,,,,,,,,,,,,,,10,30
,10,20,,0,IDL,0,2,1,0,,,,0,0,0,0,,,,,HMC,0,00000:00:00,,,,,,,,,HBM,0,,,100,0,0,,60,0,0,,,0,0,,0,0,0,0
,30,50,20,65,SIM,0,,,,0,0,0,0,,,,,JDC,0,25,,5,10,10,,0,0,0,0,,WLT,0,,,,,,,,,,,,,,HRM,,,EF,FE5FBF,FE5F
BF,0000FFFD,EF,7D,7BF,7F,,CMS,0,1,5,150,2,0,0003,0,0,0,0,0,0,,,,,UDT,0,,0,0,,00000001,,00087F
FF,,,,,,,URT,0,12,8,1,0,0,0,,,SSR,0,2,1,5,0,,,,FTP,,0,,,,0,0,0,,,,20190429011108,03BE$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,5,IDA,0,1,50,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,30,0,30,,,,0,0,0,0,,,,,20190429011108,03BF$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,6,IDA,0,51,100,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,30,0,30,,,,0,0,0,0,,,,,20190429011108,03C0$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,7,IDA,0,101,150,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,30,0,30,,,,0,0,0,0,,,,,20190429011108,03C1$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,8,IDA,0,151,200,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,30,0,30,,,,0,0,0,0,,,,,20190429011108,03C2$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,9,IDA,0,201,250,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,30,0,30,,,,0,0,0,0,,,,,20190429011108,03C3$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,10,ACD,0,0,0,0,0,0,,,,,PDS,0,0,,,,,,,FVR,,
0000,0000000000000000000,0000000000000000,0000000000000000,0000000000000000,,00
00000000000000,,,,,BZA,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,,,,,,,,,GPJ,1,1,1,,,,,1,1,0,0,,20190429011108,03C4$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,11,RMD,0,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,3FFF
,,,3FFF,,,,,0,0,0,0,,,20190429011108,03C5$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,12,FFC,0,0,0,,,,,,0,30,500,500,300,,0,,,,,
1,0,0,,,,,,0,30,500,500,300,,0,,,,,2,0,0,,,,,,0,30,500,500,300,,0,,,,,3,0,0,,,,,,0,30,500,500,300,,0,,,,,
4,0,0,,,,,,0,30,500,500,300,,0,,,,,FSC,,0,20,0,100,,0,,,,,,,,,,1,20,0,100,,0,,,,,,,,,,2,20,0,100,,0,,,,,,,,,,
3,20,0,100,,0,,,,,,,,,,4,20,0,100,,0,,,,,,,,,20190429011108,03C6$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,13,CLT,0,0,0,000FFFFF,00000000,00000
000,00000000,30,8,001FFFFF,,,,,,,,1,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF
,,,,,,,,2,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,3,0,0,000FFFFF,0000000
0,00000000,00000000,30,8,001FFFFF,,,,,,,,4,0,0,000FFFFF,00000000,00000000,00000000,30,8,0
01FFFFF,,,,,,,,5,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,6,0,0,000FFFFF,
00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,7,0,0,000FFFFF,00000000,00000000,000000
00,30,8,001FFFFF,,,,,,,,8,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,9,0,0,0
00FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,10,0,0,000FFFFF,00000000,0000000
0,00000000,30,8,001FFFFF,,,,,,,,11,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,
,,,,,,12,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,13,0,0,000FFFFF,000000
00,00000000,00000000,30,8,001FFFFF,,,,,,,,14,0,0,000FFFFF,00000000,00000000,00000000,30,
8,001FFFFF,,,,,,,,15,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,16,0,0,000F
FFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,17,0,0,000FFFFF,00000000,00000000,0
0000000,30,8,001FFFFF,,,,,,,,18,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,
,19,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,20190429011108,03C7$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,14,CAN,0,0,0,C03FFFFF,0,7FFFFF,0,,,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,,,2,1
```

0,,,0,0,0,0,,,,,JBS,0,,10,10,1800,1,30,0,0,5,1,0,0,0,CRA,0,5,0,,,,,0,0,0,0,,OWL,0,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,60,,,,,OEX,0,,,,,IEX,,,9,0,A,0,B,0,C,0,,,,,,,20190429
011108,03C8$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,15,CMD,0,0,,,,,,0,1,,,,,,0,2,,,,,,0,3,,,,,,0,4,
,,,,,0,5,,,,,,0,6,,,,,,0,7,,,,,,20190429011108,03C9$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,16,CMD,0,8,,,,,,0,9,,,,,,0,10,,,,,,0,11,,,,,,0
,12,,,,,,0,13,,,,,,0,14,,,,,,0,15,,,,,,20190429011108,03CA$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,17,CMD,0,16,,,,,,0,17,,,,,,0,18,,,,,,0,19,,,,
,,0,20,,,,,,0,21,,,,,,0,22,,,,,,0,23,,,,,,20190429011108,03CB$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,18,CMD,0,24,,,,,,0,25,,,,,,0,26,,,,,,0,27,,,,
,,0,28,,,,,,0,29,,,,,,0,30,,,,,,0,31,,,,,,20190429011108,03CC$
+RESP:GTALM,4B0502,867995030131778,,28,19,UDF,0,0,0000000000000000,0,00000,00000,0
0000000,0,00000,00000,,,0,1,0000000000000070,12,04080,04080,00400802,1,FFFFF,FFF34,,,0,
2,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,3,0000000000000000,0,000
00,00000,00000000,0,00000,00000,,,0,4,0000000000000000,0,00000,00000,00000000,0,0000
0,00000,,,0,5,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,6,00000000000
00000,0,00000,00000,00000000,0,00000,00000,,,0,7,0000000000000000,0,00000,00000,0000
0000,0,00000,00000,,,0,8,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,9,0
000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,10,0000000000000000,0,0000
0,00000,00000000,0,00000,00000,,,0,11,0000000000000000,0,00000,00000,00000000,0,0000
0,00000,,,0,12,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,13,000000000
0000000,0,00000,00000,00000000,0,00000,00000,,,0,14,0000000000000000,0,00000,00000,0
0000000,0,00000,00000,,,0,15,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,
20200107051716,0038$
+RESP:GTALM,4B0502,867995030131778,,28,20,UDF,0,16,0000000000000000,0,00000,00000,
00000000,0,00000,00000,,,0,17,0000000000000000,0,00000,00000,00000000,0,FFFFF,FFF34,,,
0,18,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,19,0000000000000000,0
,00000,00000,00000000,0,00000,00000,,,0,20,0000000000000000,0,00000,00000,00000000,0,
00000,00000,,,0,21,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,22,00000
00000000000,0,00000,00000,00000000,0,00000,00000,,,0,23,0000000000000000,0,00000,000
00,00000000,0,00000,00000,,,0,24,0000000000000000,0,00000,00000,00000000,0,00000,000
00,,,0,25,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,26,00000000000000
00,0,00000,00000,00000000,0,00000,00000,,,0,27,0000000000000000,0,00000,00000,000000
00,0,00000,00000,,,0,28,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,29,0
000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,30,0000000000000000,0,0000
0,00000,00000000,0,00000,00000,,,0,31,0000000000000000,0,00000,00000,00000000,0,0000
0,00000,,,20200107051716,0039$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,21,BTS,0,,GV300CAN_BT,0007,3,0,1D07
,0003,0,123456,,,,,,,,,,,20190429011108,03CF$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,22,BMS,0,0,BT_SENSOR,000000000000
,0003,1,0000,1,0000,0,123456,0,0,,,,,,1,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,12
3456,0,0,,,,,,2,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,3,0,BT_SENS
OR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,4,0,BT_SENSOR,000000000000,0003,1
,0000,1,0000,0,123456,0,0,,,,,,5,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,

0,,,,,,6,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,7,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,8,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,9,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,GAM,1,1,25,10,60,60,,,,,UPC,0,10,0,0,0,,0,00,0,00000000,00000380,3,20190429011108,03D0$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,23,BSE,12,,,,,,,20190429011108,03D1$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,24,PEO,0,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,1,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,2,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,3,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,4,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,20190429011108,03D2$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,25,PEO,5,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,6,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,7,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,8,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,9,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,20190429011108,03D3$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,26,PEO,10,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,11,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,12,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,13,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,14,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,20190429011108,03D4$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,27,PEO,15,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,16,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,17,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,18,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,19,0,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,20190429011108,03D5$
+RESP:GTALM,4B0306,867995030082104,gv300can,28,28,GDO,0,30,1,,,,,,VVS,13500,600,10,,,AVS,20,30,,,,BAS,0,0,0,,FFFFFFFFFFFF,001F,30,,,,,,1,0,0,,FFFFFFFFFFFF,001F,30,,,,,,2,0,0,,FFFFFFFFFFFF,001F,30,,,,,,3,0,0,,FFFFFFFFFFFF,001F,30,,,,,,4,0,0,,FFFFFFFFFFFF,001F,30,,,,,,5,0,0,,FFFFFFFFFFFF,001F,30,,,,,,6,0,0,,FFFFFFFFFFFF,001F,30,,,,,,7,0,0,,FFFFFFFFFFFF,001F,30,,,,,,8,0,0,,FFFFFFFFFFFF,001F,30,,,,,,9,0,0,,FFFFFFFFFFFF,001F,30,,,,,, 20190429011108,03D6$
+RESP:GTALM,4B0500,867995030131778,,32,29,BID,,0,0,1F,2400,,1,60,,0,0,0,0,,,20191120093046,021F$
+RESP:GTALM,4B0500,867995030131778,,32,30,BID,,0,0,1F,2400,,61,120,,0,0,0,0,,,20191120093046,0220$
+RESP:GTALM,4B0500,867995030131778,,32,31,BID,,0,0,1F,2400,,121,180,,0,0,0,0,,,20191120093046,0221$
+RESP:GTALM,4B0500,867995030131778,,32,32,BID,,0,0,1F,2400,,181,240,,0,0,0,0,,,20191120093046,0222$

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	2	37	
Current Packet	<=2	1 – 37	
Configurations	< 1500		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

- <*Total Packets*>: The total number of **+RESP:GTALM**.
- <*Current Packet*>: The sequence number of the current packet.
- <*Configurations*>: The current configuration of the device. The 1st message contains configuration for the commands from **BSI** to **FRI**, the 2nd is for the command **GEO**, the 3rd is for the commands from **SPD** to **DOG**, the 4rd is for the commands from **AIS** to **FTP**, the 5th-9th messages are for the command **IDA**, the 10th is for the commands from **ACD** to **GPJ**, the 11th message is for the command **RMD**, the 12th message is for the commands from **FFC** to **FSC**, the 13th-14th message is for the command **CLT**, the 15th message is for the commands from **CAN** to **IEX**, the 16th-19th messages are for the command **CMD**, the 20th-21th messages are for the command **UDF**, the 22th message is for the commands from **BTS** to **BSE**, the 23th-26th messages are for the command **PEO**, the 27th message is for the commands from **GDO** to **DAS**, the 28th-37th messages are for the command **BID**.

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

3.3.3.4. +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 GPRS even if the report mode is forced SMS mode. The **+RESP:GTALC** message does not support the HEX report.

- **+RESP:GTALC,**

Example:
+RESP:GTALC,4B0303,867995030082104,,3FFFB,1,1,BSI,cmnet,daniel,daniel,,,,,SRI,3,,1,60.174.225.171,10030,0.0.0.0,0,,0,0,0,0,0,,,,,,CFG,gv300can,gv300can,0,0.0,,,003F,1,,3FEF,,0,1,300,1,1,0,,,0,000F,0,0,,,,TOW,1,5,1,30,0,0,0,0,2,3,2,,,,,,,,EPS,1,11000,13000,1,0,0,0,0,0,1,0,0,,DIS,0,1,0,0,1,1,0,1,2,1,0,1,,,,,,,,OUT,0,,,,,,,IOB,0,001,000,1,1,1,0,0,,,,,1,000,000,0,0,0,0,0,,,,,2,000,000,0,0,0,0,0,,,,,3,000,000,0,0,0,0,0,,,,,TMA,+0000,0,,,,,FRI,1,0,,0,0000,0000,30,30,1000,1000,,0,6000,00000002,,,,GEO,0,0,117.129245,31.839335,2000,10,0,0,0,0,21,1,0000,0000,0,1,0,,,50,0,0,0,0,0,0,0,0,0,0000,0000,0,2,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,3,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,4,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,5,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,6,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,7,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,8,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,9,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,10,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,11,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,12,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,13,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,14,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,15,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,16,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,17,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,18,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,19,0,,,50,0,0,0,0,0,0,0,0,0000,0000,0,SPD,2,10,20,60,30,0,0,0,0,,,,,,,,,,,SOS,1,1,,1,1,0,0,,,,,EFS,,,9999,30,10,,0,10,,0,300,,10,5,PIN,1,,,,,,OWH,0,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,,DOG,1,60,1,0810,,1,0,,60,60,,20190416092209,0A0

```
8$
+RESP:GTALC,4B0303,867995030082104,,7FFC0000,1,2,AIS,2,0,500,1000,1,,1,1,0,0,1,,,,,,,,,,,,,,,
10,30,10,20,,0,IDL,0,2,1,0,,,,0,0,0,0,,,,,HMC,0,00000:00:00,,,,,,,,,HBM,2,,,100,0,0,,60,0,0,,,0,0,,
0,0,0,0,30,50,20,65,SIM,0,,,,0,0,0,0,,,,,JDC,0,25,,5,10,10,,0,0,0,0,,WLT,0,,,,,,,,,,,,,,,HRM,,,EF,FE5
FBF,FE5FBF,0000FFFD,EF,7D,7BF,7F,,CMS,0,1,5,150,2,0,0003,0,0,0,0,0,0,,,,,UDT,0,,0,0,,0000000
1,,00087FFF,,,,,,,URT,3,7,8,1,0,2,0,4,,,SSR,0,2,1,5,0,,,,FTP,,0,,,,0,0,0,,,,20190416092209,0A09$
+RESP:GTALC,4B0303,867995030082104,,80000000,1,3,IDA,2,1,50,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,30,3,15,,,,1,1,0,0,,,,,20190416092209,0A0A$
+RESP:GTALC,4B0303,867995030082104,,80000000,1,4,IDA,2,51,100,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,30,3,15,,,,1,1,0,0,,,,,20190416092209,0A0B$
+RESP:GTALC,4B0303,867995030082104,,80000000,1,5,IDA,2,101,150,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,30,3,15,,,,1,1,0,0,,,,,20190416092209,0A0C$
+RESP:GTALC,4B0303,867995030082104,,80000000,1,6,IDA,2,151,200,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,30,3,15,,,,1,1,0,0,,,,,20190416092209,0A0D$
+RESP:GTALC,4B0303,867995030082104,,80000000,1,7,IDA,2,201,250,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,30,3,15,,,,1,1,0,0,,,,,20190416092209,0A0E$
+RESP:GTALC,4B0303,867995030082104,,7F700000000,1,8,ACD,0,0,0,0,0,0,,,,,PDS,0,0,,,,,,,FVR
,,0000,00000000000000000000,0000000000000000,0000000000000000,0000000000000000,,
0000000000000000,,,,,BZA,0,,,,0,0,0,,,0,0,0,,,0,0,0,,,0,0,0,,,,,,,,,SPA,0,50,,60,0,,,70,,60,0,,,90,,6
0,0,,,110,,60,0,,,,,,,,,GPJ,0,15,3,,,,,0,0,0,0,,RMD,0,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,3FFF,,,3FFF,,,,,0,0,0,
0,,,FFC,0,0,0,,,,,,0,30,500,500,300,,0,,,,,1,0,0,,,,,,0,30,500,500,300,,0,,,,,2,0,0,,,,,,0,30,500,500,3
00,,0,,,,,3,0,0,,,,,,0,30,500,500,300,,0,,,,,4,0,0,,,,,,0,30,500,500,300,,0,,,,,FSC,,0,20,0,100,,0,,,,,,
,,,1,20,0,100,,0,,,,,,,,,,2,20,0,100,,0,,,,,,,,,,3,20,0,100,,0,,,,,,,,,,4,20,0,100,,0,,,,,,,,,201904160922
09,0A0F$
+RESP:GTALC,4B0303,867995030082104,,200000000000000,1,9,CLT,0,0,0,000FFFFF,00000000,
00000000,00000000,30,8,001FFFFF,,,,,,,,1,0,0,000FFFFF,00000000,00000000,00000000,30,8,0
01FFFFF,,,,,,,,2,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,3,0,0,000FFFFF,
00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,4,0,0,000FFFFF,00000000,00000000,00000
000,30,8,001FFFFF,,,,,,,,5,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,6,0,0
,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,7,0,0,000FFFFF,00000000,000000
00,00000000,30,8,001FFFFF,,,,,,,,8,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,
,,,,,,,9,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,10,0,0,000FFFFF,000000
00,00000000,00000000,30,8,001FFFFF,,,,,,,,11,0,0,000FFFFF,00000000,00000000,00000000,30
,8,001FFFFF,,,,,,,,12,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,13,0,0,000
FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,14,0,0,000FFFFF,00000000,00000000,
00000000,30,8,001FFFFF,,,,,,,,15,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,
,,,,16,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,17,0,0,000FFFFF,000000
00,00000000,00000000,30,8,001FFFFF,,,,,,,,18,0,0,000FFFFF,00000000,00000000,00000000,30
,8,001FFFFF,,,,,,,,19,0,0,000FFFFF,00000000,00000000,00000000,30,8,001FFFFF,,,,,,,,20190416
092209,0A10$
+RESP:GTALC,4B0303,867995030082104,,DF00000000000,1,10,CAN,1,60,60,C03FFFFF,0,7FFFF
F,0,,,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,,,,,JBS,0,,10,10,1800,1,30,0,0,5,1,0,0,0,CRA,0,5,0,,,,,0,0,0,0,,OWL,0,,,,,,,,,,
```

,,,60,,,,,OEX,0,,,,,IEX,,,9,0,A,0,B,0,C,0,,,,,,
,20190416092209,0A11$
+RESP:GTALC,4B0303,867995030082104,,100000000000000,1,11,CMD,0,0,,,,,,0,1,,,,,,0,2,,,,,,0,3
,,,,,,0,4,,,,,,0,5,,,,,,0,6,,,,,,0,7,,,,,,20190416092209,0A12$
+RESP:GTALC,4B0303,867995030082104,,100000000000000,1,12,CMD,0,8,,,,,,0,9,,,,,,0,10,,,,,,0,
11,,,,,,0,12,,,,,,0,13,,,,,,0,14,,,,,,0,15,,,,,,20190416092209,0A13$
+RESP:GTALC,4B0303,867995030082104,,100000000000000,1,13,CMD,0,16,,,,,,0,17,,,,,,0,18,,,,,
,0,19,,,,,,0,20,,,,,,0,21,,,,,,0,22,,,,,,0,23,,,,,,20190416092209,0A14$
+RESP:GTALC,4B0303,867995030082104,,100000000000000,1,14,CMD,0,24,,,,,,0,25,,,,,,0,26,,,,,
,0,27,,,,,,0,28,,,,,,0,29,,,,,,0,30,,,,,,0,31,,,,,,20190416092209,0A15$
+RESP:GTALC,4B0303,867995030082104,,200000000000000,1,15,UDF,0,0,0000000000000000,
0,00000,00000,00000000,0,00000,00000,,,0,1,0000000000000070,12,04080,04080,00400802,
1,FFFFF,FFF34,,,0,2,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,3,000000
0000000000,0,00000,00000,00000000,0,00000,00000,,,0,4,0000000000000000,0,00000,0000
0,00000000,0,00000,00000,,,0,5,0000000000000000,0,00000,00000,00000000,0,00000,00000
,,,0,6,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,7,0000000000000000,0
,00000,00000,00000000,0,00000,00000,,,0,8,0000000000000000,0,00000,00000,00000000,0,
00000,00000,,,0,9,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,10,000000
0000000000,0,00000,00000,00000000,0,00000,00000,,,0,11,0000000000000000,0,00000,000
00,00000000,0,00000,00000,,,0,12,0000000000000000,0,00000,00000,00000000,0,00000,000
00,,,0,13,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,14,0000000000000
000,0,00000,00000,00000000,0,00000,00000,,,0,15,0000000000000000,0,00000,00000,00000
000,0,00000,00000,,,20200107051716,0A16$
+RESP:GTALC,4B0303,867995030082104,,200000000000000,1,16,UDF,0,16,0000000000000000
,0,00000,00000,00000000,0,00000,00000,,,0,17,0000000000000000,0,00000,00000,00000000
,0,FFFFF,FFF34,,,0,18,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,19,0000
000000000000,0,00000,00000,00000000,0,00000,00000,,,0,20,0000000000000000,0,00000,0
0000,00000000,0,00000,00000,,,0,21,0000000000000000,0,00000,00000,00000000,0,00000,0
0000,,,0,22,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,23,00000000000
00000,0,00000,00000,00000000,0,00000,00000,,,0,24,0000000000000000,0,00000,00000,000
00000,0,00000,00000,,,0,25,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,
26,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,27,0000000000000000,0,
00000,00000,00000000,0,00000,00000,,,0,28,0000000000000000,0,00000,00000,00000000,0,
00000,00000,,,0,29,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,30,00000
00000000000,0,00000,00000,00000000,0,00000,00000,,,0,31,0000000000000000,0,00000,00
000,00000000,0,00000,00000,,,20200107051716,0A17$
+RESP:GTALC,4B0303,867995030082104,,7C0000000000000,1,17,BTS,0,,GV300CAN_BT,0007,
3,0,1D07,0003,0,123456,,,,,,,,,,,,BMS,0,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,12
3456,0,0,,,,,,1,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,2,0,BT_SENS
OR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,3,0,BT_SENSOR,000000000000,0003,
1,0000,1,0000,0,123456,0,0,,,,,,4,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,
0,0,,,,,,5,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,6,0,BT_SENSOR,0
00000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,7,0,BT_SENSOR,000000000000,0003,1,000
0,1,0000,0,123456,0,0,,,,,,8,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,

```
,9,0,BT_SENSOR,000000000000,0003,1,0000,1,0000,0,123456,0,0,,,,,,GAM,1,1,25,10,60,60,,,,,
UPC,0,10,0,0,0,,0,00,0,00000000,00000380,3,BSE,12,,,,,,,20190416092209,0A18$
+RESP:GTALC,4B0303,867995030082104,,107800000000000000,0,18,PEO,0,3,1,3,116.129246,
30.839335,117.129246,30.839335,116.129246,31.839335,,,,,,,,,,,,,10,0,0,0,0,,,,,1,0,0,0,,,,,,,,,,
,,,,,,,,,0,0,0,0,0,,,,,2,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,3,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,4,0,0,0,,,,,,,,,
,,,,,,,,,,,0,0,0,0,0,,,,,5,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,6,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,7,0,0,0,,,,,,,
,,,,,,,,,,,,,0,0,0,0,0,,,,,8,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,9,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,10,0,0,0,,,
,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,11,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,12,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,13,0,
0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,14,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,15,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,
16,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,17,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,18,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0
,0,,,,,19,0,0,0,,,,,,,,,,,,,,,,,,,,0,0,0,0,0,,,,,GDO,0,30,1,,,,,,VVS,13500,600,10,,,AVS,20,30,,,,BAS,0,0
,0,,FFFFFFFFFFFF,001F,30,,,,,,1,0,0,,FFFFFFFFFFFF,001F,30,,,,,,2,0,0,,FFFFFFFFFFFF,001F,30,,,,,,3,
0,0,,FFFFFFFFFFFF,001F,30,,,,,,4,0,0,,FFFFFFFFFFFF,001F,30,,,,,,5,0,0,,FFFFFFFFFFFF,001F,30,,,,,,6
,0,0,,FFFFFFFFFFFF,001F,30,,,,,,7,0,0,,FFFFFFFFFFFF,001F,30,,,,,,8,0,0,,FFFFFFFFFFFF,001F,30,,,,,,
9,0,0,,FFFFFFFFFFFF,001F,30,,,,,,BID,,0,0,1F,2400,,1,60,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0,
0,0,0,,,BID,,0,0,1F,2400,,61,120,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0,0,0,0,,,BID,,0,0,1F,240
0,,121,180,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0,0,0,0,,,,0,0,1F,2400,,181,240,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0,0,0,0,,,20191120093046 0A19$
```

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	<=23	0000000000000000 – FFFFFFFFFFFFFFF	
Next Packet	1	0|1	
Current Packet	<=2	1 – 29	
BSI	3	BSI	BSI
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SRI	3	SRI	SRI

Report Mode	1	0 – 7	
Reserved	0		
Buffer Mode	1	0|1|2	
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	
SACK Enable	1	0|1	
Protocol Format	1	0|1	0
SMS ACK Enable	1	0|1	0
Connection Retry Pattern	1	0 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ODO Enable	1	0|1	
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Power Saving Mode	1	0 – 2	
Reserved			
Event Mask	4	0000 – FFFF	

Reserved	0		
LED On	1	0|1	
Info Report Enable	1	0|1	
Info Report Interval	<=5	30 – 86400sec	
Location by Call	1	0|1|2	
Backup Battery Switch	1	0|1	
Backup Battery Charge Mode	1	0|1	
Reserved	0		
Reserved	0		
AGPS Mode	1	0|1	
Cell Info Report	4	0000 – FFFF	
GNSS Lost Time	2	0 – 30min	
GNSS Working Mode	1	0 – 4	0
Feature Switch Mask	4	0000 – FFFF	0000
Reserved	0		
Reserved	0		
TOW	3	TOW	TOW
Tow Enable	1	0|1	
Engine Off to Tow	<=2	5 – 15min	
Fake Tow Delay	<=2	0 – 10min	
Tow Interval	<=5	30 – 86400sec	
Tow Output ID	1	0 – 2|9 – C	
Tow Output Status	1	0-2	
Tow Output Duration	<=3	0 – 255(×100ms)	
Tow Output Toggle Times	<=3	0 – 255	
Rest Duration	<=3	1 – 255(×15sec)	
Motion Duration	<=2	1 – 10(×100ms)	
Motion Threshold	1	2 – 4	
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0|1|2	
Min. Threshold	<=5	250 – 28000 mV	
Max. Threshold	<=5	250 – 28000 mV	
Sample Period	<=2	0|1 – 12(×2s)	
Debounce Time	1	0 – 5(×1s)	
Output ID	1	0 – 2|9 – C	
Output Status	1	0-2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Sync with FRI	1	0|1	
Voltage Margin Error	<=3	0 – 100(×10mv)	0
Debounce Voltage Threshold	<=3	0 – 100 (×100mv)	0
Reserved	0		
DIS	3	DIS	DIS
Ignition Detection	1	0	0
Sample Period	<=2	0|1 – 12(×2s)	
MPF Debounce Time	<=2	0|1 – 12(×2s)	0
No Ignition	1	0|1	0
Input ID 1	1	1	1
Enable	1	0|1	
Debounce Time	<=2	0 – 20(×10ms)	
Validity Time	<=2	0|1 – 12(×2s)	0
Input ID 2	1	2	2

Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=2	0|1 – 12(×2s)	
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		
Reserved	0		
Reserved	0		
Overspeed Restrict Output	2	0|1-60km/h	0
Debounce Time	3	5-120s	5
Reserved	0		
IOB	3	IOB	IOB
IOB ID0	1	0	0
Input Mask	<=4	0 – F07	
Trigger Mask	<=4	0 – F07	
Input Sample Period	<=2	0|1 – 12(×2s)	
Output ID	1	0 – 2|9 – C	
Output Status	1	0-2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
IOB ID1	1	1	1
Input Mask	1	0 – 7	
Trigger Mask	1	0 – 7	
Input Sample Period	<=2	0|1 – 12(×2s)	
Output ID	1	0 – 2|9 – C	
Output Status	1	0-2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID2	1	2	2
Input Mask	1	0 – 7	
Trigger Mask	1	0 – 7	
Input Sample Period	<=2	0|1 – 12(×2s)	
Output ID	1	0 – 2|9 – C	
Output Status	1	0-2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved			
IOB ID3	1	3	3
Input Mask	1	0 – 7	
Trigger Mask	1	0 – 7	
Input Sample Period	<=2	0|1 – 12(×2s)	

Output ID	1	0 – 2|9 – C	
Output Status	1	0-2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TMZ	3	TMZ	TMZ
Time Zone	5	–|+HHMM	
Daylight Saving	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 4	
Discard No Fix	<=2	0|1	
Reserved	0		
Period Enable	1	0|1	
Begin Time	4	HHMM	
End Time	4	HHMM	
Check Interval	<=5	0 – 86400sec	
Send Interval	<=5	1 – 86400sec	
Distance	<=5	300 – 65535m	
Mileage	<=5	300 – 65535m	
