GV56RS @Track Air Interface Protocol

GSM/GPRS/GNSS Tracker

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Contents

Contents 2
0. Revision History 5
1. Overview 10
1.1. Scope of This Document 10
1.2. Terms and Abbreviations 10
2. System Architecture 11
3. Message Description 12
3.1. Message Format 12
3.2. Command and Acknowledgement 13
3.2.1. Server Connection 13
3.2.1.1. Bearer Setting Information 13
3.2.1.2. Backend Server Registration Information 14
3.2.1.3. Quick Start Setting 18
3.2.1.4. Multi Server Information 19
3.2.2. Device Configuration 21
3.2.2.1. Global Configuration 21
3.2.2.2. Auto-unlock PIN 25
3.2.2.3. Time Adjustment 27
3.2.2.4. Outside Working Hours 28
3.2.2.5. Protocol Watchdog 30
3.2.2.6. Settings for Preserving Device's Specified Logic States 32
3.2.2.7. Over-the-air Configuration Update 33
3.2.3. Position Related Report 35
3.2.3.1. Fixed Report Information 35
3.2.3.2. Frequency Change of Fixed Report Information 39
3.2.4. Alarm Settings 41
3.2.4.1. Tow Alarm Configuration 41
3.2.4.2. Geo-Fence Information 43
3.2.4.3. Polygon Geo-Fence 45
3.2.4.4. Roaming Detection Configuration 47
3.2.4.5. Speed Alarm 51
3.2.4.6. Buzzer Alarm 52
3.2.4.7. Overspeed Alarm with Buzzer Notification 54
3.2.4.8. SOS Function 56
3.2.4.9. Excessive Idling Detection 58
3.2.4.10. Start/Stop Report 59
3.2.4.11. Harsh Behavior Monitoring 61
3.2.4.12. Jamming Detection 63
3.2.4.13. Crash Detection 65
3.2.4.14. Three Axis Self-Calibration 67
3.2.5. IO Application 68
3.2.5.1. Digital Output 68

3.2.5.2. Digital Input Port Setting 70
3.2.5.3. Input/Output Port Binding 73
3.2.5.4. External Power Supply Monitoring 74
3.2.5.5. Analog Input Port Setting 77
3.2.6. Virtual Ignition Detection 80
3.2.6.1. Voltage Virtual Ignition Setting 80
3.2.6.2. Accelerometer (Motion Status) Virtual Ignition Setting 81
3.2.6.3. Virtual Ignition Mode Selection 82
3.2.7. Bluetooth Setting 84
3.2.7.1. Bluetooth Setting 84
3.2.7.2. Bluetooth Voice Setting 86
3.2.7.3. Bluetooth Manager Setting 88
3.2.7.4. Bluetooth Accessory Setting 90
3.2.7.5. Bluetooth Beacon ID Setting 98
3.2.7.6. CANBUS Device Configuration 102
3.2.7.7. CANBUS Alarm Setting 107
3.2.7.8. CAN 100 FOTA Upgrade 115
3.2.7.9. Input Expansion 116
3.2.7.10. Analog Input Expansion 118
3.2.7.11 Output Expansion 120
3.2.8. Other Settings 121
3.2.8.1. Real Time Operation 121
3.2.8.2. Hour Meter Count 127
3.2.8.3. White List 129
3.2.8.4. Command String Storage 130
3.2.8.5. User Defined Function 131
3.2.8.6. GNSS-Assisted Motion Measurement 136
3.2.8.7. 1-Wire Device Settings 137
3.2.8.8. ID Authentication 139
3.2.8.9. Temperature Alarm 141
3.2.8.10. Humidity Alarm 143
3.2.8.11. Fuel Sensor Calibration Table 145
3.2.8.12. Transparent Data Transmission 147
3.2.8.13. Serial Port Setting 148
3.2.8.14. RS485 Configuration Setting 150
3.2.8.15. Operator List Configuration 152
3.2.8.16. Configuration File Version 153
3.3. Report 155
3.3.1. Position Related Report 155
3.3.2. Device Information Report 175
3.3.3. Report for Real Time Querying 178
3.3.3.1. +RESP:GTGPS 178
3.3.3.2. +RESP:GTALM 178
3.3.3.3. +RESP:GTALC 181

3.3.3.4. +RESP:GTALS 224
3.3.3.5. +RESP:GTCID 225
3.3.3.6. +RESP:GTCSQ 226
3.3.3.7. +RESP:GTVER 227
3.3.3.8. +RESP:GTBAT 227
3.3.3.9. +RESP:GTIOS 228
3.3.3.10. +RESP:GTTMZ 229
3.3.3.11. +RESP:GTCVN 229
3.3.3.12. +RESP:GTCSN 230
3.3.3.13. +RESP:GTQBI 231
3.3.3.14. +RESP:GTSCS 232
3.3.3.15. +RESP:GTAIF 233
3.3.3.16. +RESP:GTCML 234
3.3.4. Event Report 235
3.3.5. Buffer Report 276
3.3.6. Report with Google Maps Hyperlink 277
3.3.7. Crash Data Packet 278
3.3.8. Bluetooth Data Report 280
3.3.9. Transparent Data Transmission 282
3.3.10. CANBUS Device Information Report 284
3.4. Heartbeat 292
3.5. Server Acknowledgement 293
4. HEX Format Report Message 294
4.1. Hex Report Mask 294
4.2. Acknowledgement +ACK 301
4.3. Location Report +RSP 306
4.4. Information Report +INF 329
4.5. Event Report +EVT 334
4.6. Heartbeat Data +HBD 391
4.7. Crash Data Packet +CRD 392
4.8. Buffer Report in HEX Format 394
4.9. CANBUS Device Information Report 394
Appendix A: Two's Complement 403
Appendix B: Message Index 404

0.Revision History

Version	Date	Author	Description of Change
1.01	2018-07-11	Bart Yuan	1. Initial.
1.02	2018-09-30	Oscar Liu	1. Added the **AT+GTBAS** command for connecting the device with Bluetooth accessories.
1.03	2018-12-11	Oscar Liu	1. Added the <*MPF Validity Time*> parameter to the **AT+GTEPS** command.
2.00	2019-03-29	Oscar Liu	1. Added the instructions for using Bluetooth related functions: the <*Mode*> in **AT+GTBTS** needs to be enabled first. 2. Added the **AT+GTDAT** command for transferring data between the backend server and an external device connected to the Bluetooth of the device.
2.01	2019-06-12	Oscar Liu	1. Added Sub Command 25 to the **AT+GTRTO** command. 2. Extended the parameter <*+INF Mask*> to [00000000 – FFFFFFFF] in the command **AT+GTHRM**.
3.00	2019-07-31	Lemon Xue	1. Added the command **AT+GTVMS**. 2. Added Bit 38 for VMS to <*Configuration Mask*> in the **AT+GTRTO** command. 3. Added Type 7 to <*Report Type*> in the **+RESP:GTVGN** message. 4. Added the <*Smart Voltage Adjustment*> and <*Ignition Off Debounce*> parameters to the **AT+GTVVS** command. 5. Added Sub Command 10 to the **AT+GTRTO** command.
3.01	2019-08-19	Reid Chen	1. Added the **AT+GTFVR** command. 2. Added the parameter <*Update Status Mask*> in the command **AT+GTUPC**. 3. Added Bit 64 for FVR to <*Configuration Mask*> in the command **AT+GTRTO**.

4.00	2019-12-04	Oscar Liu	1. Added the parameter <*Wrap Corner Point*> in the command **AT+GTFRI**. 2. Added the parameter <*GNSS Trigger Type*> in the **+RESP:GTFRI**, **+RESP:GTERI** and HEX format +RSP messages. 3. Added Type 2 and Accessory Model 0 in the **AT+GTBAS** command to support the WTS300 accessory. 4. Added the parameter <*Low Voltage Threshold*> in the **AT+GTBAS** command. 5. Added the **AT+GTBID** command to support scanning Bluetooth beacon accessories. 6. Added the **+RESP:GTBAA** message to indicate alarm events (temperature alarm, , low voltage alarm or pushbutton event). 7. Added the **+RESP:GTBID** message to indicate the number of beacon accessories detected by the device.
	2019-12-04	Brooks Wang	1. Added the parameter <*Continue Time*> in the command **AT+GTFRI**.
5.00	2020-04-01	Oscar Liu	1. Added Accessory Type 4 and Accessory Model 0 in the **AT+GTBAS** command to support the BLE CAN100 accessory. 2. Added the **AT+GTCAN** command and **+RESP:GTCAN** message. 3. Added the **AT+GTCLT** command and **+RESP:GTCLT** message. 4. Added "**CAN**", "**CVN**" and "**CSN**" in <*Sub Command*> of **AT+GTRTO.** 5. Added the parameter <*CAN100 Operation*> in the command **AT+GTRTO**. 6. Added the messages **+RESP:GTCML**, **+RESP:GTCVN** and **+RESP: GTCSN**. 7. Added <*+CAN Mask*> in the command **AT+GTHRM.** 8. Added hex ACK message type for the **AT+GTCAN** command. 9. Added <*CAN Data*> in the **+RSP** in HEX format. 10. Added <*CAN Data*> in the **+EVT** in HEX format. 11. Added "+CAN" HEX format report message. 12. Added CAN data mask to the <*ERI Mask*> in the **AT+GTFRI** command.

		Abert Xu	13. Added Accessory Type 7 and Accessory Model from 0 to 4 in the **AT+GTBAS** command to support the Technoton accessory. 14. Added **+RESP:GTBAR** message to report the information of Technoton accessories. 15. Added the parameter <*ID List Type*> in the command **AT+GTIDA**.
5.01	2020-04-21	Abert Xu	1. Added Accessory Type 6 and Accessory Model 2 in the **AT+GTBAS** command to support the WTH300 accessory.
5.02	2020-05-25	Abert Xu	1. Added temperature and humidity parameters monitoring for WTH300.
6.00	2020-09-10	Oscar Liu Benson Zhang	1. Added Accessory Type 1 and Accessory Model 3 in the **AT+GTBAS** command to support the Escort angle sensor. 2. Added the parameter <*Index*> in the command **AT+GTBID**. 3. Added the Beacon ID model 1 to the parameter <*Beacon ID Model*> in the command **AT+GTBID**. 4. Added the **AT+GTCFU** command and **+RESP:GTCFU** message to support upgrade the firmware and configuration of BLE CAN100 accessory. 5. Extended the range of parameter <*CAN100 Operation*> in the command **AT+GTRTO** to support CAN100 automatic synchronization. 6. Added the parameter <*QBI Operation Mode*> in the command **AT+GTRTO.**
7.00	2021-05-28	Oscar Liu	1. Added Accessory Type 8 and Accessory Model 0 in the **AT+GTBAS** command to support the WBC300 accessory. 2. Added the commands **AT+GTIEX**, **AT+GTOEX** and **AT+GTAEX**. 3. Added Accessory Type 10 and Accessory Model from 0 to 1 in the **AT+GTBAS** command to support the Mechatronics accessory. 4. Added the parameters <*Actual Sensor Length*>, <*Empty Frequency*> and <*Full Frequency*> in the command **AT+GTBAS** for Technoton fuel sensor (DUT_E) to calculate

			the fuel level. 5. Added the parameter <*Event Notification*> in the command **AT+GTBAS** for Escort angle sensor to support the event notify function.
8.00	2024-08-06	Archie Li	1. Added parameters <*Fuel Data Debounce*>, <*Fuel Sensor Delay*>, <*Fuel Lost Alarm*> and <*Fuel Sensor Samp2le Count*> to the command **AT+GTAIS**. 2. Added the command **AT+GTFSC**. 3. Added the message **+RESP:GTFLA**. 4. Added Bit3/Bit4 to parameter <*Event Mask*> in the command **AT+GTFRI**.
8.01	2024-08-12	Archie Li	1. Added Accessory Type 17 and Accessory Model 0 to the command **AT+GTBAS** to support the Italon fuel accessory.
8.02	2024-08-14	Harper Kuang	1. Added the parameter <*Position Append Mask*> to the command **AT+GTCFG**. 2. Added the parameter <*Check Interval*> to the command **AT+GTFRI**. 3. Added Accessory Type 11 and Accessory Model 0 to the command **AT+GTBAS** to support the MAG accessory. 4. Added Accessory Type 13 and Accessory Model 0 to the command **AT+GTBAS** to support the Relay accessory. 5. Added Accessory Type 6 and Accessory Model 5 to the **AT+GTBAS** command to support the WTH301 accessory. 6. Added Accessory Model 1 to the **AT+GTBAS** command to support the ELA accessory. 7. Added Accessory Type 6 and Accessory Model 3 to the command **AT+GTBAS** to support the RHT ELA accessory. 8. Added the <*Enhanced Temperature*> to the parameter <*Accessory Append Mask*> in the command **AT+GTBAS**. 9. Added the <*Magnet Data*> to the parameter <*Accessory Append Mask*> in the command **AT+GTBAS**. 10. Added <*Accessory Battery Percentage*> to the parameter <*Accessory Append Mask*> in the command **AT+GTBAS.** 11. Added the Beacon ID model 1 to the parameter <*Beacon ID Model*> in the

			command **AT+GTBID**. 12. Added Beacon ID Model 2 to the command **AT+GTBID** to support the ID ELA accessory. 13. Added parameter <*Electric Report Mask*> to the command **AT+GTCAN**. 14. Added Bit24 <*Service Distance*> and Bit28 <*DTC Codes*> to parameter <*CAN Report Expansion Mask*> in the **AT+GTCAN** command. 15. Added Sub Command 3A (RLY) to the **AT+GTRTO** command. 16. Added the parameter <*Humidity Timer*> to the command **AT+GTACD.** 17. Added the command **AT+GTHUM**. 18. Added the command **AT+GTOWL**. 19. Deleted the <*GNSS Trigger Type*> from all messages.
8.03	2024-08-26 2024-09-03	Archie Li Harper Kuang	1. Added RS485 Device Model 2/3/4 to the command **AT+GTRCS** to support the LLS digital fuel accessory. 2. Added type 10/11/12 to parameter <*Sensor Type*> in the command **AT+GTFSC**.
8.04	2024-10-31	Harper Kuang	1. Added RS485 Device Model 5 to the command **AT+GTRCS** and added type 13 to parameter <*Sensor Type*> in the command **AT+GTFSC** to support the TD-150 accessory. 2. Added Accessory Type 1 and Accessory Model 4 to the **AT+GTBAS** command to support the TD-150 accessory. 3. Added the command **AT+GTMSI**.

1.Overview

1.1.Scope of This Document

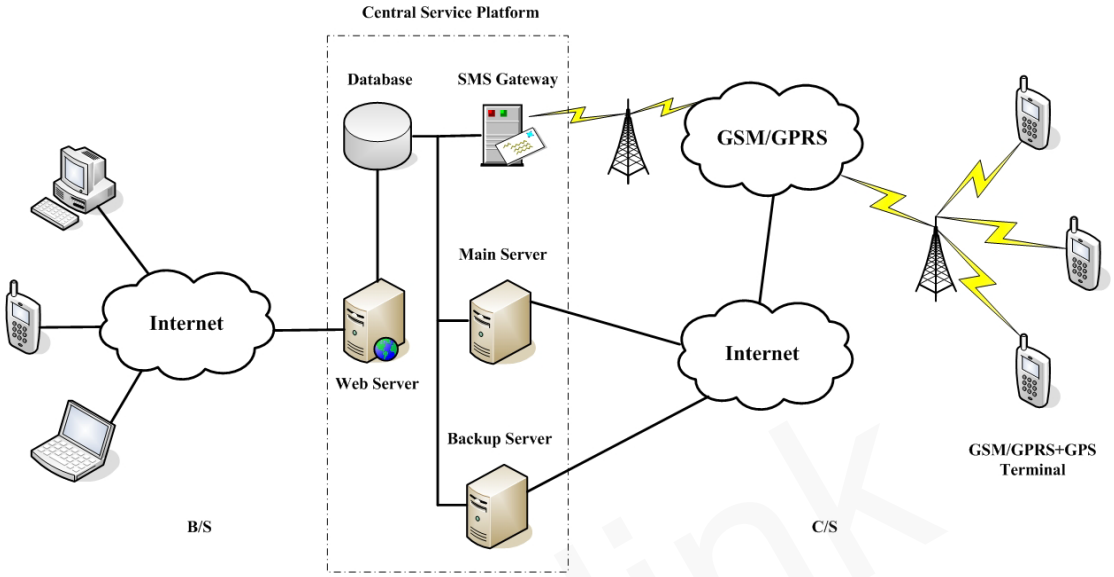
The @Track Air Interface Protocol is a digital communication interface based on printable ASCII characters over SMS or GPRS, which is used for all communications between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms the receipt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

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

1.2.Terms and Abbreviations

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

2.System Architecture



The backend server needs to be accessible by many terminals and should have the following abilities:

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

3.Message Description

3.1.Message Format

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

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

The entire message string ends with the character '$'.
The characters "XXX" allow the identification of the difference between messages.
The "<parameter1>,<parameter2>,…" carry the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighbouring parameter characters. The parameter string may contain the following ASCII characters: '0'–'9', 'a'–'z', and 'A'–'Z'.
Details of each message format are available in the corresponding message sections.

By sending Commands to the terminal, the backend server can either configure and query the parameters of the terminal or control the terminal when it performs specific actions. When the terminal receives Commands over the air, it will reply with a corresponding Acknowledgement message.
According to the configuration of the parameters, the terminal can send Report messages to the backend server. Please see the following figure:

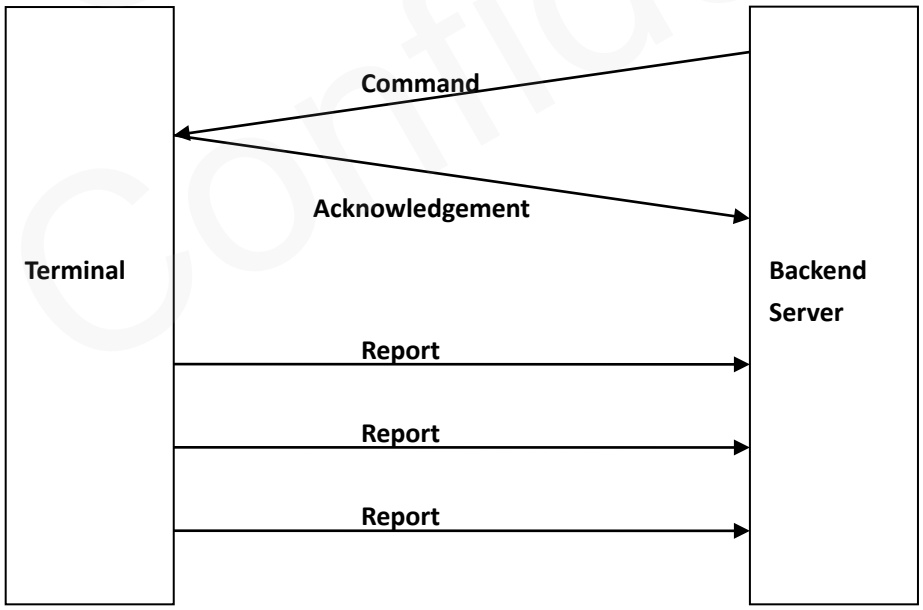


Figure 1: @Track Protocol Message Flow

3.2.Command and Acknowledgement

3.2.1.Server Connection

3.2.1.1.Bearer Setting Information

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

➢ **AT+GTBSI=**

Example: **AT+GTBSI=gv56,cmnet,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Password*>: The valid characters for the password include '0'– '9', 'a' – 'z', and 'A' – 'Z'. The default value is "gv56".

