GV620MG @Track Air Interface Protocol

EGPRS/LTE Cat-M1/LTE Cat-NB2/GNSS Tracker

QSZTRACGV620MGAN010D

Version: 1.0D

Document Title	GV620MG @Track Air Interface Protocol
Version	1.0D
Date	2023-07-18
Status	Released
Document Control ID	QSZTRACGV620MGAN010D

General Notes

Queclink offers this information as a service to its customers, to support application and engineering efforts that use the products designed by Queclink. The information provided is based upon requirements specifically provided to Queclink by the customers. Queclink has not undertaken any independent search for additional relevant information, including any information that may be in the customer's possession. Furthermore, system validation of this product designed by Queclink within a larger electronic system remains the responsibility of the customer or the customer's system integrator. All specifications supplied herein are subject to change.

Copyright

Contents

0. Revision History

Version	Date	Author	Description of Change
1.00	2021-08-17	Beck Wan	Initial 1. Modify +RESP:GTRSS report example. 2. Modify <Index> functional description in "AT+GTBAS" command. 3. Modify +RESP:GTBAA/BID report examples. 4. Modify <Accessory Model> in +RESP:GTERI. 5. Modify <Main Server IP> description in AT+GTSRI.
1.01	2021-12-09	Beck Wan	1. Modified "MUID Enable" value range in AT+GTCFG. 2. Added AT+GTUFS ACK type in +ACK. 3. Added AT+GTFSC ACK report. 4. Modified AT+GTERI descriptions. 5. Modified some descriptions. 6. Added "Configuration Name" in AT+GTFVR. 7. Added AT+GTRPC command. 8. Added AT+GTRPC HEX ACK. 9. Added GTRTO read command mask: AT+GTRPC. 10. Added Accessory Type 1 and Accessory Model 3 to the AT+GTBAS command to support the Escort angle sensor. 11. Added the parameter <*Event Notification*> in the command **AT+GTBAS** for Escort angle sensor to support the event notification function. 12. Added the parameter "Accessory Mode/Accessory Event" in +RESP:GTERI.
1.02	2022-02-25	Beck Wan	1. Modified <Reboot Interval> description in AT+GTDOG.
1.03	2022-03-11	Beck Wan	1. Added +RESP:GTGSM hex report in +INF. 2. Added +RESP:GTGSM mask in AT+GTHRM.
1.04	2022-04-18	Beck Wan	1. Changed the value range of External Power VCC/Analog Input VCC to 0-36000mV.
1.05	2022-06-21	Beck Wan	1. Added "TS Lock" in <Accessory Model> of AT+GTBAS. 2. Added "ELA Sensor" in <Accessory Model> 3 of AT+GTBAS. 3. Added "WMS301" in <Accessory Model> of AT+GTBAS. 4. Added CAN100 in AT+GTMUT. 5. Added AT+GTCAN command. 6. Added AT+GTCLT command.

			7. Added AT+GTCFU command. 8. Added sub commands 10/12/13/22 in AT+GTRTO. 9. Added "+CAN Mask" in AT+GTHRM.
	2022-07-29	Beck Wan	1. Added battery heat content in *<Backup Battery Charge Mode>* in AT+GTCFG. 2. Added <Digital Fuel Sensor Data> mask in AT+GTFRI. 3. Added <Digital Fuel Sensor Data> in +RESP:GTERI. 4. Modified "ELA RHT&T Sensor" description in AT+GTBAS.
	2022-08-25	Beck Wan	1. Modified +RESP:GTIGN/FLA/BPL/DOS/IDF/SOS hex report examples.
	2022-09-16	Beck Wan	1. Deleted content of battery heat in *<Backup Battery Charge Mode>* in AT+GTCFG.
1.06	2022-10-17	Beck Wan	1. Modified <TS Unlock Relay> in AT+GTBAS. 2. Added <1-wire Report Sequence Mode> in AT+GTRPC.
1.07	2022-10-18	Beck Wan	1. Added WID310 in AT+GTBID.
	2022-11-07	Beck Wan	1. Modified report examples.
1.08	2022-11-30	Beck Wan	1. Added <Working Mode>3/6 in AT+GTMUT. 2. Added +RESP:GTDTT report. 3. Added <Event Report Mask> in AT+GTRPC. 4. Added <Backup Battery Charge Current> in AT+GTCFG.
1.09	2023-01-31	Beck Wan	1. Added +RESP:GTBIE ASCII/HEX report. 2. Added <Message Type> in AT+GTBID. 3. Added <Beacon ID Accessory Model> 5 in AT+GTBID. 4. Deleted <Output ID> in AT+GTBID.
1.0A	2023-03-23	Beck Wan	1. Added <RAT and Band data> in +RESP:GTERI. 2. Added <RAT and Band Data> in <ERI Mask> of AT+GTFRI. 3. Added <Standard Beacon> in AT+GTBID.
1.0B	2023-04-19	Beck Wan	1. Added <Sample Unit> in AT+GTAIS. 2. Modified <Sample Rate> in AT+GTAIS.
	2023-05-16	Beck Wan	1. Modified <Backup Battery Charge Mode> value range in AT+GTCFG.
1.0C	2023-06-19	Beck Wan	1. Added WTH301 in *<Accessory Model>* of AT+GTBAS.
1.0D	2023-07-18	Beck Wan	1. Added <Organization Unique Identifier> in AT+GTBID.

1. Overview

1.1. Scope of This Document

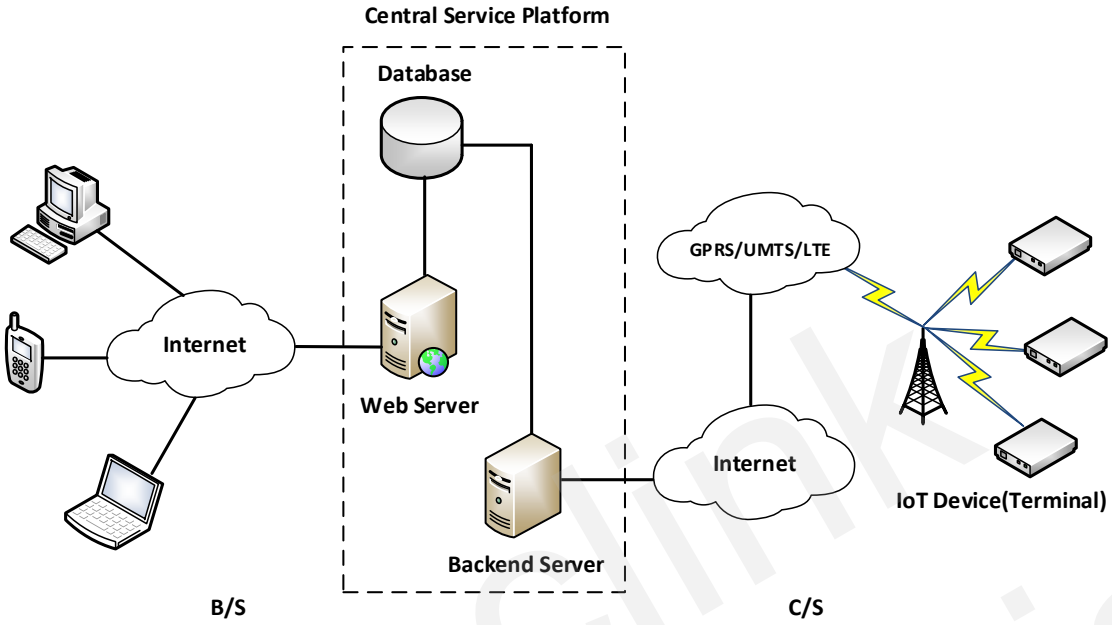
The @Track Air Interface Protocol, a digital communication interface based on printable ASCII characters over SMS or network, is used for communication between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms with an acknowledgement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

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

1.2. Terms and Abbreviations

Abbreviation	Description
APN	Access Point Name
ASCII	American National Standard Code for Information Interchange
GSM	Global System for Mobile Communication
HDOP	Horizontal Dilution of Precision
ICCID	Integrated Circuit Card Identity
IMEI	International Mobile Equipment Identity
IP	Internet Protocol
LTE	Long Term Evolution
RSSI	Received Signal Strength Indication
SMS	Short Message Service
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
UTC	Coordinated Universal Time

2. System Architecture



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

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

3. Message Description

3.1. Message Format

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

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

The entire message string ends with character '$'.
The characters 'XXX' identify the transmitted messages.
The "<parameter1>, <parameter2>,…" carries the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighboring parameter characters. The parameter string may contain the ASCII characters: '0'–'9', 'a'–'z', 'A'–'Z'.
Detailed descriptions of each message format are located in the specific message sections.

The backend server can either configure and query the parameters of the terminal or control the terminal to perform specific actions by sending Commands to the terminal. When the terminal receives Commands over the air, it will reply with a corresponding Acknowledgement message.
The device can send other Reports to the server by configuring related parameters. Please see the following figure:

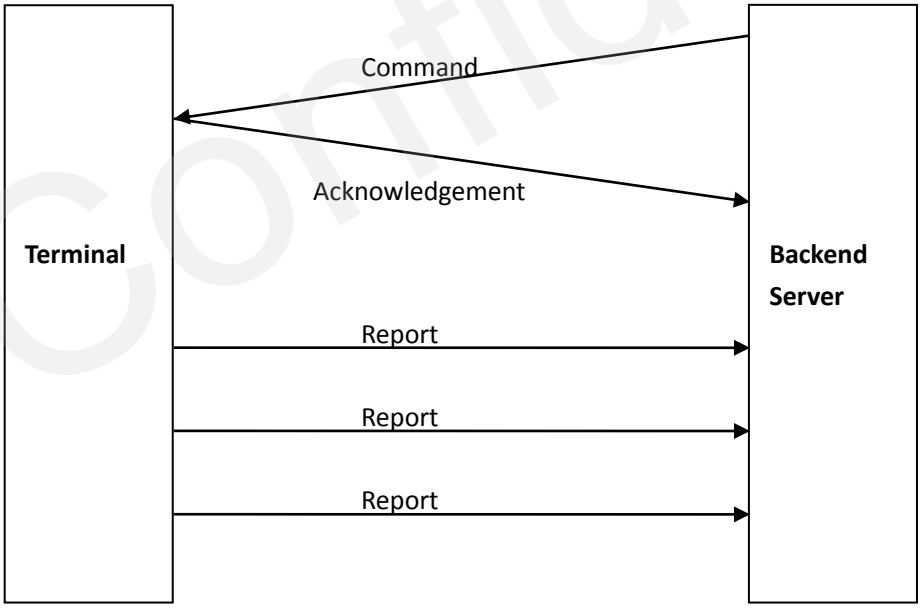


Figure 1: @Tracker Protocol messages flow

3.2. Command and Acknowledgement

3.2.1. Server Connection

3.2.1.1. Bearer Setting Information

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

➢ **AT+GTBSI=**

Example: **AT+GTBSI=gv620mg,,,,,,,0,2,0,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	LTE APN	<=64		
3	LTE APN User Name	<=30		
4	LTE APN Password	<=30		
5	GPRS APN	<=64		
6	GPRS APN User Name	<=30		
7	GPRS APN Password	<=30		
8	Network Mode/APN Authentication Methods	2	00--33	00
9	LTE Mode	1	0-5	2
10	Manual Netreg	1	0-1	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Password*>: The valid character of password is '0'–9', 'a' –'z', 'A' –'Z'. The default value is "gv620mg".

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

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

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

✧ <*GPRS APN*>: The GPRS access point name. If the <LTE APN> does not useful, the <*GPRS APN*> will be used.

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

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

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

Mobile network modes of the device:

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

Mobile APN authentication methods of the device:

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

✧ <*LTE Mode*>: Select Cat-M1 and Cat-NB2 work mode.

- 0: Cat-M1 & Cat-NB2 (Cat-M1 first)
- 1: Cat-NB2 & Cat-M1 (Cat-NB2 first)
- 2**:** Cat-M1.
- 3: Cat-NB2.
- 4: Cat-NB2 first (network search sequence: NB2, 2G, M1). It is valid when <*Network Mode*> is set to 0: Auto. (LTE &GSM).
- 5: Cat-NB2 only (network search sequence: NB2, 2G). It is valid when <*Network Mode*> is set to 0: Auto. (LTE &GSM).

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

Network Mode		**LTE Mode**		**Search Order**		
Mode	Detail	Mode	Detail	1	2	3
0	Auto	0	Cat-M1&Cat-NB2(Cat-M1 first)	M1	2G	NB2
		1	Cat-M1&Cat-NB2(Cat-NB2 first)	2G	NB2	M1
		2	Cat-M1	M1	2G	N/A
		3	Cat-NB2	2G	NB2	N/A
		4	Cat-NB2 First	NB2	2G	M1
		5	Cat-NB2 Only	NB2	2G	N/A
1	GSM Only	N/A	N/A	2G	N/A	N/A
2	LTE Only	0	Cat-M1&Cat-NB2(Cat-M1 first)	M1	NB2	N/A
		1	Cat-M1&Cat-NB2(Cat-NB2 first)	NB2	M1	N/A
		2	Cat-M1	M1	N/A	N/A
		3	Cat-NB2	NB2	N/A	N/A
3	GSM First	0	Cat-M1&Cat-NB2(Cat-M1 first)	2G	M1	NB2
		1	Cat-M1&Cat-NB2(Cat-NB2 first)	2G	NB2	M1
		2	Cat-M1	2G	M1	N/A
		3	Cat-NB2	2G	NB2	N/A

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

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

✧ <*Serial Number*>: The serial number 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. And it must be "$".

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

➢ **+ACK:GTBSI,**

Example: **+ACK:GTBSI,C20107,863695050491870,,0199,20221107034453,0F6D$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Protocol Version*>: The protocol version that the terminal conforms to. The first two characters point out the device type. As in the example, "**C2**" means GV620MG. The middle two characters point out the major version number of the protocol and the last two characters point out the minor version number of the protocol. All version numbers are hex digits. For example, "**0100**" means version 1.00.

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

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

✧ <*Serial Number*>: A serial number which is included in the corresponding command to distinguish which command the ACK message is for.

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

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

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

Note:

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

3.2.1.2. Backend Server Register Information

The command **AT+GTSRI** is used to configure where and how to report the messages such as the server information and the communication method between the backend server and the terminal.

➢ **AT+GTSRI=**

Example: **AT+GTSRI=gv620mg,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$** **AT+GTSRI=gv620mg,3,,1,some.host.name,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Report Mode	1	0 – 7	0
3	Reserved	0		
4	Buffer Mode	1	0|1|2	1
5	Main Server IP/Domain Name	<=60		
6	Main Server Port	<=5	0 – 65535	
7	Backup Server IP/Domain Name	<=60		
8	Backup Server Port	<=5	0 – 65535	
9	SMS Gateway	<=20		
10	Heartbeat Interval	<=3	0|5 – 360min	0
11	SACK Enable	1	0|1|2	0
12	Protocol Format	1	0|1	0
13	SMS ACK Enable	1	0|1	0
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- 0: Stop reporting.
- 1: TCP short-connection preferred mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. If it fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will try to send data via SMS to the SMS gateway.
- 2: TCP short-connection forced mode. The connection is based on TCP protocol. The

terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. And if it fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the memory buffer if buffer report function is enabled, otherwise the data is dropped.

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

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

- 0: Disable the buffer report function.
- 1: Low priority. The buffer report function is enabled and the device will send the buffered messages after sending the normal messages.
- 2: High priority. The buffer report function is enabled and the device will send all the buffered messages before sending any normal message except the SOS message (**+RESP:GTSOS**).

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

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

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

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

✧ <*SMS Gateway*>: Maximum 20 characters (including the optional national code starting with "+"). Short code (for example: 10086) is also supported.

✧ <*Heartbeat Interval*>: the interval of sending heartbeat package message (**+ACK:GTHBD**) when report mode is TCP long-connection mode or UDP mode. If it is set to 0, there will be no heartbeat package message sending.

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

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

➢ **+ACK:GTSRI,**

Example: **+ACK:GTSRI,C20107,863695050491870,,0200,20221107034453,0F6E$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note:

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

3.2.1.3. Quick Start Setting

The command **AT+GTQSS** is used to configure the parameters for network data connection and backend server information in one command if all these settings are within 160 bytes, otherwise use **AT+GTBSI** and **AT+GTSRI**.

➢ **AT+GTQSS=**

Example: **AT+GTQSS=gv620mg,,,,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,0002$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	LTE APN	<=40		
3	LTE APN User Name	<=30		
4	LTE APN User Password	<=30		
5	Report Mode	1	0 – 8	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/ Domain Name	<=60		
11	Backup Server Port	<=5	0 – 65535	
12	SMS Gateway	<=20		
13	Heartbeat Interval	<=3	0|5 – 360min	0
14	SACK Enable	1	0|1|2	0
15	Protocol Format	1	0|1	0
16	SMS ACK Enable	1	0|1	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

➢ **+ACK:GTQSS,**

Example: **+ACK:GTQSS,C20107,863695050491870,,0201,20221107034453,0F6F$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	

Unique ID	15/12	IMEI/MUID	
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=gv620mg,123456,gv620mg,,,,,,,,,,,,,,,,,,,,,,,,,,0003$
AT+GTCFG=gv620mg,,,1,123.4,0,,0,1,,2FF,0,1,1,300,0,1,1,,,0,0003$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	New Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	
3	Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv620mg
4	ODO Enable	1	0|1	0
5	ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
6	Reserved	0		
7	Reserved	0	0	0
8	Report Composition Mask	4	0000 – FFFF	003F
9	Power Saving Mode	1	0 – 3	1
10	Reserved	0		
11	Event Mask	4	0000 – FFFF	3DEF
12	IO Mode	1	0-F	0
13	LED On	1	0|1	0
14	Info Report Enable	1	0|1	0
15	Info Report Interval	<=5	30 – 86400sec	300

16	Location Request Mask	2	00|20	00
17	Reserved			
18	Backup Battery Charge Mode	1	0--1	0
19	AGPS Mode	1	0|1	0
20	GSM Report	4	0000 – FFFF	001F
21	GPS Lost Time	2	0 – 30min	0
22	GSM Deep Charge Mode	1	0|1	0
23	Backup Battery Charge Current	1	0: 2A 1: 1.5A	0
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Wakeup Hour Interval	<=3	1-720(hour)	24
28	Sensor Wakeup Device Debounce	<=2	0|10-60(s)	10
29	Work Time per Wakeup	<=2	5-60(min)	15
30	Power Output	1	0|1	0
31	Temperature Sample Timer	<=3	0|10– 255(s)	0
32	MUID Enable	1	0	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*New Password*>: Change the current password with a new one.
- <*Device Name*>: An ASCII string to represent the name of the device.
- <*ODO Enable*>: Enable/Disable the odograph function to calculate the total mileage. The current mileage is included in every position message.
- <*ODO Initial Mileage*>: The initial value for calculating the total mileage.
- <*Report Composition Mask*>: Bitwise report mask to configure the composition of message, especially the GPS message composition.
  - Bit 0 for <*Speed*>
  - Bit 1 for <*Azimuth*>
  - Bit 2 for <*Altitude*>
  - Bit 3 for Network data, including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*reserved*> parameter “00”

- Bit 4 for <*Mileage*>
- Bit 5 for <*Send Time*>
- Bit 6 for <*Device Name*>

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

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

- 0: Disable power saving function.
- 1: GPS deep saving mode.
- 2: GPS low saving mode.
- 3: GSM deep saving mode. When this mode is selected, the parameters "Wakeup Hour Interval", "Sensor Wakeup Device Debounce" and "Work Time per Wakeup" will be valid. 5 minutes in stillness status after ignition off, the device will enter power saving mode with both the modem and GPS module turned off. After that, the device will wake up periodically as "Wakeup Hour Interval" and "Work Time per Wakeup" determines how long the device will work upon each wake-up. For every wakeup, a **+RESP: GTFRI** (<Report ID> is 6: GSM deep mode fixed timing report/<Report Type> is 0: The normal fixed report) will be sent out. Triggers such as device/vehicle movement, input and ignition can be used to wake up the device. The device will enter into sleep again once the triggers disappear.

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

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

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

- <*IO Mode*>: Configure the working mode of IO1-IO4 on the connector.
  - Bit0: 0-Input1, 1-Output1
  - Bit1: 0-Input2, 1-Output2
  - Bit2: 0-Input3, 1-Output3
  - Bit3: 0-Input4, 1-Output4
- <*LED On*>: Configure the working mode of power LED and GPS LED.
  - 0: Each time the device powers on, both LEDs will work for 30 minutes and then are turned off deadly.
  - 1: Turn on Power LED and GPS LED if necessary.
- <*Info Report Enable*>: Enable/Disable the device information report function (**+RESP:GTINF**). The device information includes: state of the device, received signal strength, voltage of external power supply, battery voltage, charging status, Power and GPS LED working mode, the last known time of GPS fix, analog input voltage, all digit inputs and outputs status.
  - 0: Disable the device information report function.
  - 1: Enable the device information report function.
- <*Info Report Interval*>: The interval of reporting the device information.
- <*Location Request Mask*>: Bitwise mask for SMS request position. 4 high bits for SMS request and 4 low bits for reserved. Each bit, from bit 4 to bit 7, represents one kind of reports. Set to 1 to enable and 0 to disable corresponding report.
  - Bit 5: Report the current position with Google Map link through SMS to the original number when the device receives SMS Request Position message via SMS.
- <*Backup Battery Charge Mode*>: Control the charge mode of the backup battery.

  Bit0 is for charge mode:
  - 0: When the main power supply is connected, charge the backup battery on need.
  - 1: When the main power supply is connected, the backup battery will be charged only when ignition on is detected. The charge process will begin 3 minutes after the ignition on. The charge process is stopped after ignition off.
- <*AGPS Mode*>: A numeric to indicate the AGPS mode. AGPS is helpful to improve the chance to get GPS position successfully and reduce the time to get GPS position.
  - 0: Disable the AGPS function.
  - 1: AGPS Offline mode.
- <*GSM Report*>: It controls how or when to report cell information. The message **+RESP:GTGSM** is only sent via TCP short connection even if the report mode is Force on SMS.

  The 2 high bits, Bit 14 – 15, represent the GSM report mode.
  - 0: Do not allow the cell information report.
  - 1: Allow the cell information report after failing to get GPS position if cell information is available.
  - 2: Report the message **+RESP:GTGSM** after each successful GPS fix if cell information is available.
  - 3: Report the message **+RESP:GTGSM** regardless of getting GPS position is successful or not if cell information is available.

  Bitwise mask to configure which event report should be sent to the backend server.
  - Bit 0 for **+RESP:GTRTL**

- Bit 1 for **+RESP:GTLBC**
- Bit 2 for **+RESP:GTFRI/+RESP:GTERI**
- Bit 3 for **+RESP:GTSOS**
- Bit 4 for **+RESP:GTTOW**
- Bit 5 – 13 are reserved

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

✧ <*GPS Lost Time*>: A time parameter to monitor the GPS signal. If the device stays <*GPS Lost Time*> consecutively without GPS signal or without successful GPS fix, it will send the event report **+RESP: GTGSS** to indicate the GPS signal is lost. When the GPS signal is recovered or a successful fix is obtained again, the device will send the event report **+RESP:GTGSS** to indicate the recovery. 0 minute means to disable this function.

✧ <GSM Deep Charge Mode>:

- 0: When external power supply is connected or disconnected, the device will not be waked up. **+RESP:GTMPN** or **+RESP:GTMPF** will not be generated. Power LED will not flash.
- 1: When external power supply is connected, the device will be waked up. **+RESP:GTMPN** will be generated. Power LED will flash. When external power supply is disconnected, **+RESP:GTMPF** will be generated.

✧ <*Backup Battery Charge Current*>: Default 2A charge.

- 0: 2A.
- 1: 1.5A.

✧ <*Wakeup Hour interval*>: A numeral to specify the interval to wake up the terminal. The value 24 means the terminal wakes up once per 24 hours.

✧ <*Sensor Wakeup Device Debounce*>*:* A numeral to specify the debounce time for sensor for waking up the terminal in the GSM deep saving mode,0 means no wakeup device.

✧ <*Work Time per Wakeup*>*:* Set work time per Wakeup, the value range 5 – 60 minutes and the default value is 15 minutes.

✧ <*Power Output*>*:* Set 5V (or 3.3V) output, enable or disable

✧ <*Temperature Sample Timer*>*:* Temperature sample interval. All sensors are read every time.

✧ <*MUID Enable*>*:* 0 means to disable this function.

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

➢ **+ACK:GTCFG,**

Example: **+ACK:GTCFG,C20107,863695050491870,,0202,20221107034454,0F70$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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 **AT+GTPIN** command is used to unlock the USIM automatically.

➢ **AT+GTPIN=**

Example: **AT+ GTPIN=gv620mg,1,1234,1,,,,,0011$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Auto Unlock PIN	1	0|1	0
3	PIN	4-8	'0'-'9'	
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Auto Unlock PIN>: A numeric to indicate whether to unlock the USIM-PIN for the device.

- 0: Do not unlock USIM-PIN automatically.
- 1: Each time the device powers on, it will detect whether the USIM card is locked with a PIN. If it is locked, the device will unlock the PIN automatically.

✧ <PIN>: The PIN code which is used to unlock the USIM automatically. If it is empty, the PIN code saved in the device will be cleared.

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

➢ **+ACK: GTPIN,**

Example: **+ACK:GTPIN,C20107,863695050491870,,0203,20221107034454,0F71$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' –	

		'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. Software Protocol Watchdog

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

- **AT+GTDOG=**

Example:
AT+GTDOG=gv620mg,1,,1,0130,,1,1,,60,,,0011$
AT+GTDOG=gv620mg,2,30,,,,1,2,,60,,,0011$
AT+GTDOG=gv620mg,0,60,25,,,1,0,1,60,60,60,0011$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1|2	1
3	Ignition Frequency	<=3	10 – 120 min	60
4	Reboot Interval	<=2	1 – 30 day/hour	7
5	Reboot Time	4	HHMM	0200
6	Reserved	0		
7	Report Before Reboot	1	0|1	1
8	Input ID	1	0|1|2|3|4	0
9	Unit	1	0|1	0
10	No Network Interval	<=4	0 | 5-1440 min	480
11	No Activation interval	<=4	0 | 5-1440 min	480
12	Send Failure timeout	<=4	0 | 5-1440 min	480
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: Working mode.
  - 0: Disable this function
  - 1: Reboot periodically according to the <*Interval*> and <*Time*> setting.
  - 2: Reboot when ignition on.
- <*Ignition Frequency*>: When the working mode is 2, if the time interval between this ignition and last ignition is greater than the specified value in Ignition Frequency, the device will automatically reboot upon ignition on. If the function is enabled for the first time, the device will reboot at next ignition even if the interval is less than the value set in Ignition Frequency.
- <Reboot *Interval*>: The interval to reboot the device per days or hours, and a random time, 1-60min, will be added. That is, a random time between 1 to 60mins is added to the <*Reboot Interval*>. For example, if the <Reboot Interval> is set to 1 hour, the actual reboot interval will be 1 hour + 1-60min, if the <Reboot Interval> is set to 1 day, the actual reboot interval will be 1 day + 1-60min.
- <Reboot *Time*>: At what time to perform the reboot when <*Interval*> is met.
- <*Report Before Reboot*>: Whether to report the **+RESP:GTDOG** message before reboot. 0 means not to report and 1 to report. If this parameter is enabled, the device will obtain a real-time location and send it to the server.
- <*Input ID*>: ID of the digital input port which is used to trigger the manual reboot. 0 means no manual reboot. Digital input ports 1 and 4 are supported.
- <*Unit*>: Unit
  - 0: Unit is day.
  - 1: Unit is hour.
- <*No Network Interval*>: The interval to reboot the device when in no network signal. 0 means no rebooting the device.
- <*No Activation Interval*>*:* The interval to reboot the device when PDP is unable to register or message interaction failed (such as no TCP Ack, Sever Ack). 0 means no rebooting the device.
- <*Send Failure Timeout*>: The device will reboot automatically if report sending time is greater than <Send Failure Timeout>. 0 minute means no rebooting the device.

The acknowledgment message of AT+GTDOG command:

➢ **+ACK:GTDOG,**

Example: **+ACK:GTDOG,C20107,863695050491870,,0204,20221107034454,0F72$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

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

3.2.2.4. Time Adjustment

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

➢ **AT+ GTTMA =**

Example: **AT+ GTTMA =gv620mg,-,3,30,0,20090917203500,,,,,0006$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Sign	1	+|-	+
3	Hour Offset	<=2	0-12	00
4	Minute Offset	<=2	0-59	00
5	Daylight Saving	1	0|1	0
6	UTC Time	14	YYYYMMDDHHMMSS	
7	Reserved			
8	Reserved			
9	Reserved			
10	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

✧ <UTC time>: The UTC time.

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

➢ **+ACK: GTTMA,**

Example: +ACK:GTTMA,C20107,863695050491870,,0206,20221107034454,0F74$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.5. Outside Working Hours

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

- **AT+GTOWH=**

Example: AT+GTOWH=gv620mg,1,1F,0900,1200,1300,1730,,,3,1,1,0,0,,,,,0010$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
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 – 4	0
11	Output ID	1	0 – 4	0

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

✧ <*Mode*>: Working Mode.

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

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

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

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

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

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

✧ <*Digital Input ID*>: The input ID used to trigger this function when mode is 1 or 2. The working parameters of the specified input must be set by **AT+GTDIS** first. If using interruptible digital input, please connect slide button instead of tact button to that input.

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

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

➢ **+ACK:GTOWH,**

Example: **+ACK:GTOWH,C20107,863695050491870,,0205,20221107034454,0F73$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.6. Preserve Device Special Logical State

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

➢ **AT+GTPDS=**

Example: **AT+GTPDS=gv620mg,1,0,,,,,,001A$**				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1|2	1
3	Mask	4	0000-07FF	07FF
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ *<Mode>*:

- 0: Disable this function

- 1: Preserve special device logical state according to the value of the MASK
- 2: Reset all the special logical states of the device that listed in the <*Mask*> after receiving the command, and then preserve the special logical state of the device according to the value of the <*Mask*>.

✧ <*Mask*>: Bitwise mask to configure which device states will be preserved. Each bit represents a state.

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

The acknowledgment message of AT+GTPDS command:

➢ **+ACK:GTPDS,**

Example: **+ACK:GTPDS,C20107,863695050491870,,0207,20221107034454,0F75$**			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. Configuration File Version

The command **AT+GTFVR** is used to record information of the configuration file version.

➢ **AT+GTFVR=**

Example: **AT+GTFVR=gv620mg,,0000,,,,,,,,,,0010$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9''a' – 'z''A' – 'Z'	gv620mg

2	Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
3	Configuration Version	4	0000 – FFFF	
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	Reserved	0		
13	Reserved	0		
	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 "gv620mg".

✧ <*Configuration Name*>: The name of the configuration file.

✧ <*Configuration Version*>: The version number of the configuration. The first two characters means the major version number, the last two characters means the minor version number.

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

➢ **+ACK:GTFVR,**

Example: **+ACK:GTFVR,C20107,863695050491870,,0209,20221107034454,0F77$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' –'Z','0' –'9'}	
Unique ID	15|12	IMEI|MUID	
Device Name	<=20	'0'–'9''a'–'z''A'–'Z''-''_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.3. Position Related Report

3.2.3.1. Fixed Report Information

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

➢ **AT+GTFRI=**

Example:
AT+GTFRI=gv620mg,0,,,,,,,,,,,,,,,0009$
AT+GTFRI=gv620mg,1,1,,1,1000,2300,,30,,,,,600,,,,,0009$
AT+GTFRI=gv620mg,2,1,,1,1000,2300,,,500,,,,,,,,,0009$
AT+GTFRI=gv620mg,3,1,,1,1000,2300,,,,1000,,,,,,,0009$
AT+GTFRI=gv620mg,4,1,,1,1000,2300,,60,,300,,,,,,,0009$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0 – 5	0
3	Discard No Fix	1	0|1	1
4	Reserved	0		
5	Period Enable	1	0|1	1
6	Start Time	4	HHMM	0000
7	End Time	4	HHMM	0000
8	Reserved	0		
9	Send Interval	<=5	5 – 86400sec	30
10	Distance	<=5	50 – 65535m	1000
11	Mileage	<=5	50 – 65535m	1000
12	Reserved	0		
13	Corner Report	<=3	0 – 180	0
14	IGF Report Interval	<=5	0|5-86400sec	600
15	ERI Mask	8	00000000-FFFFFFFF	00000000
16	FRI enable for GSM DEEP	1	0|1	0
17	Reserved	0		
18	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- 0: Disable this function.
- 1: Fixed Timing Report. The position message is sent to the backend server

periodically according to the parameter <*Send Interval*>.

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

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

✧ <*Discard No Fix*>: Disable/Enable reporting when there is no GPS fixing
- 0: Enable reporting
- 1: Disable reporting

✧ <*Period Enable*>: Disable/enable the time range specified by <*Start time*> and <*End time*>. If the time range is enabled, the position reporting is limited within the time range.

✧ <*Start Time*>: The start time of the scheduled fixed report. The valid format is “HHMM”. The value range of “HH” is “00”–“23”. The value range of “MM” is “00”–“59”.

✧ <*End Time*>: The end time of the scheduled fixed report. The valid format and range are as same as <*Start Time*>.

✧ <*Send Interval*>: Period to send the position information. The value range is 5 – 86400 and the unit is second. If <*Report Mode*> in **AT+GTSRI** is set to Force on SMS, <*Send Interval*> should be greater than 15 seconds, otherwise the reports will be sent via TCP short connection.

✧ <*Distance*>: The specified distance to send the position information when <*Mode*> is 2. Unit: meter.

✧ <*Mileage*>: The specified length to send the position information when <*Mode*> is 3 and 4. Unit: meter.