Reserved	0		
Corner Report	<=3	0 – 180	
IGF Report Interval	<=5	0|5 – 86400sec	
ERI Mask	8	00000000 – FFFFFFFF	00000000

Reserved	0		
Reserved	0		
Wrap Corner Point	1	0|1	0
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	
Longitude	<=11	-180 – 180	
Latitude	<=10	-90 – 90	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Output ID	1	0 – 2|9 – C	
Output Status	1	0-2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
State Mode	1	0|1	0
GEO ID1	1	1	1
Mode	1	0 – 3	
Longitude	<=11	-180 – 180	
Latitude	<=10	-90 – 90	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Output ID	1	0 – 2|9 – C	
Output Status	1	0 - 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0|21|22	0

Trigger Report	1	0|1	0
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
State Mode	1	0|1	0
GEO ID2	1	2	2
Mode	1	0 – 3	
Longitude	<=11	-180 – 180	
Latitude	<=10	-90 – 90	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
State Mode	1	0|1	0
GEO ID3	1	3	3
Mode	1	0 – 3	
Longitude	<=11	-180 – 180	
Latitude	<=10	-90 – 90	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0|21|22	0

Trigger Report	1	0|1	0
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
State Mode	1	0|1	0
GEO ID4	1	4	4
Mode	1	0 – 3	
Longitude	<=11	-180 – 180	
Latitude	<=10	-90 – 90	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
State Mode	1	0|1	0
…	…	…	
GEO ID19	2	19	19
Mode	1	0 – 3	0
Longitude	<=11	-180 – 180	
Latitude	<=10	-90 – 90	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	

Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
State Mode	1	0|1	0
SPD	3	SPD	SPD
Mode	1	0|1|2	
Min. Speed	<=3	0 – 400km/h	
Max. Speed	<=3	0 – 400km/h	
Validity	<=4	0 – 3600sec	
Send Interval	<=4	30 – 3600sec	
Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 4	
Digital Input ID	1	0 – 2|9 – C	
SOS Number	<=20		

Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	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
Reserved	0		
Unsolicited Enable Ex	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	<=2	30 – 1800s	300
Reserved	0		
IGN Sample Count	<=2	3 – 30	10
Ex Fuel Loss Alarm IGN	<=3	0 – 100 %	5
PIN	3	PIN	PIN
Enable Auto-unlock PIN	1	0|1	
PIN	1	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
OWH	3	OWH	OWH
Mode	1	0|1|2|3	
Day of Work	<=2	0 – 7F	
Working Hours Start1	4	HHMM	
Working Hours End1	4	HHMM	
Working Hours Start2	4	HHMM	
Working Hours End2	4	HHMM	
Reserved	0		
Reserved	0		
Digital Input ID	1	0 – 2|9 – C	
Digital Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0|1|2	
Ignition Frequency	<=3	10 – 120min	
Interval	<=2	1 – 30	
Time	4	HHMM	
Reserved	0		
Report Before Reboot	1	0|1	
Input ID	1	0 – 2	
Reserved	0		
GSM Interval	4	0|5-1440 min	60
PDP Interval	4	0|5-1440 min	60

Fail Interval	4	0|5-1440 min	0
No CAN Interval	4	0|5 – 1440 min	60
AIS	3	AIS	AIS
Mode	1	0|1|2|3|4|5	0
Range Switch	1	0|1	1
Min. Threshold	<=5	0 – 30000 mV	
Max. Threshold	<=5	0 – 30000 mV	
Sample Rate	<=2	0|1 – 12(×2s)	0
Reserved	0		
Output ID	1	0 – 2|9 – C	
Output Active	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Fuel Data Debounce	2	0 – 150	10
Fuel Sensor Delay	<=3	0 – 600 sec	30

Fuel Loss Alarm	<=2	0 – 50	10
Fuel Sensor Sample Count	<=3	0 – 150	20
Reserved	0		
IDL	3	IDL	IDL
Mode	1	0|1	
Time to Idling	2	1 – 30 min	
Time to Movement	1	1 – 5 min	
Debounce Distance	<=4	0|100-9999m	
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Hour Meter Enable	1	0|1	
Initial Hour Meter Count	11	00000:00:00-99999:00:00	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

HBM	3	HBM	HBM
HBM Enable	1	0|1|2|3|4	
Reserved	0		
Discard Unknown Event	1	0|1	0
High Speed	<=3	100 – 400km/h	
ΔVhb	<=3	0 – 100km/h	
ΔVha	<=3	0 – 100km/h	
Reserved	0		
Medium Speed	<=3	100 – 400km/h	
ΔVmb	<=3	0 – 100km/h	
ΔVma	<=3	0 – 100km/h	
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100km/h	
ΔVla	<=3	0 – 100km/h	
Reserved	0		
Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Cornering and Braking Threshold	<=3	30 – 70	
Cornering and Braking Duration	<=3	40 – 100(*8ms)	
Acceleration Threshold	<=3	15 – 50	
Acceleration Duration	<=3	50 – 250(*8ms)	
SIM	3	SIM	SIM
Mode	1	0|1|2	0
ICCID	20		
Reserved	0		
Reserved	0		

Output ID	1	0 – 2|9 – C	0
Output Status	1	0 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
JDC	3	JDC	JDC
Mode	1	0|1	0
Signal Threshold	<=2	0 – 31	25
Reserved	0		
Jamming Cell Number Threshold	<=2	0 – 99	5
Enter Jamming Timer Threshold	<=3	0 – 300 sec	10
Quit Jamming Timer Threshold	<=4	0 – 3600sec	10
Reserved	0		
Output ID	1	0 – 2|9 – C	
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
WLT	3	WLT	WLT
Call Filter	1	0|1|4|5	0
Start Index	<=2	1 – 10	
End Index	<=2	1 – 10	
Phone Number List	<=20*10		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
HRM	3	HRM	HRM
Reserved	0		
Reserved	0		
ACK Mask	2	00 – FF	EF
Response Mask	<=8	00000000 – FFFFFFFF	FE5FBF
Event Mask	<=8	00000000 – FFFFFFFF	FE5FBF
Information Mask	8	00000000 – FFFFFFFF	FF7D
HBD Mask	2	0000 – FFFF	EF
CRD Mask	2	0000-FFFF	7D
CAN Mask	8	00000000 – FFFFFFFF	7FF
Reserved	0		
Reserved	0		
CMS	3	CMS	CMS
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 – 2	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 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	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	00000000 – FFFFFFFF	1
Reserved	0		
Report Composition Mask	8	00000000 – FFFFFFFF	00087FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
URT	3	URT	URT
Working Mode	1	0 – 9|17|24	0
Baudrate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 4	0
Sleep Enable	1	0|1|2|3	0
Input ID of Wakeup	0	0|1	0
Reserved (Optional)	0		
Reserved (Optional)	0		
SSR	3	SSR	SSR
Mode	1	0|1	0
Time to Stop	2	1 – 30 min	2

Time to Start	1	1 – 5 min	1
Start Speed	2	1 – 10 Km/h	5
Long Stop	3	0 – 255 min	0
Reserved	0		
Reserved	0		
Reserved	0		
FTP	3	FTP	FTP
Server Address	<=60		
Server Port	<=5	0 – 65535	0
Full Name	<=60		
User Name	<=20		
Login Password	<=20		
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		
IDA	3	IDA	IDA
Mode	1	0|1|2	0
Start Index	1	1	1
End Index	1	50	50
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0 – 3600sec	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 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
RFID Report Mode	1	0 – 1	0
Reserved	0		
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Mode	1	0|1|2	0
Start Index	1	51	51
End Index	1	100	100
ID Number List	<=8*20	'0' – '9', 'a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0 – 3600sec	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 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
RFID Report Mode	1	0 – 1	0
Reserved	0		
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Mode	1	0|1|2	0
Start Index	1	101	101
End Index	1	150	150

ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0 – 3600sec	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 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
RFID Report Mode	1	0 – 1	0
Reserved	0		
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Mode	1	0|1|2	0
Start Index	1	151	151
End Index	1	200	200
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0 – 3600sec	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 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

RFID Report Mode	1	0 – 1	0
Reserved	0		
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Mode	1	0|1|2	0
Start Index	1	201	201
End Index	1	250	250
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0 – 3600sec	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 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
RFID Report Mode	1	0 – 1	0
Reserved	0		
Reserved	0		
Reserved	0		
ACD	3	ACD	ACD
iButton Timer	<=2	0|1 – 10(s)	0
Output ID	1	0 – 2	0
Output Status	1	0 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle	<=3	0 – 255	0
Temperature Timer	<=3	0|10– 255(s)	0

Reserved			
Reserved			
Reserved			
Reserved			
PDS	3	PDS	PDS
Mode	1	0|1|2	0
Mask	4	0000 – FFFF	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FVR	3	FVR	FVR
Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
Configuration Version	4	0000 – 9999	
Command Mask	32	00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
GEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Stocmd ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Group ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Digital Signature	32	'0'-9' 'a'-'z' 'A'-'Z'	
PEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		

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

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

Reserved	0		
Reserved	0		
Reserved	0		
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 – 2|9 – C	0
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	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		
Reserved	0		
Roaming Operator List	<=6*100		
Reserved	0		
Reserved	0		
Black List Operator	<=6*20		
Reserved	0		

Reserved	0		
Known Roaming Event Mask	<=6	000000 – FFFFFF	3FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	<=6	000000 – FFFFFF	3FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2|9 – C	0
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
FFC	3	FFC	FFC
Priority	1	0	0
Mode	1	0 – 3	0
FRI Mode	1	0 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI Check Interval	<=5	0 – 86400sec	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	5 – 86400s	300
Reserved	0		

Corner Report	<=3	0 – 180	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
…	…	…	…
Priority	1	4	4
Mode	1	0 – 3	0
FRI Mode	1	0 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI Check Interval	<=5	0 – 86400sec	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	5 – 86400s	300
Reserved	0		
Corner Report	<=3	0 – 180	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FSC	3	FSC	FSC
Reserved			
Reserved			
Reserved			
Enable	1	0|1	0

Reserved			
Reserved			
Num of Node	<= 2	0|2 – 11	0
Node 1 Value	< = 5	0 – 99999	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	< = 4	0 – 99999	
Node N Percentage	<= 2	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
CLT	3	CLT	CLT
Group ID	<=2	0 – 19	
Mode	1	0|1	0
Debounce Time	<=3	0 – 255(×1s)	0
CAN Data Mask	8	0 – FFFFFFFF	000FFFFF
Alarm Mask 1	<=8	0 – FFFFFFFF	0
Alarm Mask 2	<=8	0 – FFFFFFFF	0
Alarm Mask 3	<=8	0 – FFFFFFFF	0
High RPM Threshold	<=3	1 – 100(x100 rpm)	30
Low RPM Threshold	<=3	0 – 99(x100 rpm)	8
CAN Report Expansion Mask	8	0 – FFFFFFFF	001FFFFF
Reserved	0		
Vehicle Speed High Threshold	<=3	0 – 455Km/h	60
Vehicle Speed Low	<=3	0 – 455Km/h	15

Threshold			
Output ID	1	0 – 2|9 – C	0
Output Status	1	0|1|2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
CAN	3	CAN	CAN
Mode	1	0|1	1
CAN Report Interval	<=5	0|5 – 86400sec	0
CAN Report Interval IGF	<=5	0|5 – 86400sec	0
CAN Report Mask	<=8	0 – FFFFFFFF	C03FFFFF
Additional Event	1	0|1	0
CAN Report Expansion Mask	8	0 – FFFFFFFF	007FFFFF
GNSS Assisted Mode	1	0|1	0
Electric Report Mask	4	0 – FFFF	003F
Reserved	0		
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		
Validity	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 2|9 – C	0

Output Status	1	0 – 2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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
Enable Siren	1	0|1	1
Release Fuel Cut-off Timer (T5)	4	0 – 1000 (min)	0
Check Jamming in T3	1	0|1	0
Waiting Release Fuel Timer (T6)	5	0 – 65535 (sec)	0
CRA	3	CRA	CRA
Mode	1	0|1	0
Sensitivity	1	1 – 9	5
Report ACC	1	0|1	0
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Output ID	1	0 – 2|9 – C	0
Output Status	1	0 – 2	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
OWL	3	OWL	OWL
Mode	1	0 – 2	
Operator List 1	6		
…..			
Operator List 100	6		
TCP Connection Timeout	2	30 – 90(min)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OEX	3	OEX	OEX
DOS Report	1	0 – F	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IEX	3	IEX	IEX
Reserved	0		
Reserved	0		
Input Number	1	1 – 4	
Input ID	1	9 – C	
Sample Period	<=2	0|1 – 12(×4s)	0
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
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	00000 – FFFFF	0
Outpeo Mask	5	00000 – FFFFF	0
Reserved			
Reserved			
BTS	3	BTS	BTS
Mode	1	0|1	0
Reserved	0		
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	GV300CAN_BT

Bluetooth Service	<=2	00-FF	07
Discoverable Mode	1	0 – 3	3
Discoverable Time	<=4	0|1 –1440 min	0
Bluetooth Report Mask	<=4	0000 – FFFF	1D07
Bluetooth Event Mask	<=4	0000 – FFFF	0003
Pin Need	1	0|1	0
Pin Code	4|6	0000-9999|000000-999999	123456
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BMS	3	BMS	BMS
Index	1	0 – 9	
Mode	1	0|1	
Peripheral Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	BT_SENSOR
Peripheral MAC Address	12	000000000000 - FFFFFFFFFFFF	
Data Mask	4	0000 – 0003	0003
Service UUID Type	1	1|2	1
Service UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	

Characteristic UUID Type	1	1|2	1
Characteristic UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Pin Need	1	0|1	0
Pin Code	4|6	'0' – '9'	123456
Data Format	1	0|1	0
Send Interval	<=5	0|1 – 86400(×5s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GAM	3	GAM	GAM
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5 – 50km/h	10
Motion Cumulative Time	<=3	10 – 100s	10
Motionless Cumulative Time	<=3	10 – 250s	60
GNSS Fix Failure Timeout	<=4	5 – 1800s	60
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	
Identifier Number	8	00000000 – FFFFFFFF	
Reserved	0		
Update Status Mask	1	0 – F	3
BSE	3	BSE	BSE
Preferred Band	2	0 – 12	12
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
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 – 2	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
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		
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
Rest Validity	<=3	1 – 255 sec	20
Movement Validity	<=3	1 – 255 sec	30
Reserved	0		
Reserved	0		
Reserved	0		
BAS	3	BAS	BAS
Index	1	0 – 9	
Accessory Type	1	0 – 2|6|7	0
Accessory Model	1	0 – 4	0
Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC	12	000000000000 –	FFFFFFFFFFFF

		FFFFFFFFFFFF	
Accessory Append Mask	<=4	0 – FFFF	0F
Read Interval	<=5	10 – 86400sec	30
Low Voltage Threshold	<=4	0 – 5000mV	2400
Reserved			
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved			
Output ID	1	0 – 2|9 – C	0
Output Status	1	0|1|2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved			
Reserved			
BID	3	BID	BID
Index	1	0 – 1	0
Enable	1	0|1	
Beacon ID Model	1	0 – 9	0
Accessory Append Mask	<=4	0 – FFFF	0A
Low Voltage Threshold	<=4	0 – 5000mV	2400
Reserved	0		
Start Index	<=3	1 – 300	
End Index	<=3	1 – 300	
MAC List	<=12*60		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		

Reserved (Optional)	0		
Reserved (Optional)	0		
Organization Unique Identifier	6	000000 – FFFFFF	
Output ID	1	0 – 2|9 – C	0
Output Status	1	0|1|2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
BID	3	BID	BID
Index	1	0 – 1	1
Enable	1	0|1	
Beacon ID Model	1	0 – 9	0
Accessory Append Mask	<=4	0 – FFFF	0A
Low Voltage Threshold	<=4	0 – 5000mV	2400
Reserved	0		
Start Index	<=3	1 – 300	
End Index	<=3	1 – 300	
MAC List	<=12*60		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Organization Unique Identifier	6	000000 – FFFFFF	
Output ID	1	0 – 2|9 – C	0
Output Status	1	0|1|2	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

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

✧ <*Next Packet*>: Whether the following information packet is the last one or not.
- 0: The following packet is the last information packet.
- 1: The following packet is not the last information packet.

✧ <*Current Packet*>: It indicates the first of several data packets if <*Next Packet*> is set to 1. The default is 1 if the <*Next Packet*> is set to 0.

3.3.3.5. +RESP:GTCID

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

➢ **+RESP:GTCID,**

Example: **+RESP:GTCID,4B0303,867995030082104,,898602a21247f6090710,20190416092451,0A2B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ICCID	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.6. +RESP:GTCSQ

After the device receives the command **AT+GTRTO** to read the GSM signal level, it will send the message **+RESP:GTCSQ**.

➢ **+RESP:GTCSQ,**

Example:

+RESP:GTCSQ,4B0303,867995030082104,,28,0,20190416092642,0A35$			
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	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*CSQ RSSI*>: It indicates the signal strength level.

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 – 30	-109 – -53
31	>-51
99	Unknown

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

3.3.3.7. +RESP:GTVER

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

➢ **+RESP:GTVER,**

Example: **+RESP:GTVER,4B0303,867995030082104,,GV300CAN,0317,0102,20190416092714,0A3A$**			
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	

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**.

3.3.3.8. +RESP:GTBAT

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

- ➢ **+RESP:GTBAT,**

Example: **+RESP:GTBAT,4B0303,867995030082104,,1,12376,,0.00,0,0,20190416092735,0A3D$**			
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 Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery Voltage	<=4	0.00 – 4.20 V	
Charging	1	0|1	
LED On	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.9. +RESP:GTIOS

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

- **+RESP:GTIOS,**

Example: **+RESP:GTIOS,4B0303,867995030082104,,,23,,01,01,20190416092756,0A42$**			
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		
Analog Input VCC	<=5	0 – 30000 mV	
Reserved	0		
Digital Input Status	4	0000 – 0F07	
Digital Output Status	4	0000 – 0F03	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.10. +RESP:GTTMZ

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

- **+RESP:GTTMZ,**

Example: **+RESP:GTTMZ,4B0303,867995030082104,,+0000,0,20190416092827,0A46$**			
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	$	$

3.3.3.11. +RESP:GTGTS

After the device receives the command **AT+GTRTO** to get the device's network registration status information, it will send the message **+RESP:GTGTS**. This report does not support the HEX format.

Example: **+RESP:GTGTS,4B0303,867995030082104,,1,1,2|2,27|0,0|0,,,20190416093016,0A54$**			
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' '-' '_'	
GSM State	1	0 – 5	
GPRS State	1	0 – 5	
Send State / PDP State	2	0 – 5|0 – 3	
CSQ RSSI / BER	<=4	0 – 31 or 99|0 – 7	
Message Queued Number / Message Buffered Number	<=6	0 – 10|0 – 10000	
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*GSM State*>: The current state of GSM network.

- 0: Not registered, not searching for a new operator
- 1: Registered
- 2: Not registered, searching for a new operator
- 3: Registering
- 4: Unknown

- 5: Registered, roaming

✧ <*GPRS State*>: The current state of GPRS network.

- 0: No registered, not searching for a new operator
- 1: Registered
- 2: Not registered, searching for a new operator
- 3: Registering
- 4: Unknown
- 5: Registered, roaming

✧ <*Send State / PDP State*>: The item before the symbol '/' is <*Send State*>, and the item after the symbol '/' is <*PDP State*>.

<*Send State*>: The state of sending data.

- 0: Initial state
- 1: No service
- 2: Idle state
- 3: Activating GPRS
- 4: Establishing TCP or UDP connection
- 5: Sending data to the backend server
- 6: Reset

<*PDP State*>: The state of PDP context activation.

- 0: The PDP context is deactivated.
- 1: The PDP context is being activated.
- 2: The PDP context is activated.
- 3: The PDP context is being deactivated.

✧ <*CSQ RSSI / CSQ BER*>: The item before the symbol '/' is <*CSQ RSSI*>, and the item after the symbol '/' is <*CSQ BER*>.

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

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 – 30	-109 – -53
31	>-51
99	Unknown

<*CSQ BER*>: The quality of the GSM signal. The range is 0-7.

✧ <*Message Queued Number / Message Buffered Number*>: The item before the symbol '|' is <*Message Queued Number*>, and the item after the symbol '|' is <*Message Buffered Number*>. <*Message Queued Number*> represents the number of messages in the queue to be sent. <*Message Buffered Number*> represents the number of messages to be buffered.

3.3.3.12. +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,4B0201,869158008709145,,2,02,B,,,,,20150323013012,2153$**			
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 software version of the UFSxxx fuel sensor.
✧ <*Sensor HW Version*>: The hardware version of the UFSxxx fuel sensor.

3.3.3.13. +RESP:GTCVN

After the device receives the command **AT+GTRTO** to get the version number of the CAN Chipset, it will send the message **+RESP:GTCVN**.

➢ **+RESP:GTCVN,**

Example: **+RESP:GTCVN,4B0201,867995030082104,,2.3.2b,613024,,,,20190412014442,001A$**			
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' '-' '_'	
CAN Chipset SW Version	<=7	'0' – '9' 'a' – 'z'	
CAN Chipset Serial Number	<=10	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*CAN Chipset SW Version*>: The SW version of the CAN Chipset device.
- ✧ <*CAN Chipset Serial Number*>: The Serial Number of the CAN Chipset device.

3.3.3.14. +RESP:GTDAV

After the device receives the command **AT+GTRTO** to get the version number of the Driveraid device, it will send the message **+RESP:GTDAV**.

- ➢ **+RESP:GTDAV,**

Example: +RESP:GTDAV,4B0302,867995030009974,,DS02_18001_v37_3.0.5_181130_beta,,,,20190326075656,0E1F$			
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' '-' '_'	
Driveraid Version	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ <*Driveraid Version*>: The firmware version of the Driveraid device.

3.3.3.15. +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**.

➢ **+RESP:GTGSV,**

Example: +RESP:GTGSV,4B0303,867995030082104,,6,3,43,16,25,22,11,25,39,29,40,31,40,20190417011932,000E$			
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 – 24	
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 count of satellites found by GNSS.
✧ <*SV ID*>: The satellite ID.
✧ <*SV Power*>: Satellite power. In case of no satellite, fill the field with zero.

3.3.3.16. +RESP:GTRSV

After the device receives the command **AT+GTRTO** to get the satellite information, it will send the satellite information via the message **+RESP:GTRSV**.

➢ **+RESP:GTRSV,**

Example: **+RESP:GTRSV,4B0303,867995030082104,,6,3,43,16,25,22,11,25,39,29,40,31,40,20190417011932,000E$**			
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 – 24	
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 count of satellites found by GLONASS.
✧ <*SV ID*>: The satellite ID.
✧ <*SV Power*>: Satellite power. In case of no satellite, fill the field with zero.

3.3.3.17. +RESP:GTATI

After the device receives the command **AT+GTRTO** to get the basic device information, it will send the information to the backend server via the message **+RESP:GTATI.**

➢ **+RESP:GTATI,**

Example: **+RESP:GTATI,4B0303,867995030082104,,000C1301,0317,0102,0101,0102,EF6018,FA,20190417012005,0010$**			
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' – 'z'	
Firmware Version	4	'0' – '9' 'a' – 'z'	
Hardware Version	4	'0' – '9' 'a' – 'z'	
MCU Version	4	'0' – '9' 'a' – 'z'	
MCU Boot Version	4	'0' – '9' 'a' – 'z'	
Flash ID	6	'0' – '9' 'a' – 'z'	
Sensor ID	2	'0' – '9' 'a' – 'z'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*ATI Mask*>: This mask is set by the **AT+GTRTO** command and used to control parameter fields in the **+RESP:GTATI** message.
- <*Firmware Version*>: The firmware version. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.
- <*Hardware Version*>: The hardware version. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.
- <*MCU Version*>: The MCU software version. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.
- <*MCU Boot Version*>: The MCU Boot software version. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.
- <*Flash ID*>: It indicates the flash type used for the device.
- <*Sensor ID*>: It indicates the sensor type used for the device.

3.3.3.18. +RESP:GTQDA

After the device receives the command **AT+GTRTO** to get the DR100 accessory information, it will send the information to the backend server via the message **+RESP:GTQDA**.

- **+RESP:GTQDA,**

Example:
+RESP:GTQDA,4B0305,867995030082104,gv300can,0,6,FFFFFFFFFFFF,,,0,,,,,20190420032349,3F21$

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' '-' '_'	
DR100 Read Mode	1	0 – 3	
Data Block	<=2		
Key	12	'0' – '9' | 'A' – 'F'	
Reserved	0		
Reserved	0		
Prefix Number	<= 2	0 – 10	
Prefix String <n>	<= 15	ASCII (not include '=' and ',')	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.19. +RESP:GTBTI

After the device receives the command **AT+GTRTO** to get the Bluetooth peripheral information and the list of connected peripherals, it will send the information to the backend server via the **+RESP:GTBTI** message.

➢ **+RESP:GTBTI,**

Example: **+RESP:GTBTI,4B0305,867995030082104,gv300can,GV300CAN_BT,78054100BDD0,0,0,,,,,,,,,20190420033201,3F71$**			
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' '-' '_'	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth Mac Address	12	000000000000 – FFFFFFFFFFFF	
Bluetooth State	1	0|1	
Connected Device Number	2	0-11	
Connected Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Connected Device Mac	12	000000000000 – FFFFFFFFFFFF	
Role	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Bluetooth State*>: The connection status of the Bluetooth when the device role is slave.
  - 0: The Bluetooth is not connected.
  - 1: The Bluetooth is connected.
- <*Connected Device number*>: The number of the peripheral device connected.
- <*Connected Device Name*>: The name of the peripheral device connected.
- <*Connected Device Mac*>: The Mac address of the peripheral device connected.
- <*Role*>: The role type of the peripheral device.