✧ <*APN*>: Access point name (APN).

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

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

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

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

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

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

➢ **+ACK:GTBSI,**

Example:

+ACK:GTBSI,5A0103,135790246811220,,0000,20090214093254,11F0$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Protocol Version*>: The protocol version that the device conforms to. The first two characters represent the device type. As shown in the example, "5A" means GV56RS. The middle two characters represent the major version number of the protocol and the last two characters represent the minor version number of the protocol. Both version numbers are hex digits. For example, "**020A**" means version 2.10.
- <*Unique ID*>: The IMEI of the device.
- <*Device Name*>: The specified name of the device.
- <*Serial Number*>: A serial number which is the same as the <*Serial Number*> in the corresponding command. It distinguishes which command the ACK message is for.
- <*Send Time*>: The local time to send the ACK message.
- <*Count Number*>: A self-increasing count number in each acknowledgment message and report message. It begins from 0000 and increases by 1 for each message. And it recycles back after "FFFF".
- <*Tail Character*>: A character to indicate the end of the command. It must be '$'.

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

3.2.1.2.Backend Server Registration Information

The command **AT+GTSRI** is used to configure where and how to report all the messages, including the server information and the method of communication between the backend server and the terminal. When the terminal is configured correctly, it should be able to report data to the backend server.

- **AT+GTSRI=**

Example:
AT+GTSRI=gv56,3,,1,116.226.44.17,7011,116.226.44.17,7012,+8613812341234,15,1,0,0,,30,0

.0.0.0,0.0.0.0,FFFF$ AT+GTSRI=gv56,3,,1,some.host.name,7011,116.226.44.17,7012,+8613812341234,15,1,0,0,,30,0.0.0.0,0.0.0.0,FFFF$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
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	0
Backup Server IP / Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	0
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|2 – 360min	0
SACK Enable	1	0|1	0
Protocol Format	1	0|1	0
SMS ACK Enable	1	0|1	0
Reserved	0		
Connection Life	<=3	0|10 – 600s	30
Primary DNS Server	<=15		0.0.0.0
Secondary DNS Server	<=15		0.0.0.0
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 0: Stop mode.
- 1: TCP short-connection preferred mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. 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. If it fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the memory buffer if buffer report function is enabled. Otherwise the data is dropped.

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

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

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

✧ <*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 of the backup server.

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

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

- <*Heartbeat Interval*>: The interval for sending heartbeat package message (**+ACK:GTHBD**) when report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat package message will be sent.
- <*SACK Enable*>: This parameter 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 with a SACK message after receiving a message from the terminal.
  - 1: The backend server replies with a SACK message when receiving a message from the terminal.
- <*Protocol Format*>: This parameter defines the format of the report message sent from the device to the backend server. 0 means "ASCII format" and 1 means "HEX format".
- <*SMS ACK Enable*>: A numeral to indicate whether to send an acknowledgement message to the original number when the command is sent by SMS.
  - 0: The device will send the acknowledgement message to the backend server according to the mode configured by the <*Report Mode*>.
  - 1: The device will send the acknowledgement message to the original number via SMS if the command is received via SMS.
- <*Connection Life*>: A numeral to indicate the time to maintain TCP connection for receiving commands from the server. If there is no data transmission within the time of <*Connection Life*>, the TCP connection will be closed. The unit is second.
- <*Primary DNS Server*>: Primary DNS server address.
- <*Secondary DNS Server*>: Secondary DNS server address.

Note: If both <*Primary DNS Server*> and <*Secondary DNS Server*> are 0.0.0.0, 127.X.X.X or 255.X.X.X, the default DNS server address obtained from network will be used.

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

- **+ACK:GTSRI,**

Example: **+ACK:GTSRI,5A0200,865585040006177,GV56RS,011E,20190521115811,0410$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' _ '	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

3.2.1.3.Quick Start Setting

The command **AT+GTQSS** is used to configure the GPRS parameters and backend server information if the length of all the settings is no greater than 160 bytes; otherwise the two commands **AT+GTBSI** and **AT+GTSRI** are used to configure those settings.

- **AT+GTQSS=**

Example: **AT+GTQSS=gv56,cmnet,,,3,,1,some.host.name,7011,116.226.44.17,7012,+8613812341234,15,1,0,,0.0.0.0,0.0.0.0,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
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	0
Backup Server IP / Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	0
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|2 – 360min	0
SACK Enable	1	0|1	0
Protocol Format	1	0|1	0
Reserved	0		
Primary DNS Server	<=15		0.0.0.0
Secondary DNS Server	<=15		0.0.0.0

Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- **+ACK:GTQSS,**

Example: **+ACK:GTQSS,5A0200,865585040006276,,004D,20190524070904,004B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.1.4.Multi Server Information

The command **AT+GTMSI** is used to configure where and how to report all the messages, including the server information and the communication method between the backend server and the terminal. When the terminal is configured correctly, it should be able to report data to the backend server.

- **AT+GTMSI=**

Example: **AT+GTMSI=gv56,,2,0,60.174.225.173,20581,0,0,30,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Reserved	0		
Server ID	1	2	2
Report Mode	1	0|2-4|6	0
Domain	<=60	ASCII (not including '=' and ',')	
Port	<=5	0 - 65535	
Heartbeat Interval	<=3	0|2 - 360(min)	0

SACK Mode	1	0-1	0
Connection Life	<=3	0|10 - 600(s)	30
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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 "gv56".
- <*Server ID*>: The index of the Multi Server.
- <*Report Mode*>: This parameter defines the communication method between the backend server and the terminal. Supported report modes are as follows:
  - 0: Stop mode.
  - 2: TCP short-connection forced mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. If it fails to establish TCP connection to the backend server, the data will be stored in the memory buffer when buffer report function in **AT+GTSRI** command is enabled. Otherwise, the data will be discarded.
  - 3: TCP long-connection mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using heartbeat data. The backend server should respond to the heartbeat data from the terminals.
  - 4: UDP mode. The terminal will send data to the backend server by UDP protocol. Receiving protocol commands via UDP is supported if the GPRS network allows it. It is recommended to enable heartbeat sending and **+RESP:GTPDP** report when receiving commands via UDP.
  - 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using UDP protocol. The difference is the terminal will use a fixed local port rather than a random port to communicate with the server in this mode. Thus, the backend server could use the identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the primary server.
- <*Domain*>: The IP address or the domain name of the primary server.
- <*Port*>: The port number of the primary server.
- <*Heartbeat Interval*>: The interval for sending heartbeat package message (**+ACK:GTHBD**) when report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat

package message will be sent.

✧ <*SACK Mode*>: This parameter defines whether the backend server should respond to the terminal with the SACK messages when receiving messages from the terminal.

- 0: The backend server does not reply with the SACK message after receiving the message from the terminal.
- 1: The backend server replies with the SACK message when receiving the message from the terminal.

✧ <*Connection Life*>: A numeral to indicate the time to maintain TCP connection for receiving commands from the server. If there is no data transmission within the time of <*Connection Life*>, the TCP connection will be closed. Unit: second.

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

➢ **+ACK:GTMSI,**

Example: **+ACK:GTMSI,5A0300,135790246811220,,0001,20090214093254,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
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=gv56,123456,,,,,,,,,,,,,,,,,,FFFF$** **AT+GTCFG=gv56,gv56,gv56,1,0,,,3F,0,,3DEF,0,1,1,300,0,1,0,1,1F,5,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
New Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv56
ODO Enable	1	0|1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0km	0.0
Reserved	0		
Reserved	0		
Report Composition Mask	<=4	0000 – FFFF	003F
Power Saving Mode	1	0 – 2	1
Position Append Mask	<=4	0000 – FFFF	0
Event Mask	<=8	00000000 – FFFFFFFF	3DEF
Pin Mask	1	0|1	0
LED On	1	1|2	2
Info Report Enable	1	0|1	0
Info Report Interval	<=5	30 – 86400sec	300
Location by Call	1	0|1|2|3	0
Backup Battery On	1	0|1	1
Backup Battery Charge Mode	1	0|1	0
AGPS Mode	1	0|1	0
Cell Info Report	4	0000 – FFFF	001F
GNSS Lost Time	2	0 – 30min	0
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*New Password*>: It is set to change the current password.
- <*Device Name*>: An ASCII string which represents the name of the device.
- <*ODO Enable*>: Enable/disable the odograph function to calculate the total mileage. The current mileage is included in every position report message.
- <*ODO Initial Mileage*>: The initial value for calculating the total mileage.
- <*Report Composition Mask*>: Bitwise mask to configure the composition of a report message, especially the composition of GNSS information.
  - Bit 0 for <*Speed*>
  - Bit 1 for <*Azimuth*>
  - Bit 2 for <*Altitude*>
  - Bit 3 for GSM tower data, including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and <*Position*

Append Mask>.

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

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

✧ <*Power Saving Mode*>: It configures the power saving function of the device. If the parameter <*Power Saving Mode*> is set to 0, the GNSS will be always on. If the parameter <*Power Saving Mode*> is set to 1, the fixed report, geo-fence and speed alarm report functions are suspended when the device is stationary or the engine is turned off. If the parameter <*Power Saving Mode*> is set to 2, it is mostly like Mode 1 and the difference is that the fixed report will not be suspended and the fix and send interval of it will be set to <*IGF Report Interval*> in **AT+GTFRI** when the engine is off.

- 0: Disable the power saving function.
- 1: Mode 1 of the power saving function.
- 2: Mode 2 of the power saving function.

✧ <*Position Append Mask*>: A bitwise numeral to control whether to include the corresponding fields in each position after <*Cell ID*>.

- Bit 0: The number of satellites used for the current position.
- Bit 7: The length of <*Position Append Mask*> in the message is changed from one byte to two bytes.

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

- Bit 0 for **+RESP:GTPNA**
- Bit 1 for **+RESP:GTPFA**
- Bit 2 for **+RESP:GTMPN**
- Bit 3 for **+RESP:GTMPF**
- Bit 4 Reserved
- Bit 5 for **+RESP:GTBPL**
- Bit 6 for **+RESP:GTBTC**
- Bit 7 for **+RESP:GTSTC**
- Bit 8 for **+RESP:GTSTT**
- Bit 9 Reserved
- Bit 10 for **+RESP:GTPDP**
- Bit 11 for the power on **+RESP:GTRTL**
- Bit 12 for the ignition on/off report **+RESP:GTIGN**, **+RESP:GTIGF**, **+REPS:GTVGN** and **+RESP:GTVGF**
- Bit 13 for the ignition on/off location report **+RESP:GTIGL** and **+RESP:GTVGL**
- Bit 14 Reserved
- Bit 15 Reserved
- Bit 16 Reserved

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

- <*Pin Mask*>: It configures the working mode of PIN on the connector.
  - Bit 0: for PIN3. Set it to 0 as analog input 1, set it to 1 as digital input 2.
- <*LED On*>: It configures the working mode of Cell LED and GNSS LED.
  - 1: Cell LED and GNSS LED turn on as configured.
  - 2: Both LEDs (Cell LED and GNSS LED) work 10 minutes after the device is powered on and then will be off.
- <*Info Report Enable*>: Enable/disable the device information report (**+RESP:GTINF**). The device information includes state of the device, ICCID, GSM signal strength, voltage of external power supply, battery voltage, charging status, Cell and GNSS LED working mode, the last known time of GNSS fix, status of digital input and output, time zone information and daylight saving setting.
  - 0: Disable the device information report.
  - 1: Enable the device information report.
- <*Info Report Interval*>: The interval for reporting the device information.
- <*Location by Call*>: It configures how to handle the incoming call. This parameter is invalid when the parameter <*Mode*> in the **AT+GTBVS** command is not 0.
  - 0: Just hang up the call.
  - 1: Hang up the call and report the current position via the **+RESP:GTLBC** message.
  - 2: Hang up the call and report the current position with a Google Maps link via SMS to the phone number of the incoming call.
  - 3: Hang up the call and report the current position via the **+RESP:GTLBC** message, and at the same time, send a Google Map link via SMS to the phone number of the incoming call.
- <*Backup Battery On*>: It configures whether to enable backup battery. Set it to 1 to enable backup battery, and set it to 0 to disable backup battery. The backup battery will only be used when this parameter is set to 1 and the external power is not connected.
- <*Backup Battery Charge Mode*>: It controls the charge mode of the backup battery.
  - 0: When the main power supply is connected, the backup battery is charged as needed.
  - 1: When the main power supply is connected, the backup battery is only charged when ignition on is detected. The charge process will begin 3 minutes after the ignition is turned on and stop when the ignition is turned off.
- <*AGPS Mode*>: A numeral to indicate whether to enable AGPS. AGPS helps increase the chance of getting GNSS position successfully and reduce the time needed to get GNSS position.
  - 0: Disable the AGPS function.
  - 1: Enable the AGPS function.
- <*Cell Info Report*>: A hexadecimal numeral to indicate how to report cell information (**+RESP:GTGSM**).

  The 2 high bits represent the GSM working mode.
  - 0b00: Do not allow the cell information report.
  - 0b01: Allow the cell information report after failing to get GNSS position if cell information is available.
  - 0b10: Report the message **+RESP:GTGSM** after getting GNSS position successfully

each time if cell information is available.

- 0b11: Report the message **+RESP:GTGSM** no matter whether it is successful to get GNSS position if cell information is available.

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

- Bit 0 for **+RESP:GTRTL**
- Bit 1 for **+RESP:GTLBC**
- Bit 2 for **+RESP:GTFRI**
- Bit 3 for **+RESP:GTSOS**
- Bit 4 for **+RESP:GTTOW**
- Bit 5 – 13 Reserved

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

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

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

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

➢ **+ACK:GTCFG,**

Example: **+ACK:GTCFG,5A0200,865585040006276,,00CA,20190524162127,00CE$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' '	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.2.Auto-unlock PIN

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

PIN-protected SIM card, this command is used to configure the device to auto-unlock the SIM PIN with the pre-set PIN code.

➢ **AT+GTPIN=**

Example: **AT+GTPIN=gv56,1,0000,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Enable Auto-unlock PIN	1	0|1	1
PIN	4 – 8	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

➢ **+ACK:GTPIN,**

Example: **+ACK:GTPIN,5A0200,865585040006276,,007E,20190524162001,007E$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' _ '	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.3.Time Adjustment

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

➢ **AT+GTTMA=**

Example: **AT+GTTMA=gv56,+,8,0,0,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Sign	1	+|–	+
Hour Offset	<=2	0 – 23	0
Minute Offset	<=2	0 – 59	0
Daylight Saving	1	0|1	0
UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

✧ <*UTC Time*>: UTC time used to adjust for the local time on the device.

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

➢ **+ACK:GTTMA,**

Example:

+ACK:GTTMA,5A0200,865585040006276,,0052,20190524070910,0050$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.4.Outside Working Hours

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

- **AT+GTOWH=**

Example: **AT+GTOWH=gv56,3,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
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 – 2	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		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

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

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

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

- <*Working Hours Start2*>, <*Working Hours End2*>: The second period of the working hours in a day.
- <*Digital Input ID*>: The input ID used to trigger this function when mode is 1. The working parameters of the specified input must be set by **AT+GTDIS** first. If an interruptible digital input is used, please connect slide button instead of tact button to that input for this function.
- <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*>: If this function is enabled and it is currently off duty time, a specified wave will be output at the specified output.

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

➢ **+ACK:GTOWH,**

Example: **+ACK:GTOWH,5A0200,865585040006276,,0080,20190524162002,0080$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.5.Protocol Watchdog

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

➢ **AT+GTDOG=**

Example: **AT+GTDOG=gv56,1,60,1,0200,,1,0,,60,60,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1|2	0
Ignition Frequency	<=3	10 – 120 min	60
Interval	<=2	1 – 30 day	30

Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0|1	1
Input ID	1	0 - 2	0
Reserved	0		
GSM Interval	4	0|5-1440 min	60
PDP Interval	4	0|5-1440 min	60
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of the watchdog function.
  - 0: Disable this function.
  - 1: Reboot periodically according to the <*Interval*> and <*Time*> settings.
  - 2: Reboot when the ignition is turned on.
- <*Ignition Frequency*>: If the time interval between the current ignition-on and last ignition-on reboot is greater than the value specified by this parameter when the working mode is 2, the device will automatically reboot upon ignition on. The device will reboot automatically upon the second ignition on for the first time use whatever the time interval from the first ignition-on is.
- <*Interval*>: The time interval for rebooting the device. It is measured in days.
- <*Time*>: The time to perform the reboot operation when the <*Interval*> condition is met.
- <*Report Before Reboot*>: It defines whether to report the **+RESP:GTDOG** message before reboot. 0 means "Do not report the **+RESP:GTDOG** message before reboot", and 1 means "Report the **+RESP:GTDOG** message before reboot". If this parameter is enabled, the device will initiate a real-time location fix before sending the message with the current location information.
- <*Input ID*>: The ID of the digital input port which is used to trigger manual reboot. 0 means "Disable manual reboot". Only digital input port 1 or 2 is supported.
- <*GSM Interval*>: The time interval in minutes for rebooting the device when the device loses GSM signal. 0 means "Do not reboot the device".
- <*PDP Interval*>: The interval for rebooting the device when the device is unable to register on GPRS network. 0 means "Do not reboot the device".

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

- **+ACK:GTDOG,**

Example: **+ACK:GTDOG,5A0200,865585040006276,,0081,20190524162003,0081$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' ' ‗	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.6.Settings for Preserving Device's Specified Logic States

The command **AT+GTPDS** is used to preserve specified logic states of the device. The specified logic states selected based on the value of component mask will be preserved or reset according to the <*Mode*> setting.