✧ <*Corner Report*>: The threshold to determine whether the device is turning around a corner. 0 is to disable the corner report. For other values, the device will compare the current azimuth with the last known one, if the difference is greater than or equal to this value, the corner report is sent with **+RESP:GTFRI**.

✧ <*IGF Report Interval*>*:* Period to fix and send the position information when <*Power Saving*

Mode> in **AT+GTCFG** is set to 2, the engine is off and <*Mode*> is set to 1 (Fixed Timing Report). Its value range is 0|5 – 86400 and the unit is second.

✧ <*ERI Mask*>: If the serial port is connected to peripherals and the mask is not 0x00000000, the device will send **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure whether to report the data from peripherals by **+RESP:GTERI**.

- Bit 0 for the <Digital Fuel Sensor Data> field in **+RESP:GTERI.** If it is set to 1, the data block <Fuel Sensor Data> will be displayed.
- Bit 1 for temperature sensor.
- Bit 2 for the <CAN Data> field in **+RESP:GTERI**.
- Bit 3 for <Percentage> field in the report of **+RESP:GTERI**. If it is set to 1, the data block <Fuel Sensor Data> will be displayed.
- Bit 4 for <Volume> field in the report of **+RESP:GTERI**. If it is set to 1, the data block <Fuel Sensor Data> will be displayed.
- Bit 8 for <Bluetooth accessory> field in the report of **+RESP:GTERI**. If it is set to 1, the data block <Bluetooth accessory> will be displayed.
- Bit 15 for the <*RAT and Band Data*> field in **+RESP:GTERI.** RAT means Radio Access Technology.

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

✧ <FRI enable for GSM DEEP>: This field is valid only for GSM deep mode. After device is waken up, if device is under ignition off state, FRI report will be sent regularly at the interval of "IGF Report Interval", and tow function will be disabled at this time.

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

➢ **+ACK:GTFRI,**

Example: **+ACK:GTFRI,C20107,863695050491870,,0210,20221107034455,0F78$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.3.2. Frequency Change of Fixed Report Configuration

The command **AT+GTFFC** is used to change the parameters of fixed report when certain event occurs. When the event disappears, the device will restore to its previous settings.

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

➢ **AT+GTFFC=**

Example: **AT+GTFFC=gv620mg,0,1,0,30,500,500,300,,,,,0016$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Priority	1	0-4	0
3	Mode	1	0-3	0
4	FRI Mode	1	0-5	0
5	FRI IGN Report Interval	<=5	5-86400s	30
6	FRI Report Distance	<=5	50-65535m	500
7	FRI Report Mileage	<=5	50-65535m	500
8	FRI IGF Report Interval	<=5	0|5-86400s	300
9	Reserved			
10	Corner Report	<=3	0 – 180	0
11	Reserved			
12	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Priority*>: Priority of the event which triggers the parameter change for fixed report. 0 has the highest priority.

✧ <*Mode*>: Specify the trigger event to change the fixed report parameters.

- 0: Disable the parameters in the specified priority.
- 1: Change the fixed report parameter when the device enters into any of the defined Geo-Fence.
- 2: Change the fixed report parameter when the device enters into known roaming state.
- 3: Change the fixed report parameter when the device enters into unknown roaming

state.

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

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

- **+ACK:GTFFC,**

Example: **+ACK:GTFFC,C20107,863695050491870,,0213,20221107034455,0F7B$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4. Alarm Settings

3.2.4.1. Geo-Fence Configuration

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

➢ **AT+GTGEO=**

Example: **AT+GTGEO=gv620mg,0,3,121.412248,31.187891,1000,600,1,1,0,0,0,0,,,000A$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	GEO ID	<=2	0 – 19	
3	Mode	1	0 – 3	0
4	Longitude	<=11	(–)xxx.xxxxxx	
5	Latitude	<=10	(–)xx.xxxxxx	
6	Radius	<=7	50 – 6000000m	50
7	Check Interval	<=5	0|5 – 86400sec	0
8	Output ID	1	0 – 4	0
9	Output Status	1	0|1	
10	Duration	<=3	0 – 255(×100ms)	0
11	Toggle Times	<=3	0 – 255	0
12	Trigger Mode	<=2	0|21|22	0
13	Trigger Report	1	0|1	0
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*GEO ID*>: ID of the circular Geo-Fence. Total 20 zones, 0 to 19, are supported.

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

- 0: Disable the zone's Geo-Fence function.
- 1: Entering the zone. The report will be generated only when the terminal enters the

Geo-Fence.

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

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

✧ <*Latitude*>: The latitude of a point which is defined as the centre of the circular Geo-Fence region. The format is "(–) xx.xxxxxx" and the value range is from "–90.000000" to "90.000000". The unit is degree. South Latitude is defined as negative value starting with"–" and north Latitude is defined as positive value 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 GPS checking for the circular Geo-Fence alarm.

✧ <*Trigger Mode*>:

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

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

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

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

➢ **+ACK:GTGEO,**

Example: **+ACK:GTGEO,C20107,863695050491870,,0,0216,20221107034455,0F7E$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

GEO ID	<=2	0 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.2. Polygon Geo-Fence

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

- **AT+GTPEO=**

Example:
AT+GTPEO=gv620mg,0,0,1,3,121.412240,31.187801,
121.412248,31.187891,121.412258,31.187991,600,1,1,0,0,,,,,0039$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	GEO ID	<=2	0 – 19	0
3	Mode	1	0 – 3	0
4	Start Point	1	1-8	1
5	End Point	<=2	3-10	3
5+2N-1	Longitude	<=11	(–)xxx.xxxxxx	
5+2N	Latitude	<=10	(–)xx.xxxxxx	
6+2N	Check Interval	<=5	0|5 – 86400sec	0
7+2N	Output ID	1	0 – 4	0
8+2N	Output Status	1	0|1	
9+2N	Duration	<=3	0 – 255(×100ms)	0
10+2N	Toggle Times	<=3	0 – 255	0
11+2N	Reserved	0		
12+2N	Reserved	0		
13+2N	Reserved	0		
14+2N	Reserved	0		

	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- ✧ <*GEO ID*>: ID of the polygon Geo-Fence. Total twenty zones, 0 to 19, are supported.
- ✧ <*Mode*>: The working mode of the Polygon Geo-Fence to send the message **+RESP:GTGIN** or **+RESP:GTGOT** to the backend server.
  - 0: Disable the Geo-Fence function.
  - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
  - 2: Exiting the zone. The report will be generated only when the terminal exits the Geo-Fence.
  - 3: Both entering and exiting.
- ✧ <*Start Point*>: The start point of the polygon GEO-Fence.
- ✧ <*End Point*>: The end point of the polygon GEO-Fence.
- ✧ <*Longitude*>: The longitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The format is "(–)xxx.xxxxxx" and the value range is from "–180.000000" to "180.000000". The unit is degree. West longitude is defined as negative value starting with "–" and east longitude is defined as positive value without "+".
- ✧ <*Latitude*>: The latitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The format is "(–)xx.xxxxxx" and the value range is from "–90.000000" to "90.000000". The unit is degree. South Latitude is defined as negative value starting with "–" and north Latitude is defined as positive value without "+".

Note: For more groups of <*Longitude*>and <*Latitude*>, please use<*Start Point*> and <*End point*> to adjust, marked <*Longitude*> and <*Latitude*> means repeat.

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

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

- ➢ **+ACK:GTPEO,**

Example: **+ACK:GTPEO,C20107,863695050491870,,0,0236,20221107034457,0F92$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GEO ID	1	0 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

3.2.4.3. Tow Alarm

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

➢ **AT+GTTOW=**

Example: **AT+GTTOW= gv620mg,0,120,120,,0,0,0,0,,,,,,,,,,,000D$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Tow Enable	1	0|1	0
3	Tow Detection Time	<=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 – 4	
7	Tow Output Status	1	0|1	
8	Tow Output Duration	<=3	0 – 255 (×100ms)	0
9	Tow Output Toggle Times	<=3	0 – 255	0
10	Rest Duration	<=3	1 – 255 (×15sec)	2
11	Motion Duration	<=2	1 – 10 (×100ms)	3
12	Motion Threshold	1	2 – 9	4
13	Tow Mileage Enable	1	0|1	0
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
	Serial Number	4	0000 – FFFF	

	Tail Character	1	$	$

- <*Tow Enable*>: Enable or disable tow alarm (**+RESP:GTTOW**).
  - 0: Disable the tow alarm
  - 1: Enable the tow alarm
- <*Tow Detection Time*>: A time parameter to judge whether the device is considered to be towed after the engine off. If the motion sensor doesn't detect stillness within the specified time after engine off, the device is being towed.
- <*Fake Tow Delay*>: After engine off and stillness detected, if the motion sensor detects moving again, the device goes into a state called fake tow. If the device keeps in fake tow beyond the period of time defined by the parameter <*Fake Tow Delay*>, it is considered to be towed.
- <*Tow Interval*>: The period to send tow alarm message.
- <*Tow Output ID*>: The ID of the output port to send the specified waveform when tow event is detected.
- <*Tow Output Status*>: Please refer to the parameter <*Output1–4 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>: If the motion sensor detects that the duration of static state is more than <Rest Duration>, the vehicle is considered to go into static state.
- <Motion Duration>: If the motion sensor detects that the duration of motion state is more than <Motion Duration>, the vehicle is considered to go into motion state.
- <Motion Threshold>: A numeric indicates the sensitivity of sensor to detect the motion. The smaller the value is, the more sensitive the sensor will be.
- <*Tow Mileage Enable*>: Enable or disable current tow mileage (**+RESP:GTTOW**).
  - 0: Disable the tow mileage, current total mileage.
  - 1: Enable current tow mileage.

Note: If <*Tow Mileage Enable*> is set to 1: Enable current tow mileage, the mileage reported in **+RESP:GTTOW** is the accumulated mileage during tow status.

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

- **+ACK:GTTOW,**

Example: **+ACK:GTTOW,C20107,863695050491870,,0256,20221107034459,0FA6$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	

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

3.2.4.4. Speed Alarm

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

➢ **AT+GTSPD=**

Example: **AT+GTSPD=gv620mg,1,80,120,60,300,1,1,0,0,,,,,,,,,,,,000C$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1|2|3|4	0
3	Min Speed	<=3	0 – 400km/h	0
4	Max Speed	<=3	0 – 400km/h	0
5	Valid Time	<=4	0 – 3600sec	60
6	Send Interval	<=4	30 – 3600sec	300
7	Output ID	1	0 – 4	0
8	Output Status	1	0|1	
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		

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

- <*Mode*>: The working mode of the speed alarm.
  - 0: Disable speed alarm.
  - 1: Report speed alarm if the current speed is within the speed range defined by <*Min Speed*> and <*Max Speed*>.
  - 2: Report speed alarm if the current speed is outside the speed range defined by <*Min Speed*> and <*Max Speed*>.
  - 3: Report speed alarm only once if the current speed is within or outside the speed range defined by <*Min Speed*> and <*Max Speed*>. In this mode, <*Send Interval*> will be ignored.
  - 4: Report speed alarm when the speed changes from inside to outside or vice versa. But the backend server cannot receive **+RESP:GTSPD** for speed changes from inside to outside unless **+RESP:GTSPD** for speed changes from outside to inside is received first. In this mode, <*Send Interval*>will be ignored.
- <*Min Speed*>: The lower limit speed.
- <*Max Speed*>: The upper limit speed.
- <*Valid Time*>: If the speed meets the alarm condition and maintains the period of time defined by <*Valid Time*>, the speed alarm will be triggered.
- <*Send Interval*>: The time interval of sending speed alarm message.
- <*Position Type*>: This parameter indicates the type of position info included in +RESP:GTSPD report.

  0: Including real time position in the report.

  1: Including the last known position in the report.

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

- **+ACK:GTSPD,**

Example: **+ACK:GTSPD,C20107,863695050491870,,0257,20221107034459,0FA7$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.5. SOS Alarm

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

➢ **AT+GTSOS=**

Example: **AT+GTSOS=gv620mg,1,1,0,1,1,0,0,,,,,000D$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0 – 2	0
3	Digital Input ID	1	0|1 – 4	0
4	Position Type	1	0|1	0
5	Output ID	1	0 – 4	
6	Output Status	1	0|1	
7	Duration	<=3	0 – 255(×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of SOS Alarm.
- 0: Disable SOS Alarm.
- 1: Send the current position **+RESP:GTSOS** to the backend server.
- 2: Send the current position to the SMS gateway and Direct Number List (if enabled) via SMS and **+RESP:GTSOS** to backend server

✧ <*Digital Input ID*>: ID of the digital input port which triggers the SOS Alarm. 0 means the SOS Alarm is disabled. The corresponding digital input port should be configured by the

command **AT+GTDIS** first. If the SOS Alarm is configured, there is no **+RESP:GTDIS** message for the specified digital input port.

✧ *<Position Type>*: This parameter indicates the type of position info included in **+RESP:GTSOS** report.

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

➢ **+ACK:GTSOS,**

Example: **+ACK:GTSOS,C20107,863695050491870,,0258,20221107034459,0FA8$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.6. Roaming Detection Configuration

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

➢ **AT+GTRMD=**

Example: **AT+GTRMD=gv620mg,0,,,,,1,2,4600F,4602F,,,1,1,,,,2,2,,,,1f,,,1f,,,,,0,0,0,0,,,0001$** **AT+GTRMD=gv620mg,1,,,,,1,3,46000,46002,46003,,,2,2,46007,,,1,1,46001,,,3fff,,,2ff,,,,,0,0,0,0,,,0002$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
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	1-100	
13	Roaming Operator End	<=3	1-100	
14	Roaming Operator List	<=6*100		
15	Reserved	0		
16	Reserved	0		
17	Black Operator Start	<=2	1-20	
18	Black Operator End	<=2	1-20	
19	Black Operator List	<=6*20		
20	Reserved	0		
21	Reserved	0		
22	Known Roaming Event Mask	<=4	0000 – 3FFF	3FFF
23	Reserved	0		
24	Reserved	0		
25	Unknown Roaming Event Mask	<=4	0000 – 3FFF	3FFF
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Output ID	1	0 – 4	0
31	Output Status	1	0|1	
32	Duration	<=3	0～255(×100ms)	0
33	Toggle Times	<=3	0 – 255	0
34	Reserved	0		
35	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

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

✧ <*Operator Start*>: A numeral which indicates the first index of the white operator numbers to be input. For example, if the value is 1, it will update the white operator list from the 1st one. If the parameter is empty, there should be no white number list following the empty value.

✧ <*Operator End*>: A numeral which indicates the last index of the white operator numbers to be input. For example, if the value is 2, it will update the white operator list until the 2nd one. If the parameter is empty, there should be no white number list following the empty value.

✧ <*Home Operator List*>: A white number list of PLMN operators. The numbers are comprised of MCC and MNC, both of which consist of 3 digits. The operators in this list will be considered as in "Home" state. And two adjacent operator numbers are separated with '**,**'. The number of the operators in the list depends on the parameters <*Operator Start*> and <*Operator End*>. For example, if <*Operator Start*> is 1 and <*Operator End*> is 2, the operator list should include 2 operator numbers (empty value acceptable) and the two numbers are separated by with '**,**'. 'MCCFF' type code is used to identify operators across a whole country. For example, '460FF' covers the mobile network operators all across China.

✧ <*Roaming Operator List*>: It is like the <*Home Operator List*> with difference that the operators in this list will be considered as in "Known Roaming" state.

✧ <*Black Operator List*>: It is like the <*Home Operator List*> with the difference that the operators in this list will be considered as in "Blocking Report" state. In this state, all reports will be buffered instead of being sent.

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

✧ <*Known Roaming Event Mask*>: Bitwise mask to configure which event report should be sent to the backend server when GSM roaming state is detected. If the roaming state is "Known Roaming", the <*Known Roaming Event Mask*> will be valid; otherwise the <*Unknown Roaming Event Mask*> will be valid.

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

- Reserved
- Others are Reserved

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

✧ *<Unknown Roaming Event Mask>*: It works as the *<Known Roaming Event Mask>*.

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

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

➢ **+ACK:GTRMD,**

Example: **+ACK:GTRMD,C20107,863695050491870,,0264,20221107034500,0FAE$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note:

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

3.2.4.7. Buzzer Alarm

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

➢ **AT+GTBZA=**

Example: **AT+GTBZA=gv620mg,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,0000$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg

2	Output ID	1	0-4	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Alarm 1 Output Status	1	0|1	
7	Duration	<=3	0 – 255 (×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Alarm 2 Output Status	1	0|1	
12	Duration	<=3	0 – 255 (×100ms)	0
13	Toggle Times	<=3	0 – 255	0
14	Reserved	0		
15	Reserved	0		
16	Alarm 3 Output Status	1	0|1	
17	Duration	<=3	0 – 255 (×100ms)	0
18	Toggle Times	<=3	0 – 255	0
19	Reserved	0		
20	Reserved	0		
21	Alarm 4 Output Status	1	0|1	
22	Duration	<=3	0 – 255 (×100ms)	0
23	Toggle Times	<=3	0 – 255	0
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
	Serial Number	4	0000 – FFFF	

	Tail Character	1	$	$

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

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

➢ **+ACK:GTBZA,**

Example: **+ACK:GTBZA,C20107,863695050491870,,0262,20221107034500,0FAC$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.8. Overspeed Alarm

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

➢ **AT+GTSPA**

Example: **AT+GTSPA= gv620mg,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,0000$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1|2	0
3	Speed Threshold 1	<=3	0 – 400km/h	50
4	Reserved	0		
5	Validity	<=4	0 – 3600sec	60
6	Alarm Type	1	0|1 – 4	0
7	Reserved	0		
8	Reserved	0		

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

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

- 0: Disable this function.
- 1: Strict Standard Mode. This mode will check the speed and trigger the buzzer alarm during speedup or slowdown.
- 2: Warning Mode. This mode will only check the speed and trigger the buzzer alarm during speedup.

✧ <*Speed Threshold*>: The minimum speed to trigger the buzzer alarm.

- ✧ <*Validity*>: If the speed meets the alarm condition and is maintained for the period of time longer than <*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,C20107,863695050491870,,0263,20221107034500,0FAD$**			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.9. Excessive Idling Detection

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

➢ **AT+GTIDL=**

Example: **AT+GTIDL=gv620mg,1,2,1,,,,,1,1,0,0,,,,,000E$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1	0
3	Idling Detection Time	2	1 – 30 min	2
4	Idling End Time	1	1 – 5 min	1
5	Reserved	0		
6	Reserved	0		

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

- <*Mode*>: Working mode.
  - 0: Disable this function
  - 1: Enable this function.
- <*Idling Detection Time*>: If the vehicle is detected to be stationary with ignition on for this time long, it is considered to be in idling status.
- <*Idling End Time*>: After the vehicle enters into idling status, if it moves again or turns ignition off and keeps in that status for this time long, the vehicle is considered to exit idling status.
- <*Output ID*>: Specify the ID of the output port (1 to 4) to output specified waveform when the vehicle enters into idling status. If it is set to 0, there is no output waveform.
- <*Debounce Option*>*:* Specify required debouncing time to exit idle state after ignition off. 0 means needing no debouncing. 1 means needing to debounce <*Time to Movement*>.

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

- **+ACK:GTIDL,**

Example: **+ACK:GTIDL,C20107,863695050491870,,0259,20221107034459,0FA9$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	

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

3.2.4.10. Start/Stop Report

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

➢ **AT+GTSSR=**

Example:
AT+GTSSR=gv620mg,1,2,1,5,2,,,,0017$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1	0
3	Stop Detection Time	<=4	1 – 30 min/5-1800 sec	2
4	Motion Detection Time	<=3	1 – 5 min/5-300 sec	1
5	Start Speed	<=2	1 – 10 Km/h	5
6	Long Stop Detection Time	<=5	0 – 43200 min	0
7	Time Unit	1	0|1	0
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

✧ <*Stop Detection Time*>: After the vehicle enters into start status, if it rests again and keeps in that status for this time long, the vehicle is considered to exit start status.

✧ <*Motion Detection Time*>: If the vehicle is detected to be moving with ignition on for this time long, it is considered to be in start status.

✧ <*Start Speed*>: The start speed threshold to determine whether the vehicle is start or not.

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

✧ <*Long Stop Detection Time*>: If the duration of static state is more than <*Long Stop Detection Time*>, the **+RESP:GTLSP** will be sent to backend server, and 0 means to disable.

✧ <*Time Unit*>: It controls the time unit of <Stop Detection Time> and <Motion Detection Time> parameters.

- 0: The time unit is minute.
- 1: The time unit is second.

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

➢ **+ACK:GTSSR,**

Example: **+ACK:GTSSR,C20107,863695050491870,,0260,20221107034500,0FAA$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.11. iButton Setting

The command **AT+GTACD** is used to configure the parameters of iButton. When the iButton is accessed, a specified wave shape can be configured to the specified output port. iButton information is reported in message **+RESP:GTIDA**.

➢ **AT+GTACD**

Example: **AT+GTACD=gv620mg,2,0,0,0,0,,,,,0005$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**

Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
iButton Timer	<=2	0|1 – 10(s)	0
Output ID	1	0-4	0
Output status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle	<=3	0 – 255	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*iButton Timer*>: Interval of searching the iButton ID or RFID reader DR200.
Note: The number of iButton ID is in opposite order with number that printed on iButton. The ID structure is <1 byte family ID> + <6 byte serial number> + <1 byte CRC>. So the first byte of ID number is iButton's family ID.

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

➢ **+ACK:GTACD,**

Example: **+ACK:GTACD,C20107,863695050491870,,0261,20221107034500,0FAB$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

3.2.4.12. Temperature Alarm

This command is used to set temperature-alarm range for the terminal. According to the working

mode, the terminal will send event message **+RESP:GTTMP** to the backend server when the device detects the temperature is outside or inside the range.

➢ **AT+GTTMP=**

Example: **AT+GTTMP=gv620mg,0,1, 862170019025640,,,-20,50,,,2,10,,,1,1,0,0,,,,,000C$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Alarm ID	1	0-7	
3	Mode	1	0-3	0
4	Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
5	Reserved	0		
6	Reserved	0		
7	Low Temperature	<=3	-55 – 125℃	0
8	High Temperature	<=3	-55 – 125℃	0
9	Reserved	0		
10	Reserved	0		
11	Validity	<=2	1 – 10	2
12	Send Interval	<=2	0 – 60	10
13	Reserved	0		
14	Reserved	0		
15	Output ID	1	0 – 4	0
16	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	Reserved	0		
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ *<Alarm ID>*: ID of the temperature alarm. Eight groups (0-7) 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 is within or outside the temperature range defined by <*Low Temperature*> and <*High Temperature*>. In this mode, <*Send Interval*> will be ignored.
- <*Sensor ID*>: ID of the temperature sensor. Total 8 sensors are supported.
- <*Low Temperature*>: The lower limit temperature.
- <*High Temperature*>: The upper limit temperature.
- <*Validity*>: When the temperature sensor detects the environment temperature meets the alarm condition and the duration is more than the value of <*validity*>, the temperature alarm will be triggered.
- <*Send Interval*>: The sending interval of temperature report **+RESP:GTTMP**. If <*Send Interval*> is set to 0, it will only report once.

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

➢ **+ACK:GTTMP,**

Example: **+ACK:GTTMP,C20107,863695050491870,,0,0265,20221107034500,0FAF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'	
Alarm ID	1	0-7	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.13. GPS Jamming Alarm

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

➢ **AT+ GTGPJ=**

Example: **AT+GTGPJ=gv620mg,1,15,3,,,,,1,1,15,5,,0019$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4–6	'0'–'9' 'a'–'z' 'A'–'Z'	gv620mg
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 – 4	0
10	Output Status	1	0|1	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
	Serial Number	4	0000–FFFF	
	Tail Character	1	$	$

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

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

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

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

➢ **+ACK:GTGPJ**

Example: **+ACK:GTGPJ,C20107,863695050491870,,0273,20221107034502,0FB7$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. Bluetooth Setting

3.2.5.1. Bluetooth Setting

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

➢ **AT+GTBTS=**

Example: **AT+GTBTS=gv620mg,0,,,,,,,,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1|2	0
3	Reserved	0		
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	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		

	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- 0: Disable the Bluetooth.
- 1: Enable the Bluetooth after power on.
- 2: Enable the Bluetooth after ignition on is detected.

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

➢ **+ACK:GTBTS,**

Example: **+ACK:GTBTS,C20107,863695050491870,,0274,20221107034502,0FB8$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.5.2. Bluetooth Accessory Setting

The command **AT+GTBAS** is used to scan or connect the device with Bluetooth accessories which contain some effective data, such as humidity, temperature or fuel level. The parameter <*Mode*> in the command **AT+GTBTS** must be 1 or 2. Maximum 8 connectable Bluetooth accessories can be supported.

➢ **AT+GTBAS=**

Example: **AT+GTBAS=gv620mg,0,2,0,,B84BA4C0B801,001E,30,2400,,0,0,10,2,300,,0,0,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Index	1	0 – 9	0
3	Accessory Type	1	0|1|5|6|8	0
4	Accessory Model	1	0 – 5	0
5	Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	

			'-' ' _'	
6	Accessory MAC	12	000000000000 - FFFFFFFFFFFF	FFFFFFFFFFF F
7	Append Mask	<=4	0 - FFFF	3F
8	Read Interval	<=5	10 – 86400sec	30
9	Low Voltage Threshold	<=4	0 – 5000mV	2400
10	Reserved	0		
11	Reserved (Optional)	0		
12	Reserved (Optional)	0		
13	Reserved (Optional)	0		
14	Reserved (Optional)	0		
15	Reserved (Optional)	0		
16	Reserved	0		
17	Output ID	1	0– 4	0
18	Output Status	1	0|1	0
19	Duration	<=3	0 – 255(×100ms)	0
20	Toggle Times	<=3	0 – 255	0
21	Reserved	0		
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Index*>: The index of the Bluetooth accessory. All 10 groups can be used for Bluetooth beacon accessories.

✧ <*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

  For Escort angle sensor, five reserved parameters are used as follows:

Event Notification	1	0-1	0
Reserved			
Reserved			
Reserved			

Reserved			

✧ <*Event Notification*>: It configures whether to enable event notification function.

- 0: Disable event notification.
- 1: Enable event notification. If a new event occurs on the accessory, the device will report the **+RESP:GTBAA** message.

- 5: BLE lock. Five reserved parameters are used as follows:

Unlock Timeout	<=4	Noke Lock: 60-1800(s) TS Lock: 5-255(s)	Noke Lock: 600 TS Lock: 30
TS Pin Code	<=8	0 – FFFFFFFF	0
TS Unlock Relay	1	0 – 2	0
Reserved	0		
Reserved	0		

✧ <Unlock Timeout>: When unlock success or unlock timeout, the device will report message **+RESP:GTBAA** to back server.

✧ <TS Pin Code>: Pin code used to connect to the TS lock. It is only applicable to TS lock. For other lock, it is reserved by default.

✧ <TS Unlock Relay>: For each bit, set it to 1 to supply power to relay coil, and set it to 0 to cut power to relay coil. It is only applicable to TS lock. For other lock, it is reserved by default.

- Bit 0 for relay1.
- Bit 1 for relay2.

Example:

0: Reserved.

1: Means to unlock relay1.

2: Means to unlock relay2.

Note: After unlocking, relay1/2 will maintain the unlocking state for 1 second, and then relay1/2 will be locked again automatically.

- 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 – 10sec	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 – 10s	2
Humidity Send Interval	<=5	30 – 43200s	300

- ✧ <*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*> time, 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*> time, the humidity alarm will be triggered.

- 8: External Input Output Bluetooth Accessory.

Note: The input/output configuration of the accessory can be found in the **AT+GTIEX**, **AT+GTAEX** and **AT+GTOEX**.

- ✧ <*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):
    3: Angle sensor. Maximum 4 Escorts are supported.
  - The model of BLE Lock (<*Accessory Type*> is 5):
    0: Noke Lock.

1: TS Lock.

- The model of Beacon Multi-Functional Sensor (<Accessory Type> is 6):
  2: WTH300.
  3: ELA RHT&T Sensor.
  4: WMS301.
  5: WTH301.
  Note: The ELA accessories do not support voltage data collection.
- The External Input Output Bluetooth Accessory (<Accessory Type> is 8):
  0: WBC300.
  Note: The current version supports only one WBC300 configuration.

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

✧ <*Accessory MAC*>: The MAC address of the Bluetooth accessory.

Note: If <*Accessory MAC*> of Bluetooth beacon accessory is empty, the device will search for the Bluetooth beacon accessory by <*Accessory Name*>. The name must be unique. Since the name of the Bluetooth beacon accessory is variable while the MAC address of the Bluetooth beacon accessory is unique, so it is recommended to use the MAC address to scan Bluetooth beacon accessories.

✧ <*Append Mask*>: Bitwise mask to configure the composition of Bluetooth accessary info. If the device obtains the data from Bluetooth accessories, and the Bit 8 for the Bluetooth accessory data of <*ERI Mask*> in **AT+GTFRI** is set to 1, the device will report **+RESP:GTERI** including the data obtained from Bluetooth accessories instead of **+RESP:GTFRI**. In **+RESP:GTBAA** message, the Bluetooth accessories data will be included according to the mask set by this field.

- Bit 0: Bluetooth accessory name.
- Bit 1: Bluetooth accessory MAC.
- Bit 2: Bluetooth accessory connection status. This bit is only effective when the Bluetooth accessory is a Bluetooth connectable accessory. It will always be 0 when the Bluetooth accessory is a Bluetooth beacon accessory.
- Bit 3: Bluetooth accessory battery voltage.
- Bit 4: Bluetooth accessory temperature.
- Bit 5: Accessory Humidity
- Bit 6: Reserved
- Bit 7: Accessory input output data (Including <Accessory Output Status> <Accessory Digital Input Status> and <Accessory Analog Input Status>)
- Bit 8: <Accessory Event Notification Data>

Note: If <Accessory Type> 5 (BLE Lock) only supports reporting Bluetooth accessory MAC.

✧ <*Read Interval*>: The interval for reading data from the Bluetooth accessory. If *<Accessory Type> 5 (BLE lock)* is selected, this parameter is invalid.

✧ <*Low Voltage Threshold*>: Specify the lower limit voltage. When the voltage of Bluetooth accessary is below this value, the device will report message **+RESP:GTBAA** to backend server. 0 means disable low voltage detection. If *<Accessory Type> 5 (BLE lock)* is selected, this parameter is invalid.

✧ <*Output ID*>: The ID of the output port to output the specified waveform when the **+RESP:GTBAA** event is detected. If *<Accessory Type> 5 (BLE lock)* is selected, unlock success

will not trigger output. If *<Accessory Model> 4 (WMS301*) is selected, door opening and closing will not trigger output.

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

- **+ACK:GTBAS,**

Example: **+ACK:GTBAS,C20107,863695050491870,,0275,20221107034502,0FB9$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. Bluetooth Beacon ID Setting

The command **AT+GTBID** is used to scan the device with Bluetooth beacon ID accessories. The parameter *<Mode>* in the command **AT+GTBTS** must be 1 or 2.

- **AT+GTBID=**

Example: **AT+GTBID=gv620mg,,1,0,001F,2400,,1,15,B80EA1003C06,,B80EA100A00A,,B80EA11067E8,,,,,,** **B80EA1104007,,,,B80EA10017F2,1,1,31,,,,0,0,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Reserved	0		
3	Enable	1	0|1	
4	Beacon ID Accessory Model	1	0|4|5	0
5	Append Mask	<=4	0 - FFFF	5A
6	Low Voltage Threshold	<=4	0 – 5000mV	2400
7	Reserved	0		
8	Start Index	<=3	1 – 15	1
9	End Index	<=3	1– 15	1

10	MAC List	<=12*15		
11	Reserved (Optional)	0		
12	Reserved (Optional)	0		
13	Reserved (Optional)	0		
14	Reserved (Optional)	0		
15	Reserved (Optional)	0		
16	Organization Unique Identifier	0|2|4|6	00--FFFFFF	
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Message Type	1	0|1	1
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Enable*>: Whether to support the Bluetooth beacon ID accessories.

- 0: Not support.
- 1: Support.

✧ <*Beacon ID Accessory Model*>: The model of the Bluetooth accessory. The following is supported now:

0: WKF300. Two reserved parameters are used as follows:

Push Button Event	1	0|1	0
Keyfob Detect mode	1	0 -2	0
Keyfob Detect Interval	<=3	30 – 600(s)	30
Reserved	0		
Reserved	0		

✧ <*Push Button Event*>: If this parameter is set to 1 and press the WKF300, the device will report message **+RESP:GTBAA** to backend server.

✧ <*Keyfob Detect Mode*>: It specifies the mode of detecting Keyfob

- 0: Disable the Keyfob detecting mode
- 1: After entering ignition on and moving state, the device will scan Keyfobs 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

information of top 3 Keyfobs with the strongest signal.

- 2: After entering ignition on and moving state, the device will keep scanning Keyfobs continuously. If the device detects change of available Keyfob(s) over two successive time intervals specified by <*Keyfob Detect Interval*>, 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 information of top 3 Keyfobs with the strongest signal.

✧ <*Keyfob Detect Interval*>: It specifies the interval of detecting Keyfob.

4: WID310. Five reserved parameters are used as follows:

Reserved	0	0	0
WID310 Detection Mode	1	0|2	0
WID310 Detection Interval	<=3	30 - 600(s)	30
Reserved	0		
Reserved	0		

✧ <*WID310 Detection Mode*>: The parameter which specifies the mode of detecting WID310.

- 0: Disable detection.
- 2: Enable detection: Allow the device to scan continuously. After entering ignition-on and moving state, the device will keep scanning WID310 continuously. If the device detects change of available WID310, it will send the **+RESP:GTBID** messages to report information of WID310. If more than 3 WID310 are detected, the **+RESP:GTBID** message contains information of top 3 WID310 with the strongest signal.