  - 0: Master
  - 1: Slave

Note: The <*Connected Device Name*> will be empty if the device is slave.

3.3.3.20. +RESP:GTBSC

The device reports the information of nearby Bluetooth devices via the **+RESP:GTBSC** message.

➢ **+RESP:GTBSC,**

Example:
+RESP:GTBSC,4B0306,867995030096625,gv300can,GV300CAN_BT,78054100CE22,0,10,,0,3414309212B9,-83,0,L,1,EF877A21E452,-64,0,,0,D96F309212B9,-68,0,L,1,88A4BF36237B,-43,0,,0,E49F3F9212B9,-69,0,□□□□,1,B339808571D9,-82,0,GV56_BTSUSAN,1,78054100B359,-87,0,L,1,B94C585C5E43,-72,0,L,0,3AA01B6A3B12,-93,0,GV56_BTSUSAN,1,78054100B3DA,-91,0,,,,,,,,20190429105339,000B$

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' '-' '_'	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth Mac Address	12	000000000000 – FFFFFFFFFFFF	
Bluetooth State	1	0|1	
Nearby Device Number	2	0-30	
Nearby Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Nearby Mac Address Type	1	0|1	
Nearby Device Mac	12	000000000000 – FFFFFFFFFFFF	
Nearby Device RSSI	<=4	-120 - 0	
Nearby Device Status	1	0|1|2	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

- <*Bluetooth State*>: The connection status of the Bluetooth when the device role is slave.
  - 0: The Bluetooth is not connected.
  - 1: The Bluetooth is connected.
- <*Nearby Device Number*>: The number of the peripheral devices which the GV300CAN Bluetooth has found nearby.
- <*Nearby Device Name*>: The name of the nearby Bluetooth device which is found.
- <*Nearby Mac Address Type*>: The address type of the peripheral device.
  - 0: Public Device Address or Public Identity Address
  - 1: Random Device Address or Random (static) Identity
- <*Nearby Device Mac*>: The Mac address of the nearby Bluetooth device which is found.
- <*Nearby Device Status*>: The pairing status of the nearby Bluetooth device which is found.
  - 0: Unpaired device.
  - 1: The nearby device is paired.
  - 2: The device is paired and connected.
- <*Nearby Device RSSI*>: The received signal strength of nearby Bluetooth device.

3.3.3.21. +RESP:GTBAU

The device reports the Service UUIDs and Characteristic UUIDs of the Bluetooth peripherals connected to it via the **+RESP:GTBAU** message.

- **+RESP:GTBAU,**

Example: **+RESP:GTBAU,4B0302,867995030020278,gv300can,GV300CAN_BT,1,0,,,,,,,,20190125095851,0F88$**			
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' '-' '_'	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth Mac Address	12	000000000000 – FFFFFFFFFFFF	

Bluetooth State	1	0|1	
Peer Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Peer Device Mac	12	000000000000 – FFFFFFFFFFFF	
Peer Device State	1	0|1	
Service UUID Number	<=2	0-30	
Service UUID Type	1	1|2	
Service UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Characteristic UUID Number	<=2	0-30	
Characteristic UUID Type	1	1|2	
Characteristic UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Characteristic Properties	<=2	00-FF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Service UUID Number*>: The number of the Services which GV300CAN Bluetooth has found.

- ✧ <*Characteristic UUID Number*>: The number of Characteristic UUIDs in one Service which the GV300CAN Bluetooth has found.
- ✧ <*Characteristic Properties*>: It indicates how the Characteristic Value can be used, or how the characteristic descriptors can be accessed. The Characteristic Properties bit field is briefly described as follows:
  - Bit 0 (0x01): CHAR_PROP_BROADCAST (Broadcast)
  - Bit 1 (0x02): CHAR_PROP_READ (Read)
  - Bit 2 (0x04): CHAR_PROP_WRITE_WITHOUT_RESP (Write w/o resp)
  - Bit 3 (0x08): CHAR_PROP_WRITE (Write)
  - Bit 4 (0x10): CHAR_PROP_NOTIFY (Notify)
  - Bit 5 (0x20): CHAR_PROP_INDICATE (Indicate)
  - Bit 6 (0x40): CHAR_PROP_SIGNED_WRITE (Authenticated Signed Writes)
  - Bit 7 (0x80): CHAR_PROP_EXT (Extended Properties)

  For details, please see Section 3.3.1.1 Characteristic Properties in Bluetooth Specification PDF Core v4.1, Vol. 3, Part G.

3.3.3.22. +RESP:GTCML

After the device receives the command **AT+GTRTO** to get the car model ID of the CAN Chipset, it will send the information to the backend server via the message **+RESP:GTCML**.

- ➢ **+RESP:GTCML,**

Example: **+RESP:GTCML,4B0305,867995030009362,,0,,,,,20190420033539,0129$**			
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' '-' '_'	
Car Model ID	<=5	C' | 'S' | 0-65535	
Car Name	<=50	'0' – '9' 'a' – 'z'	
Car Syn Status	1	1-4	
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Car Model ID*>: The car model ID of the CAN Chipset device. If the value is 0, it means that no model has been obtained.
- ✧ <*Car Name*>: Car Name is human readable make and model of the car. If no model has been obtained or CAN Chipset has been synchronized, the value would be default.
- ✧ <*Car Syn Status*>: The car synchronization status.
  - 1: The synchronization is successful.
  - 2: The device is not properly connected to CAN-bus.
  - 3: The car is not supported by the firmware version of CAN Chipset.
  - 4: CAN Chipset is not responding.

3.3.3.23. +RESP:GTTVN

After the device receives the command **AT+GTRTO** to get the version number of the THR_100, it will send the information to the backend server via the message **+RESP: GTTVN**.

➢ **+RESP:GTTVN,**

Example: **+RESP:GTTVN,4B0401,867995030090222,gv300can,1.1.66,1.6,,,,,20190713133220,01FF$**			
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' '-' '_'	
THR_100 SW Version	<=7	'0' – '9' 'a' – 'z'	
THR_100 HW Version	<=7	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*THR_100 SW Version*>: The SW version of the THR_100 device.
- ✧ <*THR_100 HW Version*>: The HW version of the THR_100 device.

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 (reported 4 times before power off)

+RESP:GTSTT: Device motion status reported when the motion status changes

+RESP:GTANT: External GNSS antenna status reported when the state changes

+RESP:GTPDP: GPRS connection establishment report

+RESP:GTIGN: Ignition on report

+RESP:GTIGF: Ignition off report

+RESP:GTIDN: Enter into idling status

+RESP:GTIDF: Leave idling status

+RESP:GTJDR: Jamming indication when <*Mode*> in the **AT+GTJDC** command is set to 1

+RESP:GTJDS: Jamming indication when <*Mode*> in the **AT+GTJDC** command is set to 2

+RESP:GTGSM: The report for the information of the serving cell and the neighbor cells

+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:GTDOS: Status of wave shape 1 output changes

+RESP:GTTMP: Temperature alarm

+RESP:GTGPJ: GNSS jamming status report

+RESP:GTFLA: Unusual fuel consumption alarm

+RESP:GTCAN: CANBUS device information report

+RESP:GTCLT: CANBUS information alarm

+RESP:GTRMD: The report for entering or leaving GSM roaming state

+RESP:GTCFU: The report message sent to the backend server during the upgrade process

+RESP:GTMOA: Mobileye System Alert report (only ASCII format supported)

+RESP:GTPHL: Reporting location information before reporting photo data

+RESP:GTFTP: Reporting location information after transferring a file to FTP server

+RESP:GTBCS: The report for Bluetooth connection.

+RESP:GTBDS: The report for Bluetooth disconnection.

+RESP:GTUPC: The report for over-the-air configuration update

+RESP:GTVGN: Virtual ignition on report

+RESP:GTVGF: Virtual ignition off report

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

included.

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

Example:
+RESP:GTPNA,4B0303,867995030009362,gv300can,20190412061840,006A$
+RESP:GTPFA,4B0303,867995030016318,,20190403071105,0025$
+RESP:GTPDP,4B0303,867995030009362,,20190412031317,000C$

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,4B0305,867995030082104,,0,0.0,352,32.9,117.129384,31.839468,20190420034215,0460,0000,550B,B969,00,20190420034222,3FD2$
+RESP:GTMPF,4B0305,867995030082104,,0,0.0,352,32.9,117.129384,31.839468,20190420034210,0460,0000,550B,B969,00,20190420034212,3FCD$
+RESP:GTBTC,4B0305,867995030082104,,0,0.0,352,32.9,117.129384,31.839468,20190420034215,0460,0000,550B,B969,00,20190420034224,3FD3$
+RESP:GTCRA,4B0306,867995030082104,,0,2.8,177,93.4,117.129487,31.839284,20190428013842,0460,0000,550B,B969,00,20190428013843,0942$

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	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

If the <*Mode*> in the **AT+GTJDC** command is set to 1, the device will report the **+RESP:GTJDR** message when jamming is detected.

- **+RESP:GTJDR,**

Example:
+RESP:GTJDR,4B0305,867995030082104,gv300can,0,0.1,352,80.8,117.129371,31.839298,20190422030857,0460,0000,550B,B969,00,20190422032826,8540$

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	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

If <*Mode*> in the **AT+GTJDC** command is set to 2, the device will report the **+RESP:GTJDS** message when jamming is detected.

- **+RESP:GTJDS,**

Example: **+RESP:GTJDS,4B0305,867995030082104,gv300can,1,0,0.1,352,80.8,117.129371,31.839298,20190422030857,0460,0000,550B,B969,00,20190422034258,854F$**			
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	
GNSS Accuracy	1	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	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.

If the GSM roaming state of the device changes, the current roaming state will be reported in the **+RESP:GTRMD** message.

➢ **+RESP:GTRMD,**

Example:
+RESP:GTRMD,4B0305,867995030082104,gv300can,1,0,0.1,352,80.8,117.129371,31.839298,20190422030857,0460,0000,550B,B969,00,20190422034611,8557$

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	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

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

- 0: Home
- 1: Known Roaming
- 2: Unknown Roaming
- 3: Blocking Report

➢ **+RESP:GTSTC,**

Example: **+RESP:GTSTC,4B0305,867995030082104,gv300can,,0,0.0,352,32.9,117.129384,31.839468,20190420034210,0460,0000,550B,B969,00,20190420034212,3FCE$**			
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		
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTBPL,**

Example: **+RESP:GTBPL,4B0306,867995030082104,gv300can,3.65,0,0.0,0,47.2,117.129381,31.839036,20190428090551,0460,0000,550B,B969,00,20190428090554,048D$**			
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 Voltage	<=4	0.00 – 4.20 V	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTSTT,**

Example: **+RESP:GTSTT,4B0303,867995030082104,,22,0,0.0,291,92.6,117.129201,31.839215,20190416011527,0460,0000,550B,B969,00,20190416011529,031E$**			
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|16|21|22|41|42	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Motion Status*>: The current motion status of the device.

- 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 deemed to be towed.
- 16 (Tow): The device attached vehicle is ignition off and it is 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:GTANT,**

Example: **+RESP:GTANT,4B0305,867995030082104,gv300can,1,0,,,,,,,,,,,20190420023335,3D73$**			
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 GNSS Antenna	1	0|1|3	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*External GNSS Antenna*>: The current state of the external GNSS antenna.

- 0: The external GNSS antenna of the device is working.
- 1: The external GNSS antenna of the device is detected in open circuit state.
- 3: The external GNSS antenna of the device is in unknown state.

➢ **+RESP:GTIGN,**

Example: **+RESP:GTIGN,4B0305,867995030082104,gv300can,36,0,0.0,0,47.7,117.129364,31.839055,20190420034053,0460,0000,550B,B969,00,,0.0,20190420034126,3FC1$**			
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	<=6	0 – 999999 sec	

Ignition Off			
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	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 the time period 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 counts 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,4B0305,867995030082104,gv300can,170791,0,0.0,352,81.2,117.129386,31.839294,20190422030853,0460,0000,550B,B969,00,,0.0,20190422030854,8536$

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	1	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	4	XXXX	
Reserved	2	00	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 the time period 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**, the total hours the meter counts 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,**
- **+RESP:GTSTR,**
- **+RESP:GTSTP,**
- **+RESP:GTLSP,**

Example:
+RESP:GTIDN,4B0305,867995030082104,,,,0,0.0,351,215.8,117.129176,31.839766,20190422035308,0460,0000,550B,B969,00,0.0,20190422035310,856B$
+RESP:GTSTR,4B0306,867995030082104,,,,0,8.9,17,76.2,117.129338,31.839304,20190426090

023,0460,0000,550B,B969,00,0.0,20190426090048,04BF$ +RESP:GTSTP,4B0306,867995030082104,,,,0,0.0,177,61.6,117.129245,31.838887,20190426090235,0460,0000,550B,B969,00,0.0,20190426090236,04CC$ +RESP:GTLSP,4B0306,867995030082104,,,,0,0.0,0,92.7,117.129132,31.839167,20190426090512,0460,0000,550B,B969,00,0.0,20190426090512,04E6$			
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	1	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	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTIDF,**

Example: +RESP:GTIDF,4B0305,867995030082104,gv300can,11,415,0,0.0,351,144.6,117.129276,31.839365,20190422040005,0460,0000,550B,B969,00,0.0,20190422040005,859C$			
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|1A|12|16|22	
Duration of Idling Status	<=6	0 – 999999 sec	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- *<Motion Status>*: The current motion status when the vehicle leaves idling status.
- *<Duration of Idling Status>*: The time period that the vehicle has been in idling status. If the duration is greater than 999999 seconds, it will be reported as 999999 seconds.

➢ **+RESP:GTGSM,**

Example:
+RESP:GTGSM,4B0303,867995030082104,GIR,0460,0000,550b,b96a,29,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0460,0000,550b,b969,28,00,20190416092911,0A4C$

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|FRI|GIR	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4		
Cell ID1	4		
RX Level1	2	0-63	
Reserved	0		
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
Cell ID2	4		
RX Level2	2	0-63	
Reserved	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		
Cell ID3	4		
RX Level3	2	0-63	
Reserved	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
Cell ID4	4		
RX Level4	2	0-63	
Reserved	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	4		

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

- <*Fix Type*>: A string to indicate what kind of 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.
  "FRI": This cell information is for FRI request.
  "GIR": This cell information is for the sub command "**C**" in the **AT+GTRTO** command.
- <*MCC(i)*>: MCC of the neighbor cell *i* (*i* is the index of the neighbor cell).
- <*MNC(i)*>: MNC of the neighbor cell *i*.
- <*LAC(i)*>: LAC (in hex format) of the neighbor cell *i*.
- <*Cell ID(i)*> : Cell ID (in hex format) of the neighbor cell *i*.
- <*RX Level(i)*>: The signal strength of the neighbor cell *i*. This parameter is a 6-bit value coded in 1 dB steps:
  0: -110 dBm
  1 – 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 of <*LAC(i)*> and <*Cell ID(i)*> means the terminal does not know the value.
3. This message cannot be sent via SMS.

➢ **+RESP:GTGSS,**

Example: **+RESP:GTGSS,4B0305,867995030082104,gv300can,0,,21,,0,3.0,0,132.5,117.129437,31.839299,20190419021857,0460,0000,550B,B969,00,20190419022000,312B$**			
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	
Satellites in Use	2	0 - 15	
Motion Status	2	11|12|16|21|22|41|42	
Reserved	0		
GNSS Accuracy	1	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	4	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".
- ✧ <*Satellites in Use*>: Number of satellites being used for tracking, the high nibble is reserved and the low nibble is valid. If a fix fails, the parameter is empty.
- ✧ <*Motion Status*>: The current motion status of the device.
  - 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 deemed to be towed.
  - 16 (Tow): The device attached vehicle is ignition off and it is 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:GTDOS,**

Example: **+RESP:GTDOS,4B0305,867995030082104,gv300can,1,0,0,0.0,351,144.6,117.129276,31.839365,20190422035949,0460,0000,550B,B969,00,20190422035949,8599$**			
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	0-2	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Wave1 Output ID*>: The ID of the output with wave shape 1.
- <*Wave1 Output Active*>: The status of wave shape 1 output.

➢ **+RESP:GTTMP,**

Example:
+RESP:GTTMP,4B0306,867995030009362,,,0,01,1,1,0.0,0,40.4,117.129326,31.839245,20190522064721,0460,0000,550B,B969,00,0.0,,0,0,01,01,,,,28131A4103000056,,28,20190522064722,0550$

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		
External Power VCC	<=5	0 – 32000 mV	
Report ID / Report Type	2	X(0-3)X(0-1)	
Number	1	1	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input VCC	<=5	0 – 30000 mV	
Reserved	0		
Digital Input	4	0000 – 0F0F	
Digital Output	4	0000 – 0F0F	
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 the temperature alarm. The range is 0-3.

  Report Type: 0 means “Outside of the predefined temperature range”. 1 means “Inside of 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 GSM roaming state of the device changes, the current roaming state will be reported in the **+RESP:GTRMD** message. The message will be defined as an event message.

➢ **+RESP:GTGPJ,**

Example: **+RESP:GTGPJ,4B0305,867995030082104,gv300can,23,1,0,0.0,351,34.1,117.129511,31.839221,20190422054650,0460,0000,550B,B969,00,20190422054652,8953$**			
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	<=3	0-255	
GNSS Jamming State	2	0|1|3	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*CW Jamming Value*>: The current continuous wave jamming value.

✧ <*GNSS Jamming State*>: The current jamming state.

- 0: Unknown or feature disabled
- 1: (OK) No significant jamming
- 3: (Critical) Interference visible and no fix

If the CANBUS Alarm report function is enabled by the command **AT+GTCLT**, <*Alarm Mask 1*>,

Alarm Mask 2> and <*Alarm Mask 3*> meet each trigger condition at the same time, and the trigger event duration time is longer than <*Debounce Time*>, the **+RESP:GTCLT** alarm message will be sent.

➢ **+RESP:GTCLT,**

Example:
+RESP:GTCLT,4B0305,867995030082104,gv300can,0,1FFFFFFF,3F003F,6,,,207FFFFF,,2,I6782,50.56,1705,40,55,,L87.40,3960,32,860.64,755.43,105.21,7436.00,4365,BF,FFFF,3F,3F,6.38,21.61,00FFFFFF,,,,,,,,,,,,,,,,,,,1FFF,621,1324,,,,0,0.0,0,139.4,117.129313,31.839249,20190418032101,0460,0000,550B,B969,00,20190418032103,0B58$

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''-'' _ '	
Group ID	<=2	0 – 19	
Alarm Mask 1	<=8	0 – FFFFFFFF	
Alarm Mask 2	<=8	0 – FFFFFFFF	
Alarm Mask 3	<=8	0 – FFFFFFFF	
Reserved	0		
Reserved	0		
CANBUS Data 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 –2147483647)	
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 Time	<=8	0.00 – 99999.99h	
Total Vehicle Engine Overspeed Time	<=8	0.00 – 99999.99h	
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	
Ad-Blue Level	<=3	0-100L	
Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle Motion Signal	1	0|1	
Tachograph Driving Direction	1	0|1	
Analog Input Value	<=5	0-99999mv	
Engine Braking Factor	<=6	0-999999	
Pedal Braking Factor	<=6	0-999999	

Total Accelerator Kick-downs	<=6	0-999999	
Total Effective Engine Speed Time	<=8	0.00 – 99999.99h	
Total Cruise Control Time	<=8	0.00 – 99999.99h	
Total Accelerator Kick-down Time	<=8	0.00 – 99999.99h	
Total Brake Applications	<=6	0-999999	
Tachograph Driver 1 Card Number	<=10	0-9999999999	
Tachograph Driver 2 Card Number	<=10	0-9999999999	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=10	0-9999999999	
Expansion Information	4	00-FFFF	
Rapid Brakings	<=6	0-999999	
Rapid Accelerations	<=6	0-999999	
Engine Torque	<=3	0 – 100%	
Reserved	0		
Reserved	0		
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

CAN Chipset / THR_100 FOTA Upgrade Report

The device will send the message **+RESP:GTCFU** to the backend server during the upgrade process.

➢ **+RESP:GTCFU,**

Example: **+RESP:GTCFU,4B0303,867995030082104,,200,,20190415091334,0299$**			
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		
New Version (Optional)	<=10	'0'-'9', 'a'-'z'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Code*>: Information code.

- 100/110/120: Upgrade confirmed to be OK. Start upgrade.
- 101/111/121: Baud rate error. UART does not work for CAN Chipset. Stop upgrade.
- 102/112/122: Low power. Stop upgrade.
- 103/113/123: Other upgrade command are being executed. Stop upgrade.
- 104/114: CAN Chipset response is abnormal.
- 200/210/220: Start to download package.
- 201/211/221: Package download succeeds.
- 202/212/222: Package download fails.
- 300/310/320: Start to upgrade.
- 301/311/321: Upgrade succeeds
- 302/312/322: Upgrade fails.
- 303: Invalid upgrade file.

✧ <*New Version*>: The version of the new firmware in the CAN Chipset or THR_100.

Note: The codes listed before "/" as described above in <*Code*> including 100, 101, 102, 103, 104,200, 201, 202, 300, 301 302 and 303 indicate the firmware update information, while the codes listed after "/" such as 110, 111, 112,113,114, 210, 211, 212, 310, 311 and 312 indicate the configuration update information and such as 120, 121, 122, 220, 221, 222, 320, 321 and 322 indicate the THR_100 update information.

- **+RESP:GTTRD,**

This message is used to report DDD data and can only be sent via GPRS even if the report mode is forced SMS mode.

Example:

+RESP:GTTRD,4B0401,867995030090222,gv300can,000A,,,0,18,490,303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0208015D1205395D12E4E1011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0108015D1339F75D1587A9011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0108015D15DFB15D196460011F563130303030,,,,,20190710153859,0956$

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' '-' '_'	
File Download Count	4	0001-FFFF	
Reserved	0		
Reserved	0		
File Frame End flag	1	0|1	
Current Frame Index	<=3		
DDD Data Length	<=3		
DDD Data	<=684		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

- <*File Frame End Flag*>: The flag of last frame.
  - 0: Not the last frame of file.
  - 1: The last frame of file.
- <*Current Frame Index*>: The index of frames.
- <*DDD Data Length*>: The length of DDD data in current frame.
- <*File Download Count*>: It is a number that marks the messages between **+RESP:GTTRD** and **+RESP:GTTRL**.

➢ **+RESP:GTFLA,**

Example:
+RESP:GTFLA,4B0303,135790246811220,,1,92,70,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Input ID	1	0|1	
Last Fuel Level	<=4	0 – 100	
Current Fuel Level	<=4	0 – 100	
GNSS Accuracy	1	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	4	XXXX	

Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Input ID*>: The ID of the input to which the fuel sensor is connected. 0 means "Connected with serial port".
- <*Last Fuel Level*>: The fuel level saved before the fuel loss alarm event occurs.
- <*Current Fuel Level*>: The current fuel level when the fuel loss alarm event occurs.

➢ **+RESP:GTPHL,**

This message is used for reporting location information before reporting photo data, and is only sent via GPRS even if the report mode is forced SMS mode.

Example:
+RESP:GTPHL,4B0305,867995030082104,gv300can,0,,20190422085155,0,0.0,344,41.2,117.129297,31.839232,20190422085155,0460,0000,550B,B969,00,,,,,20190422085157,8B24$

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	1	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	4	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,4B0306,867995030082104,,,qd62k890jhdhu749GBGF_20190428065806.jpg,0,0.0,4,86.8,117.129307,31.838741,20190428065821,0460,0000,550B,B969,00,20190428065823,0D58$**			
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		
File Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' ''.'	
GNSS Accuracy	1	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	4	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:GTBCS,**

➢ **+RESP:GTBDS,**

Example:
+RESP:GTBCS,4B0306,867995030096625,,,0,0.0,0,58.4,117.129522,31.839343,20190426054910,0460,0000,550B,B969,00,0D03,GV300CAN_BT-1,78054100CE22,0,1,6654B1767842,,,,,20190426054911,0B44$
+RESP:GTBDS,4B0306,867995030096625,,,0,0.0,0,58.4,117.129522,31.839343,20190426054455,0460,0000,550B,B969,00,0D03,GV300CAN_BT-1,78054100CE22,0,1,E5324BC6D34C,,,,,20190426054458,0B39$

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		
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Bluetooth Report Mask	4	0000 – FFFF	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth Mac Address	12	000000000000 – FFFFFFFFFFFF	
Peer Role	1	0|1	
Peer Address Type	1	0|1	
Peer MAC Address	12	000000000000 – FFFFFFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Peer Role*>: The role type of the peripheral device.
- 0: Master
- 1: Slave

✧ <*Peer Address Type*>: The address type of the peripheral device.
- 0: Public Device Address or Public Identity Address
- 1: Random Device Address or Random (static) Identity

➢ **+RESP:GTUPC,**

Example:
+RESP:GTUPC,4B0305,867995030082104,gv300can,0,100,http://60.174.225.171:10028/GV300CAN/deltabin/111111_at.ini,20190423013149,A383$

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|303|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 always 0 before the device starts to update the configuration. It indicates the total number of the commands when the result code is 301. It indicates wrong format of command ID 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: The device refuses to update the configuration because the battery is low.
  - 304: The device refuses to update the configuration because the FVR mask check fails.
  - 305: The device is interrupted by abnormal reboot.
  - 306: The device refuses to update the configuration because of invalid MD5 in **AT+GTFVR**.
- <*Download URL*>: The complete URL to download the configuration. It includes the file name.

Command Mask
GEO ID Mask
Stocmd ID Mask
Group ID Mask

➢ **+RESP:GTVGN,**

Example:
+RESP:GTVGN,4B0305,867995030009362,,00,2,0,0,0.0,0,77.9,117.129054,31.839177,20190423021820,0460,0000,550B,B969,00,,0.0,20190423021840,01B1$

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	
Report Type	1	0-4	
Duration of Ignition Off	<=6	0 – 999999 sec	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	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*>: This parameter 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 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:GTVGF,**

Example: **+RESP:GTVGF,4B0305,867995030082104,gv300can,00,2,63150,0,0.0,345,93.7,117.129420,31.839185,20190423014806,0460,0000,550B,B969,00,,0.0,20190423014807,A3C2$**			
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	
Report Type	1	0-4	
Duration of Ignition On	<=6	0 – 999999 sec	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	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 is 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:GTEUC,**

Example: **+RESP:GTEUC,4B0305,867995030082104,gv300can,0,100,http://www.queclink.com/configure.ini,00000000,,,,,20190423022313,A465$**			
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	
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*>, <*GEO ID Mask*>, <*Stocmd ID Mask*> or <*Group ID Mask*> check fails.

- 305: The update process is interrupted by abnormal reboot.

✧ <*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**.

➢ **+RESP:GTTTR,**

Example: **+RESP:GTTTR,4B0401,867995030090222,gv300can,000C,2,,0002,0000B0000009,,,20190710152536,0925$**			
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' '-' '_'	
Request ID	4	0000 – FFFF	
Message Type	2	0 – 0C	
Reserved(option1)			
Reserved(option2)			
Reserved(option3)			
Reserved(option4)			
Reserved(option5)			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Request ID*>: It is the response to the server with the same field <*Request ID*> in the command **AT+GTTTR**.