➢ **AT+GTPDS=**

Example: **AT+GTPDS=gv56,1,3F9,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1|2	0
Mask	4	0000-FFFF	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 0: Disable this function.
- 1: Preserve specified logic state of the device according to the value of <*Mask*>.

- 2: Reset all the specified logic states listed in <*Mask*> after receiving the command, and then preserve specified logic states according to the value of <*Mask*>.

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

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

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

➢ **+ACK:GTPDS,**

Example: **+ACK:GTPDS,5A0200,865585040006276,,0092,20190524162024,0093$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.7.Over-the-air Configuration Update

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

➢ **AT+GTUPC=**

Example: **AT+GTUPC=gv56,0,10,0,1,0,http://www.queclink.com/configure.ini,1,,1,88888888,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 - 6	'0'-'9', 'a'-'z', 'A'-'Z'	gv56
Max Download Retry	1	0 – 3	0

Download Timeout	<=2	5 – 30 min	10
Download Protocol	1	0	0
Enable Report	1	0|1	0
Update Interval	<=4	0 – 8760 hour	0
Download URL	<=100	URL	
Mode	1	0|1	0
Reserved	0		
Extended Status Report	1	0|1	0
Identifier Number	8	00000000-FFFFFFFF	0
Reserved	0		
Update Status Mask	1	0 - F	3
Serial Number	4	0000-FFFF	
Tail Character	1	$	$

- <*Password*>: The valid characters for the password include '0'- '9', 'a'-'z', and 'A'-'Z'. The default value is "gv56".
- <*Max Download Retry*>: It specifies the maximum number of retries to download the configuration file upon download failure.
- <*Download Timeout*>: It specifies the expiration timeout of a single download. If the download expires, it is considered to be failure.
- <*Download Protocol*>: The protocol used to download the file. Only HTTP is supported now. It is set to 0.
- <*Enable Report*>: A numeral which indicates whether to report the message **+RESP:GTUPC** or **+RESP:GTEUC** when the configuration is updated over the air.
  - 0: Do not report the message **+RESP:GTUPC** or **+RESP:GTEUC**.
  - 1: Report the message **+RESP:GTUPC** or **+RESP:GTEUC**.
- <*Update Interval*>: The time interval measured in hours for updating the configuration over the air.
- <*Download URL*>: It specifies the URL to download the configuration file. If <*Download URL*> ends with "/" which means the URL is just a path without file name, the device will add <*IMEI*>.ini as the file name to complete the URL. If it is greater than 100 bytes in length, error will be returned.
- <*Mode*>: A numeral which indicates the working mode of downloading configuration over the air.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Identifier Number*>: A numeral to identify the configuration update request. This will be included in the message **+RESP:GTEUC** to indicate the request it is related to.
- <*Extended Status Report*>: A numeral to indicate the message to be reported for the configuration update status when <*Enable Report*> is 1.
  - 0: Report the message **+RESP:GTUPC**.
  - 1: Report the message **+RESP:GTEUC** to include more information.
- <*Update Status Mask*>: Bitwise mask to configure the status in which the device can update the configuration.

- Bit 0 for ignition off
- Bit 1 for ignition on

Note:

1. The maximum length of a single command in the configuration file is 200 bytes, and the maximum length of a single configuration file is 6400 bytes. If the length of a single command or a single configuration file exceeds the maximum allowed size, the device will fail to download the configuration file.
2. Make sure there is only one command per line in the configuration file and there is a "\r\n" between two commands.
3. There should be no space before each command.
4. The configuration file should be a plain text file.
5. **+RESP:GTEUC** in hex format has the same message format as **+RESP:GTUPC**.

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

➢ **+ACK:GTUPC,**

Example: **+ACK:GTUPC,5A0200,865585040006276,,007F,20190524162001,007F$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
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 fixed report (**+RESP:GTFRI**).

➢ **AT+GTFRI=**

Example: **AT+GTFRI=gv56,0,,,,,,,,,,,, ,,,,FFFF$** **AT+GTFRI=gv56,1,0,,1,0100,2300,,30,1000,1000,,30,600,00000000,,,,FFFF$** **AT+GTFRI=gv56,2,0,,1,0100,2300,,30,1000,1000,,60,600,00000000,,,,FFFF$** **AT+GTFRI=gv56,3,0,,1,0100,2300,,30,1000,1000,,60,600,00000000,,,,FFFF$** **AT+GTFRI=gv56,4,0,,1,0100,2300,,60,1000,1000,,60,600,00000000,,,,FFFF$** **AT+GTFRI=gv56,5,0,,1,0100,2300,,60,1000,1000,,60,600,00000000,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0 – 5	0
Discard No Fix	<=2	0|1	1
Reserved	0		
Period Enable	1	0|1	1
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
Check Interval	<=5	0 – 86400sec	0
Send Interval	<=5	5 – 86400sec	30
Distance	<=5	50 – 65535m	1000
Mileage	<=5	50 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0|5 - 86400sec	600
ERI Mask	8	00000000-FFFFFFFF	00000000
Continue Time	<=2	0– 10 min	0
Reserved	0		
Wrap Corner Point	1	0|1	0
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 0: Disable this function.
- 1: Fixed Time Report. The position report message is sent to the backend server periodically according to the parameter <*Send Interval*>.
- 2: Fixed Distance Report. The position report message is sent to the backend server when the straight line distance between the current GNSS position and the last sent GNSS position is greater than or equal to the distance specified by the parameter <*Distance*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.
- 3: Fixed Mileage Report. The position report message is sent to the backend server when the path length between the current GNSS position and the last sent GNSS position is greater than or equal to the mileage specified by the parameter <*Mileage*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.

- 4: Optimum Report. The device simultaneously checks both time interval and path length between two adjacent position reports. The device will report the current position if the calculated time interval between current time and time of the last report is greater than <*Send Interval*>, and the length of path between the current position and the last position is greater than <*Mileage*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.
- 5: Fixed Time or Mileage Report. The device checks either time interval or path length between two adjacent position reports. The device will report the current location if the calculated time interval between current time and time of the last report is greater than <*Send Interval*>, or the length of path between the current position and the last position is greater than <*Mileage*>. It is necessary to connect the ignition signal to the device or enable virtual ignition detection for this mode.

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

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

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

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

✧ <*Check Interval*>: The time interval for updating GNSS position. Its range is 0 – 86400. Unit: second. If the parameter value is 0, the device will update GNSS position according to the value of <*Send Interval*>. Please make sure <*Check Interval*> is not greater than <*Send Interval*> so that position data is ready before sending time arrives.

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

Note: Due to the limitation of the maximum report message length, please make sure the <*Send Interval*>/<*Check Interval*> ratio is less than or equal to 15.

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

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

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

✧ <*IGF Report Interval*>: The time interval for fixing and sending position information periodically when <*Mode*> is not 0, <*Power Saving Mode*> in **AT+GTCFG** is set to 0|2 and the engine is off. If <*IGF Report Interval*> is less than 60 seconds, the GNSS will be always on. Its value range is 0|5 – 86400 and the unit is second.

✧ <*ERI Mask*>: If the serial port is connected with a peripheral, and the corresponding bit for

the peripheral is set to 1, the device will report **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure whether to report the data from peripherals via **+RESP:GTERI**.

- Bit 0: Reserved
- Bit 1: for the <*1-wire Data*> field in the report message **+RESP:GTERI**
- Bit 2 for the <*CAN Data*> field in **+RESP:GTERI** (This mask just works in the **+RESP:GTERI** ASCII message)
- Bit 3 for the <*Percentage*> field in **+RESP:GTERI**. If it is set to 1, the data block <*Fuel Sensor Data*> will appear.
- Bit 4 for the <*Volume*> field in **+RESP:GTERI**. If it is set to 1, the data block <*Fuel Sensor Data*> will appear.
- Bit 5 – Bit 6: Reserved
- Bit 7: for the <*RS485 Sensor Data*> field in the report message **+RESP:GTERI**
- Bit 8: for the <*Bluetooth Accessory Data*> field in the report message **+RESP:GTERI**

✧ <*Continue Time*>: After the ignition is turned off, the **+RESP:GTFRI** / **+RESP:GTERI** message will continue to be reported according to <*Send Interval*> for an extra period of time specified by <*Continue Time*>, and then will be reported according to <*IGF Report Interval*>.

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

- 0: Do not wrap corner point. Send the corner point immediately when it is obtained.
- 1: Wrap corner point and wait until the condition to send **+RESP:GTFRI** or **+RESP:GTERI** is reached according to the <*Mode*> setting.

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

➢ **+ACK:GTFRI,**

Example: **+ACK:GTFRI,5A0200,865585040006276,,0053,20190524161912,0051$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' _ '	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.3.2.Frequency Change of Fixed Report Information

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

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

➢ **AT+GTFFC=**

Example: **AT+GTFFC=gv56,0,2,1,,,,,,,30,500,500,300,,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Priority	1	0-4	0
Mode	1	0-3	0
FRI Mode	1	0-5	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300
Reserved	0		
Corner Report	<=3	0 – 180	0
Reserved			
Reserved			
Reserved			
Reserved			

Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

- **+ACK:GTFFC,**

Example: **+ACK:GTFFC,5A0200,865585040006276,,009B,20190524162035,009D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	

Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' _ '	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.Alarm Settings

3.2.4.1.Tow Alarm Configuration

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

➢ **AT+GTTOW=**

Example: **AT+GTTOW=gv56,1,5,1,60,0,0,0,0,2,3,2,,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Tow Enable	1	0|1	0
Engine Off to Tow	<=2	5 – 15 min	10
Fake Tow Delay	<=2	0 – 10 min	1
Tow Interval	<=5	30 – 86400 sec	300
Tow Output ID	1	0 – 1	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	1 – 9	2
Reserved	0		
Reserved	0		

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

- <*Tow Enable*>: Enable/disable the tow alarm function.
  - 0: Disable the tow alarm function.
  - 1: Enable the tow alarm function.
- <*Engine Off to Tow*>: A time parameter to determine whether the device is considered to be towed after the engine is turned off. If the motion sensor does not detect rest within the specified time after engine is turned off, the device is being towed.
- <*Fake Tow Delay*>: If the motion sensor detects movement after detecting engine off and rest, the device turns into a state called fake tow. If the device stays in fake tow for a period of time specified by the parameter <*Fake Tow Delay*>, it is considered to be towed.
- <*Tow Interval*>: The time interval for sending the tow alarm message.
- <*Tow Output ID*>: The ID of the output port to output the specified wave shape when tow event is detected.
- <*Tow Output Status*>: Please refer to the parameter <*Output1 Status*> in Chapter 3.2.5.
- <*Tow Output Duration*>: Please refer to the parameter <*Duration*> in Chapter 3.2.5.
- <*Tow Output Toggle Times*>: Please refer to the parameter <*Toggle Times*> in Chapter 3.2.5.
- <*Rest Duration*>: A time parameter to measure whether the device enters into stationary state. The status of the device will be changed to rest if the motion sensor detects stationary state which is maintained for a period of time specified by the parameter <*Rest Duration*>.
- <*Motion Duration*>: A time parameter to measure whether the device enters into moving state. The status of the device will be changed to motion if the motion sensor detects motion which is maintained for a period of time specified by the parameter <*Motion Duration*>.
- <*Motion Threshold*>: The threshold for the motion sensor to measure whether the device is moving.

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

- **+ACK:GTTOW,**

Example: **+ACK:GTTOW,5A0200,865585040006276,,0090,20190524162022,0091$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.2.Geo-Fence Information

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

- **AT+GTGEO=**

Example: **AT+GTGEO=gv56,0,3,117.129327,31.838810,1000,5,0,0,0,0,0,0,0,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
GEO ID	<=2	0 – 19	
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0|5 – 86400sec	0
Output ID	1	0 – 1	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
State Mode	1	0|1	0

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

- <*GEO ID*>: The ID of the Geo-Fence. A total of 20 zones (0 - 19) are supported.
- <*Mode*>: The working mode of the Geo-Fence to report the message **+RESP:GTGEO** to the backend server.
  - 0: Disable the zone's Geo-Fence function.
  - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
  - 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
  - 3: Report will be generated upon both entering and exiting the Geo-Fence zone.
- <*Longitude*>: The longitude of a point which is defined as the center of the circular Geo-Fence zone. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the minus sign "–" and east longitude is defined as positive without "+".
- <*Latitude*>: The latitude of a point which is defined as the centre of the circular Geo-Fence zone. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "–" and north latitude is defined as positive without "+".
- <*Radius*>: The radius of the circular Geo-Fence zone. The value range is (50 – 6000000) and the unit is meter.
- <*Check Interval*>: The interval of GNSS checking position information against Geo-Fence alarm.
- <*Trigger Mode*>: A numeral to indicate the working mode of the geofencing function.
  - 0: Disable auto trigger mode.
  - 21: Automatically set up a Geo-Fence after the ignition is turned off. In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is off. It will only send the alarm report when exiting the Geo-Fence zone. The Geo-Fence will be cancelled after the device exits the zone.
  - 22: Manually enable Geo-Fence after the ignition is turned off. In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is off. It will only send the alarm report when exiting the Geo-Fence zone. When the device exits this Geo-Fence, it will cancel this Geo-Fence and disable the trigger mode at the same time. If the driver wants to use this trigger mode again, he has to manually set the trigger mode again.
- <*Trigger Report*>: Whether to report the **+RESP:GTGES** message when a specified trigger mode is triggered and when the Geo-Fence is cancelled.
  - 0: Disable the **+RESP:GTGES** report.
  - 1: Enable the **+RESP:GTGES** report.
- <*State Mode*>: A numeral to indicate the mode of reporting GEO state.

- 0: Report when getting the GEO state for the first time.
- 1: Do not report until the GEO state changes.

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

➢ **+ACK:GTGEO,**

Example: **+ACK:GTGEO,5A0200,865585040006276,,13,0061,20190524161928,0060$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
GEO ID	<=2	0 - 19	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.3.Polygon Geo-Fence

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

Note: This command can configure less than ten sets of longitude and latitude coordinates each time.

➢ **AT+GTPEO=**

Example: **AT+GTPEO=gv56,0,0,1,3,121.412240,31.187801,121.412248,31.187891,121.412258,31.187991,600,1,1,0,0,,,,,000B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
PEO ID	1	0 – 19	0
Mode	1	0 – 3	0
Start Point	2	1-10	

End Point	2	3-10	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Check Interval	<=5	0|5 – 86400sec	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
State Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*GEO ID*>: The ID of the Geo-Fence. A total of 20 zones (0 to 19) are supported.
- <*Mode*>: The working mode for the polygon Geo-Fence to report the message to the backend server.
  - 0: Disable the zone's Geo-Fence function.
  - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
  - 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
  - 3: Report both entering and exiting the zone.
- <*Start Point*>: The start point of the polygon GEO-Fence formed by a set of points.
- <*End Point*>: The end point of the polygon GEO-Fence formed by a set of points.
- <*Longitude*>: The longitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the minus sign "–" and east longitude is defined as positive without "+".
- <*Latitude*>: The latitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "–" and north latitude is defined as positive without "+".
- <*Check Interval*>: The interval of GNSS checking position information against the polygon Geo-Fence alarm.
- <*State Mode*>: A numeral to indicate the mode of reporting PEO state.
  - 0: The device should report when getting the PEO state for the first time.

- 1: The device does not report until the PEO state changes.

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

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

➢ **+ACK:GTPEO,**

Example: **+ACK:GTPEO,5A0200,865585040006276,,7,006F,20190524161944,006F$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' ' _	
GEO ID	1	0 - 19	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

3.2.4.4.Roaming Detection Configuration

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

➢ **AT+GTRMD=**

Example: **AT+GTRMD=gv56,0,,,,,1,1,,,,1,1,,,,1,1,,,,3DEF,,,3DEF,,,,,0,0,0,0,,,FFFF$** **AT+GTRMD=gv56,1,,,,,1,1,,,,1,3,46000,46001,46002,,,1,1,,,,3DEF,,,3DEF,,,,,0,0,0,0,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1	0
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Home Operator Start	1	1-10	
Home Operator End	1	1-10	
Home Operator List	<=6*10		
Reserved	0		
Reserved	0		
Roaming Operator Start	1	1-100	
Roaming Operator End	1	1-100	
Roaming Operator List	<=6*100		
Reserved	0		
Reserved	0		
Blacklist Operator Start	1	1-20	
Blacklist Operator End	1	1-20	
Black List Operator	<=6*20		
Reserved	0		
Reserved	0		
Known Roaming Event Mask	<=6	000000 – FFFFFF	3DEF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	<=6	000000 – FFFFFF	3DEF
Reserved	0		
Reserved	0		
Reserved	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		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

  Note: Operators that are not in <*Home Operator List*>, <*Roaming Operator List*> and <*Black List Operator*> will be considered as in "Unknown Roaming" state.
- <*Known Roaming Event Mask*>: Bitwise mask to configure which event report will be sent to the backend server when GSM roaming state is detected. If the roaming state indicates "Known Roaming", the <*Known Roaming Event Mask*> will be valid; if the roaming state indicates "Unknown Roaming", the <*Unknown Roaming Event Mask*> will be valid.
  - Bit 0 for **+RESP:GTPNA**
  - Bit 1 for **+RESP:GTPFA**
  - Bit 2 for **+RESP:GTMPN**
  - Bit 3 for **+RESP:GTMPF**
  - Bit 4 Reserved
  - Bit 5 for **+RESP:GTBPL**
  - Bit 6 for **+RESP:GTBTC**

- Bit 7 for **+RESP:GTSTC**
- Bit 8 for **+RESP:GTSTT**
- Bit 9 Reserved
- Bit 10 for **+RESP:GTPDP**
- Bit 11 for the power on **+RESP:GTRTL**
- Bit 12 for the ignition on/off report **+RESP:GTIGN** / **+RESP:GTVGN** and **+RESP:GTIGF** / **+RESP:GTVGF**
- Bit 13 for the ignition on/off location report **+RESP:GTIGL** / **+RESP:GTVGL**
- Bit 14 Reserved
- Bit 15 Reserved
- Bit 16 Reserved

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

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

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

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

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

➢ **+ACK:GTRMD,**

Example: **+ACK:GTRMD,5A0200,865585040006276,,0096,20190524162029,0097$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

Note: Only an AT command string of no more than 180 bytes could be accepted by the device in the case of sending the command via Manage Tool (not via GPRS).