5: Standard Beacon. Five reserved parameters are used as follows:

Beacon Type	1	0--2	0
Beacon Detection Mode	1	0|3	0
Beacon Detection Interval	<=3	60 - 600(s)	120
Beacon Report Interval	<=5	60 - 86400(s)	120
Reserved	0		

✧ <*Scan Beacon Type*>: Scan beacon type.

- 0: iBeacon.
- 1: Eddystone .
- 2: iBeacon or Eddystone.

✧ <*Beacon Detection Mode*>: The parameter which specifies the mode of detecting beacon.

- 0: Disable detection.
- 3: Enable detection: Allow the device to scan continuously.

  The **+RESP:GTBID/GTBIE** message is sent to the backend server periodically according to the parameter <Beacon Report Interval>. For **+RESP:GTBID**, if

more than 15 beacons are detected, the top 15 will be reported; for **+RESP:GTBIE**, if more than 50 beacons are detected, the message will contain the information of the top 50 beacons.

- ✧ <*Beacon Report Interval*>: The time interval for sending +RESP:GTBID/GTBIE messages when <Beacon Detection Mode> is 3.

Note: If <Beacon ID Accessory Model> is 5 (Standard Beacon), <MAC List> will be invalid and there is no need to configure it. Up to 50 beacons are supported.

- ✧ <*Append Mask*>: In **+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 level>.
  - Bit 4: <Accessory temperature>.
  - Bit 5: Reserved.
  - Bit 6: <Accessory signal strength>.
- ✧ <*Low Voltage Threshold*>: Specify the lower limit voltage. When the voltage of Bluetooth accessary is below this value, the device will report message **+RESP:GTBAA** to back server. 0 means to disable low voltage detection.
- ✧ <*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 amount 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 15 MAC addresses can be updated each time.
- ✧ <*MAC List*>: A list of comma-separated MAC address to be updated to the MAC list. The quantity of the MAC addresses are 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 address 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 the three MAC addresses of <*MAC List*> empty.
- ✧ <*Organization Unique Identifier*>: It is from the Bluetooth MAC address. Only one Organization Unique Identifier (OUI) is allowed for each type of Bluetooth accessory. For example, 'AC0123456789' represents the Bluetooth Beacon MAC. The 'AC' is OUI. If the device detects this OUI, the **+RESP:GTBID/GTBIE** message will be reported. If the value is empty, it means "Disable this function". When <Beacon ID Accessory Model> is 5 (Standard Beacon), this parameter is valid.
- ✧ <*Message Type*>: The type of message. If <Beacon ID Accessory Model> is 5 (Standard Beacon), this parameter is valid.
  - 0: Report **+RESP:GTBID** (max 15 devices information will be reported).
  - 1: Report **+RESP:GTBIE** (max 50 devices information will be reported).

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

➢ **+ACK:GTBID,**

Example: **+ACK:GTBID,C20107,863695050491870,,0285,20221107034503,0FC3$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. IO Application

3.2.6.1. Digital Output Port Settings

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

The digital output 1 is a latched output. The final status of the output will be latched during power off. It supports only waveform 1.

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

Waveform 1:

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

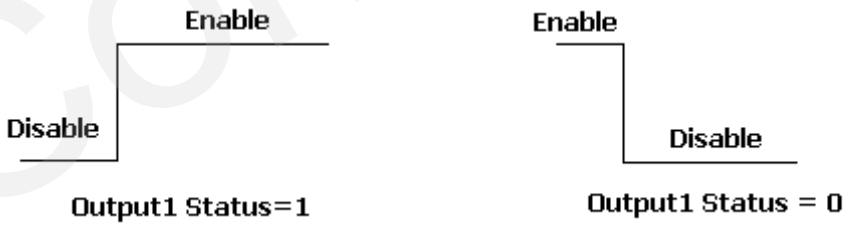


Figure 2: Waveform 1

Waveform 2:

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

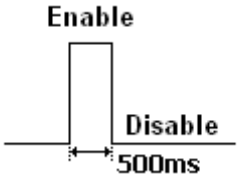


Figure 3: Waveform 2

Waveform 3:

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

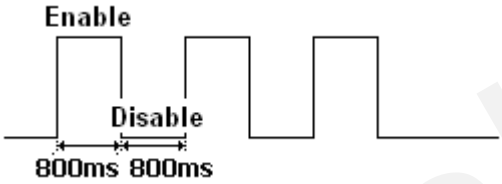


Figure 4: Waveform 3

Waveform 4:

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

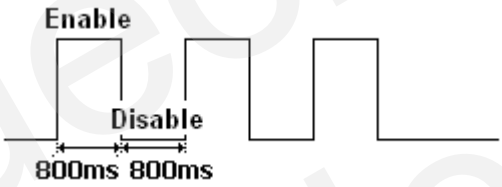


Figure 5: Waveform 4

➢ **AT+GTOUT=**

Example: **AT+GTOUT=gv620mg,1,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0004$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Output1 Status	1	0|1	0
3	Duration	<=3	0-255(*100ms)	0
4	Toggle Times	<=3	0-255	0
5	Output2 Status	1	0|1	0
6	Duration	<=3	0 – 255(×100ms)	0
7	Toggle Times	<=3	0 – 255	0
8	Output3 Status	1	0|1	0
9	Duration	<=3	0 – 255(×100ms)	0

10	Toggle Times	<=3	0 – 255	0
11	Output4 Status	1	0|1	0
12	Duration	<=3	0 – 255(×100ms)	0
13	Toggle Times	<=3	0 – 255	0
14	DOS Report	1	0-F	0
15	Long Operation1	<=3	0 – 120min	0
16	Long Operation2	<=3	0 – 120min	0
17	Long Operation3	<=3	0 – 120min	0
18	Long Operation4	<=3	0 – 120min	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Output1–4 Status*>: Used only for the waveform 1 as shown in Figure 2 to set the final status of the output port.

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

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

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

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

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

- Bit 0: for output 1 report +RESP:GTDOS
- Bit 1: for output 2 report +RESP:GTDOS
- Bit 2: for output 3 report +RESP:GTDOS
- Bit 3: for output 4 report +RESP:GTDOS

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

✧ <*Long Operation1*> to <*Long Operation4*>: The long operation time for output 1 to output 4. After the long time passed, the output waveform will be reset to the initial status at the specified output port. These two parameters would be effective only when the output waveform is 1 or 4.

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

➢ **+ACK:GTOUT,**

Example: **+ACK:GTOUT,C20107,863695050491870,,0286,20221107034503,0FC4$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' –	

		'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. External Power Supply Monitoring

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

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

- **AT+GTEPS=**

Example:
AT+GTEPS=gv620mg,1,8000,12000,,0,0,0,0,0,00,200,,0,1,8000,12000,,0,0,0,0,0,FFFF$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1|2	0
3	Min Threshold	<=5	250 – 36000 mV	250
4	Max Threshold	<=5	250 – 36000 mV	450
5	Reserved			
6	Debounce Time	1	0 –255 (×10s)	6
7	Output ID	1	0 – 4	
8	Output Status	1	0|1	
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Sync with FRI	2	00|01|10|11	00
12	Hysteresis Error	<=4	0 – 2000mV	200
13	Reserved			

14	MPN/MPF Validity Time	<=3	0 – 255 (×1s)	0
15	Mode for external power supply 2	1	0|1|2	
16	Min Threshold 2	<=5	250 – 36000 mV	
17	Max Threshold 2	<=5	250 – 36000 mV	
18	Reserved			
19	Debounce Time	1	0 – 255 (×10s)	6
20	Output ID 2	1	0 – 4	
21	Output Status 2	1	0|1	
22	Duration 2	<=3	0 – 255(×100ms)	
23	Toggle Times 2	<=3	0 – 255	
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: Working mode of the external power supply monitoring.
  - 0: Disable the external power supply monitoring.
  - 1: Enable the external power supply monitoring. If the current voltage is within the range of (<*Min Threshold*>, <*Max Threshold*>), the **+RESP:GTEPS** alarm will be triggered.
  - 2: Enable the external power supply monitoring. If the current voltage is outside the range of (<*Min Threshold*>, <*Max Threshold*>), the **+RESP:GTEPS** alarm will be triggered.
- <*Min Threshold*>: The lower limit of the voltage of the external power supply to trigger the alarm.
- <*Max Threshold*>: The upper limit of the voltage of the external power supply to trigger the alarm.
- <*Sample Period*>: The sampling period to measure the external power supply. If <*Sample Period*> is 0, <*Mode*> is forced to be 0.
- <*Debounce Time*>: The time for debouncing to avoid abnormal voltage drop of the external power supply. <*Debounce Time*> must be smaller than <*Sample Period*>.
- <*Output ID*>: Specify the ID of the output port (1 to 4) to output specified waveform when the **+RESP:GTEPS** alarm is triggered. If it is set to 0, there is no output waveform.
- <*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.
  - 00: Do not report external power supply voltage with fixed report.
  - 01: Report external power supply voltage with fixed report.
  - 10: Report second external power supply voltage with fixed report.
  - 11: Report two external power supply voltages with fixed report.

- ✧ <*MPN/MPF Validity Time*>: The validity time for detecting the device connecting or disconnecting to the main power supply. 0 means "Do not check the validity time". If <*MPN/MPF Validity Time*> is not 0, and the device remains connected or disconnected to the main power supply for the period of time specified by this parameter, the device will report **+RESP:GTMPN** or **+RESP:GTMPF** to the backend server. If it is detected that the device connects or disconnects to the main power supply when <*MPN/MPF Validity Time*> is 0, the device will report **+RESP:GTMPN** or **+RESP:GTMPF** to the backend server.
- ✧ <*Hysteresis Error*>*:* It is an offset to the <*Min Threshold*> and <*Max Threshold*>. It can be used to suppress the bouncing of external power supply voltage detection. If this parameter is set, the limit to trigger the alarm is calculated as following:
  - Outside the range: detected voltage is greater than <*Max Threshold*> + <*Hysteresis Error*> or less than <*Min Threshold*>.
  - Inside the range: detected voltage is higher than <*Min Threshold*> + <*Hysteresis Error*> or less than <*Max Threshold*>.

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

➢ **+ACK:GTEPS,**

Example: **+ACK:GTEPS,C20107,863695050491870,,0287,20221107034503,0FC5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. Digital Input Port Setting

The command **AT+GTDIS** is used to configure the parameters of 4 digital input ports. Input <Ignition Detection Port ID> is dedicated for ignition detection. The rest four inputs are customizable. If the logical status of any one of the four digital inputs ports is changed, the device will send message **+RESP:GTDIS** to the backend server.

Before using digital input 1-4, <*IO Mode*> in **AT+GTCFG** command must be set to 0 on corresponding bit.

➢ **AT+GTDIS=**

Example:

AT+GTDIS=gv620mg,0,,5,0,1,0,0,0,2,0,0,0,3,0,0,0,4,0,0,0,0,0,0,0,FFFF$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Ignition Detection Port ID	1	0	0
3	Position Type	1	0|1	0
4	Debounce Time	<=2	0 – 20(×10ms)	5
5	No ignition	1	0|1	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--240(×100ms)	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--240(×100ms)	0
14	Input ID 3	1	3	3
15	Enable	<=2	0|1	0
16	Debounce Time	0	0 – 20(×10ms)	0
17	Validity Time	<=2	0--240(×100ms)	0
18	Input ID 4	1	4	4
19	Enable	1	0|1	0
20	Debounce Time	<=2	0 – 20(×10ms)	0
21	Validity Time	<=2	0--240(×100ms)	0
22	Input1 Toggle Output ID	1	0|2|3|4	0
23	Input2 Toggle Output ID	1	0|1|3|4	0
24	Input3 Toggle Output ID	1	0|1|2|4	0
25	Input4 Toggle Output ID	1	0|1|2|3	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ *<Ignition Detection Port ID>*: The ignition detection port.

✧ *<Position Type>*: This parameter indicates the type of position info included in +RESP:GTDIS

report.

0: Including real time position in the report.

1: Including the last known position in the report.

- ✧ <*Input ID 1-4*>: The digital input port IDs.
- ✧ <*Debounce Time*>: The sampling period of the non-interruptible input port.
- ✧ <*Enable*>: Enable or disable the interrupt input.
  - 0: Disable
  - 1: Enable
- ✧ <*Debounce Time*>: The debouncing time for interruptible input port.
- ✧ <*No ignition*>: No Ignition wire connection.
  - 0: Ignition signal connected
  - 1: No ignition signal for virtual ignition, the device generates +RESP:GTVGN and +RESP:GTVGF report.
- ✧ <*Validity Time*>: The validity time of the input port. 0 means not to check the validity time.
- ✧ <*Input Toggle Output ID*>*:* Using the pulse input to toggle the output state. Every time the input is activated, it will change the state of the output.

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

➢ **+ACK:GTDIS,**

Example: **+ACK:GTDIS,C20107,863695050491870,,0288,20221107034504,0FC6$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.4. Input/output Port Binding

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

➢ **AT+GTIOB=**

Example: **AT+GTIOB=gv620mg,1,F,A,3,1,0,8,3,0,,,,0006$**

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	IOB ID	1	0 – 3	
3	Input Mask	2	0 – 1F	0
4	Trigger Mask	2	0 – 1F	0
5	Input Sample Period	<=2	0|1 – 12(×2s)	0
6	Output ID	1	0 – 4	0
7	Output Status	1	0|1	0
8	Duration	<=3	0 – 255(×100ms)	0
9	Toggle Times	<=3	0 – 255	0
10	Position Type	1	0|1	0
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*IOB ID*>: ID of the user-defined IO binding.
- <*Input Mask*>: Bitwise mask for input port composition. Each bit, from bit 0 to bit 4, represents one digital input port. Set it to 1 to enable and 0 to disable corresponding input port.
  - bit0: ignition detection
  - bit1: digital input 1
  - bit2: digital input 2
  - bit3: digital input 3
  - bit4: digital input 4
- <Trigger Mask>: bitwise mask for trigger condition composition of the corresponding input ports. Each bit, from bit 0 to bit 4, represents the logical status of the corresponding input port to trigger the IOB event. Set it to 1 to use enabled status as the trigger condition and 0 to use disabled status. Only when the logical status of all the input ports in one IO binding meets the trigger condition is the IOB event triggered.
  - bit0: ignition detection
  - bit1: digital input 1
  - bit2: digital input 2
  - bit3: digital input 3
  - bit4: digital input 4

- <*Input Sample Period*>: The period to check the status of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use independent sample period to check the input port status even for the same input port.
- <*Output ID*>: ID of the output port to output specified waveform when the trigger condition meets. 0 means no waveform will be output.
- <*Position Type*>: This parameter indicates the type of position info included in +RESP:GTIOB report.
  0: Including real time position in the report.
  1: Including the last known position in the report.

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

- **+ACK:GTIOB,**

Example: **+ACK:GTIOB,C20107,863695050491870,,0,0289,20221107034504,0FC7$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

3.2.6.5. Analog Input Port Setting

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

Make sure there is analog signal connected to the corresponding analog input port before carrying out settings to that port.

- **AT+GTAIS=**

Example: **AT+GTAIS=gv620mg,1,0,250,2700,2,0,1,1,0,0,1,,,2,1,250,2700,2,,1,1,0,0,1,,,,,,,0008$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4～7	'0'～'9' 'a'～'z' 'A'～'Z'	gv620mg
2	Analog Input ID1	1	1	1

3	Mode	1	0|1|2|3|4|5	0
4	Min Threshold	<=5	0～36000 mV	
5	Max Threshold	<=5	0～36000 mV	
6	Sample Rate	<=4	0|1～12(×2s) 0|2～2400(x10ms)	0
7	Sample Unit	1	0: 2s 1: 10ms	0
8	Output ID	1	0～4	
9	Output Status	1	0|1	
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 Level Debounce	<=3	0-150	10
28	Fuel Sensor Delay Time	<=3	0-600 sec	30
29	Fuel Loss Alarm	<=2	0-50	10
30	Sampling Number	<=3	0-150	20

31	Fuel Level Change Threshold	<=2	0-50%	0
	Serial Number	4	0000～FFFF	
	Tail Character	1	$	$

- <*Analog Input ID 1*>: The analog input port ID.
- <*Mode*>: 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 special fuel level sensor to support fuel level reporting and monitoring.

    Note: when the selected mode is 3, please do not choose the waveform 1 as the specified output waveform.
  - 4: No alarm mode. The range of the voltage 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. But the voltage will be processed before being reported.
- <*Min Threshold*>: If <*Mode*> is set to 1 or 2, this is the lower limit of the voltage of the analog input port to trigger the alarm.
- <*Max Threshold*>: If <*Mode*> is set to 1 or 2, this is the upper limit of the voltage of the analog input port to trigger the alarm.
- <*Sample Rate*>: The sampling period of the analog input port. If <*Sample Period*> is 0, <*Mode*> is forced to be 0. It is recommended the configuration should be greater than 2 seconds.
- <*Sample Unit*>: If <*Sample Unit*> is 0, <*Sample Rate*> equals to <*Sample Rate*> * 2 seconds; if <*Sample Unit*> is 1, <*Sample Rate*> equals to <*Sample Rate*> * 10 milliseconds.
- <*Output ID*>: Specify the ID of the output port (1 to 4) to output specified waveform when the analog input alarm is triggered. If it is set to 0, there is no output waveform.
- <*Output Status*>: set the final status of the output port.
  - 0: Disable status.
  - 1: Enable status.
- <*Toggle Times*>: The times of the square-wave.
- <*Sync with FRI*>: The device can send the analog input voltage periodically along with fixed message. Set this field to 1 to enable it and 0 to disable. If the analog input port is used to work with a fuel sensor and the <*Sync with FRI*> is enabled, the device will send the fuel level together with the fixed message.
- <*Fuel Level Debounce*>: Number of the data discarded when calculating the fuel level.
- <*Fuel Sensor Delay Time Time*>: After power on or enabling the fuel level reporting and monitoring function, the fuel sensor reports correct fuel level after <*Fuel Sensor Delay Time Time*>.

- <*Fuel Loss Alarm*>: If the difference between the current fuel level after ignition on and the last measured fuel level before previous ignition off is greater than this value, an unusual fuel consumption alarm is sent with the event message +RESP:GTFLA.
- <*Sampling Number*>: This parameter defines the total number of sample readings from the fuel sensor for calculating the current fuel level. And it must be larger than <Fuel Level Debounce>.
- <*Fuel Level Change Threshold*>: This parameter defines the threshold of the value change. The value change must be greater than this defined threshold to trigger it. This value should not be greater than <*Fuel Loss Alarm*>, otherwise the **+RESP:GTFLA** may be reported incorrectly.

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

➢ **+ACK:GTAIS,**

Example: **+ACK:GTAIS,C20107,863695050491870,,0293,20221107034504,0FCB$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. Main Serial Port Application

3.2.7.1. Main Serial Port Setting

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

➢ **AT+GTMUT=**

Example: **AT+GTMUT=gv620mg,1,12,8,1,0,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4～7	'0'～'9' 'a'～'z' 'A'～'Z'	gv620mg
2	Working Mode	1	0|1|3|4|6|12	0

3	Baudrate Index	<=2	1 – 12	5
4	Data Bits	1	8	8
5	Stop Bits	1	1 – 3	1
6	Parity Bits	1	0 – 4	0
7	Sleep Enable	1	0|1	0
8	Input ID of Wakeup	1	0|1-4	0
9	Reserved (Optional)	0		
10	Reserved (Optional)	0		
	Serial Number	4	0000～FFFF	
	Tail Character	1	$	$

✧ <*Working Mode*>: It configures the working mode of UART.

- 0: Disable UART.
- 1: Use UART to transfer data via **AT+GTDAT** and other protocol commands. When executing **AT+GTDAT** command, the device will send execution result to the second serial port. "OK" is returned when the command is executed successfully, and "Error" is returned when the command fails to execute.

9	Hex convert mode	1	0|1	0
10	Reserved	0	0	

<Hex convert mode>: if this mode is enabled, it means the UART uses hex data.

- 3: Used for specific RFID card reader to communicate with UART of device. The device will report the card ID received from the card reader to the server with the report **+RESP:GTIDA**.

9	RFID type	1	2--4	4
10	Reserved	0	0	

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

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

Note: DUT Fuel Sensor Type is 2 by default and UFSXXX type is 4 by default. Make sure the baud rate is suitable for the sensor and the default baud rate is 19200.

- 6: Used to transfer data from auxiliary serial port to 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 received data exceeds 1280 bytes, it will also compress responses and send them to the server.

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

- 12: Used for CANBUS devices.

✧ <*Baudrate Index*>: The index of the supported baud rate of the serial port. All supported baud rates are listed as 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. Their values can be 8.

✧ <*Stop Bits*>: Stop bits of the UART. Their values 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. Their values can be 0, 1, 2, 3, or 4.

- 0: None Parity.
- 1: Odd Parity.
- 2: Even Parity.
- 3: Space Parity.
- 4: Mark Parity.

✧ <*Enable Sleep*>: The device supports 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 or disable the sleep mode of the device.

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

✧ <*Input ID for Wakeup*>: The ID of the digital input of GV620MG used to wake up the device from the low power mode.

- 0: Do not use digital input to wake up the device.
- 1-4: The external device uses digital input to wake up the device.

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

- 0: Reserved.
- 1: Reserved.
- 2: DUT-E.
- 3: Reserved.
- 4: UFSxxx.
- 5: Reserved.
- 6: Reserved.

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

- 2: MR2. 9600 baud rate, 8 data bits, 1 stop bit, and no parity. MR2 outputs ASCII format on serial (RS232):

STX (02 HEX)	DATA (8 or 14HEX characters)	CR	LF

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

- 3: VD RFID: 9600 baud rate, 8 data bits, 1 stop bit, and no parity. The VD RFID output format of the ID data field is ASCII character (RS232), for example, if the ID of the VD RFID is "0123456789", then the original data is 0x01 0x30 0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x02.

Header	ID	End Character
0x01	DATA (10 ASCII characters)	0x02

- 4: DR100. 19200 baud rate, 8 data bits, 1 stop bit, and no parity.

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

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

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

Note: The device can receive all the AT commands only when it works under mode 0 and the GTMUT command is always supported regardless the setting of the mode.

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

➢ **+ACK:GTMUT,**

Example: **+ACK:GTMUT,C20107,863695050491870,,0294,20221107034504,0FCC$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. ID Authentication

The command **AT+GTIDA** is used to protect against unauthorized use. This function needs an

iButton and an external relay. To use this command, make sure both the iButton and the external relay are connected to the device. When the device reads an ID, it will report event report **+RESP:GTIDA** to the server. If the ID is in the white list, it will be authorized until next time ignition off. After the ignition off again, the authentication valid time will last for a short period of time (settable). Within this period, the driver can turn on the engine again without reidentification.

➢ **AT+GTIDA=**

Example: **AT+GTIDA=gv620mg,1,1,2,D2C4FBC5,87654321,45,3,,,,,1,1,0,0,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Mode	1	0/1/2	0
Start Index	<=2	1 – 250	
End Index	<=2	1 – 250	
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0/15 – 600sec	30
Report Mode	1	0 – 7	0
ID Valid Time	<=3	15 – 600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 4	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Mode>: Working mode of the ID authentication function.

- 0: Disable.

- 1: Only authorized ID cards can unlock the vehicle.
- 2: Any ID cards can unlock the vehicle.

✧ <Start Index>,<End Index>: The index range of the white list to which the ID numbers are to be updated. For example, if the <Start Index> is set to 1 and the <End Index> is set to 2, then the first two ID numbers in the white list will be updated by the numbers provided in the parameter <ID Number List>. The <Start Index> and <End Index> define the total amount of ID numbers that will be updated. If either one is empty, there should be no <ID Number List>parameter following the Index. A maximum of 8 numbers can be updated each time.

✧ <ID Number List>: A list of comma-separated ID number to be updated to the white list. The amount of the ID numbers are determined by <Start Index> and <End Index>.

✧ <Timeout After Ignition Off>: When the ignition off, it will still be authorized for a short time. In this period, re-authentication is not needed. 0 means “Lock the vehicle when ignition off”.

✧ <Report Mode>:

- 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 Valid Time> and <Timeout After Ignition Off>, then IDA report will be sent to indicate the log-out event).

For each bit, set it to 1 enable the report, and 0 disable the report. If <Report Mode> is 0, no report related to **+RESP:GTIDA** will be reported.

✧ <ID Valid Time>: It will remain authorized for this period of time when the ID is valid.

✧ <Output ID>: It Specified the ID of the output port to output specified waveform when it is authorized. Only the waveform 1 is supported.

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

➢ **+ACK:GTIDA,**

Example: **+ACK:GTIDA,C20107,863695050491870,,0301,20221107034505,0FD3$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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:

Make sure the total size of the command is not more than 160 bytes if it is sent via SMS.

3.2.7.3. External Digital Fuel Sensor

The command **AT+GTEFS** is used to configure the parameters of the external digital fuel sensor. Only when <Working Mode> in **AT+GTMUT** is set to 4, the parameters of this command will be effective.

➢ **AT+GTEFS=**

Example: **AT+GTEFS=gv620mg,,,9999,30,10,,,,,0,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Reserved	0		
Reserved	0		
Ex Full Value	<= 5	0 – 65535	9999
Ex Fuel Sensor Delay Time	<=3	0 |30- 600 sec	30
Ex Fuel Loss Alarm	<=2	0 – 50%	10
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Report Sensor Data	1	0/1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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 only for UFSxxx, and it is not required by the other sensors. The unit for DUT-E is 1mm. DUT-E can use <Ex Full Value> to calculate the percentage of fuel level.

✧ <Ex Fuel Sensor Delay Time>: After ignition on, before reporting the fuel level, the fuel sensor will be delayed for the period of time defined by <Ex Fuel Sensor Delay Time>.

✧ <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

will be sent to the backend server with event report **+RESP:GTFLA**. 0 means “Disable”.

✧ <Report Sensor Data>: A numeric to indicate whether to report raw data from fuel sensor to the server with **+RESP:GTFSD**. Currently, only the UFSxxx supports the raw data report.

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

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

➢ **+ACK:GTEFS,**

Example: **+ACK:GTEFS,C20107,863695050491870,,0295,20221107034504,0FCD$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

3.2.7.4. Fuel Sensor Calibration Table

This command is used to set the calibration table for fuel sensor.

➢ **AT+GTFSC=**

Example: **AT+GTFSC=gv620mg,,0,2,1,,,3,250,0,10000,50,16000,100,,,,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4～20	'0'～'9' 'a'～'z' 'A'～'Z'	gv620mg
Reserved			
Table ID	1	0 – 4	1
Sensor Type	1	0-6	2
Enable	1	0/1	0
Max. Tank Volume	<= 5	0 –10000	100
Reserved			
Num of Node	<= 2	0/2 – 11	0

Node 1 Value	<= 5	0～99999	
Node 1 Percentage	<= 3	0 – 100	
⋮			
Node N Value	<= 5	0～99999	
Node N Percentage	<= 3	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000～FFFF	
Tail Character	1	$	$

- ✧ <Table ID>: The ID of the calibration table that is currently being set.
- ✧ <Sensor Type>: The sensor type for this table.
  - 0: Reserved
  - 1: Reserved
  - 2: DUT-E
  - 3: Reserved
  - 4: UFSXXX
  - 5: Reserved.
  - 6: Reserved
- ✧ <Enable>: Enable or disable this table. If this table is enabled, the calculation of fuel level will be linearized.
- ✧ <Max. Tank Volume>: The maximum volume of tank. The unit is L.
- ✧ <Num of Node>: Number of the nodes in the table below.
- ✧ <Node N Value>: Value of this node.
- ✧ <Node N Percentage>: The corresponding percentage value of this node. This parameter must be in ascending order beginning with 0% and ending with 100%.

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

- ➢ **+ACK:GTFSC,**

Example:
+ACK:GTFSC,C20107,863695050491870,,0296,20221107034504,0FCE$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

3.2.7.5. Upgrade Of Fuel Sensor

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

➢ **AT+GTUFS=**

Example: **AT+GTUFS=gv620mg,3,30,0,,,http://220.178.67.210:8208/gv620mg/deltabin/csb_des_07_build1116.bin,,,,,0001$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Max Retries	1	0 – 3	0
Download Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server Password	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server URL	100	Legal URL	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Max Retries>: It specifies the maximum number of retries after the first downloading fails.

✧ <Download Timeout>: If downloading is not finished within this time, it will be regarded that

the downloading failed.

✧ <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 report of the **AT+GTUFS** command:

➢ **+ACK: GTUFS,**

Example: **+ACK:GTUFS,C20107,863695050491870,,0302,20221107034505,0FD4$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.7.6. CANBUS Upgrade

AT+ GTCFU is used to upgrade CANBUS chip.

➢ **AT+GTCFU=**

Example: **AT+GTCFU=gv620mg,1,30,0,,,http://220.178.67.210:8208/gv620mg/deltabin/csb_des_07_build1116.bin,,,,,0001$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Max Retries	1	0 – 3	0
Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server Password	<=20	'0-9', '_', 'a-z','A-Z'	
Server URL	100	Legal URL	

Cancel	<=1	0|1	0
Update Type	1	0|1	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <Max Retries>: It specifies the maximum number of retries after the first downloading fails.
- ✧ <Timeout>: If downloading is not finished within this time, it will be regarded that the downloading failed.
- ✧ <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, specify the user name here.
- ✧ <Server Password>: If the file server uses authentication, specify the password here.
- ✧ <Server URL>: It specifies the URL to download the package.
- ✧ <Cancel>:
  - 0 or empty: Start CAN100 upgrade procedure.
  - 1: Cancel CAN100 upgrade procedure.
- ✧ <Update Type>:
  - 0: Update the firmware of CAN100.
  - 1: Update the configuration of CAN100.

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

➢ **+ACK: GTCFU,**

Example: **+ACK:GTCFU,C20107,863695050491870,,0303,20221107034505,0FD5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.7.7. CANBUS Configuration

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

information.

➢ **AT+GTCAN=**

Example: **AT+GTCAN=gv620mg,1,30,250,FFFFFFFF,0,,0,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Mode	1	0|2	0
CAN Report Interval	<=5	0/5 – 86400sec	0
Reserved	0		
CAN Report Mask	<=8	0 - FFFFFFFF	C00FFFFF
Additional Event	1	0/1	0
Reserved	0		
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	001FFFFF
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Mode>: Controls the mode of CAN function.

- 0: Disable.
- 2: CAN100 mode

✧ <CAN Report Interval>: The time interval for sending **+RESP:GTCAN** report to the server when ignition on. Its value range is 0/5 – 86400 and the unit is second. 0 means "Do not send the report **+RESP:GTCAN**".

✧ <Additional Event>: Whether to send **+RESP:GTCAN** report when additional event occurs.

- 0: Ignore all additional events.
- 1: By ignition on/off event.

✧ <CAN Report Mask>: Bitwise report mask to configure the composition of CAN report.

Bit	**Item to Mask**	**Description**
Bit 31	<GSM Information>	Including <MCC>, <MNC>, <LAC>, <Cell ID> and the <Reserved> parameter "00"
Bit 30	<GPS Information>	Including <GPS Accuracy>, <Speed>, <Azimuth>, <Altitude>, <Longitude>, <Latitude>, <GPS UTC Time>
Bit 29	<CAN Report Expansion Mask>	If this bit is set to 1, the parameter <CAN Report Expansion Mask> in **GTCAN** is valid.

		If this bit is set to 0, the parameter <CAN Report Expansion Mask> in **GTCAN** 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 vehicle engine speed is greater than the limit defined in CAN100 configuration
Bit 20	<Total Vehicle Overspeed Time>	The total time when vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	<Doors>	An 8-bit hex number. Each bit indicates information of one door.
Bit 18	<Lights>	An 8-bit hex number. Each bit indicates information of one light.
Bit 17	<Detailed Information/Indicators>	A 16-bit hex number. Each bit indicates information of one indicator.
Bit 16	<Tachograph Information>	Two bytes. The higher byte describes driver 2 (whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	<Axle Weight>	Vehicle axle weight
Bit 14	<Total Idle Fuel Used>	The fuel consumption when device is in static state with ignition on
Bit 13	<Total Engine Idle Time>	The duration when device is in static state with ignition on
Bit 12	<Total Driving Time>	Total driving time (speed is not 0)
Bit 11	<Total Engine Hours>	Total time of engine running
Bit 10	<Accelerator Pedal Pressure>	Pressure applied onto accelerator pedal
Bit 9	<Range>	The mileage to drive with 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>	Engine coolant temperature
Bit 5	<Engine RPM>	Revolutions per minute of the engine
Bit 4	<Vehicle Speed>	The real-time speed of vehicle
Bit 3	<Total Fuel Used>	The total fuel consumption
Bit 2	<Total Distance>	Vehicle total distance
Bit 1	<Ignition Key>	Ignition state
Bit 0	<VIN>	Vehicle Identification Number

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

Bit	Item to Mask	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<Rapid Accelerations>	Total number of rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value)
Bit 21	<Rapid Braking>	Total number of rapid braking since installation (calculation based on CAN-Logistic's settings of speed decrease time and value)
Bit 20	<Expansion Information>	A decimal 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>	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 vehicle speed is controlled by cruise-control module
Bit 11	<Total Effective Engine Speed Time>	Total time when vehicle engine speed is effective
Bit 10	<Total Accelerator Kick-downs>	Counts of accelerator pedal kick-downs (pressing the pedal over 90%)
Bit 9	<Pedal Braking Factor>	Counts of braking with brake pedal. The more decreasing speed with brake pedal, the higher the pedal braking factor is.
Bit 8	<Engine Braking Factor>	Counts of braking with engine. The more decreasing speed with the engine, the higher the engine braking factor is.
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

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

- **+ACK: GTCAN,**

Example:

+ACK:GTCAN,C20107,863695050491870,,0304,20221107034505,0FD7$			
Parameter	**Length (Byte)**	**Range/Format**	**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	$	$

3.2.7.8. CANBUS Alarm

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>, <Alarm Mask 3>. For the CAN alarm trigger event information, please refer to the <Lights>, <Doors> and <Engine RPM> of the **+RESP:GTCAN** report. If <Alarm Mask 1>, <Alarm Mask 2>, <Alarm Mask 3>meet each trigger condition at the same time and the duration of the event is longer than the <Debounce Time>, the **+RESP:GTCLT** alarm report will be sent.