✧ <*Message Type*>:

- 0: Reply for DDD file request.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0-3	
Device Status	2	0x00-0xFF	
File State In Memory	2	0x00-0xFF	

Error Code	2	0x00-0xFF	
Reserved			

- 1: Authorization result.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0-3	
Device Status	2	0x00-0xFF	
Reserved			
Error Code	2	0x00-0xFF	
Reserved			

- 2: APDU Data received from THR_100.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			
APDU Sequence Number	4		
APDU DATA			
Reserved			
Reserved			

- 3: The result of the process that THR_100 reads file from tachograph.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0-6	
Device Status	2	0x00-0xFF	
File State In Memory	2	0x00-0xFF	
Error Code	2	0x00-0xFF	
Reserved			

- 4: Communication timeout.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			
Reserved			

Reserved			
Reserved			
Reserved			

- 5: Debug mode, the state of THR_100.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			
Device Status	2	0x00-0xFF	
File State In Memory	2	0x00-0xFF	
Error Code	2	0x00-0xFF	
Error Code Memory	2	0x00-0xFF	

- 6: FTP transfer event.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	<=2	0-14	
Reserved	2		
Reserved	2		
Reserved	2		
Reserved	2		

- 8: Restart TachoReader.

  In this mode, *<Reserved(option1)> … <Reserved(option5)>* represent the following meanings:

Reply Result	1	0|1	
Reserved			
Reserved			
Reserved			
Reserved			

- 9: Tachograph details.

Reserved			
Tachograph producer	2		

Tachograph model	<=40		
Reserved			
Reserved			

- 0A: Inquiry status of the device.

Reserved			
Reserved			
Device status / Files in device memory	4	X(0-FF)Y(0-FF)	
Reserved			
Reserved			

- 0B: Inquiry Tachograph driver 1 ID, name and surname.

Reserved			
Reserved			
Tachograph driver 1 id	<=40		
Tachograph driver 1 name and surname	<=40		
Reserved			

- 0C: Inquiry special status.

Reserved			
Reserved			
Special status	12	0x000000000000 – 0xFFFFFFFFFFFF	
Reserved			
Reserved			

✧ <*Reply Result*>: If <*Message Type*> is 0 (Reply for DDD file request), it is reply on inquiry read request.

- 0: Request OK.
- 1: Request busy: Advanced test.
- 2: Request busy: THR_100 is executing precious order.
- 3: Request busy: Configuration of the cancel order.

If <*Message Type*> is 1 (Authorization result), it is reply on inquiry the status of the device:

- 0: Authorization OK.

- 1: Authorization fail.
- 2: Authorization timeout.
- 3: Authorization data error.

If <*Message Type*> is 2, this field will be reserved.

If <*Message Type*> is 3 (file reading), it is result of file reading:

- 0: THR_100 getting file from Tachograph OK.
- 1: THR_100 getting file from Tachograph fail.
- 2: File mismatch.
- 3: THR_100 getting file from Tachograph timeout.
- 4: Device getting file from THR_100 timeout.
- 5: Device getting file from THR_100 fail.
- 6: DDD file size error.

Note: Here are the timeout instructions for file reading.

- <*Read file Type*> is 0x01

  THR_100 getting file from Tachograph timeout is 15 minutes.

  Device getting file from THR_100 timeout is 5 minutes.
- <*Read file Type*> is 0x02 or 0x04

  THR_100 getting file from Tachograph timeout is 5 minutes.

  Device getting file from THR_100 timeout is 3 minutes.
- <*Read file Type*> is 0x03 or 0x05

  THR_100 getting file from Tachograph timeout is 20 minutes.

  Device getting file from THR_100 timeout is 10 minutes.
- <*Read file Type*> is 0x06

  THR_100 getting file from Tachograph timeout is 10 minutes.

  Device getting file from THR_100 timeout is 5 minutes.
- <*Read file Type*> is 0x07

  THR_100 getting file from Tachograph timeout is 20 minutes.

  Device getting file from THR_100 timeout is 10 minutes.

If <*Message Type*> is 6, it is the event of FTP transfer.

- 0: FTP open server OK.
- 1: FTP open server no service.
- 2: FTP open server roaming.
- 3: FTP open server in FOTA process.
- 4: FTP open server login error.
- 5: FTP open server host error.
- 6: FTP open server bearer fail.
- 7: FTP open server over max.
- 8: FTP open server error.
- 9: FTP server lost connection.
- 10: FTP send data OK.
- 11: FTP send data timeout.
- 12: FTP send data error.
- 13: FTP send data server id error.
- 14: FTP send data request close.

If <*Message Type*> is 8 (Restart TachoReader), it is result of command execution.

- 0: Command OK. The command is executed successfully by TachoReader.
- 1: Command Error. An unexpected error occurs while executing the command.

✧ <*APDU Sequence Number*>: It is the serial number of APDU received from THR_100. Numbering starts from 0001 when receiving a new DDD file request. This value is in ASCII hexadecimal format.

✧ <*APDU DATA*>: It is the APDU received from THR_100. The value is in ASCII hexadecimal format.

✧ <*Device Status*>:

- Bit 0 = 1 – Authentication in progress,
- Bit 1 = 1 – Authentication OK (bit is cleared at next read request),
- Bit 2 = 1 – Authentication ERROR (bit cleared at next read request),
- Bit 3 = 1 –THR_100 is downloading files from tachograph,
- Bit 4 = 1 – Data is ready to read from THR_100 by master device. Bit is cleared after all awaiting data is read (If all bytes are sent in one frame, this bit will be cleared after sending this frame. If all bytes are sent in 3 frames, this bit will be cleared after sending 3 frames).
- Bit7:Bit5 = Details of the error. Flags bit7:bit5 and flag bit 2 must be treated as combined information. The information is split to maintain protocol's backward compatibility. Flags bit7:bit5 are cleared at next read request.
  - 000 – No error
  - 001 – 24 hours have passed after turning off the ignition, tachograph is in power down mode (This error code is generated based on THR_100's timer, there is no attempt of connection with tachograph)
  - 010 – 2hours have passed after last authentication session, tachograph is in power down mode. (This error code is generated based on THR_100's timer, there is no attempt of connection with tachograph)
  - 011 – No answer from tachograph (wrongly connected wires or CAN-C is off in tachograph)
  - 100 – Cannot open communication session with tachograph (remote download function is off in tachograph)
  - 101 – No answer or incorrect answer on company card inquiry (remote download function is off in tachograph).
  - 110 – Error during file transfer.
  - 111 – Reserved for future use.

✧ <*File State In Memory*>:

- Bit 0 = 1 tachograph file is in THR_100 memory
- Bit 1 = 1 file from card in slot 1 is in THR_100 memory
- Bit 2 = 1 file from card in slot 2 is in THR_100 memory
- Bit 3 = not used (to be ignored)
- Bit 4 = 1 file from tachograph is already read from THR_100 (it is possible to read once more, bit 0 will be still set), this flag is set after read whole file from THR_100.
- Bit 5 = 1 file from card in slot 1 is already read from THR_100 (it is possible to read

once more, bit 1 will be still set), this flag is set after reading whole file from THR_100.

- Bit 6 = 1 file from card in slot 2 is already read from THR_100 (it is possible to read once more, bit 2 will be still set), this flag is set after reading whole file from THR_100.
- Bit 7 = not used (to be ignored).

✧ <*Error Code*>: Extended error code. A detailed description of the value of this byte below:

- Extended errors before downloading.

Note: Following error codes are valid only for firmware version 2 (2.0.0 and later). Error codes for firmware version 1 can be found in protocol (TachoReader_protocol_EN_20180417) or older.

- 0x00 – No error detected. Report to the device producer.
- 0x01 – Invalid receive buffer size (BB) in read request (2.2.5). Correct the request (2.2.5) content.
- 0x02 – No communication with tachograph. Switch the ignition on and try again. If it does not help, check out CANBUS connection to tachograph.
- 0x03 – No communication on CAN-bus, frames are acknowledgements,
- 0x04 – Another reading in progress,
- 0x05 – Remote downloading function is off in the tachograph,
- 0x06 –Ignition off. Some techograph models need ignition to be on in order to download files. Switch the ignition on and try again.
- 0x07 – 24 hours had elapsed after turning off the ignition, tachograph in power-down mode,
- 0x08 – 2 hours had elapsed since the last download without ignition, tachograph in power-down mode,
- 0x09 – Company, control or workshop card in tachograph. Remove company, workshop or control card and try again.
- 0x0A – Invalid timestamps in read request (2.2.5), start time cannot be later than end time. Correct the request (2.2.5) content.
- 0x0B – THR_100 does not receive real time clock from tachograph, so TS_E in read request (ODN.) cannot be set to 0. Check if THR_100 reports active buses (2.2.5). If not – check out connection to tachograph (CANBUS and D8). If yes – tachograph may work improperly. As a short term solution – set up RTC with command (2.2.5) and try again.
- 0x0C – Invalid read request command (2.2.5). No file requested to download. Correct the request (2.2.5) content.
- 0x0D – Tachograph is not activated (factory mode),
- 0x0E – Opening session timeout. Report to the device producer.
- 0x0F – Remote company card not ready (Timeout). Report to the device producer.

- Extended errors during authentication

- 0x10 – The packet to company card was not send (GSM terminal does not read prepared by THR_100 data packet),
- 0x11 – Timeout on waiting for data from company card. THR_100 expected to get

reply from company card, but it did not come. Check data transmission path between application server, AVL terminal and THR_100 and try again.

- 0x12 – The answer from company card is incorrect,
- 0x13 – Card expiration date of company card has not yet come,
- 0x14 – Card expiration date of company card has already expired,
- 0x15 – Tachograph rejects the data package from company card,
- 0x16 – Tachograph does not support given functionality (response to the last data package from company card),
- 0x17 – Tachograph reports an error on response from company card (last data package from company card only),
- 0x18 – No data for company card from tachograph (Timeout). Report to the device producer.
- 0x19 – Tachograph reports an authentication error (response to the last data package from company card),
- 0x1A- Tachograph reports too many transmission errors (response to the last data package from company card),
- 0x1B – Data transfer error. Report to the device producer.
- 0x1F – The order is canceled by user (command 0x69, parameter 0x80).

- Extended errors during file reading:

- 0x20 – Data read timeout. Report to the device producer.
- 0x21 – Data read interrupted. Report to the device producer.
- 0x22 – Cannot process request, because data of last reading is not known. Correct the request (2.2.5) content – set start date.
- 0x23 – Requested to read overview part since date of last reading, but the date is later than requested end time. Correct the request (2.2.5) content – change end date.
- 0x30 – Remote authentication timeout. Report to the device producer.
- 0x31 – Error on download request. Report to the device producer.
- 0x32 – DDD file download request error. Report to the device producer.
- 0x33 – DDD file transmission error. Report to the device producer.
- 0x34 – Error on download request: server busy. Report to the device producer.
- 0x35 – Failed to close session. Report to the device producer.
- 0x36 – Request includes card 1, but no card in slot 1. Correct the request (2.2.5) content.
- 0x37 – Request includes card 2, but no card in slot 2. Correct the request (2.2.5) content.
- 0x38 – Missing card in slot. Probably card had been removed during the request. Issue another request.
- 0x39 – Requested cards download, but no cards in tachograph's slots. Insert card(s) into tachograph or correct the request (2.2.5) content.
- 0x40 – Downloading finished with no files, because of missing data (i.e. requested cards was removed) Insert card(s) into tachograph and try again.
- 0x55 – DDD file download request timeout. Report to the device producer.

- 0x6A – Remote Authentication Closed. Report to the device producer.
- 0x6C– APDU error. Report to the device producer.
- 0x6E – Authentication error. Check if company card is not expired. If not, report to the device producer.
- 0x70 – Too many authentication errors. Check if company card is not expired. If not, report to the device producer.
- 0xE0 – Unexpected program error. Report to the device producer.
- 0xFE – Request cancelled by command 2.2.5.
- 0xFF – No reading requested since device restart.

✧ <*Error Code Memory*>: This is the error code byte <*Error Code*> stored when the next order of the download is sent.

✧ <*Tachograph producer*>:

- 0x00: None
- 0x01: VDO/Siemens
- 0x02: Efas
- 0x03: Stoneridge
- 0x04: Actia
- 0x80: Error of connection on D8 wire
- 0x81: Not supported format „2400" analogue tachographs

✧ <*Tachograph mode*>: Tachograph name given by the manufacturer.

✧ <*Device status / Files in device memory*>:

- Device status,
- Files in device memory.

✧ <*Tachograph driver 1 id*>: Card number given in ASCII string terminated with „*". First two or three letters are country code. Following is a SPACE character (0x20) and the 16-character long card number e.g.

PL 1820625133460000*

In addition to standard country codes, the following abbreviations also apply:

- „EC" - European Union,
- „EUR" – Rest of Europe,
- „WLD" – rest of the world.

✧ <*Tachograph driver 1 name and surname*>: Surname and name (names) of driver given in an ASCII string terminated with „*". Each word is separated by a SPACE character (0x20).

Note: Number K will be returned if the card is not inserted into tachograph slot (or parameter currently not available; or card inserted, but no information read).

- K = 0x00 card not inserted,
- K = 0x01 card inserted, but no information read,
- K = 0xFF parameter currently not available.

✧ <*Special status*>:

Byte 1 - 2: Device status

- Bit 0 = 1: Authorization in progress,
- Bit 1 = 1: Authorization successful (this bit is deleted upon next read request),
- Bit 2 = 1: Authorization error (this bit is deleted upon next read request),
- Bit 3 = 1: Device is downloading files from tachograph,

- Bit 4 = 1: Data (not files!) is ready to be downloaded from the device, the counter changes to zero after all waiting data is read (If data is sent in only one frame, the counter changes to zero right after that frame; if data is sent in 3 frames, the counter will change to zero after the third frame is sent),
- Bit 5 = communication with tachograph not possible, tachograph in sleep mode,
- Bit 6 – free, always zero,
- Bit 7 – free, always zero.

Byte 3 - 4: Files in device memory

- Bit 0 = 1 file read from tachograph is in device's memory,
- Bit 1 = 1 file read from card in slot 1 is in device's memory,
- Bit 2 = 1 file read from card in slot 2 is in device's memory,
- Bit 3 = 1 file read from external reader is in device's memory,
- Bit 4 = 1 file read from tachograph, which has already been read from the device (it can be read again, bit 0 is still set), this flag is set after the whole file has been read.
- Bit 5 = 1 file read from card in slot 1, which has already been read from the device (it can be read again, bit 1 is still set), this flag is set after the whole file has been read.
- Bit 6 = 1 file read from card in slot 2, which has already been read from the device (it can be read again, bit 2 is still set), this flag is set after the whole file has been read.
- Bit 7 = 1 file read from an external reader, which has already been read from device (it can be read again, bit 3 is still set), this flag is set after the whole file has been read.

Byte 5 - 6: File currently being transferred from tachograph to TachoReader.

- Bit 0 = 1 file from card 1,
- Bit 1 = 1 file from card 2,
- Bit 2 = 1 file from tachograph's memory.

Byte 7 - 12: Amount of file data read so far. If Byte 5 - 6=0x00, then Byte 7 - 12 may be random values.

Note: If there is no data returned within 2s after the query command is issued due to abnormal communication, 00 or Reserved will be reported (Hex will report 00, string will report Reserved).

➢ **+RESP:GTTRL,**

This message is used to report location position and DDD information before reporting DDD data, and can only be sent via GPRS even if the report mode is forced SMS mode.

Example:

+RESP:GTTRL,4B0401,867995030090222,gv300can,0002,C_20190712_0700_DARIUS_TAMASAUSKAS_V100000108084000.DDD,0,0.0,0,101.1,117.129125,31.839185,20190712065656,0460,0000,550B,B969,00,,,,,20190712145659,1802$

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' '-' '_'	
File Download Count	4	0001 – FFFF	
DDD File Name	<=128		
GNSS Accuracy	1	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	4	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	$	$

✧ <*File Download Count*>: It is a number that marks the messages between **+RESP:GTTRD** and **+RESP:GTTRL**.

✧ <*DDD file name*>: The file name of DDD.

➢ **+RESP:GTBAA**

The event report message **+RESP:GTBAA** uses the format below.

Example: **+RESP:GTBAA,4B0500,867995030131778,,0,1,0,00,001F,TD_100109,FD6D3DE6D704,1,350,17,0,0.0,0,105.6,117.129384,31.839299,20191119013822,0460,0000,550B,B1E2,00,20191119013823,03F8$**			
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' '-' '_'	
Index	2	0 – 9|0xFF	
Accessory Type	1	0 – 3|6	
Accessory Model / Beacon ID Model	1	0|2|3	
Alarm Type	2	00 – FF	
Accessory Append Mask	4	0000 – FFFF	
Accessory Name(Optional)	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC(Optional)	12	'0' – '9' 'A' – 'F'	
Accessory Status(Optional)	1	0 - 1	
Accessory Battery Level (Optional)	<=4	0 – 5000mV	
Accessory Temperature(Optional)	<=3	-40 – 80℃	
Accessory Humidity (Optional)	<=2	0 –100%(rh)	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Index*>: The index of the Bluetooth accessory.
  - The index of Bluetooth accessory defined in **AT+GTBAS** which triggers the **+RESP:GTBAA** message.
  - 0xFF for WKF300.
- <*Accessory Type*>: The type of the Bluetooth accessory which is defined in the <*Index*>. The following is supported now:
  - 0: No Bluetooth accessory.
  - 1: Escort Bluetooth Accessory.
  - 2: Beacon temperature sensor.
  - 3: BLE beacon ID device.
  - 6: Beacon Multi-Functional Sensor.
- <*Accessory Model / Beacon ID Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBAS** or the model of the Bluetooth Beacon ID accessory which is defined in **AT+GTBID.**
- <*Alarm Type*>: The type of alarm which is generated according to <*Accessory Type*> and <*Accessory Model*> specified in the **AT+GTBAS** command or <*Beacon ID Model*> specified in the **AT+GTBID** command.
  - 0: The voltage of the Bluetooth accessory is low.
  - 1: The temperature alarm: The current temperature value is below <*Low Temperature*> set in the **AT+GTBAS** command.
  - 2: The temperature alarm: The current temperature value is upper <*High Temperature*> set in the **AT+GTBAS** command.
  - 3. The temperature alarm: The current temperature value is within the range defined by <*Low Temperature*> and <*High Temperature*> set in the **AT+GTBAS** command.
  - 4. Push button event for WKF300 is detected.
  - 7: Humidity alarm: The current humidity value is below <*Low Humidity*> set in the **AT+GTBAS** command.
  - 8: Humidity alarm: The current humidity value is above <*High Humidity*> set in the **AT+GTBAS** command.
  - 9: Humidity alarm: The current temperature value is within the range defined by <*Low Humidity*> and <*High Humidity*> set in the **AT+GTBAS** command.

- <Accessory *Append Mask*>: Bitwise mask defined in **AT+GTBAS** and **AT+GTBID** commands to configure which data item is reported.
  - Bit 0: <*Accessory Name*>
  - Bit 1: <*Accessory MAC*>
  - Bit 2: <*Accessory Status*>
  - Bit 3: <*Accessory Battery Level*>
  - Bit 4: <*Accessory Temperature*>
  - Bit 5: <*Accessory Humidity*>
- <*Accessory Name*>: The name of the Bluetooth accessory which ends with '\0'(0x00). If the Accessory name is empty, this filed will be filled with one byte: 0x00.
- <*Accessory MAC*>: The MAC address of the Bluetooth accessory.
- <*Accessory Status*>: It indicates the connection status of Bluetooth accessory.
  - 0: Disconnected.
  - 1: Connected.
- <*Accessory Battery Level*>: The voltage of the Bluetooth accessory.
- <*Accessory Temperature*>: Temperature data for the Bluetooth accessory.
- <*Accessory Humidity*>: Humidity data of the Bluetooth accessory.

➢ **+RESP: GTBID**

The event report message **+RESP:GTBID** uses the format below.

Example: **+RESP:GTBID,4B0501,867995030131778,,1,0,000A,78054101F478,2935,0,,,,,,,0460,0000,550B,B96A,00,20191210010818,009E$**			
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' '-' '_'	
Number	1	0 – 3|15	
Beacon ID Model	1	0|1	
Accessory Append Mask	2	00 – FF	
Accessory MAC	12	'0' – '9' 'A' – 'F'	
Accessory Battery Level	<=4	0 – 5000mV	
Accessory Signal Strength	1	-120 – 0	
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Number*>: The number of the Bluetooth beacon ID accessories.
  - WKF300. The maximum value is 3.
  - iBeacon E6. The maximum value is 15.
- ✧ <*Beacon ID Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBID**.
  - 0: WKF300.
  - 1: iBeacon E6
- ✧ <*Accessory Append Mask*>: Bitwise mask defined in the **AT+GTBID** command to configure which data item is reported.
  - Bit 0: Reserved
  - Bit 1: <*Accessory MAC*>
  - Bit 2: Reserved
  - Bit 3: <*Accessory Battery Level*>
  - Bit 4: Reserved
  - Bit 5: Reserved
  - Bit 6: <*Accessory Signal Strength*>
- ✧ <*Accessory MAC*>: The MAC address of the Bluetooth accessory.
- ✧ <*Accessory Battery Level*>: The voltage of Bluetooth accessory.
- ✧ <*Accessory Signal Strength*>: The signal strength of Bluetooth accessory.

The device reports the data that control by <*Accessory Type*> and <*Accessory Model*> in **AT+GTBAS** from peripheral Bluetooth devices to it via the **+RESP:GTBAR** message.

➢ **+RESP:GTBAR,**

Example: **+RESP:GTBAR,**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Index	1	0 – 9	
Accessory Type	1	7	
Accessory Model	1	0 – 4	
Accessory Append Mask	<=4	(HEX)	
Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC	12	(HEX)	
Accessory Status	1	0 – 1	
Accessory Battery Level	<=4	0 – 5000(mV)	
Accessory Temperature	<=3	-40 – 80(℃)	
(Accessory Data)	<=1300		
GNSS Accuracy	1	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	(HEX)	
Cell ID	4	(HEX)	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Accessory Type*>: The type of the Bluetooth accessory which is defined in the <*Index*>. The following is supported now:

- 7: Technoton accessory.

✧ <*Accessory Data*>: There are accessory data para according <*Accessory Type*> and <*Accessory Model*>:

➢ If the <*Accessory Type*> is 7 and <*Accessory Model*> is 0 (DUT-E S7), <*Accessory Model*> is 3 (GNOM DDE S7) or <*Accessory Model*> is 4(GNOM DP S7):

Version	2	(HEX)	
PGN	4	(HEX)	
PGN Data	<= 42	(HEX)	

➢ If the <*Accessory Type*> is 7 and <*Accessory Model*> is 1 (DFM 100 S7):

Version	2	(HEX)	
PGN1	4	(HEX)	
PGN Data1	<= 42	(HEX)	
PGN2	4	(HEX)	
PGN Data2	<= 42	(HEX)	
PGN3	4	(HEX)	
PGN Data3	<= 42	(HEX)	

➢ If the <*Accessory Type*> is 7 and <*Accessory Model*> is 2 (DFM 250D S7):

Version	2	(HEX)	
PGN1	4	(HEX)	
PGN Data1	<= 42	(HEX)	
PGN2	4	(HEX)	
PGN Data2	<= 42	(HEX)	
PGN3	4	(HEX)	
PGN Data3	<= 42	(HEX)	
PGN4	4	(HEX)	
PGN Data4	<= 42	(HEX)	

- <*Version*>: It indicates the version of accessory software.
- <*PGNx*>: It means parameter group number.
- <*PGN Datax*>: Different PGN, PGN Data have different data frame formats. It needs to parse according to the TECHNOTON S7 BUS Protocol

Note: If the total number of characters in a single message is too long, **+RESP:GTBAR** will be divided into multiple messages.

3.3.5. Data Report

The following reports are triggered when certain data needs to be sent.

- **+RESP:GTPHD,**

This message is used for reporting photo data and only sent via GPRS even if the report mode is forced SMS mode.

Example:

+RESP:GTPHD,4B0305,867995030082104,gv300can,0,,20190422085155,17,1,684,/9j/2wCEAAYEBQUFBAYFBQUHBwYHCRAKCQkJCRMODgsQFxQYFxYUFhUZHCQeGRsiGxUWHysgIiUmKCkoGB4sLywnLyQnKCcBBwcHCQgJEgoKEicaFhonJycnJycnJycnJycnJycnJycnJycnJycnJycnJycnJycnJycnJ//AABEIAPABQAMBIQACEQEDEQH/3QAEAAr/xAGiAAABBQEBAQEBAQAAAAAAAAAAAQIDBAUGBwgJCgsQAAIBAwMCBAMFBQQEAAABfQECAwAEEQUSITFBBhNRYQcicRQygZGhCCNCscEVUtHwJDNicoIJChYXGBkaJSYnKCkqNDU2Nzg5OkNERUZHSElKU1RVVldYWVpjZGVmZ2hpanN0dXZ3eHl6g4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2drh4uPk5ebn6Onq8fLz9PX29/j5+gEAAwEBAQEBAQEBAQAAAAAAAAECAwQFBgcICQoLEQACAQIEBAMEBwUEBAABAncAAQIDEQQFITEGEkFRB2FxEyIygQgUQpGhscEJIzNS8BVictEKFiQ04SXxFxgZGiYnKCkqNTY3ODk6Q0RFRkdISUpTVFVWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4Q=,,,,,20190422085157,8B25$

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	1		
Current Frame Index	1		
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,4B0100,862170016790444,,39,*QL,407D,01,00000,0132,0014,00000,0229#,,,,,20141021021206,0018$**			
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 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 terminal will save the report messages in a local buffer when the following occurs.

✧ GSM network is not available.
✧ GPRS context activation for the TCP or UDP connection fails.

- ✧ Establishment of the TCP connection with the backend server fails.

The buffered messages will be sent to the backend server when connection to the server is recovered again. The buffered reports are saved to the built-in non-volatile memory in case the device is reset. The terminal can buffer up to 10,000 messages.

Detailed information about buffer report is given below.

- ✧ Only **+RESP** messages except **+RESP:GTALM**, **+RESP:GTPDP**, **+RESP:GTHBD** and **+RESP:GTALC** are buffered.
- ✧ In the buffer report, the original header string "**+RESP**" is replaced by "**+BUFF**" while the other content including the original sending time and count number is kept unchanged.
- ✧ Buffered messages will be sent only via GPRS by TCP or UDP protocol. They cannot be sent via SMS. Even if the current report mode is forced SMS mode, the buffered messages will be sent via TCP short connection.
- ✧ The buffered messages will be sent after the real-time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 1.