As **AT+GTRMD** contains a large amount of configuration information in PLMN code list, make sure

the command length does not exceed 180 bytes through proper <*Operator Start*> and <*Operator End*> settings. Also a color alert will occur on Command Text Box which turns yellow if there is a command length of over 180 bytes when the Manage Tool is used.

3.2.4.5.Speed Alarm

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

➢ **AT+GTSPD=**

Example: **AT+GTSPD=gv56,1,10,50,20,30,0,0,0,0,,,,,,,,,,FFFF$** **AT+GTSPD=gv56,2,0,50,20,30,0,0,0,0,,,,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1|2|3	0
Min Speed	<=3	0 – 400km/h	0
Max Speed	<=3	0 – 400km/h	0
Validity	<=4	0 – 3600sec	60
Send Interval	<=4	30 – 3600sec	300
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		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

- ✧ <*Mode*>: The working mode of the speed alarm function.
  - 0: Disable speed alarm.
  - 1: Report speed alarm if the current speed is within the speed range defined by <*Min Speed*> and <*Max Speed*>.
  - 2: Report speed alarm if the current speed is outside the speed range defined by <*Min Speed*> and <*Max Speed*>.
  - 3: Report speed alarm only one time if the current speed is within/outside the speed range defined by <*Min Speed*> and <*Max Speed*>. In this mode, <*Send Interval*> will be ignored.
- ✧ <*Min Speed*>: The lower speed limit.
- ✧ <*Max Speed*>: The upper speed limit.
- ✧ <*Validity*>: If the speed meets the alarm condition and is maintained for the period of time specified by <*Validity*>, the speed alarm will be triggered.
- ✧ <*Send Interval*>: The time interval for sending speed alarm message.

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

- ➢ **+ACK:GTSPD,**

Example: **+ACK:GTSPD,5A0200,865585040006276,,007C,20190524161958,007C$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.6.Buzzer Alarm

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

➢ **AT+GTBZA=**

Example: **AT+GTBZA=gv56,1,,,,1,10,3,,,1,10,4,,,0,0,0,,,0,0,0,,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Output ID	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 2 Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 3 Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 4 Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		

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

✧ <*Output ID*>: The ID of the output port which indicates the connection with the buzzer.

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

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

➢ **+ACK:GTBZA,**

Example: **+ACK:GTBZA,5A0200,865585040006276,,0093,20190524162025,0094$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.7.Overspeed Alarm with Buzzer Notification

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=gv56,1,50,,60,1,,,70,,60,2,,,90,,60,3,,,110,,60,4,,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1|2	0
Speed Threshold 1	<=3	0 – 400km/h	50
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 2	<=3	0 – 400km/h	70
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 3	<=3	0 – 400km/h	90
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 4	<=3	0 – 400km/h	110
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0|1 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

✧ <*Mode*>: The working mode of the overspeed alarm function.
- 0: Disable this function.
- 1: Strict standard mode. In this mode, the device will check the speed and trigger the buzzer alarm during the acceleration or slowdown process.
- 2: Warning mode. In this mode, the device will only check the speed and trigger the buzzer alarm during the acceleration process.

✧ <*Speed Threshold*>: It defines the speed threshold to trigger the buzzer alarm.

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

✧ <*Alarm Type*>: The alarm type for each speed threshold. 0 means “No buzzer alarm”.

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

➢ **+ACK:GTSPA,**

Example: **+ACK:GTSPA,5A0200,865585040006276,,0094,20190524162027,0095$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.8.SOS Function

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

➢ **AT+GTSOS=**

Example: **AT+GTSOS=gv56,2,1,+8613812341234,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0 – 4	0
Digital Input ID	1	0 - 2	0
SOS Number	<=20		
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		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of SOS function.
  - 0: Disable SOS function.
  - 1: SOS call only.
  - 2: Send the current position to the backend server only.
  - 3: Send the current position to the backend server via GPRS and then make SOS call(s).
  - 4: Send the current position to the SOS Number via SMS and make SOS call(s).
- <*Digital Input ID*>: The ID of the digital input port which triggers the SOS function. 0 means "The SOS function is disabled". The digital input port should be configured by the command **AT+GTDIS** first for the SOS function. If a digital input port is configured to trigger the SOS function, there is no **+RESP:GTDIS** report message for the specified digital input port.
- <*SOS Number*>: The emergency phone number.

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

- **+ACK:GTSOS,**

Example: **+ACK:GTSOS,5A0200,865585040006276,,007D,20190524162000,007D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.9.Excessive Idling Detection

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

- **AT+GTIDL=**

Example: **AT+GTIDL=gv56,1,2,1,300,,,,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1	0
Time to Idling	<=2	1 – 30 min	2
Time to Movement	1	1 – 5 min	1
Debounce Distance	<=4	0|100-9999m	0
Reserved	0		
Reserved	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		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of the excessive idling detection function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Time to Idling*>: If it is detected that the vehicle is stationary with ignition on for the length of time specified by this parameter, it is considered to be in idling state.
- <*Time to Movement*>: If the vehicle moves again or ignition off is detected after it enters into idling status and the status lasts for the length of time specified by this parameter, the vehicle is considered to leave idling status.
- <*Debounce Distance*>: If the vehicle moves a longer distance than <*Debounce Distance*> after it enters into idling status, the vehicle will be considered to leave idling status.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when the vehicle enters into idling status. If it is set to 0, there will be no wave output.

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

➢ **+ACK:GTIDL,**

Example: **+ACK:GTIDL,5A0200,865585040006276,,008F,20190524162021,0090$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.10.Start/Stop Report

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

into Stop status, the device will report the event message **+RESP:GTSTP** to the backend server.

➢ **AT+GTSSR=**

Example: **AT+GTSSR=gv56,1,2,1,5,5,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1	0
Time to Stop	<=2	1 – 30 min	2
Time to Start	1	1 – 5 min	1
Start Speed	<=2	1 – 10 Km/h	5
Long Stop	<=5	0 – 43200 min	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: The working mode of the Start/Stop report function.
- 0: Disable this function.
- 1: Enable this function.

✧ <*Time to Stop*>: If the vehicle becomes stationary again and stays in that status for the period of time specified by this parameter after it enters into start status, the vehicle is considered to quit start status.

✧ <*Time to Start*>: If it is detected that the vehicle is moving with ignition on for the period of time specified by this parameter, it is considered to be in Start status.

✧ <*Start Speed*>: The start speed threshold to determine whether the vehicle is started or not. When the built-in motion sensor detects that the vehicle is moving with ignition on, the device will start to check the speed from GNSS. If the device speed is maintained at a higher level than <*Start Speed*> for a period of time longer than <*Time to Start*>, the vehicle is considered to be in Start status. The event message **+RESP:GTSTR** will be reported. Otherwise, if the device speed stays at a level lower than or equal with <*Start Speed*> for a period of time longer than <*Time to Stop*>, the vehicle is considered to quit Start status. The event message **+RESP:GTSTP** will be reported. If GNSS fix works in an abnormal status for more than 1 minute, the built-in motion sensor will be used to detect the Start/Stop status only without checking the speed.

✧ <*Long Stop*>: After the vehicle enters into Stop status and stays in the Stop status for the length of time specified by this parameter, the **+RESP:GTLSP** message will be sent. 0 means

"Disable this parameter".

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

➢ **+ACK:GTSSR,**

Example: **+ACK:GTSSR,5A0200,865585040006276,,0095,20190524162028,0096$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.11.Harsh Behavior Monitoring

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

➢ **AT+GTHBM=**

Example: **AT+GTHBM=gv56,1,,,100,5,5,,60,6,6,,,8,8,,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0 – 1	0
Reserved	0		
Reserved	0		
High Speed	<=3	100 – 400km/h	100
ΔVhb	<=3	0 – 100km/h	0
ΔVha	<=3	0 – 100km/h	0
Reserved	0		
Medium Speed	<=3	60 – 100km/h	60
ΔVmb	<=3	0 – 100km/h	0
ΔVma	<=3	0 – 100km/h	0

Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100km/h	0
ΔVla	<=3	0 – 100km/h	0
Reserved	0		
Output ID	1	0 – 1	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*>: The working mode of the harsh behavior monitoring function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*High Speed*>, <*Medium Speed*>: If the last known speed of the device read from GNSS is greater than or equal to <*High Speed*>, the vehicle that the device is attached to is considered to be at high speed. If the last known speed is less than <*High Speed*> and greater than or equal to <*Medium Speed*>, the vehicle is considered to be at medium speed. If the last known speed is less than <*Medium Speed*>, the vehicle is considered to be at low speed.
- <*ΔVhb*>: The threshold for harsh braking at high speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at high speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at high speed level".
- <*ΔVha*>: The threshold for harsh acceleration at high speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at high speed level. If it is set to 0, it means "Do not monitor harsh acceleration behavior at high speed level".
- <*ΔVmb*>: The threshold for harsh braking at medium speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at medium speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at medium speed level".
- <*ΔVma*>: The threshold for harsh acceleration at medium speed level. If the current speed is

greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at medium speed level. If it is set to 0, it means "Do not monitor harsh acceleration behavior at medium speed level".

- ✧ <*ΔVlb*>: The threshold for harsh braking at low speed level. If the current speed is lower than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at low speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at low speed level".
- ✧ <*ΔVla*>: The threshold for harsh acceleration at low speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at low speed level. If it is set to 0, it means "Do not monitor harsh acceleration behavior at low speed level".
- ✧ <*Output ID*>: It specifies the ID of the output port to output specified wave shape when harsh behavior is detected. If it is set to 0, there will be no wave output.

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

- ➢ **+ACK:GTHBM,**

Example: **+ACK:GTHBM,5A0200,865585040006276,,0083,20190524162006,0084$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.12.Jamming Detection

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

- ➢ **AT+GTJDC=**

Example: **AT+GTJDC=gv56,2,25,,5,10,10,,0,0,0,0,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56

Mode	1	0|1|2	0
Signal Threshold	<=2	0 – 31	25
Reserved	0		
Jamming Cell Number Threshold	<=2	0 – 99	5
Enter Jamming Timer Threshold	<=4	0 – 3600 sec	10
Quit Jamming Timer Threshold	<=4	0 – 3600 sec	10
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		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

- **+ACK:GTJDC,**

Example: **+ACK:GTJDC,5A0200,865585040006276,,0084,20190524162007,0085$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	

Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.13.Crash Detection

The command **AT+GTCRA** is used to configure the parameter for crash detection. When the detection condition is matched (The current acceleration in a direction is beyond the configured threshold), the device will report **+RESP:GTCRA** event message and data packets **+RESP:GTCRD** to the backend server.

- **AT+GTCRA=**

Example: **AT+GTCRA=gv56,1,80,80,80,0,500,500,0,0,0,0,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0 – 2	0
Threshold_X	<=3	0 - 160	50
Threshold_Y	<=3	0 – 160	50
Threshold_Z	<=3	0 – 160	50
Sampling Start	1	0|1	0
Samples Before Crash	4	1 – 1500	500
Samples After Crash	4	1 – 1500	500
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		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of the crash detection function.
  - 0: Disable this function.
  - 1: Enable this function.
  - 2: In this mode, the acceleration sensor data will be converted in accordance with three axis self-calibration. In the new coordinate system, the positive X-axis points in the direction in which the vehicle travels, the positive Y-axis, which is perpendicular to X axis, points in such a way that the positive X-axis is right handed, and positive Z-axis represents the opposite direction of gravity. **Note**: The device will still use the original three axis based on sensor to detect crash event until it has already detected the first **+RESP:GTASC** event.
- <*Threshold_X*>: The acceleration threshold for crash in X direction. The smaller the parameter is, the easier it is to detect crash event. If <*Threshold_X*> is 0, the device will not monitor crash event in X axis. The unit is 0.1g.
- <*Threshold_Y*>: The acceleration threshold for crash in Y direction. The smaller the parameter is, the easier it is to detect crash event. If <*Threshold_Y*> is 0, the device will not monitor crash event in Y axis. The unit is 0.1g.
- <*Threshold_Z*>: The acceleration threshold for crash in Z direction. The smaller the parameter is, the easier it is to detect crash event. If <*Threshold_Z*> is 0, the device will not monitor crash event in Z axis. The unit is 0.1g.
- <*Sampling Start*>: A numeral to indicate the time when to start acceleration sampling.
  - 0: Start acceleration sampling after power on. The device will always collect acceleration information as long as the device is on.
  - 1: Start acceleration sampling after ignition on. The device will collect acceleration information only in ignition on state.
- <*Samples Before Crash*>: The number of recorded XYZ-axis acceleration samples before crash.
- <*Samples After Crash*>: The number of recorded XYZ-axis acceleration samples after crash.

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

➢ **+ACK:GTCRA,**

Example: **+ACK:GTCRA,5A0200,865585040006276,,0091,20190524162023,0092$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.14.Three Axis Self-Calibration

The command **AT+GTASC** is used to define the condition for calibrating the directions of accelerometer. When the condition is matched and the accelerometer calibration succeeds, the device will report event message **+RESP:GTASC** which includes the calibration result to backend server. The pre-condition for the calibration is ignition on and movement.

➢ **AT+GTASC=**

Example: **AT+GTASC=gv56,50,10,2,,,,,0,0,0,0,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Brake Speed Threshold	<=3	30 – 400km/h	50
Delta Speed Threshold	<=2	5 – 72km/h	10
Delta Heading Threshold	1	0-5	2
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Brake Speed Threshold*>: The lower threshold of the speed before braking. If the speed is beyond the threshold before braking, the braking event could trigger the three-axis accelerometer calibration.

✧ <*Delta Speed Threshold*>: The lower threshold of the delta speed in one second during braking. If the delta speed is beyond the threshold, the braking event could trigger the three-axis accelerometer calibration.

✧ <*Delta Heading Threshold*>: The upper threshold of the delta heading during braking. If the delta heading is smaller than the threshold, the braking event could trigger the three-axis

accelerometer calibration.

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

- **+ACK:GTASC,**

Example: **+ACK:GTASC,5A0200,865585040006276,,008D,20190524162017,008E$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.5.IO Application

3.2.5.1.Digital Output

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

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

Wave Shape 1:

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

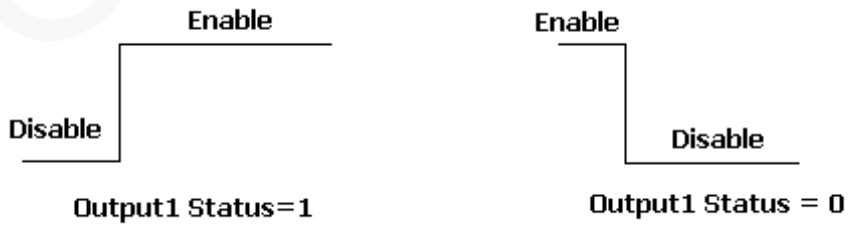


Figure 2: Wave Shape 1

Wave Shape 2:

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

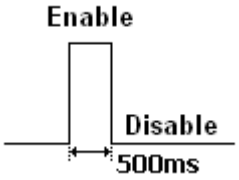


Figure 3: Wave Shape 2

Wave Shape 3:

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

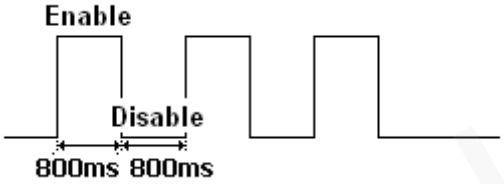


Figure 4: Wave Shape 3

➢ **AT+GTOUT=**

Example: **AT+GTOUT=gv56,0,0,0,,,,,,1,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Output1 Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOS Report	1	0-1	0
Reserved	0		
Reserved	0		
Reserved	0		

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

- <*Output1 Status*>: Valid only for the wave shape 1 as shown in **Figure 2**, it is used to set the final status of the output port.
  - 0: Disable status.
  - 1: Enable status.
- <*Duration*>: Please refer to **Figure 2**, **Figure 3** and **Figure 4**. Unit: 100ms.
- <*Toggle Times*>: Please refer to **Figure 2**, **Figure 3** and **Figure 4**.
- <*DOS Report*>: A bitwise value to control whether to report the message **+RESP:GTDOS**. Each bit represents an output. If a bit value is 1, the device will report the message **+RESP:GTDOS** when the status of the corresponding wave shape 1 output changes.
  - Bit 0: Output 1.

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

- **+ACK:GTOUT,**

Example: **+ACK:GTOUT,5A0200,865585040006276,,004E,20190524070905,004C$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.5.2.Digital Input Port Setting

The command **AT+GTDIS** is used to configure the parameters for two digital input ports. One digital input can be used as a normal input and an ignition detection input. The ignition detection input is dedicated to ignition signal detection. The other digital input can be used as an analog input. If the logic status of a normal digital input changes, the device will report the message **+RESP:GTDIS** to the backend server.

➢ **AT+GTDIS=**

Example: **AT+GTDIS=gv56,0,1,2,,0,2,1,0,0,,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Input Working Mode	1	0|1	0
Enable	1	0|1	1
Debounce Time	<=2	1 – 20(*10ms)	1
Reserved	0		
Ignition Detection Mode	1	0 - 4	0
Input ID 2	1	2	2
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=2	0|1 – 12(×2s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Input Working Mode*>: It indicates the input working mode.
- 0: Ignition detection.
- 1: Normal input detection.

✧ <*Enable*>: Enable/disable the interrupt input.
- 0: Disable the interrupt input.
- 1: Enable the interrupt input.

✧ <*Ignition Detection Mode*>: A numeral to define the ignition detection mode.
- 0: Hard-wired ignition detection mode.

- 1: Motion status to simulate ignition status. In this mode, movement state will trigger behaviors which should be triggered by ignition-on state, including (1) Enable the odograph function to calculate the total mileage, (2) GNSS chip works in "always on" mode, (3) The fixed report, geo-fence (**AT+GTGEO** and **AT+GTPEO**) and speed alarm (**AT+GTSPD**) report functions are resumed, and non-movement state will trigger behaviors which should be triggered by ignition-off state, including (1) Disable the odograph function to calculate the total mileage, (2) GNSS chip works in "only on when needed" mode, (3) The fixed report, geo-fence (**AT+GTGEO** and **AT+GTPEO**) and speed alarm (**AT+GTSPD**) report functions are suspended when the <*Power Saving Mode*> is set to Mode 1.
- 2: External power voltage mode (virtual ignition detection). Ignition state correlates with the voltage of external power. Please use the command **AT+GTVVS** to configure the parameters and enable the function of **AT+GTEPS**.
- 3: Reserved.
- 4: Accelerometer mode (virtual ignition detection). Ignition state correlates with the state of accelerometer. Please use the command **AT+GTAVS** to configure the parameters.