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

- **AT+GTCLT=**

Example: **AT+GTCLT=gv620mg,1,0,0,000FFFFF,00000000,00000000,00000000,30,8,,,,,,,,0006$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4–6	'0'–'9' 'a'–'z' 'A'–'Z'	gv620mg
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		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000–FFFF	
Tail Character	1	$	$

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

Bit	Item to Mask	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 **GTCLT** is valid. If this bit is set to 0, the parameter <CAN Report Expansion Mask> in **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 vehicle engine speed is greater than the limit defined in CAN100 configuration
Bit 20	<Total Vehicle Overspeed Time>	The total time when vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	<Doors>	An 8-bit hex number. Each bit contains information of one door.
Bit 18	<Lights>	An 8-bit hex number. Each bit contains information of a particular light.
Bit 17	<Detailed Information/ Indicators>	A 16-bit hex 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>	Vehicle axle weight
Bit 14	<Total Idle Fuel Used>	The total fuel consumption when device is in static state with ignition on
Bit 13	<Total Engine Idle Time>	The duration when device is in static state with ignition on
Bit 12	<Total Driving Time>	Total driving time of driver (speed is not 0)
Bit 11	<Total Engine Hours>	Total time of engine running
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>	The real-time speed of vehicle
Bit 3	<Total Fuel Used>	The total fuel consumption
Bit 2	<Total Distance>	Vehicle total distance
Bit 1	<Ignition Key>	Ignition state
Bit 0	<VIN>	Vehicle identification number

✧ <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** report. Please see the following alarm mask table.

Note:

For the CAN100 firmware versions 2.0.xx and 2.1.xx, the parameter is 16-bit long (bit0~bit15); for version 2.2.0 or above, the length is 32 bits.

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** report. 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> of the **+RESP:GTCAN** report. Please see the following alarm mask table.

Bit	**Alarm Mask 3**
Bit 31	Reserved
……	……
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 upper limit of the engine RPM. If the current engine RPM is more than <High RPM Threshold>, it will trigger high RPM event.

✧ <Low RPM threshold>: This is the lower limit of the engine RPM. If the current engine RPM is less than <Low RPM threshold>, it will trigger low RPM event.

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

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

Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<Rapid Accelerations>	Number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value)
Bit 21	<Rapid Braking>	Number of total rapid braking since installation (calculation based on CAN-Logistic's settings of speed decrease time and value)
Bit 20	<Expansion Information>	A decimal 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 vehicle speed is controlled by cruise-control module
Bit 11	<Total Effective Engine Speed Time>	Total time when vehicle engine speed is effective
Bit 10	<Total Accelerator Kick-downs>	Counts of accelerator pedal kick-downs (pressing the pedal over 90%)
Bit 9	<Pedal Braking Factor>	Counts of braking with brake pedal. The more decreasing speed with brake pedal, the higher the pedal braking factor is.
Bit 8	<Engine Braking Factor>	Counts of braking with engine. The more

		decreasing speed with the engine, the higher the engine braking factor is.
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

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

➢ **+ACK: GTCLT,**

Example: **+ACK:GTCLT,C20107,863695050491870,,0,0305,20221107034505,0FD8$**			
Parameter	**Length (Byte)**	**Range/Format**	**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. Other Settings

3.2.8.1. Real Time Operation

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

➢ **AT+GTRTO=**

Example:

AT+GTRTO=gv620mg,A,,,,,,0012$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Sub Command	2	0 – F|10-16|22	
3	AT Command | Configuration Mask|CAN100 Operation Mode	3|16	"SRI"| 0000000000000000 – FFFFFFFFFFFFFFFF	
4	Output direction |CAN100 Car Model ID	1	0-3	
5	Reserved	0		
6	Reserved	0		
7	Sub Command Parameter	1	0--2	
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ *<Sub Command>*:

- 0: ***GPS***. Get the GPS related information via message **+RESP: GTGPS**.
- 1: ***RTL***. Request the terminal to report its current position immediately via message **+RESP: GTRTL**.
- 2: ***READ***. Get the current configuration of the terminal via message **+RESP: GTALM or +RESP: GTALS** or **+RESP: GTALC**.
- 3: ***REBOOT***. Reboot the terminal.
- 4: ***RESET***. Reset all parameters to factory setting.
- 5: ***PWROFF***. Power off the device.
- 6: ***CID***. Get the ICCID of the SIM card which is being used by the terminal via message **+RESP:GTCID**.
- 7: ***CSQ***. Get the current received signal strength of the terminal via message **+RESP: GTCSQ**.
- 8: ***VER***. Get the version information of the device via message **+RESP: GTVER**.
- 9: ***BAT***. Get the battery level and adapter status of the terminal via message **+RESP: GTBAT**.
- A: ***IOS***. Get status of all the IO ports via message **+RESP: GTIOS**.
- B: ***TMZ***. Get the time zone settings via message **+RESP:GTTMZ**.
- C: ***GIR***. Get cell information via message **+RESP:GTGSM**.
- D: ***AIF.*** Get APN, ICCID, base station ID, RSSI, cell ID, and IP via **+RESP:GTAIF.**
- E: ***GSV***: Request the device to report the GPS fix level.

- F: **INF**: Read the device information report function. The corresponding information will be sent via the message **+RESP:GTINF.**
- 10: **CAN**. Get CAN information via report **+RESP:GTCAN**. Only when the CANBUS function is effective.
- 11: Reserved
- 12: **CVN**. Get the version number information of CAN100 via message **+RESP:GTCVN**. It works only when the CANBUS function is effective.
- 13: **CSN**. Get the serial number information of CAN100 via message **+RESP:GTCSN**. It works only when the CANBUS function is effective.
- 14: **DELBUF**. Delete all the buffered reports.
- 22: **COP** (*CAN Operation)*. Set car model for CAN or read car model from CAN.
- 30: **RSS.** Get the real time information of the sensors via message **+RESP:GTRSS**.

✧ <*AT Command/Configuration Mask/*CAN100 Operation Mode>:

- <*AT Command*>: To get a single AT command's configuration when <Sub Command> is set to 2, follow the format in the following example. For example, to get the configuration of AT+GTFRI, please set AT+GTRTO=gv620mg,2,FRI,,,,,0015$, and get it via **+RESP:GTALS**.
- <*Configuration Mask*>: If <*Sub Command*> is set to 2, the configuration information of the specified <*Configuration Mask*> can be obtained via the message +RESP:GTALC. The Configuration Mask must be 16 bytes. If it's less than 16 bytes, '0' will be added in the high bytes of the Configuration Mask.
- <CAN100 Operation Mode>: If the sub command is 0x22, 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 <*CAN Car Model ID*> to set car model.

✧ <Sub Command Parameter>: This parameter is used for part of the sub commands. This field cannot be empty for the sub-commands listed below.

For the sub command RESET (4):

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

Note: AT+GTPIN will not be reset.

Configuration Mask Table:

Bit	Item to Mask
Bit 63	Reserved
Bit 62	GPJ
Bit 61	FVR
Bit 59	GAM

Bit 58	GLM
Bit 57	IEX
Bit 56	OEX
Bit 55	BID
Bit 54	BAS
Bit 53	BTS
Bit 52	AEX
Bit 51	RPC
Bit 48-50	Reserved
Bit 47	CLT
Bit 46	CAN
Bit 45	Reserved
Bit 44	PEO
Bit 43	RMD
Bit 42	FSC
Bit 41	TMP
Bit 40	CFU
Bit 39	MUT
Bit 38	Reserved
Bit 37	SPA
Bit 36	BZA
Bit 35	Reserved
Bit 34	Reserved
Bit 33	PDS
Bit 32	ACD
Bit 31	IDA
Bit 30	EFS
Bit 29	SSR
Bit 28	Reserved
Bit 27	FFC

Bit 26	Reserved
Bit 25	HRM
Bit 24	WLT
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Reserved
Bit 20	HMC
Bit 19	IDL
Bit 18	AIS
Bit 17	DOG
Bit 16	OWH
Bit 15	PIN
Bit 14	Reserved
Bit 13	SOS
Bit 12	SPD
Bit 11	GEO
Bit 10	FRI
Bit 9	TMA
Bit 8	IOB
Bit 7	OUT
Bit 6	DIS
Bit 5	EPS
Bit 4	TOW
Bit 3	CFG
Bit 2	Reserved
Bit 1	SRI
Bit 0	BSI

✧ <*Output Direction/*CAN100 Car Model ID>: This parameter determines the destination the response message of the RTO command will be reported to. This field is invalid for <*Sub Command*> 2(READ except +RESP:GTALS), 3(REBOOT), 4(RESET) and 5(PWROFF).

- 0: The message will be sent to the backend server.
- 1: The message will be sent to the main serial port.

- 2: Reserved.
- 3: If the command is received via SMS, the message will be output to the original SMS number, otherwise the message will be sent to the backend server.

For <CAN100 Car Model ID>: This parameter will work only when the <*Sub Command*> is 0x22 and the CAN100 operation mode is 0x01. It should be car model ID from supported car models list.

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

➢ **+ACK:GTRTO,**

Example: **+ACK:GTRTO,C20107,863695050491870,,GPS,0398,20221107055813,1061$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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**.

3.2.8.2. Data transfer

The command **AT+GTDAT** is used to transfer data between the backend server and the equipment connected to the second serial port of the device. Data to the backend server is wrapped into message **+RESP:GTDAT** and sent to the backend server while data to the equipment is directly output to the second serial port without the @Tracker protocol stuffing. Transparent transfer is used to transmit the data to the device.

Before using this command, you should use **AT+GTMUT** command to set the correct parameters of the second serial port first.

➢ **AT+GTDAT=**

Example:
AT+GTDAT=gv620mg,0,,data to the backend server,,,,0014$
AT+GTDAT=gv620mg,1,,data to the serial port,,,,0014$
AT+GTDAT=gv620mg,2,,data to the backend server,,,,0014$

AT+GTDAT=gv620mg,3,,data to the serial port,,,,,0014$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Command Type	1	0|1|2|3	
3	Reserved	0		
4	Data Type	<=1280	ASCII Code	
5	Need Ack	1	0|1	
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Command Type*>: To indicate in which way to send the data.
  - 0: Means to send message to the backend server with **+RESP:GTDAT (Short Format)**.
  - 1: Means to send the pure data directly to the serial port.
  - 2: Means to send message to the backend server with **+RESP:GTDAT (Long Format)**.
  - 3: Means to send the pure data directly to the serial port without CRLF.
- <*Data Type*>: Data to be transferred between the backend server and the equipment connected to the second serial port of the device. The max length for main serial port (MUT) is 1280.
- <*Need Ack*>: Need report **+ACK:GTDAT** or not.
  - 0: Do not need Ack report.
  - 1: Need report Ack.

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

- **+ACK:GTDAT,**

Example: **+RESP:GTDAT,C20107,863695050491870,,,0,20221107034507,0FEE$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. White Number List Configuration

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

➢ **AT+GTWLT=**

Example: **AT+GTWLT=gv620mg,1,1,2,13813888888,13913999999,,,,,000C$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Number Filter	1	0|1|2	1
3	Phone Number Start	1	1-10	1
4	Phone Number End	1	1-10	1
5	White Number List	<=20*10		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- 0: Do not return SMS to original number, ignore the received position request message no matter the original number is in the <White Number List> or <Direct Number List> or not.
- 1: Do not filter the original number. It will return SMS to the original number as long as position request message is received via SMS.
- 2: Filter the original number. If the original number isn't in <White Number List> or <Direct Number List>, it won't return a SMS to the incoming number even if the device receives position request message via SMS

✧ <Phone Number Start>: A numeric to indicate the first index of the white number to be

input. For example, if it is 1, it will update the white number list from the 1st one.

- ✧ <Phone Number End>: A numeric to indicate the last index of the white number to be input. For example, if it is 2, it will update the white number list until the 2nd one.
- ✧ <White Number List>: A phone number list including multiple phone numbers. And two neighboring phone numbers are separated with ",". The number of the phone number in the list depends on the parameters <Phone Number Start> and <Phone Number End>. For example, if <Phone Number Start> is 1 and <Phone Number End> is 2, the <White Number List> should include 2 phone numbers and the two numbers are separated with ",".

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

➢ **+ACK:GTWLT,**

Example: **+ACK:GTWLT,C20107,863695050491870,,0326,20221107034507,0FED$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

3.2.8.4. Command String Storage

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

➢ **AT+GTCMD=**

Example: **AT+GTCMD=gv620mg,1,1,AT+GTRTO=gv620mg,0,,,,,,000B$,,,,,0005$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv620mg
Mode	1	0-1	0
Stored cmd ID	<=2	0 – 31	
Command String	200	AT command	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ <*Mode*>: The working mode for storing command string.
- 0: Delete the stored command.
- 1: Add the stored command.

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

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

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

➢ **+ACK:GTCMD**

Example: **+ACK:GTCMD,C20107,863695050491870,,0329,20221107034508,0FF1$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. User Defined Function

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

➢ **AT+GTUDF=**

Example: **AT+GTUDF=gv620mg,2,1,0000000000000082,30,FFFFF,00000,0000001F,1,00000,00000,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv620mg
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			
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

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

Bit 0 (00000001): Select ID1
Bit 1 (00000002): Select ID2
Bit 2 (00000004): Select ID3
Bit 3 (00000008): Select ID4
For example:
Bit (00000003): SelectID1, ID2
Bit (00000017): Select ID1, ID2, ID3, ID5

ID	Bit	Item to Mask
1	**Bit 0**	Power on finished
2	**Bit 1**	Ignition on
3	**Bit 2**	Ignition off
4	**Bit 3**	The GPRS network is attached
5	**Bit 4**	The GPRS network is not attached
6	**Bit 5**	The GSM network registered
7	**Bit 6**	The GSM network not registered
8	**Bit 7**	Network roaming
9	**Bit 8**	Network non roaming
10	**Bit 9**	SIM card is locked
11	**Bit 10**	GPS is turned on
12	**Bit 11**	GPS is turned off
13	**Bit 12**	The device is stationary
14	**Bit 13**	The device is moving
15	**Bit 14**	External charge inserted
16	**Bit 15**	No external charge
17	**Bit 16**	The device is charging
18	**Bit 17**	The device is not charging
19	**Bit 18**	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**	Reserved
26	**Bit 25**	Reserved
27	**Bit 26**	Inside the speed range
28	**Bit 27**	Outside the speed range
29	**Bit 28**	Messages need to be sent
30	**Bit 29**	No messages need to be sent
31	**Bit 30**	Digital input 3 is low
32	**Bit 31**	Digital input 3 is high
33	**Bit 32**	Backup battery inserted
34	**Bit 33**	No backup battery
35	**Bit 34**	Reserved
36	**Bit 35**	Reserved
37	**Bit 36**	Digital input 4 is low
38	**Bit 37**	Digital input 4 is high
39	**Bit 38**	Output1 Enable
40	**Bit 39**	Output1 Disable
41	**Bit 40**	Output2 Enable
42	**Bit 41**	Output2 Disable
43	**Bit 42**	Output3 Enable
44	**Bit 43**	Output3 Disable
45	**Bit 44**	Output4 Enable
46	**Bit 45**	Output4 Disable

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

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

ID	Bit	Item to Mask
1	**Bit 0**	Inside the Geo 0
2	**Bit 1**	Inside the Geo 1
3	**Bit 2**	Inside the Geo 2
4	**Bit 3**	Inside the Geo 3
5	**Bit 4**	Inside the Geo 4
6	**Bit 5**	Inside the Geo 5
7	**Bit 6**	Inside the Geo 6
8	**Bit 7**	Inside the Geo 7
9	**Bit 8**	Inside the Geo 8
10	**Bit 9**	Inside the Geo 9
11	**Bit 10**	Inside the Geo 10
12	**Bit 11**	Inside the Geo 11
13	**Bit 12**	Inside the Geo 12
14	**Bit 13**	Inside the Geo 13

15	**Bit 14**	Inside the Geo 14
16	**Bit 15**	Inside the Geo 15
17	**Bit 16**	Inside the Geo 16
18	**Bit 17**	Inside the Geo 17
19	**Bit 18**	Inside the Geo 18
20	**Bit 19**	Inside the Geo 19

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

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

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

✧ <*Stocmd Ack*>: A numeral to indicate whether to send acknowledgement message after the stored commands are executed.

- 0: Do not send acknowledgement message when the stored command is executed.
- 1: Send acknowledgement message when the stored command is executed.

✧ <*Inpeo Mask*>*:* The bitwise mask to indicate the input events within the polygon Geo-Fence.

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

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

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

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

Note:

Maximum 5 stored commands in a group will be executed.

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

➢ **+ACK:GTUDF**

Example: **+ACK:GTUDF,C20107,863695050491870,,0361,20221107034511,1011$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. Google Link SMS Configuration

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

➢ **AT+GTGLM=**

Example: **AT+GTGLM=gv620mg,1,1,2,13813888888,13913999999,,,,,000D$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Google Mode	1	0|1	0
3	Phone Number Start	1	1-3	
4	Phone Number End	1	1-3	
5	Direct Number List	<=20*3		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

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

➢ **+ACK: GTGLM,**

Example: **+ACK:GTGLM,C20107,863695050491870,,0328,20221107034508,0FF0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

3.2.8.7. Hour Meter Counter

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

➢ **AT+GTHMC=**

Example:

AT+GTHMC=gv620mg,1,12345:12:34,,,,,,,,0015$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Hour Meter Enable	1	0|1	0
3	Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Hour Meter Enable*>: Enable or disable hour meter counter function. If hour meter counter function is enabled, hour meter count will be increased when the device is in ignition.

- 0: Disable hour meter counter function
- 1: Enable hour meter counter function

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

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

➢ **+ACK:GTHMC,**

Example: **+ACK:GTHMC,C20107,863695050491870,,0325,20221107034507,0FEC$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

3.2.8.8. GPS-Assisted Motion Measurement

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

➢ **AT+GTGAM=**

Example:
AT+GTGAM=gv620mg,1,1,25,10,60,,,,,,FFFF$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Mode	1	0|1	1
3	Speed Mode	1	0|1	1
4	Motion Speed Threshold	<=2	5-50km/h	25
5	Motion Cumulative Time	<=3	10-100s	10
6	Motionless Cumulative Time	<=3	10-250s	60
7	GNSS Fix Failure Timeout	<=4	5-1800s	60
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

✧ <*Speed Mode*>: It combines with GPS speed to measure the status of movement.
- 0: Disable the function.
- 1: Enable the function.

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

✧ <*Motion Cumulative Time*>: If the average speed in <*Motion Cumulative Time*> is higher

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

- ✧ <*Motionless Cumulative Time*>: If the average speed in <*Motionless Cumulative Time*> is lower than <*Motion Speed Threshold*>, the device is considered to be in motionless status.
- ✧ <*GPS Fix Failure Timeout*>: If the time for GPS no fix is more than <*GPS Fix Failure Timeout*>, the device will update motion status by motion sensor again.

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

- ➢ **+ACK:GTGAM,**

Example: **+ACK:GTGAM,C20107,863695050491870,,0393,20221107034514,1031$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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. Update Configuration Over the Air

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

- ➢ **AT+GTUPC=**

Example: **AT+GTUPC=gv620mg,0,10,0,0,168,http://www.queclink.com/configure.ini,1,,,,,,,0001$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0'-'9','a'-'z','A'-'Z'	gv620mg
2	Max Download Retries	1	0 – 3	0
3	Download Timeout	<=2	5 – 30 min	10
4	Download Protocol	1	0	0
5	Report Enable	1	0|1	0
6	Update Interval	<=4	0 – 8760 hour	0
7	Download URL	<=100	URL	
8	Mode	1	0|1	0

9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Download User Name	<=6	'0'-'9','a'-'z', 'A'-'Z'	
15	Download Password	<=6	'0'-'9','a'-'z', 'A'-'Z'	
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Password*>: The valid characters of password include '0'-9', 'a'-'z', 'A'-'Z'. The default value is "gv620mg".
- <Max Download Retries>: Specifies the maximum times of retrying to download the configuration file upon downloading failure.
- <*Download Timeout*>: If downloading is not finished within this time, it will be regarded that the downloading failed.
- <*Download Protocol*>: The protocol used to download the file. Only HTTP is supported now. Set it to 0.
- <*Report Enable*>: A numeric to indicate whether to send the message **+RESP:GTUPC** to indicate the configuration was updated over the air.
  - 0:Do not send the message +RESP:GTUPC
  - 1:Send the message +RESP:GTUPC
- <*Update Interval*>: The time interval (hour) for updating the configuration over the air.
- <*Download URL*>: Specify the URL to download the configuration file. If the URL ends with "/", it means this is just a path without any file. <imei>.ini will be added as the file name at the end of URL.
- <*Mode*>: A numeric to indicate the working mode of downloading configuration over the air
  - 0: Disable this function.
  - 1: Enable this function
- <*Download User Name*>: If the file server uses authentication, specify the user name here.
- <*Download Password*>: If the file server uses authentication, specify the password here.

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

Notice:

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

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

- **+ACK:GTUPC,**

Example:

+ACK:GTUPC,C20107,863695050491870,,0393,20221107034514,1032$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

3.2.8.10. Input Expansion

The command **AT+GTIEX** is used to configure the External Bluetooth input accessories. All these inputs are customizable. If the logic status is changed on one of Bluetooth input accessories, the device will report the message **+RESP:GTDIS** to the backend server.

- **AT+GTIEX=**

Example: **AT+GTIEX=gv620mg,0,0,1,5,,,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Input Expansion Type	1	0	
Bind BAS Index	1	0 – 9	
Input Number	1	1	
Input ID	1	5	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	

Tail Character	1	$	$

- ✧ *<Input Expansion Type>*: It's used to indicate which extended device the following parameters are used for.
  0: Bluetooth Accessory Input Setting.
  Note: Due to the limitation of the detection mechanism, changing the input state in a short time may not be detected.
- ✧ *<Bind BAS Index>*: It is used to bind the specific configuration in **AT+GTBAS.**
- ✧ *<Input Number>*: It is used to indicate how many of the following special parameters. If the *<Input Expansion Type>* is 0, it indicates the number of configured Bluetooth input settings. In one configuration, *<Input ID>* is included and others are reserved.
- ✧ *<Input ID>*: The ID of 5 is Bluetooth accessory input and the parameters *<Accessory Type>* and *<Accessory Model>* should be set in **AT+GTBAS**.
  Note: If *<Input Number>* is set to 5 and the index in **AT+GTBAS** is set to the relevant configuration, and *<Bind BAS Index>* is also set to the same index, this means that the Bluetooth accessory input port is enabled.

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

➢ **+ACK:GTIEX,**

Example: **+ACK:GTIEX,C20107,863695050491870,,0394,20221107034515,1032$**			
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. Analog Input Expansion

The command **AT+GTAEX** is used to configure the parameters of external Bluetooth analog input accessories. All these inputs are customizable.

➢ **AT+GTAEX=**

Example:

AT+GTAEX=gv620mg,0,0,1,5,1,8000,12000,,,,,,FFFF$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Analog Input Expansion Type	1	0	
Bind BAS Index	1	0 – 9	0
Analog Input Number	1	1	
Analog Input ID	1	5	
Mode	1	0|1|2	0
Min Threshold	<=5	8000mv～32000mv	8000
Max Threshold	<=5	8000mv～32000mv	32000
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ *<Analog Expansion Type>*: It's used to indicate which extended device the following parameters are used for.
  0: Bluetooth Analog Input accessory setting.
- ✧ *<Bind BAS Index>*: It is used to bind the specific configuration in **AT+GTBAS**.
- ✧ *<Analog Input Number>*: The total number of configured Bluetooth Analog input settings. In one configuration, *<Analog Input ID>* *<Mode>* *<Min Threshold>* and *<Max Threshold>* are included and others are reserved.
- ✧ *<Analog Input ID>*: The ID of 5 is Bluetooth analog input ID, the parameters *<Accessory Type>* and *<Accessory Model>* should be set in **AT+GTBAS**.
- ✧ *<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.
- ✧ *<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.

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

➢ **+ACK:GTAEX,**

Example: **+ACK:GTAEX,C20107,863695050491870,,0395,20221107034515,1033$**			
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. Output Expansion

The **AT+GTOEX** command is used to change the Bluetooth output accessory status.

➢ **AT+GTOEX=**

Example: **AT+GTOEX=gv620mg,0,0,1,5,0,0,0,,,1,,,,,FFFF$** **AT+GTOEX=gv620mg,0,0,2,5,0,0,0,,,1,6,0,2,0,,,1,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Output Expansion Type	1	0	
Bind BAS Index	1	0 – 9	
Output Number	1	1	1
Output ID	1	5 – 6	
Status	1	0 - 1	0
Duration	<=3	0 – 999(×100ms)	0
Toggle Times	<=3	0 – 99	0
Reserved	0		

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

- <*Output Expansion Type*>: It's used to indicate which extended device the following parameters are used for.
  0: Bluetooth Output Accessory Setting.
- <*Output Number*>: It is used to indicate how many of the following special parameters. If the <*Input Expansion Type*> is 1, it indicates the number of configured Bluetooth output settings. In one configuration, <*Bind BAS Index*> <*Output ID*> <*Status*> <*Duration*> <*Toggle Times*> <*Reserved*> <*Reserved*> and <*DOS Report*> are included and others are reserved.
- <*Output ID*>: The ID of 5 – 6 is Bluetooth Output ID and the parameters <*Accessory Type*> and <*Accessory Model*> should be set in **AT+GTBAS**.
- <*DOS Report*>: Whether or not to report **+RESP:GTDOS** when wave shape 1 status of Bluetooth output changes. 1 means "Report **+RESP:GTDOS**", and 0 means "Do not report **+RESP:GTDOS**".

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

- **+ACK:GTOEX,**

Example: **+ACK:GTOEX,C20107,863695050491870,,0396,20221107034515,1034$**			
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	$	$

3.2.8.13. Report Control

The **AT+GTRPC** command is used to change the composition of message.

➢ **AT+GTRPC =**

Example: **AT+GTRPC=gv620mg,0000,,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
2	Report Mask	4	0000 – 0001	0000
3	Reserved	1		
4	1-wire Report Sequence Mode	1	0|1	0
5	Event Report Mask	<=8	0--FFFFFFFF	0
6	Reserved	0		
7	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- Bit 0 for <Device Status> and seven <Reserved> fields.
  Control ASCII +RESP:GTIGN/IGF/VGN/VGF/DIS/TOW/SPD/SOS/RTL/PNL/DOG/IGL.

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

✧ *<1-wire Report Sequence Mode>*: Use input1 to trigger sorting the sensor ID sequence of 1-wire temperature sensors in +RESP:GTERI.

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

Example: four temperature sensors need to be connected:

1. Connect 28BAFC7D08000041:
2. Trigger input1 for 2s and wait for 10s to obtain the sensor ID.
3. Connect 2809769D0A00006F:
4. Trigger input1 for 2s and wait for 10s to obtain the sensor ID.
5. Connect 28EF7B9C0A000097:
6. Trigger input1 for 2s and wait for 10s to obtain the sensor ID.
7. Connect 28EF7B9C0A000066:
8. Trigger input1 for 2s and wait for 10s to obtain the sensor ID.
9. The sensor ID sequence in +RESP:GTERI report is 28BAFC7D08000041, 2809769D0A00006F, 28EF7B9C0A000097, 28EF7B9C0A000066.
10. To change the sensor ID sequence, all the sensors must be disconnected. And then trigger input1 for 2s and wait for 10s to clear the previous sequence. Repeat steps 1-9.

Note: To use input1 (IO1), please configure <IO Mode> in AT+GTCFG.

✧ *<Event Report Mask>:* Bitwise mask to configure to report last fixed position or current position report to server. 0 means to report the last fixed position, and 1 means to report the current position. If last fixed position is selected, device will use last fixed position send to server; if current position is selected, device will turn on GPS to get the current position and then send it to server.

- Bit 0 for +RESP:GTIGN/VGN.
- Bit 1 for +RESP:GTIGF/VGF.
- Bit 2 for +RESP:GTSTT.

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

➢ **+ACK:GTRPC,**

Example: **+ACK:GTRPC,C20107,863695050491870,,0397,20221107034515,1035$**			
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	$	$

3.2.8.14. SMS Request Position

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

Command Format	**get position**
Example	get position

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

3.3. Reports

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

3.3.1. Position Related Reports

- **+RESP:GTTOW,**

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

- **+RESP:GTDIS,**

If the status of digital inputs is detected being changed, 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 send the message **+RESP:GTIOB** to the backend server.

- **+RESP:GTSPD,**

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

- **+RESP:GTSOS,**

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

- **+RESP:GTRTL,**

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

- **+RESP:GTPNL,**

Power on location

- **+RESP:GTDOG,**

The watchdog rebooting message

- **+RESP:GTIGL,**

The location message for ignition on and ignition off

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

Example:

+RESP:GTTOW,C20107,863695050425290,,,00,1,0,1.1,0,97.6,113.947875,22.573783,20221104021508,0460,0000,2495,1179,,1.0,20221104102452,4C9A$

+RESP:GTDIS,C20107,863695050425290,,,11,1,0,1.1,0,97.6,113.947875,22.573783,20221104021508,0460,0000,2495,1179,,1.0,20221104101602,4C78$

+RESP:GTIOB,C20107,863695050425290,,,00,1,1,0.0,0,128.2,113.947953,22.573545,2022110

4022754,0460,0000,2495,1179,,1.0,20221104102754,4CA8$

+RESP:GTSOS,C20107,863695050425290,,,10,1,0,1.1,0,97.6,113.947875,22.573783,20221104021508,0460,0000,2495,1179,,1.0,20221104102551,4CA1$

+RESP:GTRTL,C20107,863695050425290,,,00,1,0,1.1,0,97.6,113.947875,22.573783,20221104021508,0460,0000,2495,1179,,1.0,20221104102550,4C9F$

+RESP:GTDOG,C20107,863695050425290,,,06,1,1,0.0,0,140.5,113.948208,22.573536,20221104172135,0460,0000,2495,1179,,1.0,20221105012134,527E$

+RESP:GTIGL,C20107,863695050425290,,,00,1,1,0.0,0,150.9,113.948064,22.573572,20221104020812,0460,0000,2495,11E6,,1.0,20221104100812,4C65$

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

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Device Status	6	000000--FFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

Report ID has different meanings in different messages as below.

- The ID of digital input port which triggers the message **+RESP:GTDIS** and **+RESP:GTSOS**. The range is 1 – 4. Specifically, ID 5 of the **+RESP:GTDIS** refers to the WBC300 extended input.
- The ID of the bound IO which triggers the message **+RESP:GTIOB**. The range is 0 – 3.
- The ID of the digital input port which triggers the reboot message **+RESP:GTDOG**. The valid value is 1 - 4.

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

Meanings of different report type in different messages are as below:

- In the **+RESP:GTDIS** message generated by the digital input
  0: The current logical status of the input port is disabled status.
  1: The current logical status of the input is enabled status.
- In the **+RESP:GTIOB** message generated by bound IO
  0: The current logical status of the bound IO does not meet the alarm condition.
  1: The current logical status of the bound IO meets the alarm condition.
- In the message of speed alarm **+RESP:GTSPD**
  0: Outside the predefined speed range.
  1: Inside the predefined speed range.
- In the message of Software 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 network watchdog.
  5: Reboot message for no activation watchdog.

6: Reboot message for network data retrying to reboot watchdog.

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

  0: The engine is ignition on.

  1: The engine is ignition off.

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

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

✧ <*GPS Accuracy*>: The HDOP defined in NMEA0183 (The National Marine Electronics Association (NMEA) is a non-profit association of manufacturers, distributors, dealers, educational institutions, and others interested in peripheral marine electronics occupations. The NMEA 0183 standard defines an electrical interface and data protocol for communications between marine instrumentation.). The range of the value is 0 – 50. Here 0 means no GPS fix.

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

✧ <*Azimuth*>: The azimuth of the GPS fixing.

✧ <*Altitude*>: The height above the sea level.

✧ <*Longitude*>: The longitude of the current position.

✧ <*Latitude*>: The latitude of the current position.

✧ <*GPS UTC Time*>: The UTC time from the GPS chip.

✧ <*MCC*>: Mobile Country Code. It is 3-digit in length and ranges from 000 to 999. If bit 3 is not set to 1 in field <*Report Composition Mask*> within **AT+GTCFG**, the length of this field is 0 in ASCII format message.

✧ <*MNC*>: Mobile Network Code. It is 3-digit in length and ranges from 000 to 999. If bit 3 is not set to 1 in field <*Report Composition Mask*> within **AT+GTCFG**, the length of this field is 0 in ASCII format message.

✧ <*LAC*>: Location Area Code in hex format.

✧ <*Cell ID*>: Cell ID in hex format.

✧ <*Mileage*>: The current total mileage or the current tow mileage. If <*Tow Mileage Enable*> in **AT+GTTOW** is set to 1: Enable current tow mileage, the mileage reported in **+RESP:GTTOW** is the accumulated mileage during tow status. For other position related reports that share the same report format, this field still indicates 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,C20107,863695050425290,,14158,10,1,1,0.0,0,120.4,113.947959,22.573559,20221104070133,0460,0000,2495,116D,,1.0,,,,100,110000,0,,,20221104150154,4EA4$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power VCC	<=5	0 – 36000 mV	
Report ID/Report Type	2	X(1-6)X(0-6)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input 1	<=5	0～36000 mV	
Reserved	0		
Backup Battery Percentage	<=3	0 – 100	
Device Status	6	000000 – FFFFFF	
External Power VCC2	<=5	0 – 36000 mV	
Reserved	0		
Reserved	0		
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*External Power VCC*>: The voltage of the external power supply. Use command **AT+GTEPS** to decide whether to send the external power supply voltage periodically with fixed report or not. If not, this field will be empty.