- ✧ The buffered messages will be sent before the 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 the buffered message:

+BUFF:GTFRI,4B0303,867995030082104,,,10,1,1,0.0,0,47.3,117.129238,31.838810,20190416081145,0460,0000,550B,B969,00,0.0,,,,0,210100,,,,20190416081146,0856$

3.3.7. Report with Google Maps Hyperlink

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

➢ **Google Maps Hyperlink**

Example: **gv300can:** **<http://maps.google.com/maps?q=31.839242,117.129260** **F1 D2019/04/23T02:47:46>**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Google Maps Hyperlink Header	30	http://maps.google.com/maps?q=	http://maps.google.com/maps?q=
Latitude	<=10	-90 - 90	
Longitude	<=11	-180 - 180	
GNSS Fix	<=3	F0|F1 – F50	

GNSS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	

✧ <*GNSS Fix*>: The accuracy of the location information. F0 means “No GNSS fix”.

3.3.8. 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,4B0305,867995030082104,gv300can,00,1,C03FFFFF,,2,I6782,50.56,1705,40,55,,L87.40,3960,32,860.64,755.43,105.21,7436.00,4365,BF,FFFF,3F,3F,6.38,21.61,0,0.0,0,1.4,117.129493,31.839403,20190418055225,0460,0000,550B,B969,00,20190418055227,0DC0$

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' '-' '_'	
Distance Type / Report Type	2	X(0-1)X(0-2)	
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 – 2147483647)	
Total Fuel Used / Electric Total Power 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 / Electric Total Current	<=5	0 – 999.9L/100km | L/H	

Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100)	
Range	<=8	0 – 99999999hm	
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	8	00-FFFFFFFF	
Lights	2	0 – FF	
Doors	2	0 – FF	
Total Vehicle Overspeed Time	<=8	0.00 – 99999.99h	
Total Engine Overspeed Time	<=8	0.00 – 99999.99h	
CAN Report Expansion Mask	<=8	0 – FFFFFFFF	
Ad-Blue Level	<=3	0 – 100%	
Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle Motion Signal	1	0|1	
Tachograph Driving Direction	1	0|1	
Analog Input Value	<=5	0 – 99999mv	

Engine Braking Factor	<=6	0 – 999999	
Pedal Braking Factor	<=6	0 – 999999	
Total Accelerator Kick-Downs	<=6	0 – 999999	
Total Effective Engine Speed Time	<=8	0.00 – 99999.99h	
Total Cruise Control Time	<=8	0.00 – 99999.99h	
Total Accelerator Kick-Down Time	<=8	0.00 – 99999.99h	
Total Brake Applications	<=6	0 – 999999	
Tachograph Driver 1 Card Number	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
Tachograph Driver 2 Card Number	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
Tachograph Driver 1 Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
Tachograph Driver 2 Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
Registration Number	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
Expansion Information	4	00 – FFFF	
Rapid Brakings	<=6	0 – 999999	
Rapid Accelerations	<=6	0 – 999999	
Electric Report Mask	<=4	0 – FFFF	
Total Voltage	<=4	0 – 9999V	
Charging Times	<=4	0 – 9999	
Total Power Recovered	<=8	0 – 99999999(x1.820Wh)	
Single Charge Capacity	<=4	0.0 – 999.9kWh	
Single Discharge Capacity	<=4	0.0 – 999.9kWh	

Remaining Power	<=4	0.0 – 999.9kWh	
GNSS Accuracy	1	0	
Speed	<=5	0.0 – 999.9 km/h	
Heading	<=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	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Distance Type / Report Type*>: It indicates the type of total distance (unit: hm) and the report type.

  <*Distance Type*> has the following meanings:
  - 0: Total distance acquired from CAN Chipset.
  - 1: Total distance obtained by calculation with GNSS.

  <*Report Type*> has the following meanings:
  - 0: Periodic report.
  - 1: RTO CAN report.
  - 2: Ignition event report.
- <*CANBUS Device State*>: A numeral to indicate the communication state with the CANBUS device.
  - 0: Abnormal. Failed to receive data from the CANBUS device.
  - 1: Normal. Able to receive data from the CANBUS device.
- <*VIN*>: Vehicle identification number.
- <*Ignition Key*>: A numeral to indicate the ignition status.
  - 0: Ignition off.
  - 1: Ignition on.
  - 2: Engine on.
- <*Total Distance*>: Vehicle total distance. The number is always increasing. The unit is hectometer (H) or impulse (I) (if distance from dashboard is not available).

- <*Total Fuel Used / Electric Total Power Used*>: The number of liters of fuel used since vehicle manufacture or device installation. The unit is liter. If bit28 (<*Electric Report Mask*>) of the <*CANBUS Report Mask*> is set 1 in **AT+GTCAN** command, this parameter means the number of power used since vehicle manufacture or device installation. The unit is Wh.
- <*Fuel Level*>: The level of fuel in vehicle tank. The unit is liter (L) or percentage (P).
- <*Range*>: The number of hectometer 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 a negative sign (-), e.g. "-2". There is no extra character before a positive value (e.g. "20").
- <*Fuel Consumption / Electric Total Current*>: The fuel consumption of the vehicle. The unit is L/100Km(M) or L/H(H). If bit28 (<*Electric Report Mask*>) of the <*CANBUS Report Mask*> is set 1 in **AT+GTCAN** command, this parameter means the Total Current of the vehicle. The unit is A.
- <*Tachograph Information*>: Two bytes. The high byte describes driver 2, and the low byte describes driver 1.

  Format of each byte:

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: 15 min before 9 h
  - 4: 9 h reached
  - 5: 15 min before 16 h (without 8h rest during the last 24h)
  - 6: 16 h reached
  - 7: Other limit

  W1-W0: Driver working states:
  - 0: Rest - sleeping
  - 1: Driver available – short break
  - 2: Work – loading, unloading, working in an office
  - 3: Drive – behind the wheel
- <*Detailed Information / Indicators*>: A hexadecimal number. Each bit contains information of one indicator.

  Note: In the CAN Chipset firmware versions 2.0.xx and 2.1.xx, this parameter is 16-bit long (Bit 0 – Bit 15), which has been extended to 32 bits since the CAN Chipset version 2.2.0.
  - 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 – engaged, 0 – disengaged)
- 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)
- Bit 16: W – Webasto, a parking heating system (1 – on, 0 – off or not available)
- Bit 17: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
- Bit 18: CLL – coolant level low indicator (1 – on, 0 – off or not available)
- Bit 19: BAT – battery indicator (1 – on, 0 – off or not available)
- Bit 20: BF – brake system failure indicator (1 – on, 0 – off or not available)
- Bit 21: OP – oil pressure indicator (1 – on, 0 – off or not available)
- Bit 22: EH – engine hot indicator (1 – on, 0 – off or not available)
- Bit 23: ABS – ABS failure indicator (1 – on, 0 – off or not available)
- Bit 24: Reserved for future
- Bit 25: CHK – “check engine” indicator (1 – on, 0 – off or not available)
- Bit 26: AIR – airbags indicator (1 – on, 0 – off or not available)
- Bit 27: SC – service call indicator (1 – on, 0 – off or not available)
- Bit 28: OLL – oil level low indicator (1 – on, 0 – off or not available)

Following indicators are available since version 2.3.4:

- Bit 29: CHG – battery charging for electric cars (1 – battery is being charged, 0 – no charging)
- Bit 30: FS – fuel source – for vehicles equipped with factory gas installation (1 – engine powered by gas, 0 – engine powered by petrol)
- Bit 31: PTO – Power-take-off (1 – PTO engaged, 0 – PTO not engaged) CAN100 remembers the state of PTO signal until vehicle updates it to another state. But after power-on CAN-100 assumes it is off.

✧ <*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 speed limit defined in CAN Chipset's configuration.

✧ <*Total Engine Overspeed Time*>: The total time when the vehicle engine speed is greater than the speed limit defined in CAN Chipset's configuration.

✧ <*Ad-Blue Level*>: The level of Ad-Blue.

✧ <*Axle Weight 2nd*>: Weight of vehicle's second axle.

✧ <*Axle Weight 1st*>: Vehicle's first axle weight. Unit: Kg.

✧ <*Axle Weight 3rd*>: Vehicle's third axle weight. The unit is Kg.

✧ <*Axle Weight 4th*>: Vehicle's fourth axle weight. The unit is Kg.

✧ <*Tachograph Overspeed Signal*>: Vehicle overspeed signal from the tachograph.

- 0: Overspeed is not detected.
- 1: Overspeed is detected.

✧ <*Tachograph Vehicle Motion Signal*>: The vehicle motion signal in the tachograph.

- 0: Motion is not detected
- 1: Motion is detected.

✧ <*Tachograph Driving Direction*>: Vehicle driving direction from the tachograph.

- 0: Driving forward.
- 1: Driving backward.

✧ <*Analog Input Value*>: The value of analog input.

✧ <*Rapid Brakings*>: The count of rapid brakings of the vehicle.

✧ <*Engine Braking Factor*>: It measures how often the driver brakes with brake pedal or with engine and CAN Chipset stores both counts (always increasing). Decreasing speed with no pedal pressed causes an increase in engine braking factor.

✧ <*Pedal Braking Factor*>: It measures how often the driver brakes with brake pedal or with engine and CAN Chipset stores both counts (always increasing). Decreasing speed with brake pedal pressed causes an increase in pedal braking factor.

✧ <*Total Accelerator Kick-Downs*>: The count of accelerator pedal kick-downs (with the pedal pressed over 90%).

✧ <*Total Effective Engine Speed Time*>: Total time when the vehicle engine speed is effective. The unit is hour.

✧ <*Total Cruise Control Time*>: Total time when the vehicle speed is controlled by cruise control module. The unit is h.

✧ <*Total Accelerator Kick-Down Time*>: Total time when accelerator pedal is pressed over 90%. The unit is hour.

✧ <*Total Brake Applications*>: The count of brake pedal applications defined as braking process initiated by brake pedal.

✧ <*Tachograph Driver 1 Card Number*>: The card number of driver 1 from the tachograph.

- <*Tachograph Driver 2 Card Number*>: The card number of driver 2 from the tachograph.
- <*Tachograph Driver 1 Name*>: The name of driver 1 from the tachograph.
- <*Tachograph Driver 2 Name*>: The name of driver 2 from the tachograph.
- <*Registration Number*>: The vehicle registration number.
- <*Expansion Information Length*>: The byte length of <*Expansion Information*>.
- <*Expansion Information*>: A hexadecimal number. Each bit contains information of one indicator.
    - Bit 0: W – webasto (1 – on, 0 – off or not available).
    - Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
    - Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
    - Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
    - Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
    - Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
    - Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
    - Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
    - Bit 8: Reserved
    - Bit 9: CHK – “check engine” indicator (1 – on, 0 – off or not available)
    - Bit 10: AIR – airbags indicator (1 – on, 0 – off or not available)
    - Bit 11: SC – service call indicator (1 – on, 0 – off or not available)
    - Bit 12: OLL – oil level low indicator (1 – on, 0 – off or not available)
    - Bit 13: CHG –battery charging for electric cars (1 - battery is being charged, 0 - no charging)
    - Bit 14: FS –fuel source - for vehicles equipped with factory gas installation (1 - engine powered by gas, 0 - engine powered by petrol)
    - Bit 15: PTO –Power-take-off (1 - PTO engaged, 0 - PTO not engaged)
- <*Rapid Brakings*>: The total number of rapid brakings since installation (calculation based on CAN Chipset's settings of speed decrease time and value).
- <*Rapid Accelerations*>: The total number of rapid accelerations since installation (calculation based on CAN Chipset's settings of speed increase time and value).
- <*Total voltage*>: The total voltage of the electric vehicle.
- <*Charging Times*>: The charging times of the electric vehicle.
- <*Total power recovered*>: The total power recovered of the electric vehicle.
- <*Single Charge Capacity*>: The single charge capacity of the electric vehicle.
- <*Single Discharge Capacity*>: The single discharge capacity of the electric vehicle.
- <*Remaining Power*>: The remaining power of the vehicle.

3.3.9. Crash Data Packet

The **+RESP:GTCRD** message contains 10s tri-axial acceleration data before crash and after crash. When a crash accident is detected, tri-axial acceleration data before crash will be reported to backend server in several frames. And the device will continue to record 10s tri-axial data after crash and report it to the backend server in several frames.

- **+RESP:GTCRD,**

Example:
+RESP:GTCRD,4B0305,867995030009362,,0,3,1,0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF7004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0006FFF7004F0004FFF600500005FFF6004E0004FFF6004F0005FFF700500004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF7004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF7004F0005FFF7004E0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0005FFF7004F0004FFF6004F0004FFF7004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF600500004FFF7004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF600500004FFF7004F0004FFF6004F0005FFF7004F0006FFF600500004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0003FFF6004F0004FFF6004F0004FFF6004F0004FFF6004F0003FFF600510004FFF7004F0004FFF7004F0004FFF7004F0004FFF7004F0004,20190417075040,0011$

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	3	
Frame Number	1	1 -3	
Data	1000	'0'-'9' 'A' - 'F'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Data Type*>: The data reported to 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 1000 ASCII characters in the 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 the acceleration is 1. The ASCII "fffd" means HEX value "0xFFFD" which is the compliment of -3, so the acceleration is

-3.

Example:

+RESP:GTCRD,4B0303,359231038715676,,0,3,1,000100010055…,20120330120443,005C$

This is the oldest 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,4B0303,359231038715676,,1,3,3,...fffffff10052,20120330115736,005A$

This is the last 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 82 in decimal format and –g is -82. The linear acceleration data 1312 represents +16g and -1312 represents -16g.

3.3.10. Acceleration Data Packet

The device will report the message every 3 seconds, and record 25 sets of XYZ-axis acceleration data per second.

- **+RESP:GTACC,**

Example:

+RESP:GTACC,4B0305,867995030009362,,fffdfffbffabfffdfffcffaafffdfffbffaafffdfffbffabfffdfffbff abfffdfffcffabfffdfffbffabfffdfffcffabfffdfffbffabfffdfffbffabfffdfffbffaafffdfffbffabfffd fffcffabfffdfffcffabfffdfffbffabfffdfffbffabfffdfffbffabfffdfffcffaafffdfffcffabfffdfffbffabfffdfffcffab fffdfffbffabfffdfffcffabfffdfffcffabfffdfffbffaafffdfffbffabfffdfffcffaafffdfffcffaafffdfffbffabfffdfffb ffabfffdfffbffabfffdfffbffaafffdfffcffabfffdfffcffaafffdfffbffabfffdfffcffabfffdfffcffaafffdfffcffabfffd fffbffaafffdfffbffabfffdfffcffabfffdfffbffabfffdfffcffabfffdfffcffabfffdfffcffaafffdfffbffabfffdfffbffa bfffdfffbffabfffdfffcffabfffdfffcffabfffdfffbffabfffdfffbffaafffdfffcffaafffdfffcffaafffdfffbffabfffdfff bffaafffdfffbffabfffdfffbffabfffdfffcffabfffdfffbffabfffdfffbffabfffdfffcffabfffdfffcffabfffefffcffabff fdfffcffaafffdfffbffabfffdfffbffabfffdfffcffaafffdfffcffabfffefffcffaafffdfffbffabfffdfffbffaafffdfffcff aafffdfffbffab,,,,20190423030101,0214$

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 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 the acceleration is 1. The ASCII "fffd" means HEX value "0xFFFD" which is the compliment of -3, so the acceleration is -3.

Example:
+RESP:GTACC,4B0303, 868034001591569 ,000100010055… ,,,20120330120443,005C$
This is the oldest XYZ-axis acceleration data:
Conversion to hex format: X (axis acceleration data) = 0x0001; Y = 0x0001; Z = 0x0055;
Equal to decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;
+RESP:GTACC,4B0303, 868034001591569 , ffffff10052… ,,,20120330120443,005C$
This is the last XYZ-axis acceleration data:
Convert to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; Z = 0x0052;
Equal to decimal format: X (axis acceleration data) = -1; Y = -15; Z = 82;

Note: Acceleration of gravity (+g) is 82 in decimal format and –g is -82. The linearized acceleration data 1312 represents +16g and -1312 represents -16g.

3.3.11. Transparent Data Transmission

The device supports transparent data transfer between the backend server and the peripheral device connected to its secondary serial port or Bluetooth. GV300CAN 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
According to the <*Working Mode*> of the command **AT+GTURT**, there are two ways for the peripheral device to communicate with GV300CAN.
If the peripheral device supports the **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 or Bluetooth. According to the <*Command Type*> of **AT+GTDAT**, the device wraps the corresponding data 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 the device and the device will pick out the raw data and send it to the secondary serial port or Bluetooth. The peripheral device can thus get the data from the serial port.

Data to the Backend Server

- **+RESP:GTDAT (Short Format),**

Example: **+RESP:GTDAT,4B0305,867995030082104,gv300can,123,20190424012759,BB06$**			
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	<=245	ASCII Code	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTDAT (Long Format),**

Example: **+RESP:GTDAT,4B0305,867995030082104,gv300can,0,,,123,0,0.0,140,46.0,117.129232,31.838802,20190424012818,0460,0000,550B,B969,00,,,,,20190424012819,BB07$**			
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|11	
Reserved	0		
Reserved	0		
Data to the Backend Server	<=245	ASCII Code	
GNSS Accuracy	1	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	4	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	$	$

✧ <*Report Type*>: It indicates where the data comes from.

- 0: Reserved.
- 1: **AT+GTDAT** from serial port.
- 2: **AT+GTDAT** from Bluetooth.

Data to the secondary serial port or Bluetooth starts with a new line and is terminated with '\r\n'.

Example:
data to the serial port or Bluetooth

3.3.12. 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 device to communicate with GV300CAN.

Data to the Backend Server

➢ **+RESP:GTDTT (Short Format)**

Example: **+RESP:GTDTT,4B0305,867995030082104,gv300can,,,0,3,123,20190424013128,BB12$**			
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,4B0305,867995030082104,gv300can,,,0,3,123,0,0.0,175,66.5,117.129182,31.839176,20190424013227,0460,0000,550B,B969,00,,,,,20190424013227,BB16$**			
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	1	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	4	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	$	$

- <*Data Type*>: 0 means "binary data", and 1 means "binary data written in hexadecimal ASCII format".
- <*Data Length*>: It represents the length of the original data.
- <*Data to the Backend Server*>: If <*Working Mode*> in **AT+GTURT** is 7, it is hexadecimal data. If the <*Working Mode*> is 6 or 8, it is raw HEX data.

3.3.13. 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 will also send the message **+RESP:GTUDT** to the serial port.

- **+RESP:GTUDT,**

Example:

+RESP:GTUDT,4B0305,0318,0102,,867995030082104,gv300can,0,,1,1,0.0,175,66.5,117.129182,31.839176,20190424015933,0460,0000,550B,B969,00,0.0,,,,1,11,,0,,01,00,21,0,0.00,0,00001,,,,20190424015935,0036$			
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	
Report ID	<=2	0-99	
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	
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	
Mileage	<=9	0.0 – 4294967.0 km	
Reserved			
HMC	11	HHHHH:MM:SS	
Reserved			
External GNSS Antenna	1	0|1|3	

GSV Number	<=2	00-FF	
GEO-Fence State	1	0|1	
Analog Input VCC	<=5	0 – 30000 mV	
Reserved	0		
Digital Input	4	0000 – 0F0F	
Digital Output	4	0000 – 0F07	
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	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Report Type*>: A numeral to indicate the type of the report.
  - 0: Timer (specified by <*IGN Send Interval*> in **AT+GTUDT**) triggered
  - 1: GEO-Fence event triggered
- <*Report ID*>: GEO-Fence event triggered report ID. It is 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 to Bit 19 represent the status of GEO 0 to 19 respectively. 0 means “Outside the GEO-Fence” or “The status is unknown”, and 1 means “Inside the GEO-Fence”.

3.3.14. UFSxxx FOTA Upgrade Report

The device will send the message **+RESP:GTUFS** to the backend server during the upgrade process.

- **+RESP:GTUFS,**

Example:

+RESP:GTUFS,4B0305,867995030082104,gv300can,101,,20190424020103,BBA7$			
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	100|101|102|103|200|201 |202|300|301|302	
Reserved (Optional)	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Code*>: Information code.

- 100: Confirm ok. Start to upgrade.
- 101: Mode error. UART does not work for UFSxxx. Stop upgrade.
- 102: The upgrading process is refused because of low power or an incorrect URL.
- 103: Another upgrade command is being executed. Stop upgrade.
- 200: Start to download package.
- 201: Package download succeeds.
- 202: Package download fails.
- 300: Start to upgrade.
- 301: Upgrade succeeds. The reserved parameter is used as follows.

New Version	2		0

- 302: Upgrade fails.

✧ <*New Version*>: The version of the new firmware in the UFSxxx sensor.

3.3.15. Bluetooth Data Report

The device reports the data from peripheral Bluetooth devices connected to it via the **+RESP:GTBDR** message.

➢ **+RESP:GTBDR,**

Example:
+RESP:GTBDR,4B0306,867995030096625,gv300can,,0,0.0,0,26.0,117.129113,31.839343,20190426062942,0460,0000,550B,B969,00,1D07,GV300CAN_BT1,78054100CE22,1,0,78054100093D,GB100P_1653,0003,1,180F,1,2A19,0,\,,,,,,,,,20190426062942,0BCD$

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		
GNSS Accuracy	1	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	4	XXXX	
Reserved	2	00	
Bluetooth Report Mask	4	0000 – FFFF	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth Mac Address	12	000000000000 – FFFFFFFFFFFF	
Peer Role	1	0|1	
Peer Address Type	1	0|1	
Peer MAC Address	12	000000000000 – FFFFFFFFFFFF	
Peer Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Data Mask	4	0000-0003	
Service UUID Type	1	1|2	
Service UUID	4|32	0000 – FFFF|000000000000000000000000000000 –	

		FFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Characteristic UUID Type	1	1|2	
Characteristic UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Data Format	1	0|1	
Data	<=245	'0'-'9' 'a'-'f' | ASCII	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Data*>: There are maximum 1200 ASCII characters in one message which contains values from Peer Bluetooth device characteristic. If <*Data Format*> is 0, it will be raw data from Bluetooth. If <*Data Format*> is 1, it means the values will be in Hexadecimal format. For example, if the data is 0x69, it will be shown as 69 in the report message.

3.4. Heartbeat

Heartbeat is used to maintain the connection between the device and the backend server in GPRS communication. 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,4B0305,867995030009362,gv300can,20190423070213,0517$			
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,4B0303,11F0$** **+SACK:GTHBD,,11F0$**			
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.

3.5. Server Acknowledgement

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

➢ **+SACK:**

Example: **+SACK:11F0$**

Parameter	Length (byte)	Range/Format	Default
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

4. HEX Format Report Message

From this version, the @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 the **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 7 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**), the heartbeat data (**+HBD**), the crash data packet (**+CRD**) and the CANBUS data (**+CAN**).

The composition of the HEX report message could be customized by the **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*>, <*+CRD 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 information items are reported.

- **AT+GTHRM=**

Example: **AT+GTHRM=gv300can,,,EF,FE5FBF,FE5FBF,FFFD,EF,7D,7BF,7F,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300can
Reserved	0		
Reserved	0		
+ACK Mask	2	00 – FF	EF
+RSP Mask	8	00000000 – FFFFFFFF	FE5FBF

+EVT Mask	8	00000000 – FFFFFFFF	FE5FBF
+INF Mask	8	00000000 – FFFFFFFF	FFFD
+HBD Mask	2	00 – FF	EF
+CRD Mask	4	0000-FFFF	7D
+CAN Mask	8	00000000 – FFFFFFFF	7BF
+DAT Mask	<=8	00000000 – FFFFFFFF	7F
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	Reserved
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	*<Analog Input Voltage>*
Bit 13	Reserved
Bit 12	*<External Power Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<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>*

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

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved

Bit 27	Reserved
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	*<Analog Input Voltage>*
Bit 13	Reserved
Bit 12	*<External Power Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<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>*

✧ *<+INF Mask>*: Component mask of the information report message. Bit 8 - Bit 15 indicate which groups of information items are included when the device reports the **+RESP:GTINF** message.

Mask Bit	Item
Bit 15	**+RESP:GTGIR**
Bit 14	**+RESP:GTTMZ**
Bit 13	**+RESP:GTCSQ**
Bit 12	**+RESP:GTCID**
Bit 11	**+RESP:GTBAT**
Bit 10	**+RESP:GTGPS**
Bit 9	**+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 information items are included when the device reports the message **+RESP:GTINF**.

Mask Bit	Item
Bit 15	Reserved
Bit 14	**+RESP:GTRSV**
Bit 13	Reserved
Bit 12	Reserved
Bit 11	**+RESP:GTBAU**
Bit 10	**+RESP:GTBSC**
Bit 9	**+RESP:GTBTI**
Bit 8	**+RESP:GTTVN**
Bit 7	**+RESP:GTDAV**
Bit 6	**+RESP:GTCML**

Bit 5	Reserved
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*>

✧ <*+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.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Reserved
Bit 20	Reserved
Bit 19	Reserved
Bit 18	Reserved
Bit 17	Reserved
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	*<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>*

✧ *<+DAT Mask>*: Component mask of 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>*
Bit 2	*<Protocol Version>*
Bit 1	*<Device Type>*
Bit 0	*<Length>*

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

➢ **+ACK:GTHRM,**

Example: **+ACK:GTHRM,4B0305,867995030082104,gv300can,0026,20190424020847,BBC7$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Device Name	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: **2B41434B02EF244B03050318564F5F0300520A0400002807E30418020918BBCA4CD10D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+ACK	+ACK
Message Type	1		
Report Mask	1	00 – FF	
Length	1		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
ID	1		
Serial Number	2	0000 – FFFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Message Type*>: It indicates the ID of the command that the device receives.

Command	**ID**
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
Reserved	3
AT+GTCFG	4

AT+GTTOW	5
AT+GTEPS	6
AT+GTDIS	7
AT+GTOUT	8
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14
AT+GTCAN	15
AT+GTRTO	16
Reserved	17
Reserved	18
AT+GTSIM	19
Reserved	20
AT+GTUPD	21
AT+GTPIN	22
AT+GTDAT	23
AT+GTOWH	24
AT+GTDOG	25
AT+GTAIS	26
AT+GTJDC	27
AT+GTIDL	28
AT+GTHBM	29
AT+GTHMC	30
Reserved	31
AT+GTURT	32
Reserved	33
AT+GTWLT	34

AT+GTHRM	35
AT+GTCRA	36
AT+GTPDS	38
AT+GTBZA	39
AT+GTSPA	40
AT+GTSSR	41
Reserved	42
AT+GTGPJ	43
AT+GTACD	44
AT+GTIDA	45
AT+GTFSC	46
AT+GTRMD	47
AT+GTFFC	48
AT+GTCMD	49
AT+GTUDF	50
AT+GTJBS	51
AT+GTSMS	52
AT+GTOWL	53
AT+GTCFU	54
Reserved	55
AT+GTUPC	56
Reserved	57
AT+GTOEX	58
AT+GTIEX	59
AT+GTEFS	60
AT+GTCMS	61
AT+GTTAP	62
Reserved	63
AT+GTUDT	64
AT+GTUFS	65

AT+GTFTP	66
AT+GTCDA	67
Reserved	68
Reserved	69
AT+GTGAM	70
AT+GTBSE	71
AT+GTPEO	72
AT+GTTMP	73
AT+GTGDO	74
AT+GTVVS	75
AT+GTAVS	76
Reserved	77
AT+GTFVR	78
AT+GTCLT	79
Reserved	80-88
AT+GTBTS	89
AT+GTBMS	90
AT+GTBAS	103
Reserved	104
AT+GTTTR	105
Reserved	106-108
AT+GTBID	109

- <*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.