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

When virtual ignition detection is enabled and the corresponding bits (Bit 12 and Bit 13) of <*Event Mask*> in the command **AT+GTCFG** are set to 1, **+RESP:GTVGN**, **+RESP:GTVGF** and **+RESP:GTVGL** can be reported to the backend server.

✧ <*Input ID 2*>: The port ID of digital input 2.

✧ <*Debounce Time*>: The debounce time for the interruptible input port.

✧ <*Validity Time*>: The validity time of the input port. 0 means "Do not check the validity time".

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

➢ **+ACK:GTDIS,**

Example: **+ACK:GTDIS,5A0200,865585040006276,,0050,20190524070907,004E$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	

Tail Character	1	$	$

3.2.5.3.Input/Output Port Binding

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

➢ **AT+GTIOB=**

Example: **AT+GTIOB=gv56,0,1,1,1,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
IOB ID	1	0 – 1	0
Input Mask	1	0 – 7	0
Trigger Mask	1	0 – 7	0
Input Sample Period	<=2	0|1 – 12(×2s)	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		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*IOB ID*>: The ID of the user defined IO binding.

✧ <*Input Mask*>: Bitwise mask for input port composition. Each bit represents one digital input port. Set a bit to 1 to enable the corresponding input port and 0 to disable the corresponding input port.

- Bit 0: Ignition detection

- Bit 1: Reserved
- Bit 2: Digital input 2

✧ <*Trigger Mask*>: Bitwise mask for trigger condition composition of the corresponding input port. Each bit represents the logic status of the corresponding input port to trigger the IOB event. Set a bit to 1 to use "Enable status" as the trigger condition and 0 to use "Disable status" as the trigger condition. Only when the input logic status in one IO binding meets the trigger condition will the IOB event be triggered.

- Bit 0: Ignition detection
- Bit 1: Reserved
- Bit 2: Digital input 2

✧ <*Input Sample Period*>: The sampling interval for checking the status of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use separate sample periods to check the input port status even for the same input port.

✧ <*Output ID*>: The ID of the output port to output specified wave when the trigger condition is met. 0 means "No wave will be output".

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

➢ **+ACK:GTIOB,**

Example: **+ACK:GTIOB,5A0200,865585040006276,,0,0051,20190524070908,004F$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' '	
IOB ID	1	0 - 1	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.5.4.External Power Supply Monitoring

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

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

➢ **AT+GTEPS=**

Example: **AT+GTEPS=gv56,1,250,25000,1,1,0,0,0,0,1,0,0,5,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1|2	0
Min Threshold	<=5	250 – 32000 mV	250
Max Threshold	<=5	250 – 32000 mV	250
Sample Period	<=2	0|1 – 12(×2s)	0
Debounce Time	1	0 – 5 (×1s)	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
Sync with FRI	1	0|1	0
Voltage Margin Error	3	0 – 100(×10mv)	0
Debounce Voltage Threshold	3	0 – 100 (×100mv)	0
MPF Validity Time	2	0 – 20 (×1s)	5
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

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

alarm.

- <*Sample Period*>: The period for sampling the external power supply.
- <*Debounce Time*>: The time for debouncing external power voltage to avoid excessive voltage drop in the external power supply.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when the **+RESP:GTEPS** alarm is triggered. If it is set to 0, there will be no output wave.
- <*Sync with FRI*>: Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the fixed report message.
  - 0: Do not report external power supply voltage with fixed report message.
  - 1: Report external power supply voltage with fixed report message.
- <*Voltage Margin Error*>: This parameter is used together with <*Min Threshold*> and <*Max Threshold*> parameters. It indicates the voltage margin error of <*Min Threshold*> and <*Max Threshold*>. If the current voltage detected falls within the range of the <*Voltage Margin Error*> of the <*Min Threshold*> or the <*Voltage Margin Error*> of <*Max Threshold*>, it will not trigger **+RESP:GTEPS** alarm report. For example, if the <*Min Threshold*> is set to 6000mv, the <*Max Threshold*> is set to 12000mv, and the <*Voltage Margin Error*> is set to ±100mv, the current voltage will not trigger **+RESP:GTEPS** alarm report when the current voltage meets the condition (5900mv < current voltage < 6100mv) or (11900mv < current voltage < 12100mv). The parameter improves the performance of **+RESP:GTEPS** alarm report.
- <*Debounce Voltage Threshold*>: This parameter is used together with <*Debounce Time*>. If the voltage drops or bursts dramatically more than <*Debounce Voltage Threshold*>, the device will start to debounce voltage for the period of time specified by <*Debounce Time*>.
- <*MPF Validity Time*>: The validity time for detecting the device disconnecting main power supply. 0 means “Do not check the validity time”. If <*MPF Validity Time*> is not 0, and the device remains disconnected with main power supply for the period of time specified by this parameter, the device will report **+RESP:GTMPF** to the backend server. If it is detected that the device disconnects the main power supply when <*MPF Validity Time*> is 0, the device will report **+RESP:GTMPF** to the backend server immediately.

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

- **+ACK:GTEPS,**

Example: **+ACK:GTEPS,5A0200,865585040006532, ,0013,20190521052231,0040$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	

Tail Character	1	$	$

3.2.5.5.Analog Input Port Setting

The command **AT+GTAIS** is used to configure the parameters of the analog input port.
Make sure there is an analog signal connected to the corresponding analog input port before enabling this function for that port.

➢ **AT+GTAIS=**

Example: **AT+GTAIS=gv56,1,0,250,16000,1,,0,0,0,0,1,,,,,,,,0,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv56
Analog Input ID1	1	1	1
Mode	1	0|1|2|3	0
Min Threshold	<=5	0 – 30000 mV	0
Max Threshold	<=5	0 – 30000 mV	0
Sample Rate	<=2	0|1 – 12(×2s)	0
Reserved	0		
Output ID	1	0 – 1	0
Output Active	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		
Voltage Margin Error	3	0 – 100(×10mv)	0

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Fuel Data Debounce	2	0 – 150	10
Fuel Sensor Delay	<=3	0 – 600 sec	30
Fuel Lost Alarm	<=2	0 – 50	10
Fuel Sensor Sample Count	<=3	1 – 150	20
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Analog Input ID 1*>: The analog input port ID.
- <*Mode*>: The working mode of the analog input alarm.
  - 0: Disable analog input alarm.
  - 1: Enable analog input alarm: If the current input voltage enters the range of (<*Min Threshold*>, <*Max Threshold*>), the alarm will be triggered.
  - 2: Enable analog input alarm: If the current input voltage exits the range of (<*Min Threshold*>, <*Max Threshold*>), the alarm will be triggered.
  - 3: Connect with a fuel level sensor to support fuel level reporting and monitoring.

    Note: If the selected mode is set to 3, please do not choose the wave shape 1 as the specified output port's wave.
- <*Min Threshold*>: If <*Mode*> is set to 1 or 2, this parameter indicates the lower voltage limit of the analog input port to trigger the alarm.
- <*Max Threshold*>: If <*Mode*> is set to 1 or 2, this parameter indicates the upper voltage limit of the analog input port to trigger the alarm.

  Note:

  When <*Mode*> is set to 1 or 2, the value of <*Min Threshold*> should be set less than the value of <*Max Threshold*>.

  When <*Mode*> is set to 3, the value of <*Min Threshold*> should not be equal to the value of <*Max Threshold*>.
- <*Sample Rate*>: The sampling period for the analog input port.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when the analog input alarm is triggered. If it is set to 0, there will be no output wave.
- <*Output Active*>: It is used to set the final status of the output port.
  - 0: Disable status.
  - 1: Enable status.
- <*Toggle Times*>: The rise and fall times of the square wave.
- <*Sync with FRI*>: The device can send the analog input voltage periodically along with fixed

report message. Set this field to 1 to enable this feature, and 0 to disable it. If the analog input port is used to work with a fuel sensor and the <*Sync with FRI*> is enabled, the device will report the fuel level together with the fixed report message.

- ✧ <*Voltage Margin Error*>: This parameter is used together with <*Min Threshold*> and <*Max Threshold*> parameters. It indicates the voltage margin error of the <*Min Threshold*> and <*Max Threshold*>. If the current value of voltage detected falls within the range of the <*Voltage Margin Error*> of the <*Min Threshold*> or <*Voltage Margin Error*> of <*Max Threshold*>, this voltage value will not be processed. For example, if <*Min Threshold*> is set to 6000mv, <*Max Threshold*> is set to 12000mv, and the <*Voltage Margin Error*> is set to ±100mv, the current voltage which meets the condition (5900mv <current voltage <6100mv) or (11900mv <current voltage <12100mv) will not be processed. The parameter improves the performance of the **+RESP:GTAIS** report.
- ✧ <*Fuel Data Debounce*>: The number of the data samples abandoned before calculating the fuel level.
- ✧ <*Fuel Sensor Delay*>: After the ignition is turned on, the fuel sensor will need to wait for the length of time specified by this parameter before it can report correct fuel level.
- ✧ <*Fuel Lost Alarm*>: If the difference between the current fuel level (after the ignition is turned on) and the last measured fuel level (before the previous ignition is turned off) is greater than this parameter value, an unusual fuel consumption alarm is sent via the event message **+RESP:GTFLA.**
- ✧ <*Fuel Sensor Sample Count*>: This parameter defines the total number of sample readings from the fuel sensor for calculating the current fuel level. And the value must be greater than <*Fuel Data Debounce*>.

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

- ➢ **+ACK:GTAIS,**

Example: **+ACK:GTAIS,5A0300,135790246811220,,0008,20090214093254,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6.Virtual Ignition Detection

3.2.6.1.Voltage Virtual Ignition Setting

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

➢ **AT+GTVVS=**

Example: **AT+GTVVS=gv56,13500,600,10,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 - 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Ignition On Voltage	<=5	250 – 28000 mV	13500
Voltage Offset	<=4	200 – 2000 mV	600
Ignition On Debounce	<=3	5 – 255 (× 2 sec)	10
Smart Voltage Adjustment	1	0|1	1
Ignition Off Debounce	<=3	5 – 255 (× 2 sec)	10
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

✧ <*Voltage Offset*>: The offset from <*Ignition On Voltage*> used to determine ignition off state. When the voltage of the external power is <*Voltage Offset*> lower than <*Ignition On Voltage*>, it will be considered in ignition off state.

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

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

✧ <*Smart Voltage Adjustment*>: Enable/disable smart voltage adjustment algorithm.

- 0: Disable the smart voltage adjustment algorithm. The value of <*Ignition On Voltage*> and <*Voltage Offset*> will keep static.
- 1: Enable the smart voltage adjustment algorithm. The value of <*Ignition On Voltage*> and <*Voltage Offset*> will dynamically change according to the actual ignition on and off voltage.

✧ <*Ignition Off Debounce*>: The debounce time to wait before updating the virtual ignition off state according to the external power voltage.

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

➢ **+ACK:GTVVS,**

Example: **+ACK:GTVVS,5A0200,865585040006532, ,0014,20190521052312,0045$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6.2.Accelerometer (Motion Status) Virtual Ignition Setting

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

➢ **AT+GTAVS=**

Example: **AT+GTAVS=gv56,20,30,,,,000B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 - 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Rest Validity	<=3	1 – 255 sec	20
Movement Validity	<=3	1 – 255 sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

➢ **+ACK:GTAVS,**

Example: **+ACK:GTAVS,5A0200,865585040007340,,00B3,20190520122857,0082$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6.3.Virtual Ignition Mode Selection

The command **AT+GTVMS** is used to configure the mode of detecting virtual ignition state.

➢ **AT+GTVMS=**

Example: **AT+GTVMS=gv56,5,,,,,FFFF$** **AT+GTVMS=gv56,7,01,03,0,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Virtual Ignition Mode	1	0|1|2|4|7	0
Virtual Ignition On Mask	2	00-03	03
Virtual Ignition Off Mask	2	00-03	03

Virtual Ignition On Logic	1	0-1	1
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Virtual Ignition Mode*>: A numeral to define the working mode of detecting virtual ignition state.

- 0: Disable the virtual ignition detection function.
- 1: Motion status to simulate ignition status. In this mode, movement state will trigger behaviors which should be triggered by ignition-on state, including (1) Enable the odograph function to calculate the total mileage, (2) GNSS chip works in "always on" mode, (3) The fixed report, geo-fence (**AT+GTGEO** and **AT+GTPEO**) and speed alarm (**AT+GTSPD**) report functions are resumed, and non-movement state will trigger behaviors which should be triggered by ignition-off state, including (1) Disable the odograph function to calculate the total mileage, (2) GNSS chip works in "only on when needed" mode, (3) The fixed report, geo-fence (**AT+GTGEO** and **AT+GTPEO**) and speed alarm (**AT+GTSPD**) report functions are suspended when the <*Power Saving Mode*> is set to mode 1.
- 2: Voltage virtual ignition detection mode. The ignition status is related to the voltage of the external power supply. Please use the command **AT+GTVVS** to configure the parameters.
- 3: Reserved.
- 4: Accelerometer virtual ignition detection mode. Ignition status can be indicated by the motion status determined by <*Sensor Rest Duration*> and <*Sensor Motion Validity*> defined in the **AT+GTAVS** command. Stationary state indicates ignition off and moving state indicates ignition on.
- 7: Combined detection mode. In this mode, ignition on/off trigger conditions can be selected using <*Virtual Ignition On Mask*> and <*Virtual Ignition Off Mask*> parameters.

  Note: <*Virtual Ignition Off Mask*> must contain <*Virtual Ignition On Mask*> to prevent logic errors.

✧ <*Virtual Ignition On Mask*>: Bitwise mask to detect the ignition on event. The logic of each bit is controlled by <*Virtual Ignition On Logic*> parameter.

Bit 0 (01): Voltage virtual ignition detection

Bit 1 (02): Motion status virtual ignition detection

✧ <*Virtual Ignition Off Mask*>: Bitwise mask to detect ignition off event. All bits matched are considered as ignition off event.

Bit 0 (01): Voltage virtual ignition detection

Bit 1 (02): Motion status virtual ignition detection

For example:

Bit (00000003): Voltage virtual ignition detection and motion status virtual ignition detection combined mode. Only when ignition off is detected by both Mode 2 and Mode 4, the device is

considered in ignition off state.

✧ <*Virtual Ignition On Logic*>: The logic of each bit in <*Virtual Ignition On Mask*>.

- 0: AND logic. All bits matched are considered as ignition on event.
- 1: OR logic. Any one bit matched is considered as ignition on event.

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

➢ **+ACK:GTVMS,**

Example: **+ACK:GTVMS,5A0204,865084030004210,,FFFF,20170609080955,097C$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

Note: If the virtual ignition detection function is enabled, **+RESP:GTVGN**, **+RESP:GTVGF** and **+RESP:GTVGL** can be reported to the backend server when the corresponding bit in <*Event Mask*> of the command **AT+GTCFG** is set to 1.

3.2.7.Bluetooth Setting

3.2.7.1.Bluetooth Setting

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

➢ **AT+GTBTS=**

Example: **AT+GTBTS=gv56,1,,GV56_BT,04,,,1903,0003,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1	0
Reserved	0		

Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	GV56_BT
Bluetooth Service	<=2	00-FF	04
Reserved	0		
Reserved	0		
Bluetooth Report Mask	<=4	0000 - FFFF	1903
Bluetooth Event Mask	<=4	0000 – FFFF	0003
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of the Bluetooth on the device.
  - 0: Disable Bluetooth.
  - 1: Enable Bluetooth.
- <*Bluetooth Name*>: The name of the device for Bluetooth identification.
- <*Bluetooth Service*>: The services which the device provides.
  - Bit 0: Reserved
  - Bit 1: Reserved
  - Bit 2: Virtual Serial Port Service. The data will be transmitted over virtual serial port connection in this service.
- <*Bluetooth Report Mask*>: Bitwise mask to configure the composition of Bluetooth information in report messages.
  - Bit 0 for <*Bluetooth Name*>

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

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

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

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

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

➢ **+ACK:GTBTS,**

Example: **+ACK:GTBTS,5A0200,865585040007340,,00B6,20190520122900,0085$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.7.2.Bluetooth Voice Setting

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

➢ **AT+GTBVS=**

Example: **AT+GTBVS=gv56,1,501aa565fbe6,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1|2	0
Match Headset MAC	=12	0000000000 – FFFFFFFFFFFF	
Match BT Name	<=20		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of this function.
  - 0: Disconnect Bluetooth headset.
  - 1: Connect Bluetooth headset by headset MAC.
  - 2: Connect Bluetooth headset by Bluetooth name.
- <*Match Headset MAC*>: The headset MAC address that needs to be matched for connection between the device and Bluetooth headset. If the match succeeds, the Bluetooth on the device can connect with the Bluetooth headset. Otherwise, the device cannot connect with the Bluetooth headset.
- <*Match BT Name*>: The Bluetooth name of the headset that needs to be matched for Bluetooth connection between the device and Bluetooth headset. If the match succeeds, the Bluetooth on the device can connect with the Bluetooth headset. Otherwise, the device cannot connect with the Bluetooth headset.

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

- **+ACK:GTBVS,**

Example: **+ACK:GTBVS,5A0200,865585040007340,,00B7,20190520122901,0086$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	

Tail Character	1	$	$

3.2.7.3.Bluetooth Manager Setting

The command **AT+GTBMS** is used to configure the peripherals which the device will connect to and read the data from. Once the device connects with the peripheral, it will try to search the Service by UUID and read the data from specified Characteristic. Before using the **AT+GTBNS** function, make sure the <*Mode*> in the command **AT+GTBTS** is enabled.