✧ <*Report ID/Report Type*>: Indicate the working mode of the fixed report and the type of the message.

Report ID has six meanings as below.

- 1: Fixed timing report.
- 2: Fixed distance report.
- 3: Fixed mileage report.
- 4: Fixed timing and mileage report.
- 5: Fixed timing or mileage report.
- 6:GSM DEEP mode fixed timing report

Report type has six meanings as below.

- 0: The normal fixed report.
- 1: Corner report which indicates that the device just turns around a corner.
- 2: FRI report frequency change which indicates that the terminal enters into Geo-Fence status or known/unknown roaming status.
- 3: Corner report when FRI report frequency changed.
- 4: Mileage report when fixed report is mode 5.
- 5: Reserved.
- 6: Mileage report when fixed report is mode 5 and FFC works.

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

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

✧ <*Analog1 Input 1*>: The voltage of the analog input 1 or the fuel level measured from the fuel sensor connected to the corresponding analog input port. Use command **AT+GTAIS** to decide whether to send the external voltage of the analog input 1 or 2 or the fuel level with the format of "FXX" periodically with FRI report or not. If not, this field will be empty.

✧ <*Backup Battery Percentage*>: The current volume of the backup battery in percentage.

✧ <*Device Status*>: The state of the device. The left two bits indicate the current motion state of the device, the middle two bits indicate the input ports status and the right two bits indicate the output ports status.

The current motion state of the device:

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

The input ports status: A bitwise hex integer to represent the logical status of the digital input. From the lowest bit to the highest bit, each bit represents ignition detection and one of the digital inputs 1 – 4 respectively. For each bit, 0 means disable status, 1 means enable status.

The output ports status: A bitwise hex integer to represent the logical status of the digital output. From the lowest bit to the highest bit, each bit represents one of the digital outputs 1 – 4 respectively. For each bit, 0 means disable status, 1 means enable status.

✧ <*External Power VCC2*>: The voltage of the reserved external power supply. Use command AT+GTEPS to decide whether to send the external power supply voltage periodically with FRI report or not. If not, this field will be empty.

➢ **+RESP:GTERI,**

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

Example:

/*1wire bus connect no device*/

+RESP:GTERI,C20100,862170019025640,,00000000,,10,,2,1.8,0,-2.5,117.198440,31.845219,20120802061037,0460,0003,2493,014B,00,0.0,,,,0,410000,20120802061040,0012$

/*1wire bus connect only one device*/

+RESP:GTERI,C20100,862170019025640,,00000002,,10,,1,0.0,0,43.6,117.198435,31.845227,20120728025538,0460,0003,2493,014B,00,0.0,,,,0,220100,2,1,FD0000034129ED28,2,01A2,20120728025540,0010$

/*1wire bus connect two devices*/

+RESP:GTERI,C20100,862170019025640,,00000002,,10,1,0,3.2,0,64.7,117.198613,31.845190,20120728025304,0460,0003,2493,014B,00,0.0,,,,0,210100,2,2,3C00000340FD1128,2,019E,FD0000034129ED28,2,01AC,20120728025310,000A$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ERI Mask	8	00000000 – FFFFFFFF	
External Power Supply	<=5	0 – 36000 mV	
Report ID/Report Type	2	X(1-6)X(0-6)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	

Speed		<=5	0.0 – 999.9 km/h	
Azimuth		<=3	0 – 359	
Altitude		<=8	(–)xxxxx.x m	
Longitude		<=11	(–)xxx.xxxxxx	
Latitude		<=10	(–)xx.xxxxxx	
GPS UTC Time		14	YYYYMMDDHHMMSS	
MCC		0|4	0XXX	
MNC		0|4	0XXX	
LAC		0|4	XXXX	
Cell ID		0|4|8	XXXXXXXX	
Reserved		0|2	00	
Mileage		<=9	0.0 – 4294967.0 km	
Hour Meter Count		11	HHHHH:MM:SS	
Analog Input 1		<=5	0～36000 mV	
Reserved		0		
Backup Battery Percentage		<=3	0 – 100	
Device Status		6	000000 – FFFFFF	
External Power Supply2		<=5	0 – 36000 mV	
1-wire Data (Optional)	*1-Wire Device Number*	<=1	0-8	
	1-Wire Devices ID	<=16		
	1-Wire Devices TYPE	1	1	
	1-Wire Devices DATA	4		
CAN Data (Optional)		<=1000		
Fuel Sensor (Optional)	Fuel Sensor number	<=1	0-1	
	Sensor Type	1	2|4	
	Percentage (Optional)	<=3	0 –100	
	Volume (Optional)	<=5	0 –65535	
	Digital Fuel Sensor Data (Optional)	<= 20		

Bluetooth Accessory Data (Optional)	Bluetooth Accessory Number	<=2	0-10	
	Index	1	0 – 9	
	Accessory Type	1	0-1|3|6|8	
	Accessory Model	1	0--4	
	Raw Data Length	<=2	0 - FF	
	Raw Data	<=18		
	Accessory Append Mask	4	0000 - FFFF	
	Accessory Name	<=21		
	Accessory MAC	12	000000000000 - FFFFFFFFFFFF	
	Accessory Status	1	0 - 1	
	Accessory Voltage	<=4	0 – 5000mV	
	Accessory Temperature	<=6	-40.00 – 80.00℃	
	Accessory Humidity	<=3	0--100%(RH)	
	Accessory Output Status	2	00 – 03	
	Accessory Digital Input Status	2	00 – 01	
	Accessory Analog Input Voltage	<=5	8000 – 32000(mv)	
	Accessory Mode	<=2	0 - 10	
	Accessory Event	1	0 - 2	
RAT and Band Data (Optional)	RAT	<=2	0|1|3|4|5	
	Band	<=4	0-39|850|900|1800|1900	
Send Time		0|14	YYYYMMDDHHMMSS	
Count Number		4	0000 – FFFF	
Tail Character		1	$	$

✧ *<1-Wire Device Number>*: The number of 1-wire device connected to GV620MG. If it is 0, the following fields *<1-wire Device ID>*, *<1-wire Device Type>*, *<1-wire Device Data>* will not

display. If there are more than one 1-wire devices connected, the following fields <*1-wire Device ID*>, <*1-wire Device Type*>, <*1-wire Device Data*> will repeat to show the information of all connected 1-wire devices. If Bit 1 of <*ERI Mask*> in **AT+GTFRI** is enabled, the part <*1-Wire Data*> will display, otherwise, the part <*1-Wire Data*> will not display.

- <*1-Wire Device ID*>: Means the 1-Wire device ID read from the device. If the bit 1 is not set to 1 in field <*ERI Mask*> within **AT+GTFRI**, the length of this field is 0 in ASCII format message.
- <*1-Wire Device TYPE*>: Means the 1-Wire device type. If the bit 1 is not set to 1 in field <*ERI Mask*> within **AT+GTFRI**, the length of this field is 0 in ASCII format message.
  - 1: Temperature sensor.
- <*1-Wire Device DATA*>: Means the data read from the 1-Wire devices. If the value of <1-Wire Device Type> is the temperature sensor, this indicates the temperature value. To convert the value of the two bytes in hex to decimal, multiply it by 0.0625 to get the temperature value in Celsius degrees. If the first 5 bits of the high byte are 1, the temperature value is below zero Celsius degrees and the value is represented in two's complement format. To obtain the temperature in decimal, plus the hexadecimal data by 1 and then multiply it by 0.0625 to get the value in Celsius degrees.
- <CAN Data>: If Bit 2 of <ERI Mask> in **AT+GTFRI** is set to 1, the data got from CAN device will be displayed.
- <Digital Fuel Sensor Data>: The raw data read from the digital fuel sensor. If Bit 0 of <ERI Mask> in **AT+GTFRI** is enabled, this field will be displayed; otherwise, this field will not be displayed.
- <*Bluetooth Accessory Number*>: It indicates the number of accessories connected with the device.
- <*Index*>*:* The index of the Bluetooth accessory.
- <*Accessory Type*>: 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**.
- <*Accessory Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBAS**.
- <*Raw Data Length*>: It indicates the length of <*Raw Data*>.
- <*Raw Data*>: The data is read from Bluetooth accessory. It varies depending on <*Accessory Type*> and <*Accessory Model*>.
  - 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 indicates 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*>: A numeral to indicate whether the accessory is available.
  - 0: The accessory is not available.
  - 1: The accessory is available.
- <*Accessory Voltage*>: The voltage of Bluetooth accessory.
- <*Accessory Temperature*>: Temperature data of Bluetooth accessory. Unit: ℃.
- <*Accessory Humidity*>: It indicates the humidity measured by the Bluetooth accessory.
- <*Accessory Output status*>: The status of Bluetooth accessory output.
- <*Accessory Digital Input status*>: The status of Bluetooth accessory digital input. Each bit indicates the status of one output. For example, 0X01 indicates that Output ID of 5 is high and Output ID 6 is low.
- <*Accessory Analog Input voltage*>: The status of Bluetooth accessory analog input voltage.
- <*Accessory Mode*>: The operating mode of angle sensor.
- <*Accessory Event*>: The event is generated by the angle sensor.
- <*RAT*>: Radio Access Technology.
  - 0: Invalid RAT
  - 1: 2G
  - 3: LTE CAT-M1
  - 4: LTE NBIOT
- < *Band*>: 0 mean invalid band, 1-39 means band number and others mean GSM bands.

Note: the key word (optional) means the item is controlled by the parameter <*ERI Mask*>.

➢ **+RESP:GTEPS,**

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

➢ **+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 analog input voltage enters the alarm range.

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

Example:
+RESP:GTEPS,C20100,862170019025640,,13500,00,,1,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,2000.0,20140511093254,11F0$

+RESP:GTAIS,C20100,862170019025640,,1980,11,,1,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,2000.0,20140511093254,11F0$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power/Analog Input VCC	<=5	0 – 36000 mV	
Report ID/Report Type	2	X(0-2 | 5)X(0-1)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
External Power/Reserved	<=5|0	0 – 36000 mV | 0	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <External Power/Analog Input VCC>: The value of the external power supply voltage or the analog input voltage. When the voltage of the analog input meets the alarm condition set by command **AT+GTEPS** or **AT+GTAIS**, the device will send the current analog input voltage along with **+RESP:GTEPS** or **+RESP:GTAIS** message to the backend server
- <*Report ID/Report Type*>: The report ID and the type of the report type in hex format. 4 high bits mean report ID and 4 low bits means report type.
  Report ID has different meanings in these two messages.
  - The ID of analog input port which triggers message +RESP:GTEPS. The value is 1-2.

- The ID of analog input port which triggers message +RESP:GTAIS. The range is 1 or 5.

Report type has two meanings as below:

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

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

➢ **+RESP:GTGIN**

➢ **+RESP:GTGOT**

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

Example: **+RESP:GTGIN,C20100,862170019025640,,,,1,,,,,,3,0.7,0,58.9,117.201251,31.833126,20140511093254,0460,0003,2493,014B,00,0.0,,,,,20140511093254,0013$** **+RESP:GTGOT,C20100,862170019025640,,,,1,,,,,,3,0.0,0,58.9,117.201251,31.833126,20140511093254,0460,0003,2493,014B,00,0.0,,,,,20140511093254,0016$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved			
Reserved			
Area Type	1	0-1	
GEO ID Group	<=5	20 bit 1-FFFFF (GEOID 0 – 19)	
Reserved			
Reserved			
Reserved			
Reserved			
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	

Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Area Type>: 0-Polygon GEO; 1-Circle GEO.

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

➢ **+RESP:GTGES**

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

Example:
+RESP:GTGES,C20100,862170019025640,gv620mg,,0,0,0,100,30,,1,24.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,2000.0,20140511093254,11F0$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Trigger GEO ID	<=2	0-19	
Trigger GEO Enable	1	0|1	
Trigger Mode	<=3	0|21|22	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

➢ **+RESP:GTLBC,**

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

there is a location request.

Example: **+RESP:GTLBC,C20100,862170019025640,,+8613800000000,1,4.3,92,70.0,121.354335,31.222073,20151015013254, 0460,0003,2493,014B,00,20151015093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Original Number	<=20	phone number	
Number	1	1	1
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

➢ **+RESP:GTIDA,**

According to the <Mode> of the command **AT+GTIDA**, the reporting mode of **+RESP:GTIDA** varies.

If <Mode> is set to 1 or 2, **+RESP:GTIDA** will be reported according to the configuration in <Report Mode>.

If <Mode> is set to 0, **+RESP:GTIDA** will always be reported without checking the state of ID authorization.

Example: **+RESP:GTIDA,C20100,862170013895931,,,D2C4FBC5,1,1,1,0.8,0,22.2,117.198630,31.845229,20120802121626,0460,0000,5663,2BB9,00,0.0,,,,,20120802121627,008E$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
ID	<=20	'0' – '9' 'A' – 'F'	
ID Report Type	1	0/1/2	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	2	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 that is read currently.

✧ <ID Report Type>: A numeric to indicate the type of reported ID.

0: The ID is unauthorized or IDA function is disabled.

1: The ID is authorized.

2: The ID has logged out.

3.3.2. Device Information Report

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

➢ **+RESP:GTINF,**

Example:
+RESP:GTINF,C20107,863695050425290,,11,898604690921901640 73,19,0,01,14158,0,4.23,0,1,,,20221104071115,0,0,,00,00,,,20221104152545,4EE9$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11|12|21|22|41|42|1A|16	
ICCID	20	'0' – '9''a' – 'z' 'A' – 'Z'	
CSQ RSSI	<=2	0 – 31	
CSQ FER	<=2	0 – 7	
External Power Supply	2	00|01|10|11	
External Power VCC	<=5	0 – 36000mV	
External Power VCC2	<=5	0 – 36000mV	
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0|1	
LED On	1	0|1	
Reserved	0		
Reserved			
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
IO Mode	1	0-F	

Analog Input VCC1	<=5	0~36000mV	
Reserved			
Digital Input	2	00 – 1F	
Digital Output	2	00 – 0F	
Reserved	0		
Reserved	0		
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*State*>: The current motion state of the device.
  - 16 (**Tow**): The device attached vehicle is ignition off and it is towed.
  - 1A (**Fake Tow**): The device attached vehicle is ignition off and it might be towed.
  - 11 (**Ignition Off Rest**): The device attached vehicle is ignition off and it is motionless.
  - 12 (**Ignition Off Motion**): The device attached vehicle is ignition off and it has been moving before it is regarded as being towed.
  - 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motionless.
  - 22 (**Ignition On Motion**): The device attached vehicle is ignition on and it is moving.
  - 41 (**Sensor Rest**): The device attached vehicle is motionless without ignition signal detected.
  - 42 (**Sensor Motion**): The device attached vehicle is moving without ignition signal detected.
- <*CSQ RSSI*>: The signal strength level.

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

- <*CSQ FER*>: The quality of the network signal. The range is 0-7.
- <*External Power Supply*>: Whether the external power supply is connected.
  - 00: No External Power Supply connected
  - 01: External Power Supply VCC connected, VCC2 not connected.
  - 10: External Power Supply VCC2 connected, VCC not connected
  - 11: Two external power supplies connected.
- <*External Power Supply VCC*>: The voltage of the external power supply.
- <*External Power Supply VCC2*>: The voltage of the external power supply.
- <*Backup Battery VCC*>: The voltage of the backup battery. The value of this field is only valid when the external power is not connected.
- <*Charging*>: Whether the backup battery is being charged when the main power supply is connected.

- 0: Not charging
- 1: Charging

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

✧ <*IO Mode*>: The working mode of IO1-IO4 on the connector.

✧ <*Analog Input VCC1*>: The voltage of the analog input 1.

✧ <*Digital Input*>: A bitwise hex integer to represent the logical status of the digital input. From the lowest bit to the highest bit, each bit represents ignition detection and one of the digital inputs 1 – 4 respectively. For each bit, 0 means disabled status and 1 means enabled status.

✧ <*Digital Output*>: A bitwise hex integer to represents the logical status of the digital output. From the lowest bit to the highest bit, each bit represents one of the digital outputs 1 – 4 respectively. For each bit, 0 means disabled status and 1 means enabled status

3.3.3. Report of Real Time Querying

3.3.3.1. +RESP:GTGPS

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

➢ **+RESP:GTGPS,**

Example: **+RESP:GTGPS,C20107,863695050425290,,,,,003F,,,20221104035832,20221104115901,4D83$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Reserved	0		
Reserved			
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

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

3.3.3.2. +RESP:GTALM

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

➢ **+RESP:GTALM,**

Example:
+RESP:GTALM,C20107,863695050425290,,19,1,BSI,,,,,,03,2,0,SRI,3,,2,218.17.50.142,7009,66.8.37.70,0,,5,1,0,0,,,CFG,gv620mg,gv620mg,1,1.0,,,003F,2,,7FFF,0,1,1,300,00,,0,1,401F,1,1,,,,,12,15,5,0,0,0,TOW,1,5,1,300,0,0,0,0,2,3,4,0,,,,,,,,EPS,2,1000,29500,,1,0,0,0,0,11,200,,1,2,1000,29500,,1,0,0,0,0,DIS,0,1,5,0,1,1,10,3,2,1,0,0,3,0,0,0,4,0,0,0,0,0,0,0,OUT,0,,,,,,IOB,0,2,2,10,0,1,10,3,0,,,,1,0,0,0,0,0,0,0,0,0,,,,2,0,0,0,0,0,0,0,0,0,,,,3,0,0,0,0,0,0,0,0,,,,TMA,+0800,0,,,,,FRI,1,0,,0,0000,0000,,60,1000,1000,,45,60,00000000,1,,,20221104103848,4CBE$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Total Packets	2	19	
Current Packet	<=2	1 – 19	
Configurations	< 1500		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Total Packets*>: The total number of **+RESP:GTALM.**

✧ <*Current Packet*>: The sequence number of current packet.

✧ <*Configurations*>: The current configuration of the device. The 1st message contains configuration for the commands from **BSI** to **FRI**, the 2nd is for the commands from **GEO** to **DOG**, the 3rd is for the commands from **AIS** to **SSR**, the 4th to 8th are for the command **IDA,** the 9th is for the commands from **ACD** to **TMP**, the 10th is for the command **RMD**, the 11th to 14th messages are for the command **PEO**, the 15th is for the commands from **CAN** to **CLT,** the 16th is for the commands from **RPC** to **BTS,** the 17th message is for the command **BAS,** the 18th is for the commands for **BID,** the 19th is for the commands from **GLM** to **GPJ**.

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

3.3.3.3. +RESP:GTALC

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

➢ **+RESP:GTALC,**

Example:
+RESP:GTALC,C20107,863695050425290,,7FB,1,1,BSI,,,,,,03,2,0,SRI,3,,2,218.17.50.142,7009,66.8.37.70,0,,5,1,0,0,,,CFG,gv620mg,gv620mg,1,1.0,,,003F,2,,7FFF,0,1,1,300,00,,0,1,401F,1,1,,,,,12,15,5,0,0,0,TOW,1,5,1,300,0,0,0,0,2,3,4,0,,,,,,,,EPS,2,1000,29500,,1,0,0,0,0,11,200,,1,2,1000,29500,,1,0,0,0,0,DIS,0,1,5,0,1,1,10,3,2,1,0,0,3,0,0,0,4,0,0,0,0,0,0,0,OUT,0,,,,,,,IOB,0,2,2,10,0,1,10,3,0,,,,1,0,0,0,0,0,0,0,,,,2,0,0,0,0,0,0,0,0,0,,,,3,0,0,0,0,0,0,0,0,0,,,,TMA,+0800,0,,,,,FRI,1,0,,0,0000,0000,,60,1000,1000,,45,60,00000000,1,,,20221104103900,4CD2$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Configuration Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Next Packet	1	0-1	0
Current Packet	<=2	1-20	1
BSI	3	BSI	BSI
LTE APN	<=40		
LTE APN User Name	<=30		
LTE APN Password.	<=30		
GPRS APN	<=40		
GPRS APN User Name	<=30		
GPRS APN Password	<=30		
Network Mode/APN Authentication Methods	2	00--33	0

LTE Mode	1	0-5	2
Manual netreg	1	0-1	0
SRI	3	SRI	SRI
Report Mode	1	0 – 7	0
Reserved	0		
Buffer Mode	1	0|1|2	1
Main Server IP/ Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP/ Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	0
Enable SACK	1	0|1|2	0
Protocol Format	1	0|1	0
Enable SMS ACK	1	0|1	0
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4–20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv620mg
Enable ODO	1	0|1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
Reserved	0		
Reserved	0		
Report Component Mask	4	0000 – FFFF	003F
Power Saving Mode	1	0 –3	1
Reserved	0		
Event Mask	4	0000 – FFFF	3FFFF
IO Mode	1	0 - F	0

LED On	1	0|1	0
Enable Info Report	1	0|1	0
Info Report Interval	<=5	30 – 86400sec	300
Location request mask	2	00|20	00
Reserved	0		
Backup Battery Charge Mode	1	0--3	0
AGPS Mode	1	0|1	0
GSM Report	4	0000 – FFFF	000F
GPS Lost Time	2	0 – 30min	0
GSM Deep Charge Mode	1	0|1	0
Backup Battery Charge Current	1	0: 2A 1: 1.5A	0
Reserved	0		
Reserved	0		
Reserved	0		
Wakeup Hour Interval	<=3	1-720	24
Sensor Wakeup Device Debounce	<=2	0|10-60(s)	10
Work Time Per Wakeup	<=2	5-60	15
Power Output	1	0|1	0
Temperature Sample Interval	<=2	0|10-255(s)	0
MUID Enable	1	0	
TOW	3	TOW	TOW
Tow Enable	1	0|1	0
Engine Off to Tow	<=2	5 – 15min	10
Fake Tow Delay	<=2	0 – 10min	1
Tow Interval	<=5	30 – 86400sec	300
Tow Output ID	1	0 – 4	0
Tow Output Status	1	0|1	0
Tow Output Duration	<=3	0 – 255(×100ms)	0

Tow Output Toggle Times	<=3	0 – 255	0
Rest Duration	<=3	1 – 255(×15sec)	2
Motion Duration	<=2	1 – 10(×100ms)	3
Motion Threshold	1	2 – 9	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	0
Min. Threshold	<=5	250 – 36000 mV	250
Max. Threshold	<=5	250 – 36000 mV	450
Reserved			
Debounce Time	<=3	0 – 255(×10s)	6
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	2	00|01|10|11	00
Hysteresis Error	<=4	0--2000mV	200
Reserved	0		
MPN/MPF Validity Time	<=3	0 – 255 (×1s)	0
Mode	1	0|1|2	0
Min. Threshold	<=5	250 – 36000 mV	250
Max. Threshold	<=5	250 – 36000 mV	250
Reserved			

Debounce Time	<=3	0 – 255(×10s)	6
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
DIS	3	DIS	DIS
Ignition Detection	1	0	0
Position Type	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	5
No ignition	1	0|1	0
Input ID 1	1	1	1
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=3	0 – 240(×100ms)	0
Input ID 2	1	2	2
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=3	0 – 240(×100ms)	0
Input ID 3	1	3	3
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=3	0 – 240(×100ms)	0
Input ID 4	1	3	4
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=3	0 – 240(×100ms)	0
Input1 Toggle Output ID	1	0|2|3|4	0
Input2 Toggle Output ID	1	0|1|3|4	0
Input3 Toggle Output ID	1	0|1|2|4	0
Input4 Toggle Output ID	1	0|1|2|3	0

OUT	3	OUT	OUT
DOS Report	1	0-7	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB	3	IOB	IOB
IOB ID0	1	0	0
Input Mask	2	0 – 1F	0
Trigger Mask	2	0 – 1F	0
Input Sample Period	<=2	0|1 – 12(×2s|×4s)	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Position Type	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID1	1	1	1
Input Mask	2	0 – 1F	0
Trigger Mask	2	0 – 1F	0
Input Sample Period	<=2	0|1 – 12(×2s|×4s)	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Position Type	1	0|1	0

Reserved	0		
Reserved	0		
Reserved	0		
IOB ID2	1	2	2
Input Mask	2	0 – 1F	0
Trigger Mask	2	0 – 1F	0
Input Sample Period	<=2	0|1 – 12(×2s|×4s)	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Position Type	1	0|1	0
Reserved	0		
Reserved	0		
Reserved			
IOB ID3	1	3	3
Input Mask	2	0 – 1F	0
Trigger Mask	2	0 – 1F	0
Input Sample Period	<=2	0|1 – 12(×2s|×4s)	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Position Type	1	0|1	0
Reserved	0		
Reserved	0		
Reserved			
TMA	3	TMA	TMA
Time zone	1	-|+HHMM	+
Daylight Saving	1	0|1	

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 5	0
Discard No Fix	1	0|1	1
Reserved	0		
Enable Period	1	0|1	1
Begin Time	4	HHMM	0000
End Time	4	HHMM	0000
Check Interval	<=5	0|30 – 86400sec	180
Send Interval	<=5	0|5 – 86400sec	30
Distance	<=5	300 – 65535m	1000
Mileage	<=5	300 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0|5-86400sec	600
ERI Mask	8	00000000-FFFFFFFF	00000000
FRI enable for GSM DEEP	1	0|1	0
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0

Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID2	1	2	2
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0

Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID3	1	3	3
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID4	1	4	4
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0

Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID5	1	5	5
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID6	1	6	6
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		

Reserved	0		
GEO ID7	1	7	7
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID8	1	8	8
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID9	1	9	9

Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID10	2	10	10
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID11	2	11	11
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000

Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID12	2	12	12
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID13	2	13	13
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50

Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID14	2	14	14
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID15	2	15	15
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0

Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID16	2	16	16
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID17	2	17	17
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0

Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID18	2	18	18
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
GEO ID19	2	19	19
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0|21|22	0

Trigger Report	1	0|1	0
Reserved	0		
Reserved	0		
SPD	3	SPD	SPD
Mode	1	0|1|2|3|4	0
Min Speed	<=3	0 – 400km/h	0
Max Speed	<=3	0 – 400km/h	0
Validity	<=4	15 – 3600sec	60
Send Interval	<=4	30 – 3600sec	300
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Report ID	<=2	0 – 15	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 4	0
Digital Input ID	1	0 – 4	0
Position Type	1	0|1	0
Output ID	1	0 – 4	0
Output Status	1	0|1	0

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

Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0|1|2	1
Ignition Frequency	<=3	10 – 120min	60
Interval	<=2	1 – 30	7
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0|1	1
Input ID	1	0-4	0
Unit	1	0|1	0
No Network Interval	4	0 | 5-1440 min	480
No Activation Interval	4	0 | 5-1440 min	480
Send Failure timeout	4	0 | 5-1440 min	480
AIS	3	AIS	AIS
Analog Input ID1	1	1	1
Mode	1	0|1|2|3|4|5	0
Min. Threshold	<=5	0～2700|0~36000mV	0
Max. Threshold	<=5	0～2700|0~36000mV	0
Sample Rate	<=4	0|1～12(×2s) 0|2～2400(x10ms)	0
Sample Unit	1	0:2s 1:10ms	0
Output ID	1	0 - 4 | 5 - 6	0
Output Status	1	0|1	0
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		
Fuel Level Debounce	<=3	0-150	10
Fuel Sensor Delay Time	<=3	0-600 sec	30
Fuel Loss Alarm	<=2	0-50	10
Sampling Number	<=3	0-150	20
Change Threshold	<=2	0-50%	0
IDL		IDL	IDL
Mode	1	0|1	0
Time to Stationary	2	1 – 30 min	2
Time to Movement	1	1 – 5 min	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
IDF after IGF	1	0-1	0
Reserved	0		

Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Enable Hour Meter	1	0|1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
WLT	3	WLT	WLT
Call Filter	1	0|1|2|3	
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	'0' – '9' 'a' – 'f' 'A' – 'F'	7F
Response Mask	8	'0' – '9' 'a' – 'f' 'A' – 'F'	00FEFFFF
Event Mask	8	'0' – '9' 'a' – 'f' 'A' – 'F'	00FEFFFF
Information Mask	<=8	'0' – '9' 'a' – 'f' 'A' – 'F'	7F7F
HBD Mask	2	'0' – '9' 'a' – 'f' 'A' – 'F'	FF

DAT Mask	<=8	00000000 – FFFFFFFF	7F
Reserved	0		
Reserved	0		
Reserved	0		
FFC	3	FFC	FFC
Priority	1	0	0
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300
Reserved			
Corner Report	<=3	0-180	0
Reserved			
Reserved			
Priority	1	1	1
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300
Reserved			
Corner Report	<=3	0-180	0
Reserved			
Reserved			
Priority	1	2	2
Mode	1	0-3	0
FRI Mode	1	0-5	0

FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300
Reserved			
Corner Report	<=3	0-180	0
Reserved			
Reserved			
Priority	1	3	3
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300
Reserved			
Corner Report	<=3	0-180	0
Reserved			
Reserved			
Priority	1	4	4
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300
Reserved			
Corner Report	<=3	0-180	0
Reserved			
Reserved			

SSR	3	SSR	SSR
Mode	1	0|1	0
Time to Stop	<=4	1 – 30 min/5-1800 sec	2
Time to Start	<=3	1 – 5 min/5-300 sec	1
Start Speed	<=2	1 – 10 Km/h	5
Long Stop	<=5	0 – 43200 min	0
Time Unit	1	0|1	0
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Mode	1	0/1/2	0
Start Index	<=2	1 – 250	
End Index	<=2	1 – 250	
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0/15 – 600sec	30
Report Mode	1	0 – 7	0
ID Valid Time	<=3	15 – 600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 4	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ACD	3	ACD	ACD
iButton Timer	<=2	0|1 – 10(s)	0

Output ID	1	0-4	0
Output status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle	<=3	0 – 255	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
PDS	3	PDS	PDS
Mode	1	0|1|2	0
Mask	4	0000-FFFF	07FF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BZA	3	BZA	BZA
Output ID	1	0|2|3	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 2 Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0

Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 3 Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 4 Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SPA	3	SPA	SPA
Mode	1	0|12	0
Speed Threshold 1	<=3	0 – 400km/h	50
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 2	<=3	0 – 400km/h	70
Reserved	0		
Validity	<=4	0 – 3600sec	60

Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 3	<=3	0 – 400km/h	90
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 4	<=3	0 – 400km/h	110
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
MUT	3	MUT	MUT
Working Mode	1	0|1|3|4|6|12	0
Baudrate Index	<=2	1 – 12	5
Data Bits	1	8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 4	0
Sleep Enable	1	0|1	0
Input ID of Wakeup	1	0|1-4	0
Reserved (Optional)	0		

Reserved (Optional)	0		
TMP	3	TMP	TMP
Alarm ID	1	0-7	0
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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	0-7	1
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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	0-7	2
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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0

Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	0-7	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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	0-7	4
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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	0-7	5
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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	0-7	6
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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	0-7	7

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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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 Operator List	<=6*20		
Reserved	0		
Reserved	0		
Known Roaming Event Mask	<=4	0000 – 3FFF	3FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	<=4	0000 – 3FFF	3FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 4	0
Output Status	1	0|1	
Duration	<=3	0～255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
PEO	3	PEO	PEO
GEO ID	1	0 – 19	0
Mode	1	0 – 3	0
Start point	1	1-10	1
End point	<=2	1-10	3
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
…			
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	

Check Interval	<=5	0|5 – 86400sec	0
Output ID	1	0 – 4	0
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
AEX	3	AEX	AEX
Analog Input Expansion Type	1	0	
Bind BAS Index	1	0 – 9	0
Analog Input ID	1	5	
Mode	1	0|1|2	0
Min Threshold	<=5	8000mv～32000mv	
Max Threshold	<=5	8000mv～32000mv	
…			
Bind BAS Index	1	0 – 9	9
Analog Input ID	1	5	
Mode	1	0|1|2	0
Min Threshold	<=5	8000mv～32000mv	
Max Threshold	<=5	8000mv～32000mv	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BTS	3	BTS	BTS
Mode	1	0|1|2	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		
Reserved	0		
Reserved	0		
Reserved	0		
BAS	3	BAS	BAS
Index	1	0 – 9	0
Accessory Type	1	0|1|5|6|8	0
Accessory Model	1	0--5	0
Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC	12	000000000000 - FFFFFFFFFFFF	FFFFFFFFFFFF
Append Mask	<=4	0 - FFFF	3F
Read Interval	<=5	10 – 86400sec	30
Low Voltage Threshold	<=4	0 – 5000mV	2400
Reserved	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		

Reserved (Optional)	0		
Reserved	0		
Output ID	1	0– 1	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
BID	3	BID	BID
Reserved	0		
Enable	1	0|1	
Accessory Model	1	0|4|5	0
Append Mask	<=4	0 - FFFF	5A
Low Voltage Threshold	<=4	0 – 5000mV	2400
Reserved	0		
Start Index	<=3	1 – 15	1
End Index	<=3	1– 15	15
MAC List	<=12*15		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Organization Unique Identifier	0|2|4|6	00--FFFFFF	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Message Type	1	0|1	0
Reserved	0		

OEX	3	OEX	OEX
Output Expansion Type	1	0	
Bind BAS Index	1	0 – 9	
Output ID	1	5 – 6	
DOS Report	1	0 – 1	0
...			
Bind BAS Index	1	0 – 9	
Output ID	1	5 – 6	
DOS Report	1	0 – 1	0
DOS Report	1	0 – 1	0
IEX	3	IEX	IEX
Input Expansion Type	1	0	
Bind BAS Index	1	0 – 9	
Input ID	1	5	
...			
Bind BAS Index	1	0 – 9	
Input ID	1	5	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GLM	3	GLM	GLM
Google Mode	1	0|1|2	0
Phone Number Start	1	1-3	
Phone Number End	1	1-3	
Direct Number List	<=20*3		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
GAM	3	GAM	GAM
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GPS Fix Failure Timeout	<=4	5-1800s	60
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 – 4	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
FVR	3	FVR	FVR
Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	

Configuration Version	4	0000 – 9999	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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 Time	<=3	0 |30- 600 sec	30
Ex Fuel Loss Alarm	<=2	0 – 50%	10
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Report Sensor Data	1	0/1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FSC	3	FSC	FSC
Reserved			
Table ID	1	0 – 4	1
Sensor Type	1	0-6	2

Enable	1	0/1	0
Max. Tank Volume	<= 5	0 –10000	100
Reserved			
Num of Node	<= 2	0/2 – 11	0
Node 1 Value	<= 5	0～99999	
Node 1 Percentage	<= 3	0 – 100	
⋮			
Node N Value	<= 5	0～99999	
Node N Percentage	<= 3	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
UFS	3	UFS	UFS
Max Retries	1	0 – 3	0
Download Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server Password	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server URL	100	Legal URL	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CFU	3	CFU	CFU
Max Retries	1	0 – 3	0

Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server Password	<=20	'0-9', '_', 'a-z','A-Z'	
Server URL	100	Legal URL	
Cancel	<=1	0|1	0
Update Type	1	0|1	0
Reserved	0		
Reserved	0		
RPC	3	RPC	RPC
Report Mask	4	0000 – 0001	0000
Reserved	1		
1-wire Report Sequence Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
CAN	3	CAN	CAN
Mode	1	0|2	0
CAN Report Interval	<=5	0/5 – 86400sec	0
Reserved	0		
CAN Report Mask	<=8	0 - FFFFFFFF	C00FFFFF
Additional Event	1	0/1	0
Reserved	0		
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	001FFFFF
Reserved	0		
Reserved	0		
CLT	3	CLT	CLT
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		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

3.3.3.4. +RESP:GTCID

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

➢ **+RESP:GTCID,**

Example: **+RESP:GTCID,C20107,863695050425290,,89860469092190164073,20221104115914,4D85$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	

Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ICCID	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.5. +RESP:GTCSQ

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

➢ **+RESP:GTCSQ,**

Example: **+RESP:GTCSQ,C20107,863695050425290,,16,0,20221104115944,4D87$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CSQ RSSI	<=2	0 – 31	
CSQ FER	<=2	0 – 7	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

3.3.3.6. +RESP:GTVER

After the device receives the command **AT+GTRTO** to get the versions (including firmware

version, hardware version and module version), it will send the version information to the backend server by the message **+RESP:GTVER**.