- <*Device Name*>: If Bit 4 of <*+ACK Mask*> is 0, the IMEI of the device is used as the device name 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	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 4 of <*+ACK Mask*> is 1, the <*Device Name*> is used as the device name 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 more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	**g**	**v**	**3**	**0**	**0**			
HEX	**67**	**76**	**33**	**30**	**30**	**00**	**00**	**00**

- <*ID*>: The ID of the sub-command of **AT+GTRTO** or the ID of **AT+GTIOB**, **AT+GTTMP** or **AT+GTGEO**. For others, it is 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	**2011**		**01**	**31**	**06**	**29**	**11**
HEX	**07**	**DB**	**01**	**1F**	**06**	**1D**	**0B**

- <*Checksum*>: The CRC16 checksum of data between the fields of <*Message Header*> and <*Checksum*> (exclude <*Message Header*> and <*Checksum*>).

4.3. Location Report +RSP

Location report messages including **+RESP:GTTOW**, **+RESP:GTEPS**, **+RESP:GTDIS**, **+RESP:GTIOB**, **+RESP:GTFRI**, **+RESP:GTGEO**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTDOG**, **+RESP:GTIGL** and **+RESP:GTHBM** use the format below.

➢ **+RSP,**

Example:
2B5253500700FE0FBF005D4B03050318564F5F0300520A040001002118100101000000000AF0043
06FB3FDE01E5D3C807E3041802093904600000550BB969000000000000000000000000000000
0000007E3041802093ABBCD1D7C0D0A

Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Voltage	2		

Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Report ID / Report Type	1		
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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 location report message.

Message	ID
Reserved	0
+RESP:GTTOW	1
Reserved	2
+RESP:GTLBC	3
+RESP:GTEPS	4
+RESP:GTDIS	5
+RESP:GTIOB	6
+RESP:GTFRI	7
+RESP:GTGEO	8
+RESP:GTSPD	9
+RESP:GTSOS	10
+RESP:GTRTL	11
+RESP:GTDOG	12
Reserved	13
+RESP:GTAIS	14
+RESP:GTHBM	15
+RESP:GTIGL	16
+RESP:GTIDA	17
+RESP:GTERI	18
Reserved	19
+RESP:GTGIN	20
+RESP:GTGOT	21
Reserved	22
Reserved	23
+RESP:GTVGL	24

- <*Report Mask*>: Please refer to the <*+RSP Mask*> in **AT+GTHRM**.
- <*Device Name*>: If Bit 6 of <*+RSP Mask*> is 0, the IMEI of the device is used as the device name 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	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit 6 of <*+RSP Mask*> is 1, the <*Device Name*> is used as the device name 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 more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	g	v	3	0	0	n		
HEX	67	76	33	30	30	6E	00	00

- <*External GNSS Antenna Status / Satellites*>: The last 2 bits of the high nibble are for <*External GNSS Antenna Status*> and the low nibble is for <*Satellites*>.
- <*Motion Status*>: The motion status of the device.
- <*Satellites*>: The low nibble is for <*Satellites*>.
- <*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.

In **+RESP:GTGEO**, Bit 0 is used for Report Type, Bit 1 – Bit 3 are used as high 3 bits of Report ID, and Bits 4 – 7 are used as low 4 bits of Report ID.

- <*Speed*>: 3 bytes in total. The first 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 from the GNSS chip. 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.

GNSS UTC Time	2011		07	14	08	24	13
HEX	07	DB	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 represent the hour's part, the fifth byte represents the minute's part, and the sixth byte indicates the second's part.

Total Hour Meter Count	0				0	0
HEX	00	00	00	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 for EIO100, it is always "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

✧ <*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 for EIO100, it is always "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

✧ <*RFID*>: This is the card ID of Old RFID. 4 bytes in total.

Reserved	0			
HEX	00	00	00	00

✧ <*CAN Data*>: Please refer to the **+RESP:GTCAN** report in hex format. <*CAN Data*> includes fields from <*CANBUS Device State*> to <*Rapid Accelerations*>. This field can be analyzed according to the **+RESP:GTCAN** report.

The location report message **+RESP:GTFRI** uses the format below.

➢ **+RSP,**

Example: **2B5253500700FE0FBF005D4B03050318564F5F0300520A040001002118100101000000000AF004306FB3FDE01E5D3C807E3041802093904600000550BB969000000000000000000000000000000000000000000007E3041802093ABBCD1D7C0D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Report ID / Report Type	1		
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	2	0000 – FFFF	
GNSS Trigger Type	1	0-4	
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	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*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 the following meanings.

- 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 the following meanings.

- 0: Normal fixed report
- 1: Corner report which indicates that the device just turns around a corner
- 2: FRI report frequency change which indicates that the terminal enters into Geo-Fence or roaming status
- 3: Corner report when FRI report frequency changes
- 4: Mileage report when fixed report is mode 5
- 5: Reserved
- 6: Mileage report when fixed report is mode 5 and **AT+GTFFC** works

✧ <*GNSS Trigger Type*>: The trigger type of GNSS point has the following meanings.

- 0: Time point.
- 1: Corner point.
- 2: Distance point
- 3: Mileage point.
- 4: Optimum point (time & mileage).

Note: <*GNSS Trigger Type*> is controlled by <*Report Composition Mask*> in **AT+GTCFG**. If the bit 3 in <*Report Composition Mask*> is unchecked, <*GNSS trigger point*> will be hidden. <*GNSS trigger point*> will also be influenced by **AT+GTOWH** if it is used.

The location report message **+RESP:GTLBC** uses the format below.

Example:
2B5253500300FE5FBF00684B03050318564F5F0300520A040000000000100211A007018019927387F010100000000AF004306FB3FDE01E5D3C807E30418020B3704600000550BB9690000000000000000000000000000000000000000007E30418020B38BBD6E2740D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	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	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Number Length / Number Type*>: The high nibble is for <*Number Length*> and the low nibble is for <*Number Type*>. <*Number Length*> is the total number of bytes which is equal to the length of the <*Phone Number*> in bytes plus the length of the parameter <*Number Length / Number Type*>. <*Number Type*> indicates if 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 are used to represent one digit of the phone number respectively. If there is no digit for the last low nibble to represent, fill it with 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.

Example:
2B5253500A00FE5FBF00624B03050318564F5F0300520A040000000000300221A00000101000000000000AA06FB416E01E5D3EF07E30418022623046000005 50BB96900000000000000000000000000000000000000007E30418022626BC454EBE0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna	1		

Status | Satellites in Use			
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	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:
2B5253501107FE5FFF00CC4B030603196776333030636 16E00000000000000000000111B00042AF7737601010000000000000004606FB402E01E5D2E807E3041A072E1604600000550BB96900000000

000000000000002300000004292600000000000C03FFFFF000000000000000000000000000000000
000000000000000000000000000000000FE0000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000007E3041A0
72E170352BA7B0D0A

Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Report ID / Report Type	1	00	00
ID Length	1	4|8	
ID	<=20	'0' – '9' 'A' – 'F'	
ID Report Type	1	0|1	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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*>: 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 been logged out.

The location report message **+RESP:GTERI** uses the format below.

- **+RSP,**

Example:
2B5253501200FE0FBF0000011E00664B03050318564F5F0300520A040001002119100000000000010100000000F8007F06FB402E01E5D4AB07E3041803070D04600000550BB96900000000000000000000000000000000000000007E3041803070FBCD2421F0D0A

Message Header		4	+RSP	+RSP
Message Type		1		
Report Mask		4	00000000 – FFFFFFFF	
ERI Mask		4	00000000 – FFFFFFFF	
Length		2		
Device Type		1	4B	4B
Protocol Version		2	0000 – FFFF	
Firmware Version		2	0000 – FFFF	
Device Name		8	IMEI	
Battery Level		1	0 – 100	
External Power Supply Voltage		2		
Analog Input Voltage		2		
EIO100 Input Status		1	00 – 0F	
Digital Input Status		1	00 – 07	
EIO100 Output Status		1	00 – 0F	
Digital Output Status		1	00 – 03	
Motion Status		1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status/ Satellites in Use		1		
Report ID / Report Type		1		
Reserved		1	00	00
Digital Fuel Sensor Data (Optional)		2	0000 – FFFF	
1-Wire Data (Optional)	1-Wire Device Number	1	0 – 19	
	1-wire Device ID	8		
	1-wire Device Type	1	00 – FF	
	Device Data Length	1	00 – FF	
	1-wire Device Data	<= 20		
Fuel Sensor Data	Sensor Number	1	0 –99	
	Sensor Type	1	0 – 6|20 – 21	

(Optional)	Reserved	1	0x00	
	Percentage (Optional)	2	0 – 100	
	Volume (Optional)	2	0 – 10000	
Bluetooth Accessory Data (Optional)	Bluetooth Accessory Number	1	0 – 10	
	Index	1	0 – 9	
	Accessory Type	1	0 – 2|6|7	
	Accessory Model	1	0 – 4	
	Raw Data Length	1	0 – FF	
	Raw Data			
	Accessory Append Mask	2	0 – FFFF	
	Accessory Name	<=21		
	Accessory MAC	6	000000000000 – FFFFFFFFFFFF	
	Accessory Status	1	0 – 1	
	Accessory Battery Level	2	0 – 5000	
	Accessory Temperature	1	00 – FF	
	Accessory Humidity	1	0 – 100%(rh)	
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		2	0000 – FFFF	

GNSS Trigger Type	1	0 – 4	
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	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*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.
- <*1-Wire Device Number*>: The number of devices connected to 1-wire. 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 be repeated for each 1-wire device so that the information of all connected 1-wire devices are displayed. If Bit 1 of <*ERI Mask*> in **AT+GTFRI** is set to 1, the <*1-Wire Data*> field will be displayed; otherwise, the <*1-Wire Data*> field 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.
  - 2: iButton sensor.

  Note: The message **+RESP:GTERI** will report iButton information only when the **AT+GTIDA** function is enabled in the authorized state.
- <*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.
- <*Bluetooth Accessory Number*>: It indicates the number of accessories connected with the device.
- <*Index*>: The Index of the Bluetooth accessory.
- <*Accessory Type*>: The type of the Bluetooth accessory.
  - 0: No Bluetooth accessory

- 1: Fuel sensor
- 2: Beacon temperature sensor
- 6: Beacon Multi-Functional Sensor
- 7: Technoton accessory

✧ <*Accessory Model*>: The model of the Bluetooth accessory.

✧ <*Raw Data Length*>: It indicates the length of <*Raw Data*>.

✧ <*Raw Data*>: The data read from Bluetooth accessory. It varies depending on <*Accessory Type*> and <*Accessory Model*>.

- WTS300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate battery voltage, the unit is millivolt. And the 2 lower bytes of the hexadecimal value indicate temperature, the high byte is the integer part and the low byte is the fractional part. Temperature is equal to the low byte divided by 256 plus the high byte, the unit is Celsius. If this value is negative, it is represented in 2's complement format.
- WTH300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate temperature. And the 2 lower bytes of the hexadecimal value indicate humidity. The high byte is the integer part and the low byte is the fractional part. Temperature is equal to the low byte divided by 256 plus the high byte, and the unit is Celsius. Humidity is equal to the low byte divided by 256 plus the high byte, and the unit is RH.
- Escort Angle Sensor: It is a four-byte hexadecimal value. The first byte in higher 2-byte of the hexadecimal value is reserved byte, the value is 00. The second byte in higher 2-byte of the hexadecimal value indicate Event Notification of Angle sensor. And the 2 lower bytes of the hexadecimal value indicate Tilt Angle of sensor. The specific definitions are as follows:

Reserved	1	00	00
Event Notification	1	00 – FF	
Tilt Angle	2	0000 – FFFF	

✧ <*Accessory Name*>: The name of the Bluetooth accessory. It ends with 0x00.

✧ <*Accessory MAC*>: The MAC address of the Bluetooth accessory.

✧ <*Accessory Status*>: It indicates the connection status of Bluetooth accessory.

- 0: Disconnected.
- 1: Connected.

✧ <*Accessory Battery Level*>: It indicates the remaining percentage level of the battery in Bluetooth accessory.

✧ <*Accessory Temperature*>: It indicates the temperature measured by Bluetooth accessory.

✧ <*Accessory Humidity*>: It indicates the humidity measured by the Bluetooth accessory.

✧ <*GNSS Trigger Type*>: The trigger type of GNSS point has the following meanings.

- 0: Time point.
- 1: Corner point.
- 2: Distance point
- 3: Mileage point.

- 4: Optimum point (time & mileage).

Note: <*GNSS Trigger Type*> is controlled by <*Report Composition Mask*> in **AT+GTCFG**. If the bit 3 in <*Report Composition Mask*> is unchecked, <*GNSS trigger point*> will be hidden. <*GNSS trigger point*> will be also influenced by **AT+GTOWH** if it is used.

Note: The word "Optional" indicates the item is controlled by the parameter <*ERI Mask*>.

The location report messages **+RESP:GTGIN** and **+RESP:GTGOT** use the format below.

➢ **+RSP,**

Example: **2B5253501500FE5FBF006A4B03050318564F5F0300520A040000000000010021190001000000000000001010100000000F8007F06FB402E01E5D4AB07E30418030936046000005 50BB9690000000000000000000000000000000000000007E30418030939BCE506410D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Battery Level	1	0 – 100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
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 Use	1		

Area Type	1	0 – 1	
Mask Group	1	01 – 1F	
Area Mask Group 1	8	0000000000000001 – 00000000000FFFFF	
Area Mask Group 2	8	0000000000000001 – 00000000000FFFFF	
Number	1	1	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Mask Group*>: The bitwise mask to determine whether to report <*Area Mask Group*>. Bit 0 is for Area Mask Group 1 and Bit 1 is for Area Mask Group 2. 1 means "Report the

information", and 0 means "Do not report the information".

✧ *<Area Mask Group 1>*: Bitwise mask for trigger condition composition of the corresponding PEO ID. Each bit, from Bit 0 to Bit 24, represents the logic status of the corresponding PEO ID to trigger the entering or exiting event. 1 means that the event of the PEO ID set is triggered and 0 means the event of the PEO ID set is not triggered. In a group, if no event of PEO ID is triggered, the bitwise mask will be null.

4.4. Information Report +INF

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

➢ **+INF,**

Example: **2B494E4601FFFD00000091564F5F0300520A044B0305031801020101000000000000000000000000000010000210019200 7E30418030C0C0000007F001E025800000000008000000000008986 02A21247F6090710180000000000040460000055 0BB96A00180460000055 0B9B89001304600000055 0B3C6C000D04600000550BB969001807E30418030C0EBCFB86BD0D0A**			
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	
Length	2		
Device Name	8	IMEI/Device Name	
Device Type	1	4B	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	**+RESP:GTVER**
MCU Version	2	0000 – FFFF	
Reserved	2	0000	
Reserved	1	00	**+RESP:GTIOS**
Analog Input Voltage	2		

Reserved	2	0000	
Reserved	1	00	
Reserved	2	0000	
Reserved	2	0000	
EIO100 IO Status	2	0000 – 0F0F	
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 03	
Reserved	1	00	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Reserved	1	00	
External GNSS Antenna Status | Satellites in Use	1		
Power Saving Enable / OWH Mode / Outside Working Hours / AGPS	1		
Last Fix UTC Time	7	YYYYMMDDHHMMSS	**+RESP:GTGPS**
Reserved	1	00	
FRI Discard No Fix	1	0|1	
Response Report Item Mask	2		
IGN Interval	2		
IGF Interval	2		
Reserved	4	00000000	
Reserved	1	00	
External Power Supply / Backup Battery On / Charging / LED On / Backup Battery Charge Mode	1		
External Power Voltage	2	0	**+RESP:GTBAT**
Backup Battery Voltage	2	0 – 4200mV	
Backup Battery Level	1	00	
ICCID	10	ICCID	**+RESP:GTCID**

CSQ RSSI	1	0 – 31|99	**+RESP:GTCSQ**
CSQ BER	1	0 – 7|99	
Time Zone Offset Sign / Daylight Saving Enable	1		**+RESP:GTTMZ**
Time Zone Offset	2	HHMM	
GIR Trigger Type	1		**+RESP:GTGIR**
Cell Number	1		
MCC	2		
MNC	2		
LAC	2		
Cell ID	2		
Reserved	1		
RX Level	1		
SV Count	1		**+RESP:GTGSV /+RESP:GTRSV**
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		
CAN Chipset SW Version Length	1	0-10	**+RESP:GTCVN**
CAN Chipset SW Version	<=10		
CAN Chipset Serial Number length	1	0-10	
CAN Chipset Serial Number	<=10		
Car Model ID	2	0x0000-0xFFFF	**+RESP:GTCML**
CAN Chipset Car Name Length	1	0-50	
CAN Chipset Car Name	<=50		
Driveraid Version Length	1		**+RESP:GTDAV**
Driveraid Version	<=36		

THR_100 SW Version	<=8	'0' – '9' 'a' – 'z'	**+RESP:GTTVN**
THR_100 HW Version	<=8	'0' – '9' 'a' – 'z'	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	**+RESP:GTBTI**
Bluetooth MAC Address	6	000000000000 – FFFFFFFFFFFF	
Bluetooth State	1	0|1	
Connected Device Number	1	0 – 11	
Connected Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Connected Device MAC	6	000000000000 – FFFFFFFFFFFF	
Role	1	0|1	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	**+RESP:GTBSC**
Bluetooth Mac Address	6	000000000000 – FFFFFFFFFFFF	
Bluetooth State	1	0|1	
Nearby Device Number	2	0-30	
Nearby Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Nearby MAC Address Type	1	0|1	
Nearby Device MAC	6	000000000000 – FFFFFFFFFFFF	
Nearby Device RSSI	1	-120 - 0	
Nearby Device Status	1	0|1|2	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	**+RESP:GTBAU**
Bluetooth Mac Address	6	000000000000 – FFFFFFFFFFFF	
Bluetooth State	1	0|1	
Peer Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Peer Device MAC	6	000000000000 –	

		FFFFFFFFFFFF	
Peer Device State	1	0|1	
Service UUID Number	1	0 – 30	
Service UUID Type	1	1|2	
Service UUID	2|16	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Characteristic UUID Number	1	0-30	
Characteristic UUID Type	1	1|2	
Characteristic UUID	2|16	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Characteristic Properties	1	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 information report message.

Message	ID
+RESP:GTINF	1
+RESP:GTGPS	2
+RESP:GTCID	4
+RESP:GTCSQ	5
+RESP:GTVER	6
+RESP:GTBAT	7
+RESP:GTIOS	8

+RESP:GTTMZ	9
+RESP:GTGIR	10
+RESP:GTGSV	11
+RESP:GTUVN	12
+RESP:GTCVN	13
+RESP:GTRSV	21
+RESP:GTBTI	24
+RESP:GTBSC	25
+RESP:GTCML	26
+RESP:GTDAV	29
+RESP:GTBAU	31
+RESP:GTTVN	32

- <*Report Mask*>: Please refer to the <*+INF Mask*> in **AT+GTHRM**.
- <*Device Name*>: If Bit 1 of <*+INF Mask*> is 0, the IMEI of the device is used as the device name 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	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 1 of <*+INF Mask*> is 1, the <*Device Name*> is used as the device name 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 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**	**3**	**0**	**0**	**n**		
HEX	**67**	**76**	**33**	**30**	**30**	**6E**	**00**	**00**

- <*Power Saving Enable / OWH Mode / Outside Working Hours / AGPS*>: The highest bit, or Bit 7 is reserved, Bit 5 and Bit 6 are for <*Power Saving Enable*>, 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".
- <*External Power Supply / Backup Battery On / Charging / LED On / 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 On*> 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 / Daylight Saving Enable*>: 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 time. 1 means “negative offset”.

✧ <*GIR Trigger Type*>: A string to indicate what kind 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 the sub command “**C**” in the **AT+GTRTO** command.

"ERI": This cell information is for ERI requirement.

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.

✧ <*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 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

✧ <*Car Model ID*>: Car Name is human readable make and model of the car.

✧ <*Car Name*>: Car Name is human readable make and model of the car. If no model has been obtained or CAN Chipset has been synchronized, the value would be default.

✧ <*Driveraid Version Length*>: The length of <*Driveraid Version*>.

✧ <*Driveraid Version*>: The firmware version of the Driveraid device.

Note : <*THR_100 SW Version*>, <*THR_100 HW Version*>, <*Connected Device Name*>, <*Peer Device Name*> and <*Nearby Device Name*> end with 0x00.

4.5. Event Report +EVT

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

➢ **+EVT,**

Example: **2B4556540900FE5FBF00604B03050318564F5F0300520A040000000000010022190100000000000F8007F06FB402E01E5D4AB07E30418030D0C04600000550BB969000000000000000000000000000000000000000000007E30418030D0FBD013A290D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	

Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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 event report message.

Message	ID
+RESP:GTPNA	1
+RESP:GTPFA	2
+RESP:GTMPN	3
+RESP:GTMPF	4
Reserved	5
+RESP:GTBPL	6
+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
+RESP:GTANT	10
Reserved	11
+RESP:GTPDP	12
+RESP:GTIGN	13
+RESP:GTIGF	14
+RESP:GTUPD	15
+RESP:GTIDN	16
+RESP:GTIDF	17
+RESP:GTDAT	18
Reserved	19
+RESP:GTJDR	20
+RESP:GTGSS	21
+RESP:GTFLA	22
+RESP:GTCRA	23
+RESP:GTDOS	25
+RESP:GTGES	26
+RESP:GTSTR	28
+RESP:GTSTP	29
+RESP:GTLSP	30

+RESP:GTGPJ	31
+RESP:GTRMD	32
Reserved	33
+RESP:GTJDS	34
+RESP:GTUPC	35
+RESP:GTCFU	36
+RESP:GTDTT	37
Reserved	38
Reserved	39
Reserved	40
+RESP:GTCLT	41
+RESP:GTPHL	42
+RESP:GTUFS	43
+RESP:GTFTP	44
Reserved	45
Reserved	46
Reserved	47
Reserved	48
+RESP:GTTMP	49
+RESP:GTVGN	50
+RESP:GTVGF	51
+RESP:GTBCS	52
+RESP:GTBDS	53
Reserved	54
+RESP:GTBDR	55
Reserved	56
Reserved	57
Reserved	58
Reserved	59
+RESP:GTTTR	62

+RESP:GTTRL	63
Reserved	…
+RESP:GTBAA	65
Reserved	…
+RESP:GTBID	67
Reserved	…
+RESP:GTBAR	70

- <*Report Mask*>: Please refer to the <*+EVT Mask*> in **AT+GTHRM**.
- <*Device Name*>: If Bit 6 of <*+EVT Mask*> is 0, the IMEI of the device is used as the device name 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	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 6 of <*+EVT Mask*> is 1, the device name is used as the device name 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 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**	**3**	**0**	**0**	**n**		
HEX	**67**	**76**	**33**	**30**	**30**	**6E**	**00**	**00**

The event report message **+RESP:GTBPL** uses the format below.

➢ **+EVT,**

Example:
2B4556540607FE5FFF00C74B0306031967763330306361 6E0800000000000000000011060E2F0100 00000000B4002506FB409401E5D0E707E3041C07212704600000550BB9690000000000000000000 0000000000000000000000000000000C03FFFFF000000000000000000000000000000000000000000000 0000000000000000000000000FE000000000000000000000000000000000000000000000000000000 0000000000000000000000000000000000000000000000000000000000000007E3041C07212A0DF DC5FA0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		

Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Backup Battery Voltage	2	0 – 4200 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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	

Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTFLA** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 16 FF FF FF BF 00 67 01 04 02 0C 01 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 00 0C 00 41 10 00 64 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 18 78 08 72 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 01 1E 0A 08 06 00 20 7F F3 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	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 – 100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	

Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Input ID	1	0 – 1	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	

Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*Input ID*>: The ID of the input to which the fuel sensor is connected.
- ✧ <*Last Fuel Level*>: The fuel level saved before the fuel loss alarm event occurs.
- ✧ <*Current Fuel Level*>: The current fuel level when the fuel loss alarm event occurs.

The event report message **+RESP:GTRMD** uses the format below.

➢ **+EVT,**

Example:
2B4556542000FE5FBF00614B03050318564F5F0300520A045500000000000001119000100000000 00F8006906FB404901E5D43B07E30418051016046000005 50BB969000000000000000000000000000 00000000000007E30418051018BE1922490D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		

Roaming 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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

- 0: Home
- 1: Known Roaming
- 2: Unknown Roaming
- 3: Blocking Report

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: **2B4556540D00FE5FBF00644B03050318564F5F0300520A045500000000010022190000 1CC7010000000000F8006906FB404901E5D43B07E3041805103A04600000550BB9690000000000000000000000000000000000000000000000007E30418051102BE1D62A20D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 -100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Duration of Ignition On / 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	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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 parameters <*Protocol Version*> and <*Firmware Version*> will always be present regardless of the <*+EVT Mask*> setting.

➢ **+EVT,**

Example:
2B4556540F00FE5FBF00634B03050318564F5F0300520A0453000000000000111900C8010100000000000F8FFEC06FB410B01E5D48F07E3041805113704600000550BB969000000000000000000000000000000000000000000007E3041805113ABE2D0C000D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	

Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	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	2	0000 – FFFF	

Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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: **2B4556541100FE5FBF00644B03050318564F5F0300520A0464000000000000121A000000620100000000000004006FB415B01E5D43D07E30418051C2704600000550BB96900000000000000000000000000000000000000007E30418051C28BE68EAF20D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	

EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Duration of Idling Status	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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTGSS** uses the format below.

➢ **+EVT,**

Example: **2B4556541500FE5FBF00654B03050318564F5F0300520A040000000000010321130000000000010000000903007C000C06FB407B01E5D27507E3041807312E04600000550BB9690000000000000000000000000000000000000000007E30418073230C0BB808A0D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
GNSS Signal Status	1	0 | 1	
Reserved	4	00000000	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	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTDOS** uses the format below.

➢ **+EVT,**

Example:
2B4556541900FE5FBF00624B03050318564F5F0300520A0464000000000000111A020101000000000000004006FB415B01E5D43D07E3041805283904600000550BB969000000000000000000000000000000000000007E30418052A2ABEA058FC0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT

Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Wave1 Output ID	1	1-2	
Wave1 Output Active	1	0|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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTGES** uses the format below.

➢ **+EVT,**

Example:
2B4556541A00FE5FBF006C4B03060319564F5F0300520A040000000000000011070000011500000320000001E0101000000000400320 6FB404401E5D1C707E3041C07121D04600000550BB9690000000000000000000000000000000000000007E3041C0712210DBA6C8F0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 - 100	
External Power Supply	2		

Voltage			
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Trigger GEO ID	2	0 – 19	
Trigger GEO Enable	1	0|1	
Trigger Mode	1	0|21|22	
Radius	4	50 – 6000000m	
Check Interval	4	0|5 – 86400sec	
Number	1	1	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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-Parking-Fence. The range is 0 – 19.