➢ **AT+GTBMS=**

Example: **AT+GTBMS=gv56,0,1,BT_SENSOR,124343423212,3,1,3430,1,3431,,,0,12,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Index	1	0 – 3	
Mode	1	0|1	0
Peripheral Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' _'	BT_SENSOR
Peripheral MAC Address	12	000000000000 - FFFFFFFFFFFF	
Data Mask	4	0000 – FFFF	0003
Service UUID Type	1	1|2	1
Service UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Characteristic UUID Type	1	1|2	1
Characteristic UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Reserved	0		
Reserved	0		
Data Format	1	0|1	0

Send Interval	<=5	0|1-86400(×5s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Index*>: The index of a specific peripheral device stored in the device.
- <*Mode*>: Enable/disable the function of connecting to and reading data from the peripheral specified by <*Index*>.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Peripheral Name*>: The name of the peripheral device which the device will connect.
- <*Peripheral MAC Address*>: The MAC address of the peripheral device which the device will connect.
- <*Data Mask*>: Bitwise mask to configure the composition of Bluetooth data in report messages.
  - Bit 0 for Service information which includes <*Service UUID Type*> and <*Service UUID*>
  - Bit 1 for Characteristic information which includes <*Characteristic UUID Type*> and <*Characteristic UUID*>

  For each bit, set it to 1 to enable the corresponding component in the report, and 0 to disable the corresponding component in the report. This mask is valid for all Bluetooth report messages.
- <*Service UUID Type*>: The type of Universally Unique Identifier of Service. If the UUID of the peripheral uses Bluetooth standard specification, 16-bit UUID is used; otherwise only 128-bit UUID is used. For the standard data format, see following byte0 ~ byte11(0xFB, 0x34, 0x9B, 0x5F, 0x80, 0x00, 0x00, 0x80, 0x00, 0x10, 0x00, 0x00), byte14~byte15(0x00, 0x00).
  - 1: 16-bit UUID.
  - 2: 128-bit UUID.
- <*Service UUID*>: The Universally Unique Identifier for a Bluetooth Service.
- <*Characteristic UUID Type*>: The type of Universally Unique Identifier of Characteristic. If the UUID of the peripheral uses Bluetooth standard specification, 16-bit UUID is used; otherwise only 128-bit UUID is used. For the standard data format, see following byte0 ~ byte11(0xFB, 0x34, 0x9B, 0x5F, 0x80, 0x00, 0x00, 0x80, 0x00, 0x10, 0x00, 0x00), byte14~byte15(0x00, 0x00).
  - 1: 16-bit UUID.
  - 2: 128-bit UUID.
- <*Characteristic UUID*>: The Universally Unique Identifier of a Bluetooth Characteristic.
- <*Data Format*>: This parameter defines the format of the data in the **+RESP:GTBDR**

message.

- 0: Raw data received from Bluetooth. If the data is not an ASCII code and protocol format is ASCII format, please do not use this mode.
- 1: Hexadecimal format. For example, if the data is 0x69, it will be shown as 69 in the report message.

✧ <*Send Interval*>: If this parameter is 0, the message **+RESP:GTBDR** will be sent once after the device connects with a Bluetooth peripheral. If this parameter value is not 0, the message **+RESP:GTBDR** will be sent at the interval specified by this parameter after the device connects with a peripheral device.

Note: The two functions **AT+GTBMS** and **AT+GTBAS** cannot be used at the same time.

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

➢ **+ACK:GTBMS,**

Example: **+ACK:GTBMS,5A0200,865585040007340,,00D5,20190520122935,00A4$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' _ '	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.7.4.Bluetooth Accessory Setting

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

➢ **AT+GTBAS=**

Example: **AT+GTBAS=gv56,5,1,0,TD_100114,B339808571D9,1F,30,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Index	1	0 - 9	0

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

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

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

- 0: No Bluetooth accessory
- 1: Escort Bluetooth Accessory

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.

- 2: Beacon temperature sensor. Five reserved parameters are used as follows:

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

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

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

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

✧ <*Low Temperature*>: It specifies the lower temperature limit.

✧ <*High Temperature*>: It specifies the upper temperature limit.

✧ <*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 <*Validity*> time, the temperature alarm will be triggered.

- 3: Reserved
- 4: CAN accessory. Five reserved parameters are used as follows:

PIN Code	4|6	0000-9999|000000-999999	0000
Reserved			
Reserved			
Reserved			
Reserved			

✧ <*PIN Code*>: the code needs to be input when paired with accessories.

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

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

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

✧ <*Low Temperature*>: It specifies the lower temperature limit.

✧ <*High Temperature*>: It specifies the upper temperature limit.

✧ <*Temperature Validity*>: If the sensor detects the environment temperature which meets the alarm condition, it will continuously check the temperature. If the temperature keeps meeting the alarm condition for <*Temperature Validity*> 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.

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

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

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

For DUT-E fuel sensor, five reserved parameters are used as follows:

IGN Send Interval	<=5	0|10 – 86400sec	30
IGF Send Interval	<=5	0|10 – 86400sec	60
Actual Sensor Length	<=5	0 - 6000(mm)	0
Empty Frequency	<=7	0 – 4294967 (Hz)	0
Full Frequency	<=7	0 – 4294967 (Hz)	0

- ✧ <*Actual Sensor Length*>: The actual length of sensor after cutting.
- ✧ <*Empty Frequency*>: The frequency of empty sensor (not immersed in fuel).
- ✧ <*Full Frequency*>: The frequency of sensor fully immersed in fuel.

Note: If the parameters <*Actual Sensor Length*>, <*Empty Frequency*> and <*Full Frequency*> have been set and are not default values, the value of fuel level will send the message **+RESP:GTERI,** not the message **+RESP:GTBAR.**

● 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**.

● 10: Mechatronics Bluetooth accessory.

For fuel sensor, five reserved parameters are used as follows:

Fuel Level Format	1	0 - 1	0
Reserved			
Reserved			
Reserved			
Reserved			

✧ <*Fuel Level Format*>: The format of fuel level in the message.

- 0: The original value of fuel level.
- 1: The percentage of fuel level.

- 11: Magnet Bluetooth accessory.

For magnet sensor, five reserved parameters are used as follows:

MAG Event Notification	1	0-1	0
Reserved			
Reserved			
Reserved			
Reserved			

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

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

- 12: Reserved.
- 13: Relay Bluetooth accessory.

Relay Event Notification	1	0 – 1	0
Password	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	123456
New Password	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	123456
Reserved			
Reserved			

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

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

✧ <*Password*>: It is the current password for the accessory device.

✧ <*New Password*>: It is set to change the current password.

Note: If <*New Password*> is set successfully, <*Password*> will be changed to <*New Password*>.

- 17: ITALON Bluetooth Accessory.

✧ <*Accessory Model*>: The model of the Bluetooth accessory which is defined in <*Accessory*

Type>. The following is supported now:

- The model of Escort Bluetooth Accessory (<*Accessory Type*> is 1):
  0: TD_BLE fuel sensor
  3: Angle sensor
  4: TW_BLE (TD-150) fuel sensor
- The model of beacon temperature sensor (<*Accessory Type*> is 2):
  0: WTS300
  1: Temperature ELA
  Note: The ELA accessories do not support voltage data collection.
- The model of CAN accessory (<*Accessory Type*> is 4):
  0: BLE CAN100
- The model of Technoton accessory (<*Accessory Type*> is 7):
  0: DUT-E S7
  1: DFM 100 S7
  2: DFM 250DS7
  3: GNOM DDE S7
  4: GNOM DP S7
- The model of Beacon Multi-Functional Sensor (<*Accessory Type*> is 6):
  2: WTH300
  3: RHT ELA
  5: WTH301
- The External Input Output Bluetooth Accessory (<*Accessory Type*> is 8):
  0: WBC300
  Note: The current version supports only one WBC300 configuration.
- The model of Mechatronics accessory (<*Accessory Type*> is 10):
  0: Fuel sensor
  1: Angle sensor
- The model of Magnet Sensor (<*Accessory Type*> is 11):
  0: MAG ELA
- The model of Relay Sensor (<*Accessory Type*> is 13):
  0: WRL300 sensor
- The model of ITALON Sensor (<*Accessory Type*> is 17):
  0: fuel sensor

✧ <*Accessory Name*>: The name of the Bluetooth accessory.
Note: The WTS300 accessories do not support connection by name.

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

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

- Bit 0: <*Accessory Name*>

- Bit 1: <*Accessory MAC*>
- Bit 2: <*Accessory Status*>
- Bit 3: <*Accessory Battery Level*>
- Bit 4: <*Accessory Temperature*>
- Bit 5: <*Accessory Humidity*>
- Bit 7: <*Accessory Input Output Data*>
- Bit 8: <*Accessory Event Notification Data*>
- Bit 11: <*Enhanced Temperature*>
- Bit 12: <*Magnet Data*>
- Bit 13: <*Accessory Battery Percentage*>
- Bit 14: <*Relay Data*>

Note: Currently only ELA devices support Bit11. Bit14 controls the reporting of <*Relay Config Result*> and <*Relay state*> in the message **+RESP:GTBAA** as well as the reporting of <*Relay state*> in the message **+RESP:GTERI**.

✧ <*Read Interval*>: The interval for reading data from the Bluetooth accessory. This field is only valid when the Bluetooth accessory is a Bluetooth connectable accessory and need to send commands to get data.

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

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

Note:

The two functions **AT+GTBAS** and **AT+GTBMS** cannot be used at the same time.

If <*Accessory Type*> is 4 and <*Accessory Model*> is 0 or <*Accessory Type*> is 7, those parameters <*Accessory Append Mask*>, <*Low Voltage Threshold*>, <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*> are invalid. And the data would not be reported via the **+RESP:GTERI** message.

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

➢ **+ACK:GTBAS,**

Example: **+ACK:GTBAS,5A0200,865585040007340,,00BC,20190520122907,008B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	

Tail Character	1	$	$

3.2.7.5.Bluetooth Beacon ID Setting

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

➢ **AT+GTBID=**

Example: **AT+GTBID=gv56,5,1,0,TD_100114,B339808571D9,1F,30,,,,,,FFFF$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Index	1	0-2	0
Enable	1	0|1	
Beacon ID Model	1	0-2	0
Append Mask	<=4	0 - FFFF	A
Low Voltage Threshold	<=4	0 – 5000mV	2400
Reserved	0		
Start Index	<=3	1 - 300	
End Index	<=3	1 - 300	
MAC List	<=12*75		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
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		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Index*>: The index of the beacon Bluetooth accessory.
- <*Enable*>: Enable/disable this function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Beacon ID Model*>: The model of the beacon Bluetooth accessory. The following is supported now:
  - 0: WKF300. Five reserved parameters are used as follows:

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

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

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

Reserved	0		
Reserved	0		

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

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

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

- 2: ID ELA. Five reserved parameters are used as follows:

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

✧ <*Alarm Mode*>: It specifies the mode of detecting ID ELA.

- 0: Disable alarm.
- 1: Alarm when receiving Bluetooth broadcast.
- 2: Alarm when Bluetooth broadcast is not received.
- 3: Alarm when receiving Bluetooth broadcast or leaving Bluetooth broadcast.

Note: The alarm information will be reported in the message **+RESP:GTBAA**.

✧ <*IDELA Detection Mode*>: It specifies the mode of detecting ID ELA.

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

information of top 15 IDELA.

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

✧ <*Append Mask*>: Bitwise mask to configure the composition of Bluetooth accessary information in **+RESP:GTBAA** and **+RESP:GTBID** messages.

- Bit 0: Reserved
- Bit 1: <*Accessory MAC*>
- Bit 2: Reserved
- Bit 3: <*Accessory Battery Level*>, iBeacon E6 is not supported.
- Bit 4: Reserved
- Bit 5: Reserved
- Bit 6: <*Signal Strength*>
- Bit 7: <*Beacon Type*> and <*Beacon Data*>

✧ <*Low Voltage Threshold*>: It specifies the lower voltage limit. When the voltage of the Bluetooth accessary is below this value, the device will report the message **+RESP:GTBAA** to the backend server. 0 means "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 number of MAC addresses that will be updated. If either one is empty, there should be no <*MAC List*> following the empty value. A maximum of 15 MAC addresses can be updated each time.

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

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

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

➢ **+ACK:GTBID,**

Example: **+ACK:GTBID,5A0400,135790246811220,,0005,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	

Tail Character	1	$	$

3.2.7.6.CANBUS Device Configuration

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

➢ **AT+GTCAN=**

Example: **AT+GTCAN=gv56,1,30,60,FFFFFFFF,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1	0
CAN Report Interval	<=5	0|5 – 86400sec	0
CAN Report Interval IGF	<=5	0|5 – 86400sec	0
CAN Report Mask	8	0 - FFFFFFFF	C00FFFFF
Additional Event	1	0|1	0
Reserved	0		
CAN Report Expansion Mask	8	0 - FFFFFFFF	001FFFFF
Reserved	0		
Electric Report Mask	<=8	0 – FFFFFFFF	0
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

✧ <*CAN Report Interval IGF*>: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is off. Its value range is 0|5 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTCAN** in ignition off state.

✧ <*Additional Event*>: Whether to send the **+RESP:GTCAN** report message by additional event.
- 0: Ignore all additional events
- 1: By ignition on/off event

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

Note: Bit 31 (for <*GSM Information*>) and Bit 30 (for <*GNSS Information*>) of the <*CAN Report Mask*> only control the composition of **+RESP:GTCAN** in ASCII format (not in HEX format). <*+CAN Mask*> in **AT+GTHRM** controls the GSM information and GNSS information in **+RESP:GTCAN** in HEX format. Bit 22 of this <*CAN Report Mask*> only controls <*Total Distance Impulses*> in **+RESP:GTCAN** in HEX format.

Mask Bit	Item	Description
Bit 31	<*GSM Information*>	Including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*Reserved*> parameter value "00"
Bit 30	<*GNSS Information*>	Including <*GNSS Accuracy*>, <*Speed*>, <*Azimuth*>, <*Altitude*>, <*Longitude*>, <*Latitude*>, <*GNSS UTC Time*>
Bit 29	<*CAN Report Expansion Mask*>	If this bit is set to 1, the parameter <*CAN Report Expansion Mask*> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <*CAN Report Expansion Mask*> in **AT+GTCAN** is not valid.
Bit 28	<*Electric Report Mask*>	If this bit is set to 1, the parameter <*Electric Report Mask*> in **AT+GTCAN** will be valid. If this bit is set to 0, the parameter <*Electric Report Mask*> in **AT+GTCAN** will not be valid.
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<*Total Distance Impulses*>	Vehicle total distance measured in Impulses (if distance from dashboard is not available)
Bit 21	<*Total Vehicle Engine Overspeed Time*>	The total time when the vehicle engine speed is greater than the limit defined in CAN100 configuration
Bit 20	<*Total Vehicle Overspeed Time*>	The total time when the vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	<*Doors*>	An 8-bit hexadecimal number. Each bit indicates information of one door.
Bit 18	<*Lights*>	An 8-bit hexadecimal number. Each bit indicates information of one light.

Bit 17	*<Detailed Information / Indicators>*	A hexadecimal number. Each bit indicates information of one indicator.
Bit 16	*<Tachograph Information>*	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	*<Axle Weight 2nd>*	Weight of vehicle's second axle
Bit 14	*<Total Idle Fuel Used>*	Number of liters of fuel used since vehicle manufacture or device installation
Bit 13	*<Total Engine Idle Time>*	Time of engine running during idling status (vehicle at a standstill) since vehicle manufacture or device installation
Bit 12	*<Total Driving Time>*	Time of engine running during driving (non-zero speed) since vehicle manufacture or device installation
Bit 11	*<Total Engine Hours>*	Time of engine running since vehicle manufacture or device installation
Bit 10	*<Accelerator Pedal Pressure>*	Pressure applied onto accelerator pedal
Bit 9	*<Range>*	The number of kilometers to drive on remaining fuel
Bit 8	*<Fuel Level>*	The level of fuel in vehicle's tank (in liters or percentage)
Bit 7	*<Fuel Consumption>*	The fuel consumption of the engine
Bit 6	*<Engine Coolant Temperature>*	Engine coolant temperature
Bit 5	*<Engine RPM>*	Revolutions per minute of the engine
Bit 4	*<Vehicle Speed>*	Vehicle road speed
Bit 3	*<Total Fuel Used>*	Number of liters of fuel used since vehicle manufacture or device installation
Bit 2	*<Total Distance>*	Vehicle total distance
Bit 1	*<Ignition Key>*	Ignition status
Bit 0	*<VIN>*	Vehicle identification number

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

Mask Bit	Item	Description

Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	<*DTC Codes*>	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	<*Service Distance*>	The parameter describes distance left to diagnostic car review.
Bit 23	<*Engine Torque*>	The engine torque. Unit: percentage.
Bit 22	<*Rapid Accelerations*>	Total number of rapid accelerations since installation (calculation based on CAN 100 settings of speed increase time and value)
Bit 21	<*Rapid Brakings*>	Total number of rapid brakings since installation (calculation based on CAN 100 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*>	Count of applying brake pedal (braking process initiated by brake pedal)
Bit 13	<*Total Accelerator Kick-down Time*>	Total time when accelerator pedal is pressed over 90%
Bit 12	<*Total Cruise Control Time*>	Total time when the vehicle speed is controlled by cruise-control module
Bit 11	<*Total Effective Engine Speed Time*>	Total time when the vehicle engine speed is effective
Bit 10	<*Total Accelerator*	Count of accelerator pedal kick-downs (with the

	Kick-downs>	pedal pressed over 90%)
Bit 9	<*Pedal Braking Factor*>	It measures how often the driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes increase of pedal braking factor.
Bit 8	<*Engine Braking Factor*>	It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with no pedal pressed causes increase of engine braking factor.
Bit 7	<*Analog Input Value*>	Analog input value
Bit 6	<*Tachograph Driving Direction*>	Vehicle driving direction from tachograph
Bit 5	<*Tachograph Vehicle Motion Signal*>	Vehicle motion signal from tachograph
Bit 4	<*Tachograph Overspeed Signal*>	Tachograph overspeed signal for the vehicle
Bit 3	<*Axle Weight 4th*>	Weight of vehicle's fourth axle
Bit 2	<*Axle Weight 3rd*>	Weight of vehicle's third axle
Bit 1	<*Axle Weight 1st*>	Weight of vehicle's first axle
Bit 0	<*Ad-Blue Level*>	The level of Ad-Blue

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

Mask Bit	Item	Description
Bit 31	Reserved	
…	…	
Bit 15	<*Battery Charging Remaining Time*>	The parameter shows time remaining for the battery of electric vehicle to be fully charged by connected charger.
Bit 14	Reserved	
Bit 13	Reserved	
Bit 12	Reserved	
Bit 11	Reserved	
Bit 10	Reserved	

Bit 9	<*Battery Charging Current*>	It indicates the electric car's battery charging current.
Bit 8	Reserved	
Bit 7	Reserved	
Bit 6	<*Battery Level*>	The battery charge level.
Bit 5	Reserved	
Bit 4	Reserved	
Bit 3	Reserved	
Bit 2	Reserved	
Bit 1	Reserved	
Bit 0	Reserved	

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

- **+ACK:GTCAN,**

Example: **+ACK:GTCAN,5A0504,135790246811220,,000D,20090214093254,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.7.7.CANBUS Alarm Setting

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

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

➢ **AT+GTCLT**

Example: **AT+GTCLT=gv300,1,0,0,000FFFFF,00000000,00000000,00000000,30,8,,,,,,,,0006$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4–6	'0'–'9' 'a'–'z' 'A'–'Z'	gv56
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*>: The ID of the CANBUS alarm group. A total of 20 groups are supported.