➢ **+RESP:GTVER,**

Example: **+RESP:GTVER,C20107,863695050425290,,GV620MG,0702,0102,0000,BG95-M5,BG95M5LAR02A03,0202,20221104115949,4D89$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Firmware Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Configuration Version	4	0000 – FFFF	
Modem Hardware Version	<=20		
Modem Software Version	<=50		
Bluetooth Version	4	0000 – FFFF	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Device Type*>: The type of the device.
- <*Firmware Version*>: The firmware version. The first two characters represent the major version and the last two characters represent the minor version. For example: **010A** means the version GV620MG_R13A01V10.
- <*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**.
- <Configuration Version>: The GTFVR configuration version. The first two characters represent the major version and the last two characters represent the minor version. For example: **0102** means the version **1.02.**
- <*Modem Hardware Version*>: The module model BG95.
- <*Modem Software Version*>: The software version of the modem, for example, ”BG95M5LAR02A03”.
- <Bluetooth Version>: The Bluetooth version. The first two characters represent the major

version and the last two characters represent the minor version. For example: **010A** means the version **1.10**.

3.3.3.7. +RESP:GTBAT

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

➢ **+RESP:GTBAT,**

Example: **+RESP:GTBAT,C20107,863695050425290,,01,14162,0,4.24,0,1,20221104115956,4D8C$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Supply	2	00|01|10|11	
External Power VCC	<=5	0 – 36000mV	
External Power VCC2	<=5	0 – 36000mV	
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0|1	
LED On	1	0|1	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

+RESP:GTIOS

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

➢ **+RESP:GTIOS,**

Example: **+RESP:GTIOS,C20107,863695050425290,,0,0,,00,00,20221104120004,4D8E$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	

Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
IO Mode	1	0-F	
Analog Input VCC1	<=4	0 –36000 mV	
Reserved			
Digital Input	2	00 – 1F	
Digital Output	2	00 – 0F	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

+RESP:GTTMZ

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

- **+RESP:GTTMZ,**

Example: **+RESP:GTTMZ,C20107,863695050425290,,+0800,0,20221104120009,4D90$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
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	$	$

+RESP:GTAIF

After the device receives the command **AT+GTRTO** to get the **AIF**, it will send the information by the message **+RESP:GTAIF** to the backend server. The **+RESP:GTAIF** does not support the HEX report.

- **+RESP:GTAIF,**

Example: **+RESP:GTAIF,C20107,863695050425290,,,,,,,,898604690921901640 73,18,0,1179,10.178.142.5,,,,,,0,20221104134550,4E25$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Backup APN	<=40		
Backup APN User Name	<=30		
Backup APN Password	<=30		
ICCID	20		
CSQ RSSI	<=2	0 – 31	
CSQ FER	<=2	0 – 7	
Cell ID	0|4|8		
IP Addr	<=15	0.0.0.0	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Network Type	1	0,,2	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

CSQ RSSI	**Signal Strength (dBm)**
0	<-133
1	-111

2 – 30	-109 – -53
31	>-51

- <*CSQ FER*>: The quality of the network signal. The range is 0-7.
- <*Cell ID*>: Cell ID in hex format.
- <*IP Addr*>: The IP address of the device.
- <*Network Type*>: Type of current registered mobile network.
  - 0: 2G
  - 2: LTE-4G/CAT-M1/NB2
  - Other: Unregistered.

+RESP:GTALS

After the device receives the command **AT+GTRTO** to get sub AT command configuration information, it will send the configuration information to the backend server by the message **+RESP:GTALS**. Different AT Command gets different configuration information. For example, to get FRI configuration: **AT+GTRTO=gv620mg,2,FRI,,,,,0015$**

- **+RESP:GTALS,**

Example: **+RESP:GTALS,C20100,862170019025640,gv620mg,FRI,1,0,,0,0000,0000,,30,1000,1000,,40,60,00000000,,,,20140511093254,00C3$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub AT Command	3	'a' – 'z' 'A' – 'Z' '	
Mode	1	0 – 4	
Discard No Fix	<=2	0|1	
Reserved	0		
Period Enable	1	0|1	
Start Time	4	HHMM	
End Time	4	HHMM	
Reserved	0		
Send Interval	<=5	5 – 86400sec	
Distance	<=5	50 – 65535m	
Mileage	<=5	50 – 65535m	

Reserved	0		
Corner Report	<=3	0 – 180	
IGF Report Interval	<=5	0|5-86400sec	
ERI Mask	8	00000000-FFFFFFFF	00000000
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.8. +RESP:GTGSV

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

- **+RESP:GTGSV,**

Example: **+RESP:GTGSV,C20107,863695050425290,,9,10,48,12,42,18,37,22,39,23,43,24,28,25,43,31,43,32,44,20221104134832,4E2A$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device name	20		
SV count	2	0-16	
SV id	2	> =0	
SV power	2	> =0	
……			
SV id	2	> =0	
SV power	2	> =0	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*SV count*>: Number of satellites the GPS found.
- ✧ <*SV id*>: Satellite id, when no satellites, zero used as special number to fill.
- ✧ <*SV power*>: Satellite power, when no satellites, zero used as special number to fill.

3.3.3.9. +RESP:GTCVN

After the device receives the command **AT+GTRTO** to get the version number of the CAN100, it will send the information to the server by the report **+RESP:GTCVN**.

➢ **+RESP:GTCVN,**

Example: **+RESP:GTCVN,C20105,863695050486615,,2.3.3j,,,,,20220617014854,1689$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CAN100 SW Version	<=7	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <CAN100 SW Version>: The SW version of the CAN100 device.

3.3.3.10. +RESP:GTCSN

After the device receives the command **AT+GTRTO** to get the serial number of the CAN100, it will send the information to the server by the report **+RESP:GTCSN**.

➢ **+RESP:GTCSN,**

Example: **+RESP:GTCSN,C20105,863695050486615,,111442,,,,,20220617014909,168B$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CAN100 Serial Number	<=10	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <CAN100 Serial Number>: The serial number of the CAN100 device.

3.3.3.11. +RESP:GTCML

After the device receives the command **AT+GTRTO** to get the car model with which CAN100 works, it will send the information to the backend server via the message **+RESP:GTCML**.

➢ **+RESP:GTCML,**

Example: **+RESP:GTCML,C20105,863695050486615,,34,Volvo FH (02-),,,,20220617014935,16A8$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CAN100 Car Model ID	<=5	0-65535	
CAN100 Car Name	<=50	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<CAN100 Car Model ID>*: The model ID of the car with which CAN100 device works. If the

value is 0, it means that no model has been obtained.

✧ <*CAN100 Car Name*>: It indicates the readable make and model of the car.

3.3.3.12. +RESP:GTRSS

After the device receives the command **AT+GTRTO** to get the real time information of the temperature and motion sensor, it will send the information to the server by the report **+RESP:GTRSS.** The **+RESP:GTRSS** does not support HEX report.

➢ **+RESP:GTRSS,**

Example: **+RESP:GTRSS,C20107,863695050425290,,0,1,1,D4140738E8F7,9,23,,,,20221104144051,4E7E$**			
Parameter	**Length (Byte)**	**Range/Format**	**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 Sensor Status	1	0|1	
Sensor Number	<=1	0-18	
Sensor Type(optional)	<=1		
Sensor ID(optional)	<=16		
Temperature(optional)	<=3	(-)XX	
Humidity(optional)	<=3	0-100%(RH)	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Motion Sensor Status>:

- 0: motionless
- 1: motion

✧ <Sensor Number>: The number of temperature sensors.

If it is 0, the following fields <Sensor Type>, <Sensor ID>, <Temperature> and <Humidity>will not display. If there is more than one sensor, these fields will display to show the information of all connected sensors.

✧ <Sensor Type>: Means the type of the sensor.

- 0: 1-wire sensor

- 1: WTH300

✧ <Temperature>: the real time temperature.

✧ <Humidity>: the real time humidity, only supported by WTH300.

3.3.4. Event Report

The following event reports are triggered when certain events occur

+RESP:GTPNA: Power on report

+RESP:GTPFA: Power off report

+RESP:GTMPN: The report for connecting main power supply

+RESP:GTMPF: The report for disconnecting main power supply

+RESP:GTBTC: Backup battery starts charging report

+RESP:GTSTC: Backup battery stops charging report

+RESP:GTBPL: Backup battery low

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

+RESP:GTPDP: GPRS 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:GTGPJ: GPS jamming status

+RESP:GTGSM: The report for the information of the serving cell and the neighbor cells.

+RESP:GTGSS: GPS signal status

+RESP:GTSTR: Vehicle enters into start status

+RESP:GTSTP: Vehicle enters into stop status

+RESP:GTLSP: Vehicle enters into long stop status.

+RESP:GTFLA: Unusual fuel consumption alarm

+RESP:GTDOS: Output status change with waveform 1

+RESP:GTTMP: Temperature alarm

+RESP:GTRMD: The report for entering or leaving GSM roaming state

+RESP:GTUPC: Reporting information about UPC

+RESP: GTVGN: Ignition on report

+RESP: GTVGF: Ignition off report

+RESP:GTEXP: Reporting malfunction information of digital fuel sensor

+RESP:GTCLT: CANBUS information alarm.

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

➢ **+RESP:GTPNA,**

➢ **+RESP:GTPFA,**

➢ **+RESP:GTPDP,**

Example: **+RESP:GTPNA,C20107,863695050425290,,20221105163659,577A$** **+RESP:GTPFA,C20107,863695050425290,,20221105105853,5599$** **+RESP:GTPDP,C20107,863695050425290,,20221105110014,559D$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

Example: **+RESP:GTMPN,C20107,863695050425290,,0,0.0,0,120.4,113.947959,22.573559,20221104085543,0460,0000,2495,1179,,20221104165603,4FC7$** **+RESP:GTMPF,C20107,863695050425290,,0,0.0,0,120.4,113.947959,22.573559,20221104085543,0460,0000,2495,1179,,20221104165544,4FC4$** **+RESP:GTBTC,C20107,863695050425290,,0,0.0,0,95.3,113.948072,22.573498,20221104121112,0460,0000,0000,0000,,20221104201121,50D9$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	

MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTGPJ,**

Example: **+RESP:GTGPJ,C20100,862170019025640,,,0,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,20140511093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CW Jamming Value	<=3	0-255	
GPS Jamming State	1	0-3	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00

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

- ✧ *<CW Jamming Value>*: Current continuous wave jamming value.
- ✧ *<GPS Jamming State>*: Current jamming state.
  - 0: Unknown or feature disabled.
  - 1: (Ok) no significant jamming.
  - 2: (Warning) interference visible but fixing OK.
  - 3: (Critical) interference visible and no fix.

➢ **+RESP:GTSTC,**

Example:
+RESP:GTSTC,C20107,863695050425290,,,0,0.0,0,95.3,113.948072,22.573498,20221104121151,0460,0000,2495,1179,,20221104201217,50DE$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Send Time	0|14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTBPL,**

Example: **+RESP:GTBPL,C20100,862170019025640,,3.53,0,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,20140511093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Backup Battery VCC	<=4	0.00 – 4.50 V	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTSTT,**

Example: **+RESP:GTSTT,C20107,863695050425290,,11,0,0.0,0,94.8,113.947999,22.573603,20221105083043,0460,0000,2495,116D,,20221105163659,577B$**

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11|12|21|22|41|42|16	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

➢ **+RESP:GTIGN, +RESP:GTVGN,**

Example: **+RESP:GTIGN,C20107,863695050425290,,9408,0,0.0,0,150.9,113.948064,22.573572,20221104020755,0460,0000,2495,11E6,,,1.0,20221104100802,4C63$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition Off	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Device Status	6	000000--FFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		

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

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

➢ **+RESP:GTIGF, +RESP:GTVGF**

Example:
+RESP:GTIGF,C20107,863695050425290,,0,1,1.1,0,97.6,113.947875,22.573783,20221104021508,0460,0000,2495,1179,,,1.0,20221104101508,4C73$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition On	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	

Mileage	<=9	0.0 – 4294967.0 km	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Device Status	6	000000--FFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

➢ **+RESP:GTIDN,**

Example: **+RESP:GTIDN,C20100,862170019025640,,,,0,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,2000.0,20140511093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	

Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTIDF,**

Example:
+RESP:GTIDF,C20100,862170019025640,,22,300,0,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,2000.0,20140511093254,11F0$

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

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

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

➢ **+RESP:GTGSM**

Example:
+RESP:GTGSM,C20107,863695050425290,FRI,0460,0000,247F,0EB1,13,,0460,0000,247F,0DF4,16,,0460,0000,2495,0E4D,16,,,,,,,,,,,,,,,,,,0460,0000,2495,1179,13,,20221104151454,4EBF$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15/12	IMEI/MUID	
Fix Type	3	SOS|RTL|LBC|TOW|FRI|GIR|ERI	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4		
Cell ID1	0|4|8		
RX Level1	2	0-91	
Reserved	0		
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
Cell ID2	0|4|8		

RX Level2	2	0-91	
Reserved	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		
Cell ID3	0|4|8		
RX Level3	2	0-91	
Reserved	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
Cell ID4	0|4|8		
RX Level4	2	0-91	
Reserved	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	0|4|8		
RX Level5	2	0-91	
Reserved	0		
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4		
Cell ID6	0|4|8		
RX Level6	2	0-91	
Reserved	0		
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0|4|8		

RX Level	2	0-91	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Fix Type*>: A string to indicate the type of GPS fixing this cell information is for.
  "SOS": This cell information is for SOS requirement.
  "RTL": This cell information is for RTL requirement.
  "LBC": This cell information is for LBC requirement.
  "TOW": This cell information is for TOW requirement.
  "FRI": This cell information is for FRI requirement.
  "GIR": This cell information is for sub command "**C**" in **AT+GTRTO** command.
  "ERI": This cell information is for ERI requirement.
- <*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 of 6-bit.
- <*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. If no neighbor cell is found, all the fields of the neighbor cell will be empty.
2. "ffff" in the field of <*LAC(i)*>, <*Cell ID(i)*> means the terminal doesn't know the value.
3. This message cannot be sent via SMS.

➢ **+RESP:GTGSS**

Example:
+RESP:GTGSS,C20107,863695050425290,,0,,11,,0,0.0,0,120.4,113.947959,22.573559,20221104070633,0460,0000,2495,116D,,20221104150822,4EAE$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Signal Status	1	0 | 1	
Satellite Number	2	0 - 24	
Device State	2	11|12|21|22|41|42|16	
Reserved	0		
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*GPS Signal Status*>: 0 means GPS signal is lost or no successful GPS fix; 1 means GPS signal has recovered and GPS fix succeeded.
- <*Satellite Number*>: The number of the visible satellites when fix succeeded. If fix failed, the parameter is reserved.
- <Device *State*>: The current movement state of the device.
  - 16 (Tow): The device attached vehicle is ignition off and it is towed.
  - 11 (Ignition off Rest): The device attached vehicle is ignition off and it is motionless.
  - 12 (Ignition off Motion): The device attached vehicle is ignition off and it has been moving before it is regarded as being towed.
  - 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
  - 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
  - 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
  - 42 (Sensor Motion): The device attached vehicle is moving without ignition signal

detected.

- **+RESP:GTSTR,**
- **+RESP:GTSTP,**
- **+RESP:GTLSP,**

Example:
+RESP:GTSTR,C20100,862170019025640,,,,0,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,2000.0,20140511093254,11F0$
+RESP:GTSTP,C20100,862170019025640,,,,0,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,2000.0,20140511093254,11F0$
+RESP:GTLSP,C20100,862170019025640,,,,0,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,2493,014B,00,2000.0,20140511093254,11F0$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

➢ **+RESP:GTFLA**

Example: **+RESP:GTFLA,C20100,862170019025640,,2,92,70,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Input ID	1	0|1	
Last Fuel Level	<=3	0 – 100	
Current Fuel Level	<=3	0 – 100	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Input ID*>: ID of the input to which the fuel sensor is connected. 0 means “Connected to serial port”.

✧ <*Last Fuel Level*>: The fuel level saved before last ignition off when FLA event occurs.

✧ <*Current Fuel Level*>: The fuel level when the FLA event occurs.

➢ **+RESP:GTDOS**

Example: **+RESP:GTDOS,C20107,863695050425290,,5,1,0,0.0,0,120.4,113.947959,22.573559,20221104071115,0460,0000,2495,1179,,20221104153022,4F20$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Wave1 Output ID	1	1-4|5-6	
Wave1 Ouptut Active	1	0|1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

✧ <*Wave1 Output Active*>: The output status with waveform 1

➢ **+RESP:GTTMP**

Example:

+RESP:GTTMP,C20100,862170019025640,,,0,01,,0,0.0,0,39.0,117.201299,31.833024,20140511093254,0460,0000,5678,2D7E,00,0.0,,0,0,01,01,,,,28131A4103000056,,28,20140511093254,0028$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power VCC	<=5	0 – 36000 mV	
External Power VCC2	<=5	0 – 36000 mV	
Report ID/Report Type	2	X(0-3)X(0-1)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input VCC1	<=5	0 – 36000 mV	
Reserved			
Digital Input	2	00 – 1F	
Digital Output	2	00 – 0F	
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	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Report ID/Report Type*>: The report ID and the type are in hex format. 4 high bits mean report ID and 4 low bits means report type.
  Report ID: The ID of temperature sensor, the range is 0-7.
  Report type: 0 means beyond the predefined temperature range. 1 means within the predefined temperature range.
- ✧ <*Temperature Sensor device ID*>: The ID of the temperature sensor.
- ✧ <*Temperature Sensor device DATA*>: The current temperature detected by the sensor.

➢ **+RESP:GTBAA**

The event report message **+RESP:GTBAA** uses the format below.

Example: **+RESP:GTBAA,C20107,863695050425290,,FF,3,4,00,001E,B912ACD097FF,1,2704,0,0,0.0,0,90.6,113.948079,22.573591,20221105053153,0460,0000,2495,1179,,20221105133210,566F$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Index	2	0 – 9|0xFF	
Accessory Type	1	0|1|3|5|6	
Accessory Model/Beacon ID Accessory Model	1	0--5	
Alarm Type	2	00 – FF	
Append Mask	4	0000 – FFFF	

Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC	12	'0' – '9' 'A' – 'F'	
Accessory Status	1	0 - 1	
Accessory Voltage	<=4	0 – 5000mV	
Accessory Temperature	<=3	-40 – 80℃	
Accessory Humidity	<=3	0 - 100% (RH)	
Accessory Mode	<=2	0 - 10	
Accessory Event	1	0 - 2	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Index>*: There are two meaning for *<Index>.*

- The index of Bluetooth accessory defined in **AT+GTBAS** which triggers the **+RESP:GTBAA** message.
- For BID Accessory, it is 0xFF.

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

- 0: No Bluetooth accessory.
- 1: Escort Bluetooth Accessory.
- 3: Bluetooth beacon accessory.
- 5: BLE lock.
- 6: Beacon multi-functional sensor.

- ✧ <*Accessory Model/Beacon ID Accessory Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBAS** and **AT+GTBID**.
- ✧ <*Alarm Type*>: The type of alarm which generated according to <*Sensor Type*> and <*Sensor Model*> specified in **AT+GTBAS** command.
    - 0: The voltage of the Bluetooth accessory is low.
    - 1: Temperature alarm: The current temperature value is below <*Low Temperature*> set in the **AT+GTBAS** command.
    - 2: Temperature alarm: The current temperature value is above <*High Temperature*> set in the **AT+GTBAS** command.
    - 3: 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 of WKF300 is detected.
    - 5. Unlock success.
    - 6. Unlock fail.
    - 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*>, which are set in the **AT+GTBAS** command.
    - A: Angle event notification.
    - 11 No available Bluetooth accessory was detected.
    - 12 An available Bluetooth accessory was detected.
    - 13: Door opened.
    - 14: Door closed.
- ✧ <*Append Mask*>: Bitwise mask defined in **AT+GTBAS** and **AT+GTBID** commands to configure which data item is reported.
- ✧ <*Accessory Name*>: Bluetooth accessory Name.
- ✧ <*Accessory MAC*>: Bluetooth accessory MAC address.
- ✧ <*Accessory Status*>: A numeral to indicate whether the accessory is available.
    - 0: The accessory is not available.
    - 1: The accessory is available.
- ✧ <*Accessory Voltage*>: The voltage of Bluetooth accessory.
- ✧ <*Accessory Temperature*>: Temperature data of Bluetooth accessory.
- ✧ <*Accessory Humidity*>: Humidity data of the Bluetooth accessory.
- ✧ <*Accessory Mode*>: The operating mode of angle sensor.
- ✧ <*Accessory Event*>: The event is generated by the angle sensor.

➢ **+RESP:GTBID**

The event report message **+RESP:GTBID** uses the format below.

Example:
+RESP:GTBID,C20100,865284040847836,gv620mg,1,0,001F,B80EA100A00A,3053,2,0.2,163,126.2,114.015392,22.537366,20191024091232,0460,0001,253D,AEC3,,20191024091233,23CD$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Number	1	0 – 15	
Beacon ID Accessory Model	1	0|4|5	
Accessory Append Mask	4	0000 – FFFF	
Accessory MAC	12	'0' – '9' 'A' – 'F'	
Accessory Battery Level	<=4	0 – 5000mV	
Accessory Signal Strength	1	-120 - 0	
Accessory Temperature	<=6	-40.00 - 80.00(℃)|-128.00	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTBIE**

The event report message **+RESP:GTBIE** uses the format below.

Example:

+RESP:GTBIE,C20109,863695059210040,GV600M,5,1,1,16,5,005F,AC233FA24983,3195,-66,21.85,5,005F,780541251F32,3579,-86,21.67,5,005F,780541251EF3,3585,-91,21.56,5,005F,780541251E98,3573,-82,21.84,5,005F,780541251EF7,3588,-88,21.61,5,005F,780541045862,3108,-85,21.95,5,005F,780541251EF1,3570,-80,21.27,5,005F,AC233FA24890,3564,-72,21.76,5,005F,780541251EE7,3573,-82,21.79,5,005F,AC233FE2C05A,3156,-85,27.00,5,005F,AC233FA248B3,3252,-74,21.96,5,005F,AC233FE2BEDB,2766,-83,26.00,5,005F,B84BA4CFC400,2861,-85,21.20,5,005F,60C0BF87F685,2861,-48,19.75,5,005F,780541251EF4,3570,-88,21.67,5,005F,60C0BF60A2C2,3218,-69,21.44,1,0.0,0,64.6,113.947780,22.573598,20230131065917,0460,0000,2495,116D,,20230131065918,7DD0$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Detected Count	<=3	0 - 9999	
Total Frame	1	1 - 2	
Frame Index	1	1 - 2	
Beacon Number	<=2	0 - 25	
Beacon ID Accessory Model	1	0|5	
Accessory Append Mask	4	(HEX)	
Accessory MAC	12	(HEX)	
Accessory Battery Level	<=4	0 - 5000(mV)	
Accessory Signal Strength	<=4	-120 - 0	
Accessory Temperature	<=6	-40.00 - 80.00(℃)|-128.00	
GPS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180.000000 - 180.000000	
Latitude	<=10	-90.000000 - 90.000000	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	

LAC	4	(HEX)	
Cell ID	4|8	(HEX)	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- ✧ *<Detected Count>*: The value to indicate the sequence number of beacons have been detected. It will start from 0 when it is over 9999.
- ✧ *<Total Frame>*: A numeral to indicate the total number of frames that the following data takes up.
- ✧ *<Frame Index>*: A numeral to indicate the index of the current frame.
- ✧ *<Beacon Number>*: The number of the Bluetooth beacon accessories.
- ✧ *<Beacon ID* Accessory *Model>*: The model of the Bluetooth beacon ID accessory which is defined in AT+GTBID.
- ✧ *<Accessory Append Mask>*: Bitwise mask defined in the AT+GTBID command to indicate the reported Bluetooth beacon accessory data fields.
- ✧ *<Accessory MAC>:* The MAC address of the Bluetooth beacon accessory.
- ✧ *<Accessory Battery Level>:* The battery voltage of the Bluetooth beacon accessory, 0 means invalid.
- ✧ *<Accessory Signal Strength>:* The signal strength of the Bluetooth beacon accessory. If the value of the signal strength is negative, it is represented in 2's complement format.
- ✧ *<Accessory Temperature>:* Temperature data of Bluetooth beacon accessory,
  Example, 0x1B8F means 27.56°C (0x1B=27; 0x8F=143, 143/256=0.55), -128 (0x8000) means invalid.

➢ **+RESP:GTRMD,**

Example: **+RESP:GTRMD,C20107,863695050425290,,0,0,0.0,0,126.6,113.948116,22.573602,20221105025551,0460,0000,2495,116D,,20221105105627,5591$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Roaming State	1	0-3	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	

Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

➢ **+RESP:GTEXP,**

This report is used for reporting the malfunction information of digital fuel sensor.

Example:
+RESP:GTEXP,C20100,135790246811220,,2,,0,0004,0,0.0,0,74.1,117.201527,31.832957,20160510012210,0460,0000,5665,47A1,00,20160510012212,0063$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000–XXFFFF,X∈{'A'–'Z','0'–'9'}	
Unique ID	15|12	IMEI|MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Digital Fuel Sensor Type	1	2|4	
Reserved			
Reserved			
HW Fault Code	4	0000 – FFFF	

GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 –999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Digital Fuel Sensor Type>: For details, please refer to <Digital Fuel Sensor Type> in **AT+GTMUT**.

✧ <HW Fault Code>: The malfunction code has different meanings for different digital fuel sensors.

UFSxxx:

- Bit 0: The detector of the fuel sensor is not connected or the signal extension cable is broken.
- Bit 1: The detector of the fuel sensor is detached from the fuel tank.
- Bit 2: The input power supply is too low.
- Bit 3: Abnormal reset of the system.
- Bit 4: The value of analog output is abnormal.
- Bit 5: The current fuel level is in the blind zone.
- Bit 6 - 15: Reserved.

➢ **+RESP:GTCLT,**

Example:

+RESP:GTCLT,C20105,863695050486615,,0,0,0,2,,,FE7FFFFF,LSVNY41Z0B2521890,2,I13728,10.02,1073,30,51,L/100km8999.0,L1000.00,1000,70,2500.00,2000.00,400.00,80.02,21777,FFFF,FFF,3F,3F,450.00,200.00,7FFFFF,60,5000,60000,45533,0,1,0,10000,80000,89996,98888,99999.99,1.00,2.00,472,9999999999,9999999998,fhjahfdsjkafhdjkasfhajskdfhasdjklfhaskdj,fhajskdfhasjkdfhasdkjfhasdkjfhasdkjf,1234567890,1FFF,1000,5000,,,1,0.0,0,107.4,114.015303,22.537314,20

220617011813,0460,0000,27BD,0DFC,,20220617011810,15CE$			
Parameter	**Length (Byte)**	**Range/Format**	**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	L/100km(0.0 – 999.9)/L/H(0.0 – 999.9)	
Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100.00)	
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	<=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	<=10	0-9999999999	

Card Number			
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 Braking	<=6	0-999999	
Rapid Accelerations	<=6	0-999999	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 –999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

CAN IC FOTA Upgrade Report

The device will send the report **+RESP:GTCFU** to the server during the upgrade process.

- **+RESP:GTCFU:**

Example:
+RESP:GTCFU,C20105,863695050486615,,100,,20220617022733,16D5$

Parameter	Length (Byte)	Range/Format	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)			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Code>: Information code.

- 100: Confirm ok. Start upgrade.
- 101: The upgrading process is refused because of GTCFU parameters error, GTMUT working mode error, GTCAN mode error or no network.
- 102: The upgrading process is refused because of low power.
- 200: Start downloading package.
- 201: Downloading package succeeds.
- 202: Downloading package fails.
- 300: Start upgrade.
- 301: Upgrade successful. The reserved parameter is used as follows.

New Version	<=10		

- 302: Upgrade fails.

✧ <New Version>: The version of the new firmware in the CAN IC.

➢ **+RESP:GTUFS:**

Example:
+RESP:GTUFS,C20100,862170019025640,,100,,20150201000000,11F0$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved			
Result	3	100|101|102|103|200|201 |202|300|301|302	
Reserved			

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

✧ <*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.

➢ **+RESP:GTUPC:**

Example:
+RESP:GTUPC,C20100,862170019025640,,1,http://www.queclink.com/configure.ini,20150201000000,11F0$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Command ID	<=3		
Result	3	100|101|102|103|200|201|202|300|301|302	
Download URL	<=100	Complete URL	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

- 100: The update command is starting.

- 101: The update command is confirmed by the device.
- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name.

3.3.5. Data Report

The following report will be triggered when certain data needs to be sent.

➢ **+RESP:GTFSD,**

This report is used for reporting fuel sensor data.

Example: **+RESP:GTFSD,C20100,862170016790444,,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	15/12	IMEI/MUID	
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 '*QL' and ends with '#'.

3.3.6. Buffer Report

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

- ✧ No network signal.
- ✧ Failed to activate network context for the TCP or UDP connection.
- ✧ Network Failed to establish the TCP connection with the backend server.

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

Detailed information about buffer report is listed below.

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

Example:

The following is an example of the buffered message:

+BUFF:GTFRI,C20107,863695050425290,,14158,10,1,1,0.0,0,109.2,113.947938,22.573550,2022
1104034040,0460,0000,2495,1179,,1.0,,,,100,110000,0,,,20221104114102,4D56$

3.3.7. Transparent Data Transmission

The device supports transparent transfer between the backend server and the peripheral device connected to its second serial port. GV620MG supports bi-directional data transmission. In both directions, the data is transmitted to the device via transparent transfer.

a) Transfer data from the peripheral device to the backend server

According to the <*working mode*> of the command **AT+GTMUT**, there are two ways for the peripheral device communicates with GV620MG.

If the peripheral device supports **AT+GTDAT** command, it can transfer data via this command. The peripheral device can send command **AT+GTDAT** with the data to the serial port. According to the <*Command Type*> of **AT+GTDAT**, The device wraps the corresponding data format into backend server with **+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 command **AT+GTDAT** with the data to GV620MG and GV620MG will pick out the pure data and send it to the second serial port. In this way the peripheral device can get the data from the serial port.

Data to the backend server

- **+RESP:GTDAT (Short Format),**

Example: **+RESP:GTDAT,C20100,862170019025640,,data,20140511093254,0017$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Data to the Backend Server	<=1280	ASCII Code	
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTDAT (Long Format)**

Example: **+RESP:GTDAT,C20100,862170019025640,,3,,,1645026150,0,0.5,0,29.4,121.390923,31.164295,20111222022935,0460,0003,2493,014B,00,,,,,20140511093254,001A$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Report Type	1	0|1|2	
Reserved	0		
Reserved	0		
Data to the Backend Server	<=1280	ASCII Code	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	

Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0|2	00	00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	0|14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report Type*>: The value of <*Report Type*> refers to <*Working Mode*> of **AT+GTMUT**.

- 0: Disable the second serial port.
- 1: AT+GTDAT.
- 2: Reserve.

Data to the second serial port starts with a new line and ends with '\r\n'.

Example:
Data to the serial port

3.3.8. Data Transfer Report Based on Specified Terminator Character or Data Length

The device supports data transfer from the peripheral device to the server. According to the <Working Mode> of the command **AT+GTMUT**, there are two ways for the peripheral device to communicate with GV620MG.

Data to the server

➢ **+RESP:GTDTT (Short Format)**

Example:
+RESP:GTDTT,C20108,860977050135563,GV600M,0,,0,9,789456asd,20221123083724,0033$

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' '-' '_'	
Reserved	1	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,C20108,860977050135563,GV600M,0,,0,15,1235676876878a,1,0.0,0,112.4,113.947933,22.573545,20221124033131,0460,0000,2495,116D,,,,,,20221124033130,0072$

Parameter	Length (Byte)	Range/Format	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	1	0	
Reserved	0		
Data Type	1	0-1	
Data Length	<=4	1-1280	
Data to the Backend Server	<=1280		
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	

Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
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 server>: It is pure HEX data when **AT+GTMUT** <Mode> is 6.