- ✧ <*Trigger GEO Enable*>: The zone's Geo-Parking-Fence function is enabled or disabled.
  - 0: The zone's Geo-Parking-Fence function is disabled.
  - 1: The zone's Geo-Parking-Fence function is enabled.

The event report message **+RESP:GTGPJ** uses the format below.

➢ **+EVT,**

Example:
2B4556541F00FE5FBF00624B03060319564F5F0300520A040000000000100211B0D0101000000000000004F06FB40AF01E5D44A07E3041D01093204600000550BB969000000000000000000000000000000000000000000007E3041D01093403B749C00D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	

EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
CW Jamming Value	1	0-255	
GNSS Jamming State	1	0|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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 –4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	

Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*CW Jamming Value*>: The current continuous wave (CW) jamming value.
- ✧ <*GNSS Jamming State*>: The current jamming state.
  - 0: Unknown or feature disabled
  - 1: (OK) No significant jamming
  - 3: (Critical) Interference visible and no fix

The event report message **+RESP:GTJDS** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 22 FF FF FF BF 00 69 21 02 06 06 02 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 0C 00 41 10 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 18 78 08 72 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 01 1E 0A 08 06 00 20 7F F3 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	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	

External GNSS Antenna Status | Satellites in Use	1		
Jamming Status	1	1-2	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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.

The event report message **+RESP:GTCLT** uses the format below.

➢ **+EVT,**

Example:

2B4556543507FE5FFF01174B03050318677633303063616E00000000000010003211A001FFFFF
FF003F003F000000060100000000000000006606FB417001E5D66107E30419030A1604600000550B
B969000000000000000000000000000000000000000000001E07FFFFF0000000000000000000
00000000000000002000000000000000323806A900280037FE0000000000572800000431400000F
7800200000035C40000002F32B000000691500001D0C00110D00BFFFFF3F3F0000000626000000
153D00001A7E007FFFFF000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000001FFF0000026D0000052C07E30419030A18
D3B4C5750D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
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 Use	1		
Group ID	1	00– 19	
Alarm Mask 1	4	00000000 – FFFFFFFF	

Alarm Mask 2	4	00000000 – FFFFFFFF	
Alarm Mask 3	4	00000000 – FFFFFFFF	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN DATA	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Group ID*>: The ID of CANBUS alarm group. The CANBUS alarm function supports settings of a total of 20 groups.
- <*Alarm Mask 1*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Detailed Information / Indicators*> of the **+RESP:GTCAN** message.
- <*Alarm Mask 2*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Lights*> and <*Doors*> of the **+RESP:GTCAN** message.
- <*Alarm Mask 3*>: The alarm mask is configured in a bitwise manner. The alarm mask

information is based on <*Engine RPM*> of the **+RESP:GTCAN** message.

The event report message **+RESP:GTCFU** uses the format below.

➢ **+EVT,**

Example: **2B4556542400FE5FBF00634B03050318564F5F0300520A045A000000000003111A00640001000000000000005306FB40D201E5D3DB07E30418061217046000005508B9690000000000000000000000000000000000000007E30418061219BF0738630D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 – 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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.

- **+EVT,**

Example:
2B4556541200FE5FBF00654B03050318564F5F0300520A045D0000000000031A1A00033132330100000000000000005306FB40D201E5D3DB07E30418061326046000005508B96900000000000000000000000000000000000000000000000007E30418061328BF1515F20D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	

Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTPHL** uses the format below, and it is only sent via GPRS even if the report mode is forced SMS mode.

➢ **+EVT,**

Example:
2B4556542A00FE5FBF006C4B03060319564F5F0300520A040000000000101211C000300080007E3041A0827000100000000000004A06FB3FEB01E5D3C007E3041A08263B04600000550BB9690000000000000000000000000000000000007E3041A0827010438B7770D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		

Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	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	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	

RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTUFS** uses the format below.

➢ **+EVT,**

Example:
2B4556542B00FE5FBF00604B03050318564F5F0300520A045F000000000003111A010000000000005306FB40D201E5D3DB07E3041806153804600000550BB969000000000000000000000000000000000000000007E3041806153ABF2106260D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 - 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12	

		0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:
2B4556542C00FE5FBF00884B03060319564F5F0300520A040000000000010021067164363263838393306A6864687537343947424746 5F32303139303432383037303334302E6A7067000100000000004005706FB405B01E5D21507E3041C0703350460000055 0BB969000000000000000000000000000000000000000007E3041C0703380D6D57FA0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 - 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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 the file name string which ends by '\0'. The value is in ASCII format.

The event message **+RESP:GTTMP** uses the format below.

➢ **+EVT,**

Example: **2B 45 56 54 1E FF FF FF BF 00 67 25 04 02 0C 01 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 0C 00 41 10 00 64 00 01 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 04 60 00 00 18 78 08 72 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 01 1E 0A 08 06 00 20 7F F3 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	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Battery Level	1	0 – 100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
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 Use	1		
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN DATA	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Temperature Alarm ID*>: The ID of the temperature alarm.
- <*Temperature Status*>: The status of 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:
2B4556542500FE5FBF00664B03050318564F5F0300520A045E000000000003111B000003313233010000000000000005306FB40D201E5D3DB07E3041806170504600000550BB9690000000000000000000000000000000000000000007E30418061708BF2BDDDE0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	

Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 - 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Reserved	1	00	00
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTUPC** uses the format below.

➢ **+EVT,**

Example:
2B4556542300FE5FBF00894B03050318564F5F0300520A045F000000000003111A000064687474703A2F2F7777772E717565636C696E6B2E636F6D2F636F6E6669677572652E696E690001000000000000005306FB40D201E5D3DB07E30418061832046000005508B969000000000000000000000000000000000000000000007E30418061835BF36B66A0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Battery Level	1	0 - 100	
External Power Supply	2		

Voltage			
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
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 Use	1		
Command ID	1		
Result	2	100|101|102|103|200|201|202|300|301|302|303|304|305	
Download URL	<=101	Complete URL	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of commands when the response code is 301. It indicates wrong format of command ID when the response code is 302.
- ✧ <*Result*>: A numeral to indicate whether the configuration is updated successfully.
  - 100: The update command is starting.
  - 101: The update command is confirmed by the device.
  - 102: The update command is refused by the device.
  - 103: The update process is refused because the battery is low.
  - 200: The device starts to download the package.
  - 201: The device finishes downloading the package successfully.
  - 202: The device fails to download the package.
  - 300: The device starts to update the device configuration.
  - 301: The device finishes updating the device configuration successfully.
  - 302: The device fails to update the device configuration.
  - 303: The device refuses to update the configuration because the battery is low.
  - 304: The device refuses to update the configuration because the mask check in **AT+GTFVR** fails.
  - 305: The device is interrupted by abnormal reboot.
- ✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name and ends by 0x00.

The 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: **2B4556543400FE5FBF00604B03050318564F5F0300520A040000000000000031217010000000000700100106FB40CF01E5D1C507E3041807363B04600000550BB969000000000000000000000000000000000000000000007E30418073700C0D3DE500D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI / Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
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 Use	1		
Reserved	1	00	
Report 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	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTBCS** and **+RESP:GTBDS** uses the format below.

➢ **+EVT,**

Example:
2B4556543400FE5FBF00794B03070324564F5F0300520A04642FDF00000101211C001047563330 3043414E5F3834343328FFFF00780541000557010000000000000005206FB402801E5D3BB07E306 0D07033004600000550BB969000000000000000000000000000000000000000007E3060D0F0332009 CB8280D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	

Battery Level	1	0 - 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Peer Role	1	0|1	
Peer name length	1	00 – FF	
Peer name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Peer Address Type	1	0|1	
Peer MAC Address	6	000000000000 – FFFFFFFFFFFF	
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	2	0000 – FFFF	
Reserved	1	00	00

Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
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:GTBDR** uses the format below.

- **+EVT,**

Example:
2B4556543700FE5FBF007D4B03070324564F5F0300520A04642FDB00000101211C00007805410005571047563330304341 4E5F3834343332FFFF0003FF0001000000000000005206FB402801E5D3BB07E3060D07052D04600000550BB969000000000000000000000000000000000000000007E3060D0F052F00A3177F0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 - 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	

EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Peer Role	1	0|1	
Peer Address Type	1	0|1	
Peer MAC Address	6	000000000000 – FFFFFFFFFFFF	
Peer Name Length	1	00 – FF	
Peer Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth Report Mask	2	0000 – FFFF	
Reserved (Optional 1)			
Reserved (Optional 2)			
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Bluetooth Report Mask*>: Bitwise mask to configure the composition of Bluetooth data report.
<*Reserved (Optional1)*>, <*Reserved (Optional 2)*> have the following meanings:

- Bit 0:

Service UUID Type	1	1|2	
Service UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	

- Bit 1:

Characteristic UUID Type	1	1|2	
Characteristic UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	

The event report message **+RESP:GTTTR** uses the format below.

➢ **+EVT,**

Example:
2B4556543E00FE5FBF00684B04010407564F5F0301342D010000000000010021190002030000020000010000000000000004806FB403601E5D0AD07E3070508090904600000550BB969000000000000000000000000000000000000000000000007E3070510090B005044860D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT

Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 - 100	
External Power Supply Voltage	2		
Analog Input Mode	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
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 Use	1		
Request ID	2	0000-FFFF	
Message Type	1	0-0C	
Reserved(option1)			
Reserved(option2)			
Reserved(option3)			
Reserved(option4)			
Reserved(option5)			
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Request ID*>: It is the response to the server with the same field <*Request ID*> in the command **AT+GTTTR**.

✧ <*Message Type*>:

● 0: Reply for DDD file request.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0-3	
Device Status	1	0x00-0xFF	
File State In Memory	1	0x00-0xFF	
Error Code	1	0x00-0xFF	
Reserved			

- 1: Authorization result.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0-3	
Device Status	1	0x00-0xFF	
Reserved			
Error Code	1	0x00-0xFF	
Reserved			

- 2: APDU Data received from THR_100.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			
APDU Sequence Number	2		
APDU DATA	2		
Reserved			
Reserved			

- 3: The result of the process that THR_100 reads file from tachograph.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0-6	
Device Status	1	0x00-0xFF	
File State In Memory	1	0x00-0xFF	
Error Code	1	0x00-0xFF	
Reserved			

- 4: Communication timeout.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			
Reserved			
Reserved			
Reserved			
Reserved			

- 5: Debug mode, the state of THR_100.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			
Device Status	1	0x00-0xFF	
File State In Memory	1	0x00-0xFF	
Error Code	1	0x00-0xFF	
Error Code Memory	1	0x00-0xFF	

- 6: FTP transfer event.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0-14	
Reserved			
Reserved			
Reserved			
Reserved			

- 7: DDD files retry event. This type means DDD file retry event, and the application should be initialized to accept the next request.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0	
Device Status	1	0x00-0xFF	
File State In Memory	1	0x00-0xFF	
Error Code	1	0x00-0xFF	
Reserved			

- 8: Restart TachoReader.

  In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0|1	
Reserved			
Reserved			

Reserved			
Reserved			

- 9: Tachograph details.

Reserved			
Tachograph producer	1		
Tachograph model	<=40		
Reserved			
Reserved			

- 0A: Inquiry status of the device.

Reserved			
Reserved			
Device status / Files in device memory	2	X(0-FF)Y(0-FF)	
Reserved			
Reserved			

- 0B: Inquiry Tachograph driver 1 ID, name and surname.

Reserved			
Reserved			
Tachograph driver 1 id	<=40		
Tachograph driver 1 name and surname	<=40		
Reserved			

- 0C: Inquiry special status.

Reserved			
Reserved			
Special status	6	0x000000000000 – 0xFFFFFFFFFFFF	
Reserved			
Reserved			

✧ <*Reply Result*>: If <*Message Type*> is 0(Reply for DDD file request), it is reply on inquiry read request.

- 0: Request OK.
- 1: Request busy: Advanced test.
- 2: Request busy: THR_100 is executing precious order.
- 3: Request busy: Configuration of the cancel order.

If <*Message Type*> is 1(Authorization result), it is reply on inquiry the status of the device:

- 0: Authorization OK.
- 1: Authorization fail.
- 2: Authorization timeout.
- 3: Authorization data error.

If <*Message Type*> is 2, this field is reserved.

If <*Message Type*> is 3(file reading), it is result of file reading:

- 0: THR_100 getting file from Tachograph OK.
- 1: THR_100 getting file from Tachograph fail.
- 2: File mismatch.
- 3: THR_100 getting file from Tachograph timeout.
- 4: Device getting file from THR_100 timeout.
- 5: Device getting file from THR_100 fail.
- 6: DDD file size error.

Note: Here are the timeout instructions for file reading.

- <*Read file Type*> is 0x01
  THR_100 getting file from Tachograph timeout is 15 minutes.
  Device getting file from THR_100 timeout is 5 minutes.
- <*Read file Type*> is 0x02 or 0x04
  THR_100 getting file from Tachograph timeout is 5 minutes.
  Device getting file from THR_100 timeout is 3 minutes.
- <*Read file Type*> is 0x03 or 0x05
  THR_100 getting file from Tachograph timeout is 20 minutes.
  Device getting file from THR_100 timeout is 10 minutes.
- <*Read file Type*> is 0x06
  THR_100 getting file from Tachograph timeout is 10 minutes.
  Device getting file from THR_100 timeout is 5 minutes.
- <*Read file Type*> is 0x07
  THR_100 getting file from Tachograph timeout is 20 minutes.
  Device getting file from THR_100 timeout is 10 minutes.

If <*Message Type*> is 6, it is the event of FTP transfer.

- 0: FTP open server OK.
- 1: FTP open server no service.
- 2: FTP open server roaming.
- 3: FTP open server in FOTA process.
- 4: FTP open server login error.
- 5: FTP open server host error.
- 6: FTP open server bearer fail.

- 7: FTP open server over max.
- 8: FTP open server error.
- 9: FTP server lost connection.
- 10: FTP send data OK.
- 11: FTP send data timeout.
- 12: FTP send data error.
- 13: FTP send data server id error.
- 14: FTP send data request close.

If <*Message Type*> is 8(Restart TachoReader), it is result of command execution.

- 0: Command OK. The command is executed successfully by TachoReader.
- 1: Command Error. An unexpected error occurs while executing the command.

✧ <*APDU Sequence Number*>: It is the serial number of APDU received from THR_100. Numbering starts from 0001 when receiving a new DDD file request.

✧ <*APDU DATA*>: It is the APDU received from THR_100.

✧ <*Device Status*>:

- Bit 0 = 1 – Authentication in progress,
- Bit 1 = 1 – Authentication OK (bit is cleared at next read request),
- Bit 2 = 1 – Authentication ERROR (bit cleared at next read request),
- Bit 3 = 1 – THR_100 is downloading files from tachograph,
- Bit 4 = 1 – Data is ready to read from THR_100 by master device. Bit is cleared after all awaiting data is read (If all bytes are sent in one frame, this bit will be cleared after sending this frame. If all bytes are sent in 3 frames, this bit will be cleared after sending 3 frames).
- Bit 7:Bit 5 = Details of the error. Flags bit 7:bit 5 and flag bit 2 must be treated as combined information. The information is split to maintain protocol's backward compatibility. Flags bit 7:bit 5 are cleared at next read request.
  - 000 – No error
  - 001 – 24 hours have passed after turning off the ignition, tachograph is in power down mode (This error code is generated based on THR_100's timer, there is no attempt of connection with tachograph)
  - 010 – 2hours have passed after last authentication session, tachograph is in power down mode. (This error code is generated based on THR_100's timer, there is no attempt of connection with tachograph)
  - 011 – No answer from tachograph (wrongly connected wires or CAN-C is off in tachograph)
  - 100 – Cannot open communication session with tachograph (remote download function is off in tachograph)
  - 101 – No answer or incorrect answer on company card inquiry (remote download function is off in tachograph)
  - 110 – Error during file transfer
  - 111 – Reserved for future use

✧ <*File State In Memory*>:

- Bit 0 = 1 tachograph file is in THR_100 memory,
- Bit 1 = 1 file from card in slot 1 is in THR_100 memory,

- Bit 2 = 1 file from card in slot 2 is in THR_100 memory,
- Bit 3 = not used (to be ignored),
- Bit 4 = 1 file from tachograph is already read from THR_100 (it is possible to read once more, bit 0 will be still set), this flag is set after read whole file from THR_100.
- Bit 5 = 1 file from card in slot 1 is already read from THR_100 (it is possible to read once more, bit 1 will be still set), this flag is set after reading whole file from THR_100.
- Bit 6 = 1 file from card in slot 2 is already read from THR_100 (it is possible to read once more, bit 2 will be still set), this flag is set after reading whole file from THR_100.
- Bit 7 = not used (to be ignored).

✧ <*Error Code*>: Extended error code. A detailed description of the value of this byte below:
- Extended errors before downloading.

Note: Following error codes are valid only for firmware version 2 (2.0.0 and later). Error codes for firmware version 1 can be found in protocol (TachoReader_protocol_EN_20180417) or older.

- 0x00 – No error detected. Report to the device producer.
- 0x01 – Invalid receive buffer size (BB) in read request (2.2.5). Correct the request (2.2.5) content.
- 0x02 – No communication with tachograph. Switch the ignition on and try again. If it does not help, check out CANBUS connection to tachograph.
- 0x03 – No communication on CAN-bus, frames are acknowledgements,
- 0x04 – Another reading in progress,
- 0x05 – Remote downloading function is off in the tachograph,
- 0x06 – Ignition off. Some tachograph models need ignition to be on in order to download files. Switch the ignition on and try again.
- 0x07 – 24 hours had elapsed after turning off the ignition, tachograph in power-down mode,
- 0x08 – 2 hours had elapsed since the last download without ignition, tachograph in power-down mode,
- 0x09 – Company, control or workshop card in tachograph. Remove company, workshop or control card and try again.
- 0x0A – Invalid timestamps in read request (2.2.5), start time cannot be later than end time. Correct the request (2.2.5) content.
- 0x0B – THR_100 does not receive real time clock from tachograph, so TS_E in read request (ODN.) cannot be set to 0. Check if THR_100 reports active buses (2.2.5). If not – check out connection to tachograph (CANBUS and D8). If yes – tachograph may work improperly. As a short term solution – set up RTC with command (2.2.5) and try again.
- 0x0C – Invalid read request command (2.2.5). No file requested to download. Correct the request (2.2.5) content.
- 0x0D – Tachograph is not activated (factory mode),
- 0x0E – Opening session timeout. Report to the device producer.
- 0x0F – Remote company card not ready (Timeout). Report to the device producer.

- Extended errors during authentication
    - 0x10 – The packet to company card was not send (GSM terminal does not read prepared by THR_100 data packet),
    - 0x11 – Timeout on waiting for data from company card. THR_100 expected to get reply from company card, but it did not come. Check data transmission path between application server, AVL terminal and THR_100 and try again.
    - 0x12 – The answer from company card is incorrect,
    - 0x13 – Card expiration date of company card has not yet come,
    - 0x14 – Card expiration date of company card has already expired,
    - 0x15 – Tachograph rejects the data package from company card,
    - 0x16 – Tachograph does not support given functionality (response to the last data package from company card),
    - 0x17 – Tachograph reports an error on response from company card (last data package from company card only),
    - 0x18 – No data for company card from tachograph(Timeout). Report to the device producer.
    - 0x19 – Tachograph reports an authentication error (response to the last data package from company card),
    - 0x1A- Tachograph reports too many transmission errors (response to the last data package from company card),
    - 0x1B – Data transfer error. Report to the device producer.
    - 0x1F – The order is canceled by user (command 0x69, parameter 0x80).

- Extended errors during file reading:
    - 0x20 – Data read timeout. Report to the device producer.
    - 0x21 – Data read interrupted. Report to the device producer.
    - 0x22 – Cannot process request, because data of last reading is not known. Correct the request (2.2.5) content – set start date.
    - 0x23 – Requested to read overview part since date of last reading, but the date is later than requested end time. Correct the request (2.2.5) content – change end date.
    - 0x30 – Remote authentication timeout. Report to the device producer.
    - 0x31 - Error on download request. Report to the device producer.
    - 0x32 – DDD file download request error. Report to the device producer.
    - 0x33 – DDD file transmission error. Report to the device producer.
    - 0x34 – Error on download request: server busy. Report to the device producer.
    - 0x55 – DDD file download request timeout. Report to the device producer.
    - 0xE0 – Unexpected program error. Report to the device producer.
    - 0xFE – Request cancelled by command 2.2.5.
    - 0xFF – No reading requested since device restart.

✧ <*Error Code Memory*>: This is the error code byte <*Error Code*> stored when the next order of the download is sent.

✧ <*Tachograph producer*>:

- 0x00: None,
- 0x01: VDO/Siemens,
- 0x02: Efas,
- 0x03: Stoneridge,
- 0x04: Actia,
- 0x80: Error of connection on D8 wire,
- 0x81: Not supported format „2400” analogue tachographs.

✧ <*Tachograph mode*>: Tachograph name given by the manufacturer.

✧ < *Device status / Files in device memory*>:

- Device status,
- Files in device memory.

✧ <*Tachograph driver 1 id*>: Card number given in ASCII string terminated with „*”. First two or three letters are country code. Following is a SPACE character (0x20) and the 16-character long card number e.g.

PL 1820625133460000*

In addition to standard country codes, the following abbreviations also apply:

- „EC” - European Union,
- „EUR” – Rest of Europe,
- „WLD” – rest of the world.

✧ <*Tachograph driver 1 name and surname*>: Surname and name (names) of driver given in an ASCII string terminated with „*”. Each word is separated by a SPACE character (0x20).

Note: Number K will be returned if the card is not inserted into tachograph slot (or parameter currently not available; or card inserted, but no information read).

- K = 0x00 card not inserted,
- K = 0x01 card inserted, but no information read,
- K = 0xFF parameter currently not available.

✧ <*Special status*>:

Byte 1 -2: Device status

- Bit 0 = 1: authorization in progress,
- Bit 1 = 1: authorization successful (this bit is deleted upon next read request),
- Bit 2 = 1: authorization error (this bit is deleted upon next read request),
- Bit 3 = 1: device is downloading files from tachograph,
- Bit 4= 1: data (not files!) is ready to be downloaded from the device, the counter changes to zero after all waiting data is read (If data is sent in only one frame, the counter changes to zero right after that frame; if data is sent in 3 frames, the counter will change to zero after the third frame is sent),
- Bit 5 = communication with tachograph not possible, tachograph in sleep mode,
- Bit 6 – free, always zero,
- Bit 7 – free, always zero.

Byte 3 - 4: Files in device memory

- Bit 0 = 1 file read from tachograph is in device’s memory,
- Bit 1 = 1 file read from card in slot 1 is in device’s memory,
- Bit 2 = 1 file read from card in slot 2 is in device’s memory,

- Bit 3 = 1 file read from external reader is in device's memory,
- Bit 4 = 1 file read from tachograph, which has already been read from the device (it can be read again, bit 0 is still set), this flag is set after the whole file has been read.
- Bit 5 = 1 file read from card in slot 1, which has already been read from the device (it can be read again, bit 1 is still set), this flag is set after the whole file has been read.
- Bit 6 = 1 file read from card in slot 2, which has already been read from the device (it can be read again, bit 2 is still set), this flag is set after the whole file has been read.
- Bit 7 = 1 file read from an external reader, which has already been read from device (it can be read again, bit 3 is still set), this flag is set after the whole file has been read.

Byte 5 - 6: File currently being transferred from tachograph to TachoReader.

- Bit 0 = 1 file from card 1,
- Bit 1 = 1 file from card 2,
- Bit 2 = 1 file from tachograph's memory.

Byte 7 -12: Amount of file data read so far. If Byte 5 - 6=0x00, then Byte 7 -12 may be random values.

Note: If there is no data returned within 2s after the query command is issued due to abnormal communication, 00 or Reserved will be reported (Hex will report 00, string will report Reserved).

➢ **+RESP:GTTRL,**

Example:
2B4556543F00FE5FBF00994B04010407564F5F0301342D0100000000000100211900034 35F32303139303730355F303834365F4441524955535F54414D41534155534B41535F5631303030303031303830383430302E4444440100000000000004806FB403601E5D0AD07E30705082A2404600000550BB969000000000000000000000000000000000000000007E30705102A260183CC230D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	

Battery Level	1	0 - 100	
External Power Supply Voltage	2		
Analog Input Mode	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
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 Use	1		
File Download Count	2	0001-FFFF	
DDD File Name	<=128		
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter	3	HHMMSS	

Count			
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*File Download Count*>: It is a number that indicates current download DDD file number of times.
- ✧ <*DDD file name*>: The file name of DDD which ends by '\0', the value is in ASCII format String.

The event report message **+RESP:GTBAA** uses the format below.

➢ **+EVT,**

Example:
2B4556542400FE5FBF00634B03050318564F5F0300520A045A000000000003111A00640001000000000000005306FB40D201E5D3DB07E3041806121704600000550BB969000000000000000000000000000000000000000007E30418061219BF0738630D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 – 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	

Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Index	1	0 – 9|0xFF	
Accessory Type	1	0 – 3|6	
Accessory Model / Beacon ID Model	1	0|2|3	
Alarm Type	1	00 – FF	
Accessory Append Mask	2	0000– FFFF	
Accessory Name	<=21	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC	6	'0' – '9' 'A' – 'F'	
Accessory Status	1	0 - 1	
Accessory Battery Level	2	0 – 5000mV	
Accessory Temperature	1	-40 – 80℃	
Accessory Humidity	1	0 –100%(rh)	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

<*Index*>: The index of the Bluetooth accessory.

- The index of Bluetooth accessory defined in **AT+GTBAS** which triggers the **+RESP:GTBAA** message.
- 0xFF for WKF300.

✧ <*Accessory Type*>: The type of the Bluetooth accessory which is defined in the <*Index*>. The following is supported now:

- 0: No Bluetooth accessory.
- 1: Escort Bluetooth Accessory.
- 2: Beacon temperature sensor.
- 3: BLE beacon ID device.
- 6: Beacon Multi-Functional Sensor.

✧ <*Accessory Model / Beacon ID Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBAS** or the model of the Bluetooth Beacon ID accessory which is defined in **AT+GTBID.**

✧ <*Alarm Type*>: The type of alarm which is generated according to <*Accessory Type*> and <*Accessory Model*> specified in the **AT+GTBAS** command or <*Beacon ID Model*> specified in the **AT+GTBID** command.

- 0: The voltage of the Bluetooth accessory is low.
- 1: The temperature alarm: The current temperature value is below <*Low Temperature*> set in the **AT+GTBAS** command.
- 2: The temperature alarm: The current temperature value is upper <*High Temperature*> set in the **AT+GTBAS** command.

- 3. The temperature alarm: The current temperature value is within the range defined by <*Low Temperature*> and <*High Temperature*> set in the **AT+GTBAS** command.
- 4. Push button event for WKF300 is detected.