✧ <*Mode*>: The CANBUS alarm working mode for each group.

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

✧ <*Debounce Time*>: The time for CANBUS alarm trigger event debouncing.

✧ <*CAN Data Mask*>: Bitwise mask to configure the CAN data composition of the **+RESP:GTCLT** report message. (<*CAN Data Mask*> just works in **+RESP:GTCLT** ASCII message.)

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	<*CAN Report Expansion Mask*>	If this bit is set to 1, the parameter <*CAN Report Expansion Mask*> in **AT+GTCLT** is valid. If this bit is set to 0, the parameter <*CAN Report Expansion Mask*> in **AT+GTCLT** is not valid.
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<*Total Distance Impulses*>	Vehicle total distance measured in impulses (if distance from dashboard is not available)
Bit 21	<*Total Vehicle Engine Overspeed Time*>	The total time when the vehicle engine speed is greater than the limit defined in CAN100 configuration
Bit 20	<*Total Vehicle Overspeed Time*>	The total time when the vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	<*Doors*>	An 8-bit hexadecimal number. Each bit contains information of one door.
Bit 18	<*Lights*>	An 8-bit hexadecimal number. Each bit contains information of a light.
Bit 17	<*Detailed Information/Indicators*>	A hexadecimal number. Each bit contains information of one indicator.
Bit 16	<*Tachograph Information*>	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	<*Axle Weight 2nd*>	Weight of vehicle's second axle
Bit 14	<*Total Idle Fuel Used*>	Number of liters of fuel used since vehicle manufacture or device installation

Bit 13	<*Total Engine Idle Time*>	Time of engine running during idling status (vehicle at a standstill) since vehicle manufacture or device installation
Bit 12	<*Total Driving Time*>	Time of engine running during driving (non-zero speed) since vehicle manufacture or device installation
Bit 11	<*Total Engine Hours*>	Time of engine running since vehicle manufacture or device installation
Bit 10	<*Accelerator Pedal Pressure*>	The pressure applied on acceleration pedal
Bit 9	<*Range*>	The number of kilometers to drive on remaining fuel
Bit 8	<*Fuel Level*>	The level of fuel in vehicle's tank (in Liters or Percentage)
Bit 7	<*Fuel Consumption*>	The fuel consumption of the engine
Bit 6	<*Engine Coolant Temperature*>	The temperature of the engine coolant
Bit 5	<*Engine RPM*>	Revolutions per minute of the engine
Bit 4	<*Vehicle Speed*>	Vehicle road speed
Bit 3	<*Total Fuel Used*>	The number of liters of fuel used since vehicle manufacture or device installation
Bit 2	<*Total Distance*>	Vehicle total distance
Bit 1	<*Ignition Key*>	Ignition status
Bit 0	<*VIN*>	Vehicle identification number

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

Note: In the CAN100 firmware versions 2.0.xx and 2.1.xx, the parameter is 16-bit long (Bit 0 – Bit 15), which has been extended to 32 bits since the CAN100 version 2.2.0:

Bit	Alarm Mask 1
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	OLL – oil level low indicator (1 – on, 0 – off or not available)
Bit 27	SC – service call indicator (1 – on, 0 – off or not available)
Bit 26	AIR – airbags indicator (1 – on, 0 – off or not available)

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

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

Bit	Alarm Mask 2
Bit 31	Reserved

Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Hood (1 – opened, 0 – closed)
Bit 20	Trunk (1 – opened, 0 – closed)
Bit 19	Rear Right Door (1 – opened, 0 – closed)
Bit 18	Rear Left Door (1 – opened, 0 – closed)
Bit 17	Passenger Door (1 – opened, 0 – closed)
Bit 16	Driver Door (1 – opened, 0 – closed)
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	Reserved
Bit 5	Hazard Lights (1 – on, 0 – off)
Bit 4	Rear Fog Light (1 – on, 0 – off)
Bit 3	Front Fog Light (1 – on, 0 – off)
Bit 2	High Beam (1 – on, 0 – off)
Bit 1	Low Beam (1 – on, 0 – off)

Bit 0	Running Lights (1 – on, 0 – off)

✧ <*Alarm Mask 3*>: Bitwise setting of the alarm mask. The alarm mask information is based on <*Engine RPM*> of the **+RESP:GTCAN** message. 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 the threshold of the high engine RPM. If the current engine RPM is more than <*High RPM Threshold*>, it will trigger over high RPM event.

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

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

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	<*Engine Torque*>	The engine torque. Unit: percentage.
Bit 22	<*Rapid Accelerations*>	The number of total rapid accelerations since installation (calculation based on CAN 100 settings of speed increase time and value)
Bit 21	<*Rapid Brakings*>	The number of total rapid brakings since installation (calculation based on CAN 100 settings of speed decrease time and value)
Bit 20	<*Expansion Information*>	A hexadecimal number. Each bit represents information of one indicator.

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

Bit 2	*<Axle Weight 3rd>*	Weight of vehicle's third axle
Bit 1	*<Axle Weight 1st>*	Weight of vehicle's first axle
Bit 0	*<Ad-Blue Level>*	The level of Ad-Blue

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

➢ **+ACK:GTCLT,**

Example: **+ACK:GTCLT,5A0504,135790246811220,,1,000D,20090214093254,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Group ID	<=2	0 –19	0
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.7.8.CAN 100 FOTA Upgrade

The command **AT+GTCFU** is used to upgrade the firmware in CAN 100 over the air.

➢ **AT+GTCFU=**

Example: **AT+GTCFU=gv56,3,30,0,,,http://220.178.67.210:8331/GV56/deltabin/cfg_ascii_queclink_00_01_02_ASCII.frm,1,,,,0001$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Retry Times	1	0 – 3	0
Timeout	2	10-30min	10
Protocol Type	1	0	0
Reserved	0		
Reserved	0		

Server URL	100	Legal URL	
Update Type	1	0 - 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Retry Times*>: It specifies the maximum number of retries to download the update package upon download failure.
- <*Timeout*>: It specifies the expiration time of one download. If the download expires, it is considered to be failure.
- <*Protocol Type*>: The protocol used to download the package.
  - 0: HTTP. Only HTTP is supported.
- <*Server User Name*>: If the file server uses authentication, the user name is specified here.
- <*Server Password*>: If the file server uses authentication, the password is specified here.
- <*Server URL*>: It specifies the URL to download the package.
- <*Update Type*>: It specifies the update type in CAN 100 over the air.
  - 0: CAN Chipset Firmware update.
  - 1: CAN Chipset Configuration update.

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

➢ **+ACK:GTCFU,**

Example: **+ACK:GTCFU,5A0700,135790246811220,,0018,20090214093254,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.7.9. Input Expansion

The command **AT+GTIEX** is used to configure the parameters of external Bluetooth Input

accessories. All these inputs are customizable. If the logic status is changed on one of the Bluetooth Input accessories, the device will report the message **+RESP:GTDIS** to the backend server.

➢ **AT+GTIEX=**

Example: **AT+GTIEX=gv56,1,0,1,5,,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Input Expansion Type	1	1	1
Bind BAS Index	1	0 – 9	0
Input Number	1	0 - 1	
Input ID	1	0|5	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Input Expansion Type*>: It indicates what kind of extended device the following parameters can be used for.

- 1: 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** when the <*Input Expansion Type*> is set to 1. The value is the same as the index in **AT+GTBAS**.

✧ <*Input Number*>: It indicates the number of configured Bluetooth Input Setting. It is used to define how many of the following two parameters (<*Input ID*> and Reserved) included.

✧ <*Input ID*>: The ID of Bluetooth accessory Input. 0 means “Disable this function”. 5 means that Bluetooth accessory Input 1 is enabled.

Note: If <*Input ID*> is set to 5, the parameters of <*Accessory Type*> and <*Accessory Model*> should be set in **AT+GTBAS**.

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

- **+ACK:GTIEX,**

Example: **+ACK:GTIEX,5A0303,867995030082104,,0054,20190415085637,0261$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.7.10. 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=gv56,0,1,1,5,1,8000,32000,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Analog Input Expansion Type	1	0	0
Bind BAS Index	1	0 – 9	0
Analog Input Number	1	0 - 1	
Analog Input ID	1	0|5	0
Mode	1	0|1|2	0
Min Threshold	<=5	8000 – 32000 (mV)	8000
Max Threshold	<=5	8000 – 32000 (mV)	32000
Reserved	0		
Reserved	0		

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

- <*Analog Expansion Type*>: It indicates what kind of extended device the following parameters can be 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 Setting. In one configuration, <*Analog Input ID*>, <*Mode*>, <*Min Threshold*> and <*Max Threshold*> are included and others are reserved.
- <*Analog Input ID*>: The ID 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,5A0303,867995030082104,,0054,20190415085637,0261$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

3.2.7.11 Output Expansion

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

➢ **AT+GTOEX=**

Example: **AT+GTOEX=gv56,1,0,2,5,1,0,0,,,1,6,1,10,10,,,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Output Expansion Type	1	1	1
Bind BAS Index	1	0 – 9	0
Output Number	1	0 – 2	
Output ID	1	0|5 – 6	0
Status	1	0 - 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
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 indicates what kind of extended device the following parameters can be used for.

- 1: Bluetooth Output Accessory Setting.

✧ <*Output Number*>: It indicates the number of configured Bluetooth Output Setting. In one configuration, <*Bind BAS Index*>, <*Output ID*>, <*Status*>, <*Duration*>, <*Toggle Times*>, <*Reserved*> and <*DOS Report*> are included and others are reserved.

✧ <*Output ID*>: The ID 5 or 6 represents Bluetooth Output ID and the parameters <*Accessory Type*> and <*Accessory Model*> should be set in **AT+GTBAS**.

✧ <*DOS Report*>: Whether to report **+RESP:GTDOS** when wave shape 1 status of Bluetooth

Output changes.

- 0: Do not Report **+RESP:GTDOS**.
- 1: Report **+RESP:GTDOS**.

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

➢ **+ACK:GTOEX,**

Example: **+ACK:GTOEX,5A0100,862170013988157,,FFFF,20110101000045,0008$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.8.Other Settings

3.2.8.1.Real Time Operation

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

➢ **AT+GTRTO=**

Example: **AT+GTRTO=gv56,2,FRI,,,,,0015$** **AT+GTRTO=gv56,2,000000000000000003,0,,,,FFFF$** **AT+GTRTO=gv56,A,,,,,,0015$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Sub Command	2	0 – 0x0D|0x10|0x12|0x13|0x14|0x22|0x25|0x30|0x3A	
AT Command| Configuration	3|16|1	"SRI"| 0000000000000000 – FFFFFFFFFFFFFFFF|0 – 1| 0 – 2|0 – 1|0 – 1	

Mask| SCS Action| CAN100 Operation Mode| QBI Operation Mode| RLY Operation Mode			
Output Direction|CAN100 Car Model ID |Bind BAS Index	1|1 – 5	0 – 3|1 – 65535|0 – 9	
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Sub Command*>: A hex value to indicate the sub command to be executed.

- 0: ***GPS***. Get the GNSS related information via the message **+RESP:GTGPS**.
- 1: ***RTL***. Request the device to report its current position immediately via the message **+RESP:GTRTL**.
- 2: ***READ***. Get the current configuration of the device via the message **+RESP:GTALS**, **+RESP:GTALC** or **+RESP:GTALM**.
- 3: ***REBOOT***. Reboot the device. **Note:** For this sub command to work, external power needs to be supplied to the device.
- 4: ***RESET***. Reset all parameters to factory settings and clear all buffered messages. Parameters configured by **AT+GTBSI**, **AT+GTSRI**, **AT+GTQSS**, **AT+GTCFG**, **AT+GTTMA** and **AT+GTPIN** will not be reset.
- 5: ***PWROFF***. Power off the device.
- 6: ***CID***. Get the ICCID of the SIM card which is being used by the device via the message **+RESP:GTCID**.
- 7: ***CSQ***. Get the current GSM signal level of the device via the message **+RESP:GTCSQ**.
- 8: ***VER***. Get the version information of the device via the message **+RESP:GTVER**.
- 9: ***BAT***. Get the battery level and adapter status of the device via the message **+RESP:GTBAT**.
- A: ***IOS***. Get status of all the IO ports via the message **+RESP:GTIOS**.
- B: ***TMZ***. Get the time zone settings via the message **+RESP:GTTMZ**.
- C: ***GIR***. Get cell information via the message **+RESP:GTGSM**.
- D: ***AIF***. Get APN, ICCID, RSSI, cell ID, IP and DNS server information via the message **+RESP:GTAIF**.
- 10: ***CAN***. Get CAN information via the message **+RESP:GTCAN**. It works only when

the <*Accessory Type*> of **AT+GTBAS** is 4 and the <*Accessory Model*> is 0. The <*Mode*> of **AT+GTCAN** also needs to be set to 1.

- 12: ***CVN***. Get the version number information of CAN100 via the message **+RESP:GTCVN**. It works only when the <*Accessory Type*> of **AT+GTBAS** is 4 and the <*Accessory Model*> is 0. The <*Mode*> of **AT+GTCAN** also needs to be set to 1.
- 13: ***CSN***. Get the serial number information of CAN100 via the message **+RESP:GTCSN**. It works only when the <*Accessory Type*> of **AT+GTBAS** is 4 and the <*Accessory Model*> is 0. The <*Mode*> of **AT+GTCAN** also needs to be set to 1.
- 14*:* ***QBI***. Get local and peripheral device Bluetooth information only via the ASCII message **+RESP:GTQBI**.
- 22: ***CAN100 Operation***. Set car model for CAN100, read car model from CAN100 or start CAN100 automatic synchronization. The <*Mode*> of **AT+GTCAN** also needs to be set to 1.
- 25: ***SCS***. Get the self-calibration status of the acceleration data via the message **+RESP:GTSCS** or clear the self-calibration status. It is used together with <*SCS Action*> below.
- 30: ***DELBUF***. Delete all the buffered reports.
- 3A: **RLY**. Set the state of the WRL300.

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

- AT Command: To get single AT command configuration when <*Sub Command*> is set to 2, please follow the format in the following example. **Example:** To get the configuration of **AT+GTFRI**, set **AT+GTRTO=gv56,2,FRI,,,,,0015$**, and get it via **+RESP:GTALS**.
- Configuration Mask: If <*Sub Command*> is set to 2, configuration information which varies depending on the selected configuration mask can be obtained via the message **+RESP:GTALC**. The configuration mask must be 16 bytes. If it is less than 16 bytes, add **0** in the high bytes of the configuration mask.

Configuration Mask Table:

Mask Bit	Item
Bit 94	HUM
…..	Reserved
Bit 90	AEX
Bit 89	BID
Bit 69 – **Bit 88**	Reserved
Bit 68	BAS
Bit 67	RCS
Bit 66	Reserved
Bit 65	Reserved

Bit 64	FVR
Bit 63	Reserved
Bit 62	AVS
Bit 61	VVS
Bit 60	Reserved
Bit 59	GAM
Bit 58	ASC
Bit 57	CLT
Bit 56	UPC
Bit 55	IEX
Bit 54	BMS
Bit 53	BTS
Bit 52	BVS
Bit 51	Reserved
Bit 50	UDF
Bit 49	CMD
Bit 48	OWL
Bit 47	Reserved
Bit 46	CAN
Bit 45	Reserved
Bit 44	PEO
Bit 43	RMD
Bit 42	FSC
Bit 41	TMP
Bit 40	Reserved
Bit 39	OEX
Bit 38	VMS
Bit 37	SPA
Bit 36	BZA
Bit 35	Reserved

Bit 34	Reserved
Bit 33	PDS
Bit 32	ACD
Bit 31	IDA
Bit 30	Reserved
Bit 29	SSR
Bit 28	Reserved
Bit 27	FFC
Bit 26	CRA
Bit 25	HRM
Bit 24	WLT
Bit 23	JDC
Bit 22	URT
Bit 21	HBM
Bit 20	HMC
Bit 19	IDL
Bit 18	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	TMZ
Bit 8	IOB
Bit 7	OUT
Bit 6	DIS
Bit 5	EPS

Bit 4	TOW
Bit 3	CFG
Bit 2	Reserved
Bit 1	SRI
Bit 0	BSI

Set <*Sub Command*> to 4 to specify the configuration to be reset. To specify a configuration, the last three letters of the protocol command are used. For example, to reset configuration of the **AT+GTFRI** command, send the command "**AT+GTRTO=gv56,4,FRI,,,,,000F$**". Also, the buffered messages saved can be deleted with the command "**AT+GTRTO=gv56,4,BUF,,,,,000F$**". Configurations of the commands **AT+GTBSI**, **AT+GTSRI**, **AT+GTQSS**, **AT+GTCFG**, **AT+GTPIN** and **AT+GTTMA** can not be reset by this command.

- SCS Action: If <*Sub Command*> is set to 25, Read or Clear action is controlled by this parameter.
  0: Read self-calibration status.
  1: Clear self-calibration status.
- CAN100 Operation Mode: If the sub command is 22, this parameter will work as follows.
  0: Read the current car model and report it via the message **+RESP:GTCML**.
  1: Set car model. Please use the <*CAN100 Car Model ID*> parameter to set car model.
  2: Start CAN chipset automatic synchronization.
  Note: The entire synchronization takes about 10-30s, and the CAN chipset will restart immediately after the end of the synchronization regardless of the result. If automatic sync is enabled, please wait for the synchronization to finish before reading the current car model. If automatic synchronization has not ended, it will ignore subsequent synchronization command.
- QBI Operation Mode: If the sub command is 14, this parameter will work as follows.
  0: Report the **+RESP:GTQBI** message according to the order of the scanned local and peripheral Bluetooth information.
  1: Report the **+RESP:GTQBI** message according to the signal strength of the scanned local and peripheral Bluetooth information.
- RLY Operation Mode: If the sub command is 3A, this parameter will work as follows.
  0: Disable relay of WRL300, switch the pin of the relay from NC to COM.
  1: Enable relay of WRL300, switch the pin of the relay from NO to COM.

✧ <*Output Direction/ CAN100 Car Model ID/ Bind BAS Index*>:

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

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

SMS number; otherwise the message will be output to the backend server.

Note: The parameter value 3 is invalid when the sub command is 14. When <*Sub Command*> is set to 14 to get local and peripheral device Bluetooth information, the corresponding message will still be output to the backend server even if <*Output Direction*> is set to 3.