3.3.9. CANBUS Report

If the CANBUS Report function is enabled by the command **AT+ GTCAN**, the device will send the CANBUS device information by the report **+RESP:GTCAN** to the server periodically.

- ➢ **+RESP:GTCAN,**

Example:
+RESP:GTCAN,C20105,863695050486615,,0,1,E07FFFFF,LSVNY41Z0B2521890,2,I13728,10.02,1073,30,51,L/100km8999.0,L1000.00,1000,70,2500.00,2000.00,400.00,80.02,21777,FFFF,FFFF,3F,3F,450.00,200.00,7FFFFF,60,5000,60000,45533,0,1,0,10000,80000,89996,98888,99999.99,1.00,2.00,472,9999999999,9999999998,fhjahfdsjkafhdjkasfhajskdfhasdjklfhaskdj,fhajskdfhasjkdfhasdkjfhasdkjfhasdkjf,1234567890,1FFF,1000,5000,,,1,0.0,0,274.6,114.015356,22.537234,20220616160014,0460,0000,27BD,0DFC,,20220616160013,0D0C$

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

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Report Type	1	0/1/2	
CANBUS Device State	1	0/1	
CANBUS Report Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0/1/2	
Total Distance	<=12	H(0 – 99999999)/I(0 – 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	L/100km(0.0–999.9)/L/H(0.0–999.9)	
Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100.00)	
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	<=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	

Gross Combination Vehicle Weight	<=6	0 – 642550(kg)	
Catalyst Tank Liquid Level	<=3	0 – 100%	
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	<=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 Braking	<=6	0-999999	
Rapid Accelerations	<=6	0-999999	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Report Type>: A numeric to indicate the report type.
- 0: Periodical report.
- 1: Real time request report.
- 2: Ignition on/off report.

✧ <CANBUS Device State>: A numeric to indicate the communication state with the external CANBUS device.
- 0: Abnormal. It fails to receive data from the external CANBUS device.
- 1: Normal. It is able to receive data from the external CANBUS device.

✧ <CANBUS Report Mask>: Please refer to the <CAN Report Mask> in **AT+GTCAN**.

✧ <Ignition Key>: A numeric to indicate the Ignition state.
- 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 distance impulse (I) (if distance from dashboard is not available).

✧ <Total Fuel Used>: Number of liters of fuel used. The unit is liter.

✧ <Fuel Level>: The level of fuel in vehicle tank. The unit is liter (L) or percentage (P).

✧ <Range>: The number of 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 negative sign (-), e.g. "-2". When the value is positive, no extra character is inserted, e.g. "20".

✧ <Fuel Consumption>: The fuel consumption is calculated based on values read from vehicle. The unit is L/100km (M) or L/H (H).

✧ <Total Engine Hours>: Time of engine running. The unit is hour.

✧ <Total Driving Time>: Time of engine running (speed is not 0). The unit is hour.

✧ <Total Engine Idle Time>: Time of engine running in idling status (vehicle at rest). The unit is hour.

✧ <Total Idle Fuel Used>: Number of liters of fuel used. The unit is liter.

✧ <Axle Weight>: Vehicle axle weight. The unit is kg.

✧ <Tachograph Information>: Two bytes. The high byte describes driver 2, while the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Valid Time Mark (0 – valid driver data, and 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 41h.
- 2: 41h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15min before 16h (without 8h rest during the last 24h).
- 6: 16h reached.
- 7: Other limit.

W1-W0: Driver working states:

- 0: Rest - sleeping.
- 1: Driver available – short break.
- 2: Work – loading, unloading, working in an office.
- 3: Drive – behind the wheel.

✧ <Detailed Information/Indicators>: Two bytes. Each bit contains information of one indicator.

- Bit 0: FL – fuel low indicator (1 – indicator on, 0 – indicator 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.

For CAN100, 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.

✧ <Ad-Blue level>: The level of Ad-Blue.

✧ <Axle Weight 1st>: Vehicle first axle weight. The unit is Kg.

✧ <Axle Weight 3rd>: Vehicle third axle weight. The unit is Kg.

✧ <Axle Weight 4th>: Vehicle fourth axle weight. The unit is Kg.

✧ <Tachograph Overspeed Signal>: The tachograph overspeed signal. The value 1 indicates “overspeed”. The value 0 indicates “no overspeed”.

✧ <Tachograph Vehicle Motion Signal>: The tachograph vehicle motion signal. The value 1 indicates “motion”. The value 0 indicates “no motion”.

✧ <Tachograph Driving Direction>: Vehicle driving direction obtained from tachograph.

✧ <Analog Input Value>: The value of analog input. The unit is mV.

✧ <Rapid Braking>: Counts of rapid braking of the vehicle.

✧ <Engine Braking Factor>: Counts of braking with brake pedal or with engine. The more

decreasing speed with the engine, the higher the engine braking factor is.

- <Pedal Braking Factor>: Counts of braking with brake pedal or with engine. The more decreasing speed with brake pedal, the higher the pedal braking factor is.
- <Total Accelerator Kick-downs>: The count of accelerator pedal kick-downs (pressing the pedal over 90%).
- <Total Effective Engine Speed Time>: Total time when vehicle engine speed is effective. The unit is h.
- <Total Cruise Control Time>: Total time when 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 h.
- <Total Brake Applications>: The total number of braking processes initiated by brake pedal.
- <Tachograph Driver 1 Card Number>: The card number of tachograph driver 1.
- <Tachograph Driver 2 Card Number>: The card number of tachograph driver 2.
- <Tachograph Driver 1 Name>: The name of tachograph driver 1.
- <Tachograph Driver 2 Name>: The name of tachograph driver 2.
- <Registration Number>: The vehicle registration number.
- <Expansion Information>: A decimal 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: ESP failure indicator (1 – on, 0 – off or not available).
  - 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)
- <Rapid Braking>: Number of total rapid braking since installation (calculation based on CAN-Logistic's settings of speed decrease time and value).
- <Rapid Accelerations>: Number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value).

NOTE: only 19 items of the CANBUS device information are supported now, as show below:

<Doors>
<Lights>
<Axle Weight>
<Total Idle Fuel Used>
<Total Engine Idle Time>
<Total Driving Time>

<Total Engine Hours>
<Accelerator Pedal Pressure>
<Fuel Level>
<Fuel Consumption>
<Engine Coolant Temperature>
<Engine RPM>
<Vehicle Speed>
<Total Fuel Used>
<Total Distance>
<Ignition Key>
<VIN>
<Catalyst Tank Liquid Level>
<Gross Combination Vehicle Weight>

3.3.10. Report Google Maps Hyperlink

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

If the device receives SMS position request message via SMS, GV620MG will send its current position to the original number via SMS with a Google Maps hyperlink if the original number is a direct number (please refer to <Direct Number List> in the Chapter 3.2.7.6) or a number in the white list (please refer to <White List> in the Chapter 3.2.7.5).

GV620MG will send an SMS with a Google Maps hyperlink to the direct phone numbers after the messages **+RESP:GTSOS** and **+RESP:GTGIN/+RESP:GTGOT**.

- **Google Maps Hyperlink**

Example:
LBC:gv620mg
http://maps.google.com/maps?q=31.222073,121.354335
F1 D2009/01/01 T00:00:00 B0% I1 S0.0

Parameter	Length (Byte)	Range/Format	Default
SMS Header	<=30	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Google Maps Hyperlink Header	30	http://maps.google.com/maps?q=	http://maps.google.com/maps?q=
Latitude	<=10	(–)xx.xxxxxx	
Longitude	<=11	(–)xxx.xxxxxx	

GPS Fix	<=3	F0|F1	
GPS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Battery Percentage	<=6	B0%-B100%	
Ignition Status	2	I0|I1	
Speed	<=6	S0.0 – S999.9 km/h	

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

3.4. Heartbeat

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

➢ **+ACK:GTHBD**

Example: **+ACK:GTHBD,C20107,863695050425290,,20221104115636,4D7E$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

➢ **+SACK:GTHBD**

Example: **+SACK:GTHBD,C20100,11F0$** **+SACK:GTHBD,,11F0$**			
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 can send an empty field to decrease the length of the heartbeat data acknowledgement.

✧ <*Count Number*>: Extracted from the heartbeat package from the device as the <*Count Number*> of the server acknowledgement of the heartbeat.

3.5. Server Acknowledgement

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

➢ **+SACK:**

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

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

4. HEX Format Report Message

From this version, the @Tracker protocol supports messages in HEX format. For all the commands, they still use the ASCII format as described above. By default the device uses ASCII format messages. The backend server could use **AT+GTQSS** or **AT+GTSRI** command to enable the HEX format messages by setting the <*Protocol Format*> to 1.

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

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

The device uses CRC-CCITT (0xFFFF) 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 message, the device uses 0x0D and 0x0A as the end.

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

4.1. Hex Report Mask

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

➢ **AT+GTHRM=**

Example: **AT+GTHRM=gv620mg,,,7F,00FEFFFF,00FEFFFF,2F7F,FF,,7F,,000007F0,,0018$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv620mg
Reserved	0		
Reserved	0		
+ACK Mask	2	00 – FF	7F
+RSP Mask	8	00000000 – FFFFFFFF	00FEFFFF
+EVT Mask	8	00000000 – FFFFFFFF	00FEFFFF
+INF Mask	<=8	00000000 – FFFFFFFF	7F7F
+HBD Mask	2	00 – FF	FF
+DAT Mask	<=8	00000000 – FFFFFFFF	7F
Reserved	0		
+CAN Mask	8	00000000 – FFFFFFFF	000007F0
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

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

Bit	Item to Mask
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	*<Total Hour Meter Count>*
Bit 22	*<Current Hour Meter Count>*
Bit 21	*<Total Mileage>*
Bit 20	*<Current Mileage>*
Bit 19	*<GPS Satellites Information>*
Bit 18	*<Motion Status>*
Bit 17	***<Digital IO Status>***
Bit 16	Reserved
Bit 15	*<External Power Supply2 Voltage>*
Bit 14	*<Analog Input1 Voltage>*
Bit 13	*<Analog Input Mode>*
Bit 12	*<External Power Supply Voltage>*
Bit 11	*<Battery Percentage>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*

Bit 6	*<Device Name>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<network data>*
Bit 2	*<Altitude>*
Bit 1	*<Azimuth>*
Bit 0	*<Speed>*

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

Bit	Item to Mask
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	*<Total Hour Meter Count>*
Bit 22	*<Current Hour Meter Count>*
Bit 21	*<Total Mileage>*
Bit 20	*<Current Mileage>*
Bit 19	*<GPS Satellites Information>*
Bit 18	*<Motion Status>*
Bit 17	***<Digital IO Status>***
Bit 16	Reserved
Bit 15	*<External Power Supply2 Voltage>*
Bit 14	*<Analog Input1 Voltage>*
Bit 13	*<Analog Input Mode>*
Bit 12	*<External Power Supply Voltage>*

Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<Device Name>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<network data>*
Bit 2	*<Altitude>*
Bit 1	*<Azimuth>*
Bit 0	*<Speed>*

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

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

Bit 0	<*Length*>

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

Bit	Item to Mask
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	Reserved
Bit 5	Reserved
Bit 4	**+RESP:GTCML**
Bit 3	**+RESP:GTCSN**
Bit 2	**+RESP:GTCVN**
Bit 1	Reserved
Bit 0	**+RESP:GTGSV**

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

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

Bit 1	*<Device Type>*
Bit 0	*<Length>*

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

Bit	Item to Mask
Bit 31	Reserved
⋮	Reserved
Bit 7	Reserved
Bit 6	*<Count Number>*
Bit 5	*<Send Time>*
Bit 4	*<Device Name>*
Bit 3	*<Firmware Version>*
Bit 2	*<Protocol Version>*
Bit 1	*<Device Type>*
Bit 0	*<Length>*

✧ <+CAN Mask>: Component mask of the CANBUS Information packet in HEX format.

Bit	Item to Mask
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Reserved
Bit 20	Reserved

Bit 19	Reserved
Bit 18	Reserved
Bit 17	Reserved
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	<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	Reserved
Bit 2	Reserved
Bit 1	Reserved
Bit 0	Reserved

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

- **+ACK:GTHRM,**

Example: **+ACK:GTHRM,C20100,862170019025640,,0019,20140511093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15/12	IMEI/MUID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

4.2. Acknowledgement +ACK

➢ **+ACK,**

Example: **2B 41 43 4B 23 7F 24 C2 01 00 01 01 67 76 36 32 30 6D 67 00 00 00 18 07 E5 08 18 08 31 3A 03 B3 24 9D 0D 0A**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Message Header	4	+ACK	+ACK
Message Type	1		
Report Mask	1	00 – FF	
Length	1		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
ID	1		
Serial Number	2	0000 – FFFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

Command	**ID**
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
Reserved	3
AT+GTCFG	4
AT+GTTOW	5
AT+GTEPS	6

AT+GTDIS	7
AT+GTOUT	8
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14
Reserved	15
AT+GTRTO	16
Reserved	17
Reserved	18
Reserved	19
Reserved	20
AT+GTUPD	21
AT+GTPIN	22
AT+GTDAT	23
AT+GTOWH	24
AT+GTDOG	25
AT+GTAIS	26
Reserved	27
AT+GTIDL	28
Reserved	29
AT+GTHMC	30
Reserved	31
Reserved	32
Reserved	33
AT+GTWLT	34
AT+GTHRM	35
AT+GTFFC	36

Reserved	37
AT+GTSSR	38
Reserved	39
Reserved	40
AT+GTEFS	41
Reserved	42
AT+GTIDA	43
AT+GTACD	44
AT+GTPDS	45
Reserved	46
AT+GTBZA	47
AT+GTSPA	48
AT+GTMUT	49
Reserved	50
AT+GTTMP	51
AT+GTFSC	52
AT+GTRMD	53
AT+GTPEO	54
Reserved	55 - 56
AT+GTCAN	57
Reserved	58
AT+GTUFS	59
Reserved	60
AT+GTCMD	61
AT+GTUDF	62
Reserved	63
AT+GTCFU	64
AT+GTGPJ	65
AT+GTGAM	66
AT+GTAEX	67

AT+GTOEX	68
AT+GTIEX	69
AT+GTUPC	70
AT+GTCLT	71
AT+GTGLM	79
Reserved	88
AT+GTBTS	89
AT+GTBAS	90
AT+GTBID	91
AT+GTFVR	101
AT+GTRPC	200

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

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

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

Device Name	**g**	**v**	**6**	**2**	**0**	**m**	**g**	
HEX	**67**	**76**	**36**	**32**	**30**	**6D**	**67**	**00**

- <*ID*>: Sub-command ID of **AT+GTRTO** or the ID of **AT+GTIOB** and **AT+GTGEO**. Set it to 0 for other reports.
- <*Send Time*>: The local time to send the acknowledgement message. Total 7 bytes. The first 2 bytes are for year, the rest 5 bytes 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 CRC-CCITT (0xFFFF) checksum for data from <*Message Type*> to <*Count*

Number>.

4.3. Location Report +RSP

Location messages (including **+RESP:GTPNL, +RESP:GTTOW**, **+RESP:GTAIS**, **+RESP:GTDIS**, **+RESP:GTIOB**, **+RESP:GTFRI**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTDOG, +RESP:GTIGL,** and **+RESP:GTEPS**) use this format.

➢ **+RSP,**

Example:
2B 42 53 50 00 00 FE FF FF 00 67 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 00 00 00 00 00 00 00 00 00 00 11 0C 00 01 02 00 00 00 00 00 01 43 06 CB C4 22 01 57 EA 38 07 E5 08 18 08 24 38 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 18 08 24 39 03 AB 43 8C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	

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

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

Command	**ID**
+RESP:GTPNL	0
+RESP:GTTOW	1
Reserved	2
+RESP:GTLBC	3

+RESP:GTEPS	4
+RESP:GTDIS	5
+RESP:GTIOB	6
+RESP:GTFRI	7
Reserved	8
+RESP:GTSPD	9
+RESP:GTSOS	10
+RESP:GTRTL	11
+RESP:GTDOG	12
Reserved	13
+RESP:GTAIS	14
Reserved	15
+RESP:GTIGL	16
+RESP:GTIDA	17
+RESP:GTERI	18
Reserved	19
+RESP:GTGIN	20
+RESP:GTGOT	21

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

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

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

Device Name	**g**	**v**	**6**	**2**	**0**	**m**	**g**	
HEX	**67**	**76**	**36**	**32**	**30**	**6D**	**67**	**00**

- <*Digit & Analog Input Mode*>: The mode of the digital and analog input ports, the high byte is for digital IO mode and the low 4 bits of the low byte are for the analog input 1.
- <*Digital Input Status*>: The mask of digital input1, digital input2, digital input3 and digital input4 status.

Input status mask	ID
Ignition Detection	0x01
Digital Input1	0x02
Digital Input2	0x04
Digital Input3	0x08
Digital Input4	0x10

- <*Digital Output Status*>: The mask of digital output1, digital output2, digital output3 and relay output status.

Input status mask	ID
Digital Output1	0x01
Digital Output2	0x02
Digital Output3	0x04
Digital Output4	0x08

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

Longitude 121.390847	**121390847**			
HEX	**07**	**3C**	**46**	**FF**

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

Latitude 31.164503	**31164503**			
HEX	**01**	**DB**	**88**	**57**

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

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

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

Current Mileage	0		0
HEX	00	00	00

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

Total Mileage	0				0
HEX	00	00	00	00	00

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

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

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

➢ **+RSP,**

Example:
2B 52 53 50 0A 00 FE FF FF 00 68 C2 01 05 01 01 67 76 36 32 30 6D 67 00 64 2C 58 00 01 00 00 00 00 05 00 21 0C 20 00 01 01 00 00 00 00 00 01 3D 06 CB C1 ED 01 57 E5 83 07 E5 08 18 09 33 21 01 CC 00 00 24 93 00 00 15 57 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 18 09 33 22 04 7C B3 3C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	

External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Report ID/Report Type	1		
Reserved	1		
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHHHMMSS	

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

Location report **+RESP:GTIDA** uses the format below.

- **+RSP,**

Example:
2B 52 53 50 11 00 FE FF FF 00 79 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 84 00 01 00 00 00 00 00 00 41 0B 00 10 30 31 35 41 30 31 39 37 46 41 30 30 30 30 39 31 02 01 01 00 00 00 00 00 01 AB 06 CB B9 D4 01 57 E8 CD 07 E5 08 19 07 01 28 01 CC 00 00 27 BD 00 00 12 CB 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 07 01 29 06 4A F9 FE 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+RSP	+RSP
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 3F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
Satellites in View	1		

Report ID/Report Type	1	00	00
ID Length	1		
ID	<=20	'0' – '9' 'A' – 'Z'	
ID Report Type	1	0/1/2	
Number	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <ID>: The ID that is currently being read.
- <ID Report Type>: The type of reported ID.
  0: The ID is unauthorized.
  1: The ID is authorized.
  2: The ID has logged out.

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

➢ **+RSP,**

Example:
2B 52 53 50 12 00 FE FF FF 00 00 01 00 00 AB C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 80 00 01 00 00 00 00 00 00 11 08 10 00 02 00 06 02 00 00 BF 57 54 48 33 30 30 2D 31 00 AC 23 3F A3 53 AE 01 0D E0 1A 68 3C 00 00 00 00 01 06 02 00 00 BF 57 54 48 33 30 30 2D 32 00 AC 23 3F A2 48 B3 01 0D F5 1B 00 3F 00 00 00 00 01 01 00 00 00 00 00 02 5E 06 CB CA 29 01 57 E9 56 07 E5 08 19 08 00 0D 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 08 00 0D 07 83 71 E0 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
ERI Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Report ID/Report Type	1		
Reserved	1	0	
1-Wire Device Number	1	0-8	

1-Wire Data (Optional)	*1-Wire Devices ID*	8		
	1-Wire Devices TYPE	1		
	Data Length	1		
	1-Wire Device Data	2		
CAN Data (Optional)		<=1000		
Fuel Sensor (Optional)	Fuel Sensor number	1	0-1	
	Sensor Type	1	2|4	
	Percentage (Optional)	1	0 –100	
	Volume (Optional)	2	0 –65535	
	Digital Fuel Sensor Data (Optional)	2	0 - FFFF	
Bluetooth Accessory Data(Optional)	Bluetooth Accessory Number	1	0 – 10	
	Index	1	0 – 9	
	Accessory Type	1	0-1|3|6|8	
	Accessory Model	1	0--5	
	Raw Data Length	1	00 - FF	
	Raw Data			
	Accessory Append Mask	2	0000 - FFFF	
	Accessory Name	<=21		
	Accessory MAC	6	000000000000 - FFFFFFFFFFFF	
	Accessory Status	1	0 - 1	
	Accessory Voltage	2	0 – 5000mV	
	Accessory Temperature	2	-40.00 – 80.00℃	
	Accessory Humidity	1	0-100%(RH)	
	Accessory Output status	1	00 - 03	
	Accessory Digital Input status	1	00 - 01	

	Accessory Analog Input voltage	2	8000 - 32000(mv)	
	Accessory Mode	1	0 - 10	
	Accessory Event	1	0 - 2	
RAT and Band Data (Optional)	RAT	1	0|1|3|4|5	
	Band	2	0-39|850|900|1800|1900	
Number		1	1	1
GPS Accuracy		1	0|1 – 50	
Speed		3	0.0 – 999.9km/h	
Azimuth		2	0 – 359	
Altitude		2		
Longitude		4		
Latitude		4		
GPS UTC Time		7	YYYYMMDDHHMMSS	
MCC		2	0000 – FFFF	
MNC		2	0000 – FFFF	
LAC		2	0000 – FFFF	
Cell ID		4	00000000 – FFFFFFFF	
Reserved		1	00	00
Current Mileage		3	0.0 –65535.0 km	
Total Mileage		5	0.0 – 4294967.0 km	
Current Hour Meter Count		3	HHMMSS	
Total Hour Meter Count		6	HHHHHHHHMMSS	
Send Time		7	YYYYMMDDHHMMSS	
Count Number		2	0000 – FFFF	
Checksum		2	0000 – FFFF	
Tail Characters		2	0x0D 0x0A	0x0D 0x0A

- ✧ <*UART Device Type*>: Type of device connected to the second serial port.
  - 0: No device connect
- ✧ <*1-Wire Devices ID*>: Means the 1-Wire device ID read from the device.
- ✧ <*1-Wire Devices TYPE*>: Means the 1-Wire device type.

- 1: Temperature sensor.

✧ <*Device Data Length*>: It indicates the length of <*1-Wire Devices DATA*>.

✧ <*1-Wire Devices DATA*>: Means the data read from the 1-Wire devices. If the value of <1-Wire Devices Type> is the temperature sensor, this indicates the temperature value. To convert the value of the two bytes in hex to decimal, multiply it by 0.0625 to get the temperature value in Celsius degrees. If the first 5 bits of the high byte are 1, the temperature value is below zero Celsius degrees and the value is represented in two's complement format. To obtain the temperature in decimal, plus the hexadecimal data by 1 and then multiply it by 0.0625 to get the value in Celsius degrees.

✧ <*Bluetooth Accessory Number*>: It indicates the number of accessories connected with the device.

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

✧ <*Accessory Type*>: 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**.

✧ <*Accessory Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBAS** and **AT+GTBID**.

✧ <*Raw Data Length*>: It indicates the length of <*Raw Data*>.

✧ <*Raw Data*>: The data is read from Bluetooth accessory. It varies depending on <*Accessory Type*> and <*Accessory Model*>.

- WTH300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicates 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.
- 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 indicates 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*>: A numeral to indicate whether the accessory is available.

- 0: The accessory is not available.
- 1: The accessory is available.

✧ <*Accessory Voltage*>: The voltage of Bluetooth accessory.

✧ <*Accessory Temperature*>: Temperature data of Bluetooth accessory. For example, 0x1B8F means 27.56°C (0x1B=27; 0x8F=143, 143/256=0.56).

✧ <*Accessory Output status*>: Extended output *status* of Bluetooth accessory.

✧ <*Accessory Digital Input status*>: Extended digital input status of Bluetooth accessory.

✧ <*Accessory Analog Input voltage*>: Extended analog input voltage of Bluetooth accessory.

- ✧ <*Accessory Mode*>: The operating mode of angle sensor.
- ✧ <*Accessory Event*>: The event is generated by the angle sensor.
- ✧ <*RAT*>: Radio access technology.
  - 0: Invalid RAT
  - 1: 2G
  - 3: LTE CAT-M1
  - 4: LTE NBIOT
- ✧ < *Band*>: 0 mean invalid band,1-39 means band number and others mean GSM bands.

Note: The key word (optional) means the item is controlled by the parameter <*ERI Mask*>.

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

➢ **+RSP,**

Example:
2B 52 53 50 15 00 FE FF FF 00 70 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 64 00 01 00 00 00 00 01 00 21 0C 01 01 00 00 00 00 00 00 00 01 01 01 00 00 00 00 00 01 3D 06 CB C1 ED 01 57 E5 83 07 E5 08 18 09 38 34 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 18 09 38 35 04 81 84 42 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	

Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Area Type	1	0|1	
Group Mask	1	01-1F	
GEO ID Group	8	64bit 0000000000000001-0000 0000000FFFFF (GEOID 0 - 19)	
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Area Type>*: This text belongs to Polygon or circle area, 0 means Polygon.

- <*Group Mask*>: The bitwise mask to confirm the reported <*GEO ID Group*>. For GV620MG, only bit 0 is valid and it should be set to 1.
- <*GEO ID Group*>: The bitwise mask for trigger condition composition of the corresponding GEO ID. For GV620MG, only the lowest 20 bits are valid. Each bit, from bit 0 to bit 19, represents the logical status of the corresponding GEO ID to trigger the entering or exiting event. 1 means that the event of the GEO ID set has been triggered and 0 means has not.

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

- **+RSP,**

Example:
2B 52 53 50 03 00 FE FF FF 00 6F C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 74 00 01 00 00 00 00 01 00 21 0C 00 81 86 18 66 49 49 99 2F 01 01 00 00 00 00 00 01 3D 06 CB BD 03 01 57 E3 F7 07 E5 08 18 0A 07 10 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 18 0A 07 11 04 88 95 CE 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	

Satellites in View	1		
Report ID/Report Type	1		
Number Length/ Number Type	1		
Phone Number	<=10		
Number	1	1 – 15	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

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

✧ <*Phone Number*>: Not more than 10 bytes. Each byte uses the high nibble and low nibble to represent one digit of the phone number respectively. If the last low nibble has no digit to represent, fill in 0xF.

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

4.4. Information Report +INF

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

- **+INF,**

Example:
2B 49 4E 46 01 FF 7F 00 99 67 76 36 32 30 6D 67 00 C2 01 03 04 01 01 02 00 00 01 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 11 00 08 40 07 E6 03 15 02 17 32 00 01 00 7F 00 00 1E 00 00 3C 00 00 00 80 00 00 00 00 00 00 00 89 86 04 03 10 20 80 50 55 75 11 00 00 00 00 00 04 01 CC 00 00 24 93 00 00 14 AD 00 0C 01 CC 00 00 27 BD 00 00 11 1F 00 11 01 CC 00 00 24 93 00 00 14 65 00 0E 01 CC 00 00 24 93 00 00 17 67 00 10 07 E6 03 15 02 18 0F 5B BB 1A C0 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+INF	+INF
Message Type	1		
Report Mask	2	0000 – FFFF	
Expand INF Mask	2	0000 - FFFF	
Length	2		
Unique ID	8/12	IMEI/MUID/Device Name	
Device Type	1	C2	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	**+RESP:GTVER**
Configuration Version	2	0000	
Bluetooth Version	2	0000 – FFFF	
Analog Input Mode	1		**+RESP:GTIOS**
Analog Input1 Voltage	2		
Reserved	2	0000	
Reserved	1	00	
Reserved	2	0000	

Reserved	2	0000	
Reserved	2	0000	
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
IO mode	1	0-F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	**+RESP:GTGPS**
Reserved	1	00	
Satellites in View	1		
Power Saving Enable/OWH Mode/Outside Working Hour/AGPS	1		
Last Fix UTC Time	7	YYYYMMDDHHMMSS	
Reserved	1	00	
FRI Discard No Fix	1	0|1	
Report Composition Mask	2		
IGN Interval	3		
IGF Interval	3		
Reserved	2	0000	
Reserved	1	00	
Main Supply/Backup Battery On/Charging/LED On/Backup Battery Charge Mode	1		**+RESP:GTBAT**
External Power Supply VCC	2	0 – 36000mV	
External Power Supply2 VCC	2	0 – 36000mV	
Backup Battery VCC	2	0 – 4500mV	
Backup Battery Level	1	0 - 100	
ICCID	10	ICCID	**+RESP:GTCID**
CSQ RSSI	1	0 – 31	**+RESP:GTCSQ**
CSQ FER	1	0 – 7	
Time Zone Offset Sign/	1		**+RESP:GTTMZ**

Enable Daylight Saving			
Time Zone Offset	2	HHMM	
Fix Type	1		**+RESP:GTGSM**
Cell Number	1		
MCC	2		
MNC	2		
LAC	2		
Cell ID	4		
Reserved	1		
RX Level	1		
…			
MCC	2		
MNC	2		
LAC	2		
Cell ID	4		
Reserved	1		
RX Level	1		
SV Count	1		**+RESP:GTGSV**
SV id	1		
SV Power	1		
……			
SV id	1		
SV Power	1		
CAN100 SW Version Length	1	0-10	**+RESP:GTCVN**
CAN100 SW Version	<=10		
CAN100 Serial Number length	1	0-10	**+RESP:GTCSN**
CAN100 Serial Number	<=10		
CAN100 Car Model ID	2	0x0000-0xFFFF	**+RESP:GTCML**
CAN100 Car Name Length	1	0-50	
CAN100 Car Name	<=50		

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

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

Command	ID
+RESP:GTINF	1
+RESP:GTGPS	2
Reserved	3
+RESP:GTCID	4
+RESP:GTCSQ	5
+RESP:GTVER	6
+RESP:GTBAT	7
+RESP:GTIOS	8
+RESP:GTTMZ	9
+RESP:GTGSM	10
+RESP:GTGSV	11
+RESP:GTCVN	13
+RESP:GTCSN	20
+RESP:GTCML	26

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

✧ <*Unique ID*>: When "MUID Enable" in AT+GTCFG is 0, if the Bit 1 of <*+INF Mask*> is 0, IMEI of the device is used as the unique ID. IMEI has 14 bytes in hexadecimal format. In the Hex format message, every two bytes are encoded into one byte as an integer. The 8th byte is reserved and its value is 0x00.

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

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

Device Name	g	v	6	2	0	m	g	
HEX	67	76	36	32	30	6D	67	00

- <*Power Saving Enable/OWH Mode/Outside Working Hours/AGPS*>: The highest bit, 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 the working hours. 1 means it is outside the working hours.
- <*Main Supply/Backup Battery On/Charging/LED On/Backup Battery Charge Mode*>: The highest bit, bit 7 is for <*Main Supply*> to indicate whether the external power supply is connected to the device. Bit 6 is for <*Backup Battery On*> to indicate whether the backup battery is working. Bit 5 is for <*Charging*> to indicate whether the backup battery is currently charging. Bit 4 is for <*LED On*> to indicate whether the LEDs are turned on. Bit 0-1 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 ICCID.

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

- <*Time Zone Offset Sign/Enable Daylight Saving*>: Bit 1 is for <*Enable Daylight Saving*> which indicates whether the daylight saving function is currently enabled. Bit 0 is for <*Time Zone Offset Sign*> which indicates the positive or negative offset of the local time to UTC. 1 means "negative offset".
- <*Fix Type*>: A string to indicate the type of GPS fix this cell information is for.

"INF": This cell information is for INF request.
"SOS": This cell information is for SOS requirement.
"RTL": This cell information is for RTL requirement.
"LBC": This cell information is for LBC requirement.
"TOW": This cell information is for TOW requirement.
"FRI": This cell information is for FRI requirement.
"GIR": This cell information is for sub command "**C**" in **AT+GTRTO** command.
"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*>: It represents the number of the IMSI**.** The IMSI consists of MCC, MNC, LAC, and Cell ID.
- <CAN100 Car Model ID>: The car model ID of the CAN100 device. If the value is 0, this means that no model has been obtained.
- <CAN100 Car Name>: It is the readable make and model of the car.