- 7: Humidity alarm: The current humidity value is below <*Low Humidity*> set in the **AT+GTBAS** command.
- 8: Humidity alarm: The current humidity value is above <*High Humidity*> set in the **AT+GTBAS** command.
- 9: Humidity alarm: The current temperature value is within the range defined by <*Low Humidity*> and <*High Humidity*> set in the **AT+GTBAS** command.

✧ <Accessory *Append Mask*>: Bitwise mask defined in **AT+GTBAS** and **AT+GTBID** commands to configure which data item is reported.

- Bit 0: <*Accessory Name*>.
- Bit 1: <*Accessory MAC*>.
- Bit 2: <*Accessory Status*>.
- Bit 3: <*Accessory Battery Level*>.
- Bit 4: <*Accessory Temperature*>.
- Bit 5: <*Accessory Humidity*>

✧ <*Accessory Name*>: The name of the Bluetooth accessory which ends with '\0'(0x00). If the Accessory name is empty, this filed will be filled with one byte: 0x00.

✧ <*Accessory MAC*>: The MAC address of the Bluetooth accessory.

✧ <*Accessory Status*>: It indicates the connection status of the Bluetooth accessory.

- 0: Disconnected.
- 1: Connected.

✧ <*Accessory Battery Level*>: The voltage of the Bluetooth accessory.

✧ <*Accessory Temperature*>: Temperature data for the Bluetooth accessory.

✧ <*Accessory Humidity*>: Humidity data of the Bluetooth accessory.

The event report message **+RESP:GTBID** uses the format below.

➢ **+EVT,**

Example: **2B4556542400FE5FBF00634B03050318564F5F0300520A045A000000000003111A00640001000000000000005306FB40D201E5D3DB07E3041806121704600000550BB969000000000000000000000000000000000000000007E30418061219BF0738630D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 – 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Index	1	0 – 3|15	
Beacon ID Model	1	0|1	
Accessory Append Mask	2	0000 – FFFF	
Accessory MAC	6	'0' – '9' 'A' – 'F'	
Accessory Battery Level	2	0 – 5000mV	
Accessory Signal Strength	1	-120 - 0	
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Index*>: The number of Bluetooth beacon ID.
  - WKF300. The maximum value is 3.
  - iBeacon E6. The maximum value is 15.
- <*Accessory Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBID**.
  - 0: WKF300.
  - 1: iBeacon E6
- <*Accessory Append Mask*>: Bitwise mask defined in the **AT+GTBID** command to configure which data item is reported.
  - Bit 0: Reserved.
  - Bit 1: <*Accessory MAC*>.
  - Bit 2: Reserved.
  - Bit 3: <*Accessory Battery Level*>.
  - Bit 4: Reserved.
  - Bit 5: Reserved.
  - Bit 6: <*Accessory Signal Strength*>.
- <*Accessory MAC*>: The MAC address of the Bluetooth accessory.
- <*Accessory Battery Level*>: The voltage of Bluetooth accessory.
- <*Accessory Signal Strength*>: The signal strength of Bluetooth accessory.

The event report message **+RESP:GTBAR** uses the format below.

- **+EVT,**

Example:
2B4556544100FE7FBF00794F0603071F56375504000F3B00130000000000000000110F03020003001F575453333030007805410 1E546010C2D1C0100000000000000A506FB3F2301E5D66A07E4011508251A04600000550BB96A00000000000000000000000000000000000000007E4011508251B0199FF800D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GNSS Antenna Status | Satellites in Use	1		
Index	1	0 - 9	
Accessory Type	1	7	
Accessory Model	1	0 - 4	
Append Mask	2	0000 – FFFF	
Accessory Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Accessory MAC	6	'0' – '9' 'A' – 'F'	

Accessory Status	1	0 - 1	
Accessory Battery Level	2	0 - 5000(mV)	
Accessory Temperature	1	-40 - 80(℃)	
(Accessory Data)	<=650		
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ *<Accessory Data>*:There are accessory data para according *<Accessory Type>* and *<Accessory Model>*:
  - ➢ If the *<Accessory Type>* is 7 and *<Accessory Model>* is 0 (DUT-E S7) or *<Accessory*

Model> is 4 (GNOM DP S7) :

Version	1	00 - FF	
PGN	2	0000 - FFFF	
PGN Data	21	000000000000000000000000000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	

- If the <*Accessory Type*> is 7 and <*Accessory Model*> is 3(GNOM DDE S7) :

Version	1	00 - FF	
PGN	2	0000 - FFFF	
PGN Data	20	00000000000000000000000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	

- If the <*Accessory Type*> is 7 and <*Accessory Model*> is 1 (DFM 100 S7):

Version	1	00 - FF	
PGN1	2	0000 - FFFF	
PGN Data1	20	00000000000000000000000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
PGN2	2	0000 - FFFF	
PGN Data2	20	00000000000000000000000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
PGN3	2	0000 - FFFF	
PGN Data3	20	00000000000000000000000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	

- If the <*Accessory Type*> is 7 and <*Accessory Model*> is 2 (DFM 250DS7) :

Version	1	00 - FF	

PGN1	2	0000 - FFFF	
PGN Data1	20	000000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFF	
PGN2	2	0000 - FFFF	
PGN Data2	20	000000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFF	
PGN3	2	0000 - FFFF	
PGN Data3	20	000000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFF	
PGN4	2	0000 - FFFF	
PGN Data4	20	000000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFF	

4.6. Data Report +DAT

Data report messages **+RESP:GTPHD** use the format below, and they are only sent via GPRS even if the report mode is forced SMS mode.

- **+DAT,**

Example:

**2B444154010000007F02354B03060319677633303063616E000300080007E3041A0827000D010
200FFD8FFDB0084000D09090B09080D0B0A0B0E0D0D0F131F1413111113261B1D171F2D28302
F2D282C2B3238483D323544362B2C3F553F444A4D505150303C585F584E5E484F504D010D0E0E
131013251414254D342C344D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4
D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4D4DFFC000110800F00140030
12100021101031101FFDD0004000AFFC401A2000001050101010101010000000000000000102
030405060708090A0B1000020103030204030505040400000017D01020300041105122131410613
51610722711432819 1A1082342B1C11552D1F02433627282090A161718191A25262728292A34
35363738393A434445464748494A535455565758595A636465666768696A737475767778797A8
38485868788898A92939495969798999AA2A3A4A5A6A7A8A9AAB2B3B4B5B6B7B8B9BAC2C3C
4C5C6C7C8C9CAD2D3D4D5D6D7D8D9DAE1E2E3E4E5E6E7E8E9EAF1F2F3F4F5F6F7F8F9FA01000
3010101010101010101000000000000010203040506070809 0A0B1100020102040403040705040**

400010277000102031104052131061241510761711322328108144291A1B1C109233352F0156272D10A162434E125F11718191A262728292A35363738393A434445464748494A53545556575859 5A636465666768696A737475767778797A82838407E3041A08270104395DE50D0A			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+DAT	+DAT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Attribute Mask	2	0000 – FFFF	**+RESP:GTPHD**
Attribute Length	2		
Camera ID	1	0-3	
Photo Time	7	YYYYMMDDHHMMSS	
Total Frames	1		
Current Frame Index	1		
Photo Data Length	2		
Photo Data	<=512		
Data Length	2		**+RESP:GTFSD**
Sensor Data	<=128		
File Download Count	2	0001-FFFF	
File Frame End flag	1	0|1	
Current Frame Index	2		
DDD Data Length	2		
DDD Data	<=684		
Reserved	1	0x00	
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
Reserved	3
Reserved	4
+RESP:GTTRD	5

✧ <*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*>.

✧ <*Total Frames*>: If the message is **+RESP:GTPHD** and the actual size of the picture is larger than 0xFF frames (255*512Bytes), its value will be 0 which indicates more frames wait to be received until the remaining frames is less than or equal to 0xFF (when its value equals to the remaining frames).

✧ <*Data Type*>: The data reported to the backend server is recorded before crash or after crash.

- 0: Before crash
- 1: After crash

✧ <*GNSS Validity Number*>: The number of the successfully fixed GNSS positions included in the report message.

✧ <*GNSS Point Index*>: The index of GNSS point.

4.7. CANBUS Information Report +CAN

The CANBUS device information report message **+RESP:GTCAN** uses the format below.

➢ **+CAN,**

Example:
2B43414E21000007BF00A54B03050318564F5F0300520A040001C03FFFFF4C53564E5934315A30423235323138393402000BE37D000000323806A90028005AFE0000000000572800000043140000F78002000000020E0000000111000000006100001D0C2D110D00BF7FFF3F1F00000003380000010B0000000000000006506FB407701E5D26607E30419020E0A04600000550BB9690007E30419020E0CD205D3E10D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+CAN	+CAN
Message Type	1		

Report Mask	4	0x00000000 – 0xFFFFFFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI/Device Name	
Distance Type / Report Type	1	X(0-1)X(0-2)	
CANBUS Device State	1	0|1	
CANBUS Report Mask	4	0x00000000 – 0xFFFFFFFF	
VIN	17		
Ignition Key	1	0|1|2	
Total Distance	4	0 – 99999999	
Total Fuel Used / Electric Total Power Used	5	0 – 999999.99	
Engine RPM	2	0 – 16383 rpm	
Vehicle Speed	2	0 – 455Km/h	
Engine Coolant Temperature	2	-40 – +215 ℃	
Fuel Consumption / Electric Total Current	3	0 – 9999L/100km | L/H	
Fuel Level (Liter)	5	L(0.00–999999.99)	
Fuel Level (Percentage)	5	P(0.00-99.99)	
Range	4	0 – 99999999hm	
Accelerator Pedal Pressure	2	0 – 100	
Total Engine Hours	5	0 – 99999.99h	
Total Driving Time	5	0 – 99999.99h	
Total Engine Idle Time	5	0 – 99999.99h	
Total Idle Fuel Used	5	0 – 999999.99L	
Axle Weight 2nd	2	0 – 65535kg	
Tachograph Information	2	0x0000-FFFF	
Detailed Information / Indicators	2	0x0000-FFFF	

Lights	1	0x00-0xFF	
Doors	1	0x00-0xFF	0
Total Vehicle Overspeed Time	5	0 – 99999.99h	
Total Engine Overspeed Time	5	0 – 99999.99h	
Total Distance Impulses	4	0– 2147483648	
CAN Report Expansion Mask	4	0x00000000 – 0xFFFFFFFF	
Ad-Blue Level	2	0-100%	
Axle Weight 1st	2	0 – 65535kg	
Axle Weight 3rd	2	0 – 65535kg	
Axle Weight 4th	2	0 – 65535kg	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle Motion Signal	1	0|1	
Tachograph Driving Direction	1	0|1	
Analog Input Value	4	0-99999mv	
Engine Braking Factor	4	0-999999	
Pedal Braking Factor	4	0-999999	
Total Accelerator Kick-Downs	4	0-999999	
Total Effective Engine Speed Time	5	0.00 – 99999.99h	
Total Cruise Control Time	5	0.00 – 99999.99h	
Total Accelerator Kick-Down Time	5	0.00 – 99999.99h	
Total Brake Applications	4	0-999999	
Tachograph Driver 1 Card Number	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Card Number	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Expansion Information	2	0x0000-0xFFFF	

Rapid Brakings	4	0-999999	
Rapid Accelerations	4	0-999999	
Electric Report Mask	2	0-FFFF	
Total Voltage	2	0-9999V	
Charging Times	2	0-9999	
Total Power Recovered	4	0-99999999(x1.820Wh)	
Single Charge Capacity	3	0.0-999.9kWh	
Single Discharge Capacity	3	0.0-999.9kWh	
Remaining Power	3	0.0-999.9kWh	
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	2	0000 – FFFF	
Reserved	1		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Check Sum	2	0000 - FFFF	
Tail Character	2	0x0D 0x0A	0x0D 0x0A

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

Message	**ID**
+RESP:GTCAN	33

✧ <*Report Mask*>: Please refer to the <*+CAN Mask*> in **AT+GTHRM**.

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

✧ <*Device Name*>: If Bit 1 of <*+CAN Mask*> is 0, the IMEI of the device is used as the device

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

If Bit 1 of <*+CAN Mask*> is 1, the device name is used as the device name 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 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	3	0	0	n		
HEX	67	76	33	30	30	6E	00	00

- <*Distance Type / Report Type*>: The high nibble is for <*Distance type*> and the low nibble is for <*Report Type*>.

  Distance type has two meanings below.
  - 0: Total distance acquired from CAN Chipset
  - 1: Total distance obtained by calculation with GNSS

  Report type has three meanings as follows.
  - 0: Periodic report
  - 1: RTO CAN report
  - 2: Ignition event report
- <*CANBUS Device State*>: Whether the device can receive data from CANBUS device.
  - 0: Abnormal. The device cannot receive data from CANBUS device.
  - 1: Normal. The device can receive data from CANBUS device.
- <*CANBUS Report Mask*>: Please refer to the <*CANBUS Report Mask*> in **AT+GTCAN**.
- <*VIN*>: Vehicle identification number.
- <*Total Fuel Used / Electric Total Power Used* >: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits. If bit28 (<*Electric Report Mask*>) of the <*CANBUS Report Mask*> is set 1 in **AT+GTCAN** command, this parameter means the number of power used since vehicle manufacture or device installation, it is a integer number.

  Example of float number conversion:

Total Fuel Used	5	0 – 999999.99	0000000248

  Integer: 00000002

  Fraction: 48

  Convert hex to decimal: 2.72
- <*Fuel Level (Liter)*>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Fuel Level (Percentage)*>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.

- <*Fuel Consumption / Electric Total Current* >: 3 bytes in total. The first byte indicates the unit. The unit L/100km is represented as FE, and the unit L/H is represented as FF. The other two bytes indicate the value. The device converts the fuel consumption value to an integer with 1 implicit decimal by multiplying by ten and reports this integer in HEX format. If bit28 (<*Electric Report Mask*>) of the <*CANBUS Report Mask*>is set 1 in **AT+GTCAN** command, this parameter means the Total Current of the vehicle.

Fuel Consumption Value 12.1	**121**	
HEX	**00**	**79**

- <*Total Engine Hours*>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Driving Time*>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Engine Idle Time*>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Idle Fuel Used*>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- <*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: 15min before 4½ h .
- 2: 4½ h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15 minutes 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: Work – loading, unloading, working in an office.
- 3: Driver – behind the wheel.

- <*Detailed Information / Indicators*>: It takes up two bytes. 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 – indicator 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*>: One byte. 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*>: One byte. 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*>: It takes up five bytes. 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*>: It takes up five bytes. 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 increasing. The unit is imp. If it is set to 0, the distance in imp is not available.

✧ <*Ad-Blue Level*>: The level of Ad-Blue. It takes up two bytes.

✧ <*Axle Weight 2nd*>: Weight of vehicle's second axle.

- <*Axle Weight 1st*>: Vehicle's first axle weight. Unit: Kg.
- <*Axle Weight 3rd*>: Vehicle's third axle weight. Unit: Kg.
- <*Axle Weight 4th*>: Vehicle's fourth axle weight. Unit: Kg.
- <*Tachograph Overspeed Signal*>: Vehicle overspeed signal from the tachograph.
  - 0: Overspeed is not detected.
  - 1: Overspeed is detected.
- <*Tachograph Vehicle Motion Signal*>: The vehicle motion signal from the tachograph.
  - 0: Motion is not detected
  - 1: Motion is detected.
- <*Tachograph Driving Direction*>: Vehicle driving direction from the tachograph.
  - 0: Driving forward.
  - 1: Driving backward.
- <*Analog Input Value*>: The value of analog input. Unit: mv.
- <*Engine Braking Factor*>: It measures how often the driver brakes with brake pedal or with engine and CAN Chipset stores both counts (always increasing). Decreasing speed with no pedal pressed causes an increase in the engine braking factor.
- <*Pedal Braking Factor*>: It measures how often the driver brakes with brake pedal or with engine and CAN Chipset stores both counts (always increasing). Decreasing speed with brake pedal pressed causes an increase in the pedal braking factor.
- <*Total Accelerator Kick-downs*>: The count of accelerator pedal kick-downs (with the pedal pressed over 90%).
- <*Total Effective Engine Speed Time*>: The total time when the vehicle engine speed is effective. The unit is h. 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 Cruise Control Time*>: The total time when the vehicle speed is controlled by cruise-control module. The unit is h. 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 Accelerator Kick-Down Time*>: The total time when the accelerator pedal is pressed over 90%. The unit is h. 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 Brake Applications*>: The count of brake pedal applications defined as braking processes initiated by brake pedal.
- <*Tachograph Driver 1 Card Number*>: The driver 1 card number from the tachograph. The value is a string representing the number, which ends by 0x00.
- <*Tachograph Driver 2 Card Number*>: The driver 2 card number from the tachograph. The value is a string representing the number, which ends by 0x00.
- <*Tachograph Driver 1 Name*>: The name of driver 1 from the tachograph. The value is a string representing the name, which ends by 0x00.
- <*Tachograph Driver 2 Name*>: The name of driver 2 from the tachograph. The value is a string representing the name, which ends by 0x00.
- <*Registration Number*>: The registration number of the vehicle. The value is a string representing the number, which ends by 0x00.
- <*Expansion Information*>: A hexadecimal number. Each bit contains information of one indicator.

- Bit 0: W – webasto (1 – on, 0 – off or not available).
- Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
- Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
- Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
- Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
- Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
- Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
- Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
- Bit 8: Reserved
- Bit 9: CHK – "check engine" indicator (1 – on, 0 – off or not available)
- Bit 10: AIR – airbags indicator (1 – on, 0 – off or not available)
- Bit 11: SC – service call indicator (1 – on, 0 – off or not available)
- Bit 12: OLL – oil level low indicator (1 – on, 0 – off or not available)
- Bit 13: CHG battery charging for electric cars (1 - battery is being charged, 0 - no charging)
- Bit 14: FS fuel source - for vehicles equipped with factory gas installation (1 - engine powered by gas, 0 - engine powered by petrol)
- Bit 15: PTO Power-take-off (1 - PTO engaged, 0 - PTO not engaged)

✧ <*Rapid Brakings*>: The total number of rapid brakings since installation (calculation based on CAN Chipset's settings of speed decrease time and value).

✧ <*Rapid Accelerations*>: The total number of rapid accelerations since installation (calculation based on CAN Chipset's settings of speed increase time and value).

✧ <*Total voltage*>: The total voltage of the electric vehicle.

✧ <*Charging Times*>: The charging times of the electric vehicle.

✧ <*Total power recovered*>: The total power recovered of the electric vehicle.

✧ <*Single Charge Capacity*>: The single charge capacity of the electric vehicle.

✧ <*Single Discharge Capacity*>: The single discharge capacity of the electric vehicle.

✧ <*Remaining Power*>: The remaining power of the vehicle.

✧ <*Speed*>: 3 bytes in total. The first 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**

✧ <*GNSS UTC Time*>: The UTC time from the GNSS chip. 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.

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

✧ <*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	2011		01	31	06	29	11
HEX	07	DB	01	1F	06	1D	0B

4.8. Basic Device Information +ATI

➢ **+ATI,**

Example: **2B415449234B03050318564F5F0300520A040000000007E30419030D18D3C574720D0A**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Message Header	4	+ATI	+ ATI
Length	1		
Device Type	1	4B	4B
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
ATI Mask	4	00000000 – FFFFFFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	
MCU Version	2	0000 – FFFF	
MCU Boot Version	2	0000 – FFFF	
Flash ID	3	000000 – FFFFFF	
Sensor ID	1	00 – FF	
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 the **AT+GTRTO** command and used to control parameter

fields in **+ATI** message.

4.9. Heartbeat Data +HBD

➢ **+HBD,**

Example: **2B484244EF204B03060319564F5F0300520A0407E3041A082D010455D37B0D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	4B	4B
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	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 4 of <*+HBD 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 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**	**3**	**0**	**0**	**n**		
HEX	**67**	**76**	**33**	**30**	**30**	**6E**	**00**	**00**

If the mask of <*UID*> in the <*+HBD Mask*> of **AT+GTHRM** is set to 0, the heartbeat message reported will not include device name or IMEI information. If the mask of <*UID*> is set to 1,

then the heartbeat message reported will report device name or IMEI information according to the mask of <*Device Name*>.

4.10. Buffer Report in HEX Format

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

4.11. Crash Data Packet

➢ **+CRD,**

Example:

2B435244007D02194B03060319564F5F0300520A04000301FFF4FFEFFFAEFFF4FFEFFFAEFFF4FFE FFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFAEFFF4FFEFFFADFFF 4FFEFFFAEFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFAEFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFAD FFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFF FADFFF4FFEFFFAEFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFAEFFF4FFEFFFADFFF4FFEFFFADFFF4FF EFFFAEFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFADFFF4FFEFFFAEFFF 4FFEFFFADFFF4FFEFFFADFFF4FFF1FFAFFFFFFFEFFFD2FFF8FFECFFA60000FFF0FFABFFF1FFF0FFB4 FFEFFFF0FFB0FFF5FFEFFFADFFF5FFEFFFADFFF4FFEFFFAEFFF4FFEFFFADFFF4FFEFFFAEFFF4FFEFFF ADFFF4FFEFFFADFFF4FFEFFFADFFFFFFEBFF9FFFF3FFEFFFAFFFF2FFEFFFADFFF5FFEFFFABFFF4FFE FFFADFFF4FFEFFFADFFF4FFEFFFAEFFFAFFF1FFB7FFFFFFE9FFAFFFF8FFE9FFAAFFFBFFF1FFAF0006 FFF0FFAFFFFCFFF0FFB6FFFFFFF5FFB00003FFF0FFB1000FFFBCFF22FFEFFFE6FFCFFFF0FFFCFFAAFF F7FFEFFFAFFFF4FFEEFFADFFF4FFEFFFB2FFF4FFEEFFAAFFF4FFEFFFAFFFF4FFEEFFAFFFF4FFEEFFA DFFF4FFEEFFAEFFF4FFEEFFAFFFF4FFEEFFADFFF4FFEDFFADFFF4FFEEFFAEFFF4FFEFFFAEFFF407E3 041C01271E094F65E90D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+CRD	+CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	4B	4B
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Data Type	1	0|1	

Total Frame	1	3	
Frame Number	1	1|2|3	
Data	500		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Report Mask*>: Please refer to the <*+CRD Mask*> in **AT+GTHRM**.
- <*Device Name*>: Bit 1 of <*+CRD Mask*> is 0, and the IMEI of the device is used as the device name 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 Frame*>: 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 as a group. The first 2 bytes of these 6 bytes 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.

4.12. Acceleration Data Packet

- **+ACC,**

Example:

**2B4143434B0305564F5F0300520A0400030006FFAB00030006FFAB00030006FFAB00030006FFA
B00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB0003
0006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAC00030006FFAB00030006F
FAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00
030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB0003000
6FFAB00030006FFAB00030006FFAB00030006FFAC00030006FFAB00030006FFAB00030006FFAB
00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030
006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FF
AC00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB000
30006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006**

FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB00030006FFAB07E3041903102CD3D9D6050D0A			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+ACC	+ACC
Device Type	1	4B	4B
Protocol Version	2	0000–FFFF	
Device Name	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

- <*Device Name*>: The IMEI of the device is used as the device name 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 as a group. The first 2 bytes of these 6 bytes 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.

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

Appendix B: Message Index

✧ **Command and ACK**

+ACK:GTPIN
AT+GTRTO
+ACK:GTRTO
AT+GTHMC
+ACK:GTHMC
AT+GTJDC
+ACK:GTJDC
AT+GTWLT
+ACK:GTWLT
AT+GTPDS
+ACK:GTPDS
AT+GTSSR
+ACK:GTSSR
AT+GTBZA
+ACK:GTBZA
AT+GTSPA
+ACK:GTSPA
AT+GTTMP
+ACK:GTTMP
AT+GTGPJ
+ACK:GTGPJ
AT+GTACD
+ACK:GTACD
AT+GTIDA
+ACK:GTIDA
AT+GTFSC
+ACK:GTFSC
AT+GTRMD
+ACK:GTRMD
AT+GTFFC
+ACK:GTFFC
AT+GTCMD
+ACK:GTCMD
AT+GTUDF
+ACK:GTUDF
AT+GTBSE
+ACK:GTBSE
AT+GTJBS
+ACK:GTJBS
AT+GTCRA
+ACK:GTCRA
AT+GTOWL
+ACK:GTOWL
AT+GTCFU

+ACK:GTCFU
AT+GTCDA
+ACK:GTCDA
AT+GTURT
+ACK:GTURT
AT+GTBTS
+ACK:GTBTS
AT+GTSIM
+ACK:GTSIM
AT+GTOEX
+ACK:GTOEX
AT+GTIEX
+ACK:GTIEX
AT+GTCLT
+ACK:GTCLT
AT+GTGAM
+ACK:GTGAM
AT+GTUPC
+ACK:GTUPC
AT+GTPEO
+ACK:GTPEO
AT+GTVVS
+ACK:GTVVS
AT+GTAVS
+ACK:GVAVS
AT+GTBMS
+ACK:GTBMS
AT+GTBAS
+ACK:GTBAS
AT+GTBID
+ACK:GTBID
AT+GTFVR
+ACK:GTFVR

✧ **Position Related Report**

+RESP:GTTOW
+RESP:GTEPS
+RESP:GTDIS
+RESP:GTIOB
+RESP:GTFRI
+RESP:GTGEO
+RESP:GTSPD
+RESP:GTSOS
+RESP:GTRTL

+RESP:GTLBC
+RESP:GTDOG
+RESP:GTIGL
+RESP:GTHBM
+RESP:GTTMP
+RESP:GTGES
+RESP:GTIDA
+RESP:GTERI
+RESP:GTAIS
+RESP:GTGOT
+RESP:GTCAN

✧ **Device Information Report**

+RESP:GTINF

✧ **Report for Querying**

+RESP:GTGPS
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTIOS
+RESP:GTTMZ
+RESP:GTALS
+RESP:GTALM
+RESP:GTALC
+RESP:GTGSV
+RESP:GTQDA
+RESP:GTCML
+RESP:GTDAV

✧ **Event Report**

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN
+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTPDP
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN

+RESP:GTIDF
+RESP:GTJDR
+RESP:GTGSM
+RESP:GTGSS
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTGPJ
+RESP:GTFLA
+RESP:GTCAN
+RESP:GTJDS
+RESP:GTRMD
+RESP:GTCLT
+RESP:GTCFU
+RESP:GTBCS
+RESP:GTBDS
+RESP:GTPHL
+RESP:GTFTP
+RESP:GTUPC
+RESP:GTVGN
+RESP:GTVGF
+RESP:GTEUC
+RESP:GTBAA
+RESP:GTBID

✧ **Crash Data Packet**

+RESP:GTCRD

✧ **Acceleration Data Packet**

+RESP:GTACC

✧ **Bluetooth Data Report**

+RESP:GTBDR

✧ **Heartbeat**

+ACK:GTHBD
+SACK:GTHBD

✧ **Server Acknowledgement**

+SACK

✧ **Hex Format Report Message**

+ACK
+RSP

+EVT
+INF
+HBD
+CAN