4.5. Event Report +EVT

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

➢ **+EVT,**

Example:
2B 45 56 54 01 00 FE FF FF 00 66 C2 01 00 01 01 67 76 36 32 30 6D 67 00 00 00 00 00 01 00 00 00 00 00 00 21 0C 01 00 00 00 00 00 00 01 3D 06 CB BC EF 01 57 E4 42 07 E5 08 19 03 21 0A 00 00 00 00 24 93 00 00 15 57 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 03 23 3B 05 91 21 4C 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	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	

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

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

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

+RESP:GTBPL	6
+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
Reserved	10
Reserved	11
+RESP:GTPDP	12
+RESP:GTIGN	13
+RESP:GTIGF	14
+RESP:GTUPD	15
+RESP:GTIDN	16
+RESP:GTIDF	17
+RESP:GTDAT	18
Reserved	19
Reserved	20
+RESP:GTGSS	21
+RESP:GTFLA	22
+RESP:GTSTR	23
+RESP:GTSTP	24
Reserved	25
Reserved	26
+RESP:GTDOS	27
+RESP:GTGES	28
+RESP:GTLSP	29
+RESP:GTTMP	30
+RESP:GTDTT	31
+RESP:GTRMD	33
+RESP:GTEXP	35
+RESP:GTUFS	37
+RESP:GTUPC	39

+RESP:GTGPJ	40
+RESP:GTCLT	41
+RESP:GTCFU	42
+RESP:GTVGN	45
+RESP:GTVGF	46
Reserved	47
Reserved	48
Reserved	49
+RESP:GTMUP	50
+RESP:GTBAA	51
+RESP:GTBID	52
+RESP:GTBIE	77

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

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

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

Device Name	**g**	**v**	**6**	**2**	**0**	**m**	**g**	
HEX	**67**	**76**	**36**	**32**	**30**	**6D**	**67**	**00**

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

- **+EVT,**

Example:
2B 45 56 54 06 00 FE FF FF 00 68 C2 01 05 01 01 67 76 36 32 30 6D 67 00 09 00 00 00 00 00 00 00 00 1E 00 11 0C 0E 00 01 01 00 00 00 00 00 00 77 06 CB BD 0B 01 57 E4 95 07 E5 08 1A 02 21 06 01 CC 00 00 24 93 00 00 16 F9 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 1A 02 21 07 34 EA 3C DA 0D 0A

Parameter	Length (Byte)	Range/Format	Default

Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Backup Battery VCC	2	0 – 4500 mV	
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	

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

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

- **+EVT,**

Example:
2B 45 56 54 0D 00 FE FF FF 00 6A C2 01 05 01 01 67 76 36 32 30 6D 67 00 64 2C 78 00 01 00 00 00 00 01 00 21 0C 00 00 00 15 01 01 00 00 00 00 00 00 5E 06 CB BC AC 01 57 E4 8E 07 E5 08 19 03 3A 32 01 CC 00 00 27 BD 00 00 13 4D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 03 3A 33 05 C6 8B 56 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	

Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTCLT** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 29 00 FE FF FF 00 73 C2 01 05 05 01 47 56 36 30 30 4D 00 00 64 00 00 00 00 00 00 00 00 00 00 42 0C 00 00 00 00 00 00 00 00 00 00 00 00 02 01 01 00 00 00 00 00 00 6B 06 CB BB 9A 01 57 E3 B9 07 E6 06 11 03 29 09 01 CC 00 00 27 BD 00 00 13 4D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E6 06 11 03 29 06 17 9C EA D6 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	

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

- <Group ID>: This is the ID of CANBUS alarm group. The CANBUS alarm function supports 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** report.
- <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** report.

✧ <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** report.

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

Example:
2B 45 56 54 27 00 FE FF FF 00 8C C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 5C 00 01 00 00 00 00 00 00 41 0C 00 00 CA 22 68 74 74 70 3A 2F 2F 32 31 38 2E 31 37 2E 34 36 2E 31 31 3A 39 33 35 39 2F 32 2E 47 56 36 32 30 4D 47 01 01 00 00 00 00 00 00 46 06 CB BC 4E 01 57 E3 FD 07 E5 08 19 05 2D 08 01 CC 00 00 24 93 00 00 16 F9 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 05 2D 09 05 F4 73 9E 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	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Command ID	1		

Result	2	100|101|102|103|200|201|202|300|301|302	
URL Length	1		
Download URL	<=60	Complete URL	1
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the successfully executed commands when the result code is 301. And it is the number of the commands which have failed to execute when the result code is 302.
- <*Result*>: A numeral to indicate whether the configuration is updated successfully.
  - 100: The update command is starting.
  - 101: The update command is confirmed by the device.

- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.

✧ <*URL Length*>: The length of complete URL.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name.

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

Example:
2B 45 56 54 27 00 FE FF FF 00 8C C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 5C 00 01 00 00 00 00 00 00 41 0C 00 00 CA 22 68 74 74 70 3A 2F 2F 32 31 38 2E 31 37 2E 34 36 2E 31 31 3A 39 33 35 39 2F 32 2E 47 56 36 32 30 4D 47 01 01 00 00 00 00 00 00 46 06 CB BC 4E 01 57 E3 FD 07 E5 08 19 05 2D 08 01 CC 00 00 24 93 00 00 16 F9 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 05 2D 09 05 F4 73 9E 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	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	

Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Code	2		
Retry	1		
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

- **+EVT,**

Example:
2B 45 56 54 11 00 FE FF FF 00 6A C2 01 05 01 01 67 76 36 32 30 6D 67 00 64 2C 84 00 01 00 00 00 00 00 00 11 0C 00 00 00 5E 01 01 00 00 00 00 00 00 5A 06 CB BC EF 01 57 E4 65 07 E5 08 19 03 2D 27 01 CC 00 00 27 BD 00 00 12 CB 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 03 2D 28 05 AC E7 23 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Duration of Idling	4		
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	

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

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

- **+EVT,**

Example:
2B 45 56 54 12 00 FE FF FF 00 6F C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 80 0F 01 00 00 00 00 00 00 41 0C 00 07 31 32 32 33 33 0D 0A 01 01 00 00 00 00 00 00 46 06 CB BC 84 01 57 E4 4C 07 E5 08 19 06 2F 17 01 CC 00 00 24 93 00 00 16 F9 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 06 2F 18 06 37 D5 85 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	C2	C2

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Data Length	2		
data			
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	

Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
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 <Data Type> parameter.

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

➢ **+EVT,**

Example:
2B 45 56 54 15 00 FE FF FF 00 6B C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 80 00 01 00 00 00 00 00 00 41 0C 00 00 00 00 00 01 00 00 00 00 00 00 00 46 06 CB BC 4E 01 57 E3 FD 07 E5 08 19 05 38 09 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 05 39 0A 06 00 E5 1D 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	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		

External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
GPS Signal Status	1	0 | 1	
Reserved	4	00000000	
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	

Tail Characters	2	0x0D 0x0A	0x0D 0x0A

<*GPS Signal Status*>: 0 means GPS signal is lost or no successful GPS fix; 1 means GPS signal recovered and GPS fix succeeded.

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

- **+EVT,**

Example: **2B 45 56 54 16 00 FE FF FF 00 69 C2 01 05 01 01 67 76 36 32 30 6D 67 00 64 2C 7C 00 01 00 00 00 00 00 00 11 0B 00 0C 02 01 01 00 00 00 00 00 01 AB 06 CB BC F6 01 57 EC 03 07 E5 08 19 07 16 29 01 CC 00 00 27 BD 00 00 12 CB 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 07 16 2A 07 01 12 56 0D 0A**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	

Satellites in View	1		
Input ID	1	0|1|2	
Last Fuel Level	1	0 – 100	
Current Fuel Level	1	0 – 100	
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTEXP** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 23 00 FE FF FF 00 6A C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 88 00 01 00 00 00 00 00 00 11 0B 04 00 00 02 01 01 00 00 00 00 00 01 AB 06 CB BC F6 01 57 EC 03 07 E5 08 19 07

22 1B 01 CC 00 00 24 93 00 00 17 FD 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 07 22 1C 07 1D A1 8C 0D 0A			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Digital Fuel Sensor Type	1	2/4	
Reserved	1		
Reserved	1		
HW Fault Code	1		
Number	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	

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

Event report **+RESP:GTUFS** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 25 00 FE FF FF 00 69 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 84 00 01 00 00 00 00 00 00 11 0B 00 C8 00 01 00 00 00 00 00 00 00 01 AB 06 CB BC F6 01 57 EC 03 07 E5 08 19 07 23 1A 01 CC 00 00 24 93 00 00 17 FD 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 07 24 1B 07 25 A8 8F 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	

Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Code	2		
Reserved	1		0
Number	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

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

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

- **+EVT,**

Example:
2B 45 56 54 28 00 FE FF FF 00 68 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 34 00 01 00 00 00 00 01 00 21 0C 13 01 01 01 00 00 00 00 00 00 5A 06 CB BC EF 01 57 E4 65 07 E5 08 19 03 28 2D 01 CC 00 00 24 93 00 00 15 57 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 03 28 2E 05 A5 F5 C3 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	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	

Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
CW Jamming Value	1	0-255	
GPS Jamming State	1	0-3	
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- *<CW Jamming Value>*: Current continuous wave jamming value.
- *<GPS Jamming State>*: Current jamming state.
  - 0: Unknown or feature disabled.

- 1: (Ok) no significant jamming.
- 2: (Warning) interference visible but fix OK.
- 3: (Critical) interference visible and no fix.

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

➢ **+EVT,**

Example: **2B 45 56 54 1B 00 FE FF FF 00 68 C2 01 05 01 01 67 76 36 32 30 6D 67 00 64 2C 3C 0F 01 00 00 00 00 00 00 41 0C 01 00 01 01 00 00 00 00 00 00 46 06 CB BC 53 01 57 E4 08 07 E5 08 19 06 14 28 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 06 14 29 06 1D D6 83 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	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		

Wave1 Output ID	1	1-4|5-6	
Wave1 Ouptut Active	1	0|1	
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

- **+EVT,**

Example:
2B 45 56 54 1C 00 FE FF FF 00 72 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 40 0F 01 00 00 00 00 00 00 41 0C 00 02 01 15 00 00 00 32 00 00 00 0A 01 01 00 00 00 00 00 00 46 06 CB BC 6B 01 57 E4 15 07 E5 08 19 06 17 28 01 CC 00 00 24 93 00 00 16 F9 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 06 17 29 06 24 6D 88 0D 0A

Parameter	Length	Range/Format	Default

	(Byte)		
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Trigger GEO ID	2	0-19	
Trigger GEO Enable	1	0|1	
Trigger Mode	1	0|21|22	
Radius	4	50 – 6000000m	
Check Interval	4	0|5 – 86400sec	
Number	1	1	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	

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

✧ <*Trigger GEO ID*>: The ID of Geo-Fence. The range is 0 – 19.

✧ <*Trigger GEO Enable*>: Current Parking-Fence is active or inactive.

- 0 Current Parking-Fence is inactive.
- 1 Current Parking-Fence is active.

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

➢ **+EVT,**

Example:

2B 45 56 54 1E 00 FE FF FF 00 73 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 88 00 01 00 00 00 00 01 00 21 0B 00 01 28 8C 4F C5 08 00 00 92 00 00 1B 01 00 00 00 00 00 00 01 AB 06 CB BC F6 01 57 EC 03 07 E5 08 19 07 23 1A 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 07 37 24 07 56 E1 4F 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	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Temperature Alarm ID	1	0 – 7	
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	1
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		

GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
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 temperature alarm.
- <*Temperature Status*>: The status of current temperature. 0 means beyond the predefined temperature range. 1 means within the predefined temperature range.
- <*Temperature Sensor device ID*>: The ID of the temperature sensor.
- <*Temperature Sensor device DATA*>: The current temperature detected by the sensor.

The event report message **+RESP:GTBAA** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 33 00 FE FF FF 00 7F C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 80 21 00 06 02 00 00 BF 57 54 48 33 30 30 2D 31 00 AC 23 3F A3 53 AE 01 0D E0 1A 3C 06 02 00 00 00 00 00 02 1D 06 CB C8 9C 01 57 E9 9C 07 E5 08 19 07 3A 1B 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 07 3A 1B 07 77 9D DB 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	C2	C2

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device name	
Battery Level	1	0–100	
External Power Voltage	2		
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Index	1	0 – 9|0xFF	
Accessory Type	1	0|1|3|5|6	
Accessory Model	1	0--5	
Alarm Type	1	00 – FF	
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 Voltage	2	0 – 5000mV	
Accessory Temperature	1	-40 – 80℃	
Accessory Humidity	1	0-100%(rh)	
Accessory Mode	1	0 - 10	
Accessory Event	1	0 - 2	
Satellites in View	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	4	0000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Reserved	6		
Reserved	1		
Reserved	1		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- *<Index>*: There are two meaning for *<Index>.*
  - The index of Bluetooth accessory defined in **AT+GTBAS** which triggers the **+RESP:GTBAA** message.
  - For BID Accessory, it is 0xFF..
- *<Accessory Type>*: The type of the Bluetooth accessory which is defined in the <Index>.
  - 0: No Bluetooth accessory.
  - 1: Escort Bluetooth Accessory.
  - 3: Bluetooth beacon accessory.
  - 5: BLE lock.
  - 6: Beacon multi-functional sensor.
- *<Accessory Model>*: The model of the Bluetooth accessory which is defined in **AT+GTBAS** and **AT+GTBID**.
- *<Alarm Type>*: The type of alarm which generated according to *<Sensor Type>* and *<Sensor Model>* specified in **AT+GTBAS** command.
  - 0: The voltage of the Bluetooth accessory is low.
  - 1: Temperature alarm: The current temperature value is below <Low Temperature> set in the AT+GTBAS command.
  - 2: Temperature alarm: The current temperature value is above <High Temperature> set in the AT+GTBAS command.
  - 3: 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 of WKF300 is detected.
- 5. Unlock success.
- 6. Unlock fail.
- 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*>, which are set in the **AT+GTBAS** command.
- A. Angle event notification.
- 11 No available Bluetooth accessory was detected.
- 12 An available Bluetooth accessory was detected.
- 13: Door opened.
- 14: Door closed.

✧ <*Append Mask*>: Bitwise mask defined in **AT+GTBAS** and **AT+GTBID** commands to configure which data item is reported.

✧ <*Accessory Name*>: Bluetooth accessory MAC address.

✧ <*Accessory MAC*>: Bluetooth accessory MAC address.

✧ <*Accessory Status*>: A numeral to indicate whether the accessory is available.

- 0: The accessory is not available.
- 1: The accessory is available.

✧ <*Accessory Voltage*>: The voltage of Bluetooth accessory.

✧ <*Accessory Temperature*>: Temperature data of Bluetooth accessory.

✧ <*Accessory Humidity*>: Humidity data of the Bluetooth accessory.

✧ <*Accessory Mode*>: The operating mode of angle sensor.

✧ <*Accessory Event*>: The event is generated by the angle sensor.

The event report message **+RESP:GTBID** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 34 00 FE FF FF 00 66 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 68 22 00 08 02 00 00 00 00 00 02 65 06 CB CA 8E 01 57 E8 F6 07 E5 08 19 08 03 20 01 CC 00 00 27 BD 00 00 0D FC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 08 03 20 07 90 91 09 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	C2	C2
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		
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Number	1	0 – 15	
Accessory Model	1	0|4|5	
Append Mask	2	0000 – FFFF	
Accessory MAC	6	'0' – '9' 'A' – 'F'	
Accessory Voltage	2	0 – 5000mV	
Accessory Signal Strength	1	-120 - 0	
Accessory Temperature	2	-40.00 - 80.00(℃) |-128.00	
Satellites in View	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	4	0000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	

Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Reserved	6		
Reserved	1		
Reserved	1		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Number*>: The number of Bluetooth beacon ID.
- <*Accessory Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBID**.
- <*Append Mask*>: Bitwise mask defined in the **AT+GTBID** command to configure which data item is reported.
- <*Accessory MAC*>: Bluetooth accessory MAC address.
- <*Accessory Voltage*>: The voltage of Bluetooth accessory.
- <*Accessory Signal Strength*>: The signal strength of the Bluetooth beacon accessory. If the value of the signal strength is negative, it is represented in 2's complement format.
- <*Accessory Temperature*>: Temperature data of Bluetooth beacon accessory.
  Example, 0x1B8F means 27.56°C (0x1B=27; 0x8F=143, 143/256=0.55), -128(0x8000) means invalid.

The event report message **+RESP:GTBIE** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 4D 00 FE FF FF 01 4B C2 01 09 08 01 47 56 36 30 30 4D 00 00 00 00 00 11 04 00 03 01 01 10 05 00 5F AC 23 3F A2 49 83 0C 75 BD 15 D9 05 00 5F 78 05 41 25 1F 32 0D F5 AE 15 A3 05 00 5F 78 05 41 25 1E F3 0D F5 AB 15 8C 05 00 5F 78 05 41 25 1E 98 0D F2 AB 15 CA 05 00 5F 78 05 41 25 1E F7 0E 04 A5 15 99 05 00 5F 78 05 41 04 58 62 0C 15 B0 15 F3 05 00 5F 78 05 41 25 1E F1 0D EF AD 15 42 05 00 5F AC 23 3F A2 48 90 0D E0 B1 15 C0 05 00 5F 78 05 41 25 1E E7 0D F2 A7 15 C7 05 00 5F AC 23 3F E2 C0 5A 0C 57 B0 1B 00 05 00 5F AC 23 3F A2 48 B3 0C BD B1 15 F0 05 00 5F AC 23 3F E2 BE DB 0A CE B0 1A 00 05 00 5F 78 05 41 25 1E F4 0D EF A8 15 AB 05 00 5F B8 4B A4 CF C4 00 0B 2D AE 15 19 05 00 5F 60 C0 BF 60 A2 C2 0C 91 C5 15 90 05 00 5F 60 C0 BF 87 F6 85 0B 2A D0 13 A0 01 01 00 00 00 00 00 00 40 06 CA B4 83 01 58 72 1E 07 E7 01 1F 06 39 0E 01 CC 00 00 24 95 00 00 11 79 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E7 01 1F 06 39 0F 7D CD 0C 04 0D 0A

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

Message Type	1		
Report Mask	4	(HEX)	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	(HEX)	
Firmware Version	2	(HEX)	
Unique ID	8	IMEI/Device name	
Battery Level	1	0 – 100	
External Power Voltage	2		
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Detected Count	2	0 - 9999	
Total Frame	1	1 - 2	
Frame Index	1	1 - 2	
Beacon Number	1	0 - 25	
Beacon ID Accessory Model	1	0|5	
Accessory Append Mask	2	(HEX)	
Accessory MAC	6	(HEX)	
Accessory Battery Level	2	0 - 5000(mV)	
Accessory Signal Strength	1	-120 - 0	
Accessory Temperature	2	--40.00 - 80.00(℃)|-128.00	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9(km/h)	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4	-180 - 180	
Latitude	4	-90 - 90	

GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – 0FFF	
MNC	2	0000 – 0FFF	
LAC	2	(HEX)	
Cell ID	4	(HEX)	
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	
Reserved	6		
Reserved	1		
Reserved	1		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	(HEX)	
Checksum	2	Checksum	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTDTT** uses the format below.

- **+EVT,**

Example:			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Report Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	

Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
Satellites in View	1		
Reserved	1	0	
Data Length	2		
Data			
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

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

✧ <Data Length>: It expresses the length of the <Data> parameter.

Event message **+RESP:GTRMD** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 21 00 FE FF FF 00 67 C2 01 00 01 01 67 76 36 32 30 6D 67 00 64 2C 7C 0F 01 00 00 00 00 00 00 41 0C 02 01 01 00 00 00 00 00 00 46 06 CB BC 6B 01 57 E4 15 07 E5 08 19 06 18 27 01 CC 00 00 24 93 00 00 16 F9 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E5 08 19 06 18 28 06 26 BD 8D 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	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 1F	

Digital Output Status	1	00 – 0F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in View	1		
Roaming State	1	0-3	
Number	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTCFU** uses the format below.

- **+EVT,**

Example:
2B 42 56 54 2A 00 2E 55 9B 00 52 DC 01 05 56 01 0C 04 0B 57 37 02 30 0A 00 3C 00 00 11 09 00 65 00 01 01 00 00 00 00 00 06 CA B5 3D 01 58 71 E1 07 E6 07 1C 06 2B 24 01 CC 00 00 24 95 00 00 11 6D 00 00 00 00 00 00 07 E6 07 1C 06 2B 24 42 66 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digit & Analog Input Mode	2		
Analog Input1 Voltage	2		
External Power Supply2 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
Satellites in View	1		
Code	2		
Reserved	1	00	00
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	

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

4.6. Data Report +DAT

Data reports **+RESP:GTPHD**, **+RESP:GTEHD** and **+RESP:GTCRG** use the format below. They are only sent via GPRS even if the report mode is Force on SMS.

➢ **+DAT,**

Example: **2B 44 41 54 02 00 00 00 7F 00 4E C2 01 00 01 01 67 76 36 32 30 6D 67 00 00 27 2A 51 4C 2C 35 30 38 4A 2C 30 34 2C 30 31 32 35 35 2C 30 32 30 30 2C 30 37 30 39 2C 30 31 32 35 35 2C 30 32 39 30 23 07 E5 08 19 07 11 2B 06 C7 F0 35 0D 0A**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Report Header	4	+DAT	+DAT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Data Length	2		+RESP:GTFSD
Sensor Data	<=128		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of data report.

Command	**ID**
Reserved	1
+RESP:GTFSD	2

✧ <Report Mask>: Please refer to the <+DAT Mask> in **AT+GTHRM**.

4.7. CANBUS Report +CAN

CANBUS Report Information **+RESP:GTCAN** uses the format below.

➢ **+CAN,**

Example:
2B 43 41 4E 01 00 00 07 F0 01 46 C2 01 05 05 01 47 56 36 30 30 4D 00 00 02 01 E0 7F FF FF 4C 53 56 4E 59 34 31 5A 30 42 32 35 32 31 38 39 30 02 00 00 00 00 00 00 00 0A 02 04 31 00 1E 00 33 FE 5F 86 00 00 03 E8 00 00 00 00 00 00 00 00 03 E8 00 46 00 00 09 C4 00 00 00 07 D0 00 00 00 01 90 00 00 00 00 50 02 55 11 FF FF FF FF 3F 3F 00 00 01 C2 00 00 00 00 C8 00 00 00 35 A0 00 7F FF FF 00 3C 13 88 EA 60 B1 DD 00 01 00 00 00 27 10 00 01 38 80 00 01 5F 8C 00 01 82 48 00 01 86 9F 63 00 00 00 01 00 00 00 00 02 00 00 00 01 D8 02 54 0B E3 FF 02 54 0B E3 FE 66 68 6A 61 68 66 64 73 6A 6B 61 66 68 64 6A 6B 61 73 66 68 61 6A 73 6B 64 66 68 61 73 64 6A 6B 6C 66 68 61 73 6B 64 6A 66 68 61 6A 73 6B 64 66 68 61 73 6A 6B 64 66 68 61 73 64 6B 6A 66 68 61 73 64 6B 6A 66 68 61 73 64 6B 6A 66 00 00 00 00 00 49 96 02 D2 1F FF 00 00 03 E8 00 00 13 88 01 00 00 00 00 00 00 6B 06 CB BB 9A 01 57 E3 B9 07 E6 06 11 03 29 08 01 CC 00 00 27 BD 00 00 13 4D 00 07 E6 06 11 03 29 05 17 97 BD E5 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+CAN	+CAN
Message Type	1	01	01
Report Mask	4	0x00000000 – 0xFFFFFFFF	
Length	2		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Report Type	1	0/1/2	
CANBUS Device State	1	0/1	
CANBUS Report Mask	4	0x00000000 - 0xFFFFFFFF	
VIN	17		
Ignition Key	1	0/1/2	
Total Distance	4	H(0 – 99999999)/I(0 – 2147483647)	
Total Fuel Used	5	0.00 – 999999.99	

Engine RPM	2	0 – 16383 rpm	
Vehicle Speed	2	0 - 400Km/h	
Engine Coolant Temperature	2	-40 ℃ +215 ℃	
Fuel Consumption	3	L/100km(0.0–999.9)/L/H(0.0–999.9)	
Fuel Level (Liters)	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	0.00 – 99999.99h	
Total Driving Time	5	0.00 – 99999.99h	
Total Engine Idle Time	5	0.00 – 99999.99h	
Total Idle Fuel Used	5	0.00 –999999.99l	
Axle Weight	2	0 – 65535kg	
Tachograph Information	2	00-FFFF	
Detailed Information/Indicators	2	00-FFFF	
Lights	1	0x00-0xFF	
Doors	1	0x00-0xFF	0
Total Vehicle Overspeed Time	5	0 – 99999.99h	
Total Vehicle Engine Overspeed Time	5	0 – 99999.99h	
Total Distance Impulses	4	0– 2147483648	
Gross Combination Vehicle Weight	2	0 – 64255 (10kg)	
Catalyst Tank Liquid Level	1	0 – 100%	
CANBUS 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	5	0-9999999999	
Tachograph Driver 2 Card Number	5	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	5	0-9999999999	
Expansion Information	2	0x0000-0xFFFF	
Rapid Braking	4	0-999999	
Rapid Accelerations	4	0-999999	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	

Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Character	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of CAN report.

Command	ID
+RESP:GTCAN	1

✧ <Report Mask>: Please refer to the <+CAN Mask> in **AT+GTHRM.**

✧ <Length>: The whole length of the report from header to the tail characters.

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

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

If Bit6 of <+CAN Mask> is 1, the device name is used as the unique ID of the device. Please refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	**g**	**v**	**6**	**2**	**0**	**m**	**g**	
HEX	**67**	**76**	**36**	**32**	**30**	**6D**	**67**	**00**

✧ <Report Type>: A numeric to indicate the report type.

- 0: Periodical report.
- 1: Real time request report.
- 2: Ignition on/off report.

✧ <CANBUS Device State>: A numeric to indicate the communication state with the external

CANBUS device.

- 0: Abnormal. It fails to receive data from the external CANBUS device.
- 1: Normal. It is able to receive data from the external CANBUS device.

✧ <CANBUS Report Mask>: Please refer to the <CAN Report Mask> in **AT+GTCAN**.

✧ <Total Distance>: Vehicle distance. The number is always increasing. The unit is hectometer. If it is 0, the distance is not available.

✧ <Total Fuel Used>: A total of 5 bytes. The first 4 bytes are for the integer part of the total fuel used and the last byte is for the fraction part. The fraction part has 2 digits.

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

✧ <Fuel Level (Liters)>: 5 bytes in total. The first 4 bytes are for the integer part of the fuel level (liters) and the last byte is for the fraction part. The fraction part has 2 digits. This field is controlled by Bit 8 in <CANBUS Report Mask>.

✧ <Fuel Level (Percentage)>: 5 bytes in total. The first 4 bytes are for the integer part of the fuel level (percentage) and the last byte is for the fraction part. The fraction part has 2 digits. This field is controlled by Bit 8 in <CANBUS Report Mask>.

✧ <Fuel Consumption>: 3 bytes in total. The first byte indicates the unit. The unit of L/100km is represented as FE and the unit of L/H is represented as FF. The other two bytes indicate the value. The fuel consumption value is converted to an integer with 1 implicit decimal digit multiplied it by 10. The integer is reported in HEX format.

Fuel Consumption Value 12.1	**121**	
HEX	**00**	**79**

✧ <Total Engine Hours>: 5 bytes in total. The first 4 bytes are for the integer part of the total engine hours and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Driving Time>: 5 bytes in total. The first 4 bytes are for the integer part of the total driving time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Engine Idle Time>: 5 bytes in total. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Idle Fuel Used>: 5 bytes in total. The first 4 bytes are for the integer part of the total idle fuel used and the last byte is for the fraction part. The fraction 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: Valid time 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 41h.
- 2: 41h reached.
- 3: 15min before 9h.
- 4: 9h reached.

- 5: 15 min 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>: 2 bytes in total. 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 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.

For CAN100, each bit contains information of one door.

- Bit 0: Driver Door (1 – opened, 0 – closed).
- Bit 1: Passenger Door (1 – opened, 0 – closed).
- Bit 2: Rear Left Door (1 – opened, 0 – closed)
- Bit 3: Rear Right Door (1 – opened, 0 – closed).
- Bit 4: Trunk (1 – opened, 0 – closed).
- Bit 5: Hood (1 – opened, 0 – closed).
- Bit 6: Reserved.

- Bit 7: Reserved.

✧ <Total Vehicle Overspeed Time>: 5 bytes in total. The first 4 bytes are for the integer part of the total vehicle overspeed time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Vehicle Engine Overspeed Time>: 5 bytes in total. The first 4 bytes are for the integer part of the total vehicle engine overspeed time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Distance Impulses>: Vehicle distance in impulses. The number is always increasing. The unit is imp. If it is 0, the distance in imp is not available.

✧ <Ad-Blue Level>: The level of Ad-Blue. 2 bytes in total.

✧ <Axle Weight 1st>: Vehicle first axle weight. The unit is Kg.

✧ <Axle Weight 3rd>: Vehicle third axle weight. The unit is Kg.

✧ <Axle Weight 4th>: Vehicle fourth axle weight. The unit is Kg.

✧ <Tachograph Overspeed Signal>: The value 1 indicates “Overspeed”. The value 0 indicates “No overspeed”.

✧ <Tachograph Vehicle Motion Signal>: The vehicle motion signal from tachograph. The value 1 indicates “Motion”. The value 0 indicates “No motion”.

✧ <Tachograph Driving Direction>: Vehicle driving direction from tachograph.

✧ <Analog Input Value>: The value of analog input. The unit is mV.

✧ <Engine Braking Factor>: Counts of braking with engine. The more decreasing speed with the engine, the higher the engine braking factor is.

✧ <Pedal Braking Factor>: Counts of braking with brake pedal. The more decreasing speed with brake pedal, the higher the pedal braking factor is.

✧ <Total Accelerator Kick-downs>: The count of accelerator pedal kick-downs (pressing the pedal over 90%).

✧ <Total Effective Engine Speed Time>: Total time when 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 fraction part. The fraction part has 2 digits.

✧ <Total Cruise Control Time>: Total time when 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 fraction part. The fraction part has 2 digits.

✧ <Total Accelerator Kick-down Time>: Total time when 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 fraction part. The fraction part has 2 digits.

✧ <Total Brake Applications>: The count of braking processes initiated by brake pedal.

✧ <Tachograph Driver 1 Card Number>: The card number of tachograph driver 1. The value is a numeric string and ends with 0x00.

✧ <Tachograph Driver 2 Card Number>: The card number of tachograph driver 2. The value is a numeric string and ends with 0x00.

✧ <Tachograph Driver 1 Name>: The name of tachograph driver 1. The value is a name string and ends with 0x00.

✧ <Tachograph Driver 2 Name>: The name of tachograph driver 2. The value is a name string and ends with 0x00.

✧ <Registration Number>: The vehicle registration number. The value is a numeric string of

number and ends with 0x00.

✧ <Expansion Information>: A decimal 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: ESP failure indicator (1 – on, 0 – off or not available).
- 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)

✧ <Rapid Braking>: Number of total rapid braking since installation (calculation based on CAN-Logistic's settings of speed decrease time and value).

✧ <Rapid Accelerations>: Number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value).

✧ <Send Time>: The local time to send the acknowledgement report. 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. Heartbeat Data +HBD

➢ **+HBD,**

Example: **2B 48 42 44 FF 20 C2 01 00 01 01 67 76 36 32 30 6D 67 00 07 E5 08 19 06 1A 32 06 28 A1 D9 0D 0A**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	C2	C2
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8/12	IMEI/MUID/Device Name	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

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

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

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

Device Name	**g**	**v**	**6**	**2**	**0**	**m**	**g**	
HEX	**67**	**76**	**36**	**32**	**30**	**6D**	**67**	**00**

If the mask of <*UID*> is set to 0 in the <*+HBD Mask*> of **AT+GTHRM**, the heartbeat message will not report device name or IMEI information. If the mask of <*UID*> is set to 1, the heartbeat message will send device name or IMEI according to the mask of <*Device Name*>.

4.9. Buffer Report in HEX Format

When HEX format messages are buffered in the memory, the device will replace the second byte of the messages with 'B'. Thus, **+BSP** is buffered report for **+RSP**, **+BNF** is buffered report for **+INF** and **+BVT** is buffered report for **+EVT**. The rest part of the messages is the same.

Appendix: Message Index

- Command and ACK

+ACK:GTSSR
AT+GTTMP
+ACK:GTTMP
AT+GTGPJ
+ACK:GTGPJ
AT+GTOUT
+ACK:GTOUT
AT+GTEPS
+ACK:GTEPS
AT+GTDIS
+ACK:GTDIS
AT+GTIOB
+ACK:GTIOB
AT+GTAIS
+ACK:GTAIS
AT+GTMUT
+ACK:GTMUT
AT+GTRTO
+ACK:GTRTO
AT+GTDAT
+ACK:GTDAT
AT+GTWLT
+ACK:GTWLT
AT+GTGLM
+ACK:GTGLM
AT+GTHMC
+ACK:GTHMC
AT+GTUPC
+ACK:GTUPC
AT+GTCMD
+ACK:GTCMD
AT+GTUDF
+ACK:GTDF
AT+GTIDA
+ACK:GTIDA
AT+GTACD
+ACK:GTACD
AT+GTIEX
+ACK:GTIEX
AT+GTAEX
+ACK:GTAEX
AT+GTOEX
+ACK:GTOEX
AT+GTRPC

+ACK:GTRPC
AT+GTCFU
+ACK:GTCFU
AT+GTCAN
+ACK:GTCAN
AT+GTCLT
+ACK:GTCLT

✧ Position Related Report

+RESP:GTTOW
+RESP:GTEPS
+RESP:GTDIS
+RESP:GTIOB
+RESP:GTFRI
+RESP:GTSPD
+RESP:GTSOS
+RESP:GTGPJ
+RESP:GTRTL
+RESP:GTDOG
+RESP:GTAIS
+RESP:GTIGL
+RESP:GTGES
+RESP:GTERI
+RESP:GTGIN
+RESP:GTGOT
+RESP:GTLBC

✧ Device Information Report

+RESP:GTINF

✧ Report for Querying

+RESP:GTGPS
+RESP:GTALM
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTIOS
+RESP:GTTMZ
+RESP:GTAIF
+RESP:GTALS
+RESP:GTALC
+RESP:GTGSV
+RESP:GTCVN

+RESP:GTCSN
+RESP:GTCML

✧ Event Report

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN
+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF
+RESP:GTGSM
+RESP:GTGSS
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTFLA
+RESP:GTDOS
+RESP:GTTMP
+RESP:GTPDP
+RESP:GTUPC
+RESP:GTCLT
+RESP:GTCFU
+RESP:GTBIE

✧ Transparent Data Transmission

+RESP:GTDAT (Short Format)
+RESP:GTDAT (Long Format)

✧ CANBUS Report Information

+RESP:GTCAN

✧ Heartbeat

+ACK:GTHBD
+SACK:GTHBD

✧ Server Acknowledgement

✧ +SACK Hex format message

+ACK

+RSP
+EVT
+DAT
+INF
+HBD