<*CAN100 Car Model ID*>: It works only when the sub command is 22 and the CAN100 operation mode is 0x01. This parameter value should be car model ID described in supported car model list.

<*Bind BAS Index*>: It is used to bind the specific configuration in **AT+GTBAS** when the <*Sub Command*> is set to 3A. The value is the same as the index in **AT+GTBAS**.

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

➢ **+ACK:GTRTO,**

Example: **+ACK:GTRTO,5A0200,865585040006177,,VER,FFFF,20190521051318,0175$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Sub Command	<=6	Sub Command String	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

3.2.8.2.Hour Meter Count

The command **AT+GTHMC** is used to measure the accumulated use time with each actuation of the ignition on. To use this command, it is necessary to connect the ignition signal to the device or enable virtual ignition detection. When the device sends the **+RESP:GTFRI**, **+RESP:GTIGN** or **+RESP:GTIGF** message, <*Hour Meter Count*> will be included in these reports.

➢ **AT+GTHMC=**

Example: **AT+GTHMC=gv56,1,00000:00:00,,,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Hour Meter Enable	1	0|1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Hour Meter Enable*>: Enable/disable the hour meter count function. If the hour meter count function is enabled, the hour meter count will be increased when the device detects the vehicle ignition on.

- 0: Disable the hour meter count function.
- 1: Enable the hour meter count function. The current <*Hour Meter Count*> reported in **+RESP:GTFRI**, **+RESP:GTIGN** and **+RESP:GTIGF** is equal to (=) <*Hour Meter Count*> + current <*Initial Hour Meter Count*> - last <*Initial Hour Meter Count*>

✧ <*Initial Hour Meter Count*>: It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 to 99999:00:00. When the ignition is turned on for the first time, the <*Hour Meter Count*> which is reported in **+RESP:GTFRI**, **+RESP:GTIGN** or **+RESP:GTIGF** will be increased based on this value.

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

➢ **+ACK:GTHMC,**

Example: **+ACK:GTHMC,5A0200,865585040007340,,00AD,20190520122850,007C$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.3.White List

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

➢ **AT+GTWLT=**

Example: **AT+GTWLT=gv56,5,1,2,13813888888,13913999999,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Call Filter	1	0 – 7	0
Start Index	<=2	1 – 10	
End Index	<=2	1 – 10	
Phone Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Call Filter*>: Bitwise mask to configure the white list.

- Bit 0: White list for location by call.
- Bit 1: Reserved.
- Bit 2: White list for SMS.

For each bit, set it to 1 to enable the corresponding white list, and 0 to disable the corresponding white list. If a bit is set to 1, only the phone number(s) in white list will be valid for the corresponding feature. If a bit is set to 0, the corresponding white list will be ignored.

✧ <*Start Index*>, <*End Index*>: The index range of the white list to which the phone numbers are to be updated. For example, if <*Start Index*> is set to 1 and <*End Index*> is set to 2, then the first two phone numbers in the white list will be updated by the numbers provided in

the parameter <*Phone Number List*>. <*Start Index*> and <*End Index*> determine the total number of phone numbers that will be updated. If either one is empty, there should be no <*Phone Number List*> following the empty value.

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

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

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

➢ **+ACK:GTWLT,**

Example: **+ACK:GTWLT,5A0200,865585040007340,,00B0,20190520122853,007F$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

3.2.8.4.Command String Storage

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

➢ **AT+GTCMD=**

Example: **AT+GTCMD=gv56,1,0,AT+GTRTO=gv56,6,0,,,,,FFFF$,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv56

Mode	1	0-1	0
Stored cmd ID	3	0 – 31	
Command String	200	AT command	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Mode*>: A numeral to indicate how to handle (add/delete) the stored command string.
  - 0: Delete the stored command.
  - 1: Add the stored command.
- ✧ <*Stored cmd ID*>: A numeral to identify the stored command.
- ✧ <*Command String*>: The whole content of the stored command.

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

➢ **+ACK:GTCMD**

Example: **+ACK:GTCMD,5A0200,865585040006631, ,0038,20190521141658,0056$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
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=gv56,1,0,905,1,0,0,1,1,0,0,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv56
Mode	1	0-2	0
Group ID	2	0 – 31	
Input ID Mask	16	0-FFFFFFFFFFFFFFFF	0

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	0
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 the stored commands to be executed.
- <*Input ID Mask*>: Bitwise mask which indicates the input events included in the group.

  Bit 0 (00000001): Select ID 1
  Bit 1 (00000002): Select ID 2
  Bit 2 (00000004): Select ID 3
  Bit 3 (00000008): Select ID 4
  For example:
  Bit (00000003): Select ID 1, and ID 2
  Bit (00000017): Select ID 1, ID 2, ID 3, and ID 5

ID	Mask Bit	Item
1	**Bit 0**	Power on finished
2	**Bit 1**	Ignition on
3	**Bit 2**	Ignition off
4	**Bit 3**	Attached to the GPRS network
5	**Bit 4**	Not attached to the GPRS network
6	**Bit 5**	Registered on the GSM network
7	**Bit 6**	Not registered on the GSM network
8	**Bit 7**	Network roaming
9	**Bit 8**	Network non-roaming
10	**Bit 9**	Reserved
11	**Bit 10**	GNSS is on
12	**Bit 11**	GNSS is off
13	**Bit 12**	The device is stationary.
14	**Bit 13**	The device is moving.
15	**Bit 14**	External charge inserted

16	**Bit 15**	No external charge
17	**Bit 16**	The device is charging.
18	**Bit 17**	The device is not charging.
19	**Bit 18**	Reserved
20	**Bit 19**	Reserved
21	**Bit 20**	Digital input 1 is low.
22	**Bit 21**	Digital input 1 is high.
23	**Bit 22**	SIM card is inserted.
24	**Bit 23**	SIM card is not inserted.
25	**Bit 24**	Digital input 2 is low.
26	**Bit 25**	Digital input 2 is high.
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.

- <*Debounce Time*>: The debounce time for input events before the specified stored commands are executed.
- <*Inzizo Mask*>: Bitwise mask used to indicate the input events which occur within the Geo-fence.

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

✧ <*Outzizo Mask*>: Bitwise mask to indicate the input events which occur outside the Geo-fence.

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

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

✧ <*Stocmd Ack*>: A numeral to indicate whether to return an acknowledgement message after a stored command is executed.

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

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

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

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

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

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

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

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

➢ **+ACK:GTUDF**

Example: **+ACK:GTUDF,5A0103,135790246811220,,0005,20100310172830,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	

Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.6.GNSS-Assisted Motion Measurement

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

➢ **AT+GTGAM=**

Example: **AT+GTGAM=gv56,1,1,10,10,60,60,,,,,0006$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GNSS Fix Failure Timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

- 1: Enable this feature.

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

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

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

✧ <*GNSS Fix Failure Timeout*>: If GNSS takes longer than <*GNSS Fix Failure Timeout*> before it gets a fix, the device will update the motion status from the motion sensor.

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

➢ **+ACK:GTGAM,**

Example: **+ACK:GTGAM,5A0200,865585040007340,,00B5,20190520122859,0084$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.7.1-Wire Device Settings

The command **AT+GTACD** is used to configure the parameters of 1-wire devices which include an iButton, temperature sensor and humidity sensor. When the iButton is connected, a specified wave shape can be configured for a specified output port. Temperature sensor and humidity sensor can be configured to read real-time temperature and humidity at a specified time interval. Temperature sensor and humidity sensor information is reported in the message **+RESP:GTERI**, and iButton information is reported in the messages **+RESP:GTIDA** and **+RESP:GTERI**.

➢ **AT+GTACD=**

Example: **AT+GTACD=gv56,4,0,0,0,0,10,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
iButton Timer	<=2	0|1 – 10(s)	0
Output ID	1	0 – 1	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle	<=3	0 – 255	0
Temperature Timer	<=3	0|10– 255(s)	0
Humidity Timer	<=3	0|10 – 255(s)	0
Reserved			
Reserved			
Reserved			
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*iButton Timer*>: The time interval for searching the iButton ID.
  Note: The sequence of iButton ID is in reverse order of the ID on iButton. The ID structure is composed of <1 byte family ID> + <6 byte serial number> + <1 byte CRC>. Thus, the first byte of the ID number represents iButton's family ID. For example, if the ID on iButton is 12 345678901234 01, then the actual iButton ID is 01 341290785634 12.
- <*Temperature Timer*>: The interval for reading the temperature sensor value. If more than one temperature sensor is connected to 1-wire, the device will read the temperature from the temperature sensors one by one at the interval specified by <*Temperature Timer*>. 0 means "Disable temperature detection".
- <*Humidity Timer*>: The interval for reading the Humidity sensor value. If more than one Humidity sensor is connected to 1-wire, the device will read the humidity from the Humidity sensors one by one at the interval specified by <*Humidity Timer*>. 0 means "Disable humidity detection".

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

- **+ACK:GTACD,**

Example: **+ACK:GTACD,5A0200,865585040007340,,00B4,20190520122858,0083$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	

Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.8.ID Authentication

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

- **AT+GTIDA=**

Example: **AT+GTIDA=gv56,2,1,1,12546346864,30,3,30,,,,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Mode	1	0|1|2	0
Start Index	<=3	1 – 250	
End Index	<=3	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 Validity Time	<=3	15 – 600sec	30
Reserved	0		
Reserved	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
ID List Type	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of the ID authentication function.
  - 0: Disable this function.
  - 1: Enable this function: Only authorized ID can unlock the vehicle.
  - 2: Enable this function: Any ID can unlock the vehicle.
- <*Start Index*>, <*End Index*>: The index range of the white list to which the ID numbers are to be updated. For example, if 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*> determine the total number of ID numbers that will be updated. If either one is empty, there should be no <*ID Number List*>. At most 8 numbers can be updated each time.
- <*ID Number List*>: A list of comma-separated ID numbers to be updated to the white list. The number of the ID numbers are determined by <*Start Index*> and <*End Index*>.
- <*Timeout After Ignition Off*>: If the ignition is turned off, the ID will still be authorized for a short time. In this period, re-authentication is not needed.
- <*Report Mode*>: The mode of reporting ID.
  - Bit 0: Report the authorized ID.
  - Bit 1: Report the unauthorized ID.
  - Bit 2: Report the ID that has been logged out. (If authorized ID meets the trigger conditions <*ID Validity Time*> and <*Timeout after Ignition Off*>, then the message **+RESP:GTIDA** will be sent to indicate the log-out event).

    For each bit, set it to 1 to enable the report, and set it to 0 to disable the report. If <*Report Mode*> is 0, no **+RESP:GTIDA** message will be reported.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when the driver ID is authorized.
- <*ID Validity Time*>: The ID will remain authorized for the period of time specified by this parameter when the ID is valid.
- <*ID List Type*>: This parameter indicates which ID List to use.
  - 0: Use <*IDA Number List*> in the command **AT+GTIDA**.
  - 1: Use <*MAC List*> in the command **AT+GTBID**. Please make sure the function **AT+GTBID** is configured properly. To enable this feature, the following conditions must be met:

    WKF300: Set <*Push Button Event*> to 1, and there is at least one MAC address in the <*MAC List*>.

ID ELA: Set <*Alarm Mode*> or <*IDELA Detection Mode*> to 1, and there is at least one MAC address in the <*MAC List*>.

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

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

- **+ACK:GTIDA,**

Example: **+ACK:GTIDA,5A0200,865585040007340,,00DF,20190520122946,00AE$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.9.Temperature Alarm

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

- **AT+GTTMP=**

Example: **AT+GTTMP=gv56,0,3,28131A4103000056,,,-15,30,,,2,10,,,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Alarm ID	1	0-3	
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	

Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Validity	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 1	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	$	$

- <*Alarm ID*>: The ID of the temperature alarm. A total of four samples (0-3) are supported.
- <*Mode*>: The working mode of the temperature alarm.
  - 0: Disable temperature alarm.
  - 1: Report temperature alarm if the current temperature is within the temperature range defined by <*Low Temperature*> and <*High Temperature*>.
  - 2: Report temperature alarm if the current temperature is outside the temperature range defined by <*Low Temperature*> and <*High Temperature*>.
  - 3: Report temperature alarm only once if the current temperature enters/exits the temperature range defined by <*Low Temperature*> and <*High Temperature*>. In this mode, <*Send Interval*> will be ignored.
- <*Sensor ID*>: The ID of the temperature sensor. A total of four sensors are supported.
- <*Low Temperature*>: The lower temperature limit.
- <*High Temperature*>: The upper temperature limit.
- <*Validity*>: If the temperature sensor detects the environment temperature which meets the

alarm condition, it will continuously check the temperature based on the reading timer <*Temperature Timer*> set in the command **AT+GTACD**. If the temperature keeps meeting the alarm condition for <*Validity*> times, the temperature alarm will be triggered.

✧ <*Send Interval*>: After <*Validity*> checking, the device will report temperature alarm every <*Send Interval*> times of temperature reading based on reading timer of temperature sensor. If <*Send Interval*> is set to 0, it will report the temperature alarm only once.

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

➢ **+ACK:GTTMP,**

Example: **+ACK:GTTMP,5A0200,865585040007340,,0,00CC,20190520122924,009B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Alarm ID	1	0 - 3	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.10.Humidity Alarm

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

➢ **AT+GTHUM=**

Example: **AT+GTHUM=gv56,0,1,28131A4103000056,,,0,30,,,2,2,,,0,0,0,0,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Alarm ID	1	0 – 3	
Mode	1	0 – 3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		

Reserved	0		
Low Humidity	<=3	0 – 100(%)	0
High Humidity	<=3	0 – 100(%)	0
Reserved	0		
Reserved	0		
Validity	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	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		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Alarm ID*>: The ID of the humidity alarm. A total of four samples (0-3) are supported.
- <*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/exits the humidity range defined by <*Low Humidity*> and <*High Humidity*>. In this mode, <*Send Interval*> will be ignored.
- <*Sensor ID*>: The ID of the humidity sensor. A total of four sensors are supported.
- <*Low Humidity*>: The minimum value of humidity.
- <*High Humidity*>: The maximum value of humidity.
- <*Validity*>: If the humidity sensor detects the environment humidity that meets the alarm condition, it will continuously check the humidity based on the reading timer <*Humidity Timer*> set in the command **AT+GTACD**. If the humidity keeps meeting the alarm condition

for <*Validity*> times, the humidity alarm will be triggered.

✧ <*Send Interval*>: After <*Validity*> checking, the device will report humidity alarm every <*Send Interval*> times of humidity reading based on reading timer of humidity sensor. If <*Send Interval*> is set to 0, it will report the humidity alarm only once.

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

➢ **+ACK:GTHUM,**

Example: **+ACK:GTHUM,5A0200,135790246811220,,0,000C,20090214093254,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Alarm ID	1	0 – 3	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.11.Fuel Sensor Calibration Table

The **AT+GTFSC** command is used to set up the fuel sensor's calibration table.

➢ **AT+GTFSC=**

Example: **AT+GTFSC=gv56,,,,1,,,3,16000,0,10000,50,250,100,,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv56
Reserved			
Table ID	1	0 – 4	0
Sensor Type	<= 2	10 – 13|20	20
Enable	1	0|1	0
Max. Tank Volume	<= 5	0 – 6000	100
Reserved			

Num of Node	<= 2	0|2 – 11	0
Node 1 Value	<= 5	0 - 99999(mV)	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	<= 4	0 - 99999(mV)	
Node N Percentage	<= 2	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000 - FFFF	
Tail Character	1	$	$

- <*Enable*>: Enable/disable the current calibration table. If this table is disabled, the calculation of the fuel level will be liner.
- <*Sensor Type*>: The sensor type for the currently set table.
  - 10: LLS 4 digital fuel sensor
  - 11: LLS 5 digital fuel sensor
  - 12: LLS EX 5 digital fuel sensor
  - 13: TW_BLE (TD-150) fuel sensor
  - 20: ADC1
- <*Num of Node*>: The number nodes in the blue-colored part of table above.
- <*Node N Value*>: The value of the current node.
- <*Node N Percentage*>: The percentage value of this node. The percentage values must be listed in ascending order, starting with 0% and ending with 100%.

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

- **+ACK:GTFSC,**

Example: **+ACK:GTFSC,5A0300,865084030001752,,0017,20170605110223,00FB$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	

Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.12.Transparent Data Transmission

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

➢ **AT+GTDAT=**

Example:
AT+GTDAT=gv56,0,,1234567890,,,,,FFFF$
AT+GTDAT=gv56,2,,1234567890,,,,,FFFF$
AT+GTDAT=gv56,4,,1234567890,,,,,FFFF$
AT+GTDAT=gv56,5,,1234567890,,,,,FFFF$

Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Command Type	1	0|2|4|5	
Reserved	0		
Data	<=245	ASCII Code	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Command Type*>: The command type which indicates how to send the data.

- 0: Send message to the backend server via **+RESP:GTDAT (Short Format)**.

- 2: Send message to the backend server via **+RESP:GTDAT (Long Format)**.
- 4: Send the raw data directly to the Bluetooth.
- 5: Send the raw data directly to the Bluetooth without CRLF.

✧ <*Data*>: Data to be transferred between the backend server and the external device connected to the secondary serial port or Bluetooth of the device. The <*Data*> cannot include the character '$' if it will be sent to the backend server when the value of <*SACK Enable*> in **AT+GTSRI** and **AT+GTQSS** is 1.

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

➢ **+ACK:GTDAT,**

Example: **+ACK:GTDAT,5A0200,865585040006649, ,FFFF,20190525175146,36EE$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' ' _	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.13.Serial Port Setting

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

➢ **AT+GTURT=**

Example: **AT+GTURT=gv56,21,12,8,1,0,0,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Working Mode	<=2	0 | 21	0
Baud Rate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8

Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 4	0
Sleep Enable	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 0: Disable UART.
- 21: Used for external devices with RS485 interface.

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

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

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

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

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

✧ <*Parity Bits*>: Parity Bits of the UART. The value can be 0, 1, 2, 3, or 4.

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

✧ <*Sleep Enable*>: The device supports sleep mode which helps reduce power consumption. When the device enters into 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.

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

➢ **+ACK:GTURT,**

Example: **+ACK:GTURT,5A0200,865585040007340,,FFFF,20190525022224,3BFE$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.14.RS485 Configuration Setting

The command **AT+GTRCS** is used to configure RS485 related settings for the device to be connected with multiple external devices via RS485.

➢ **AT+GTRCS=**

Example: **AT+GTRCS=gv56,0,,0,0,0,0,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Index	1	0	0
Reserved			
RS485 Device Type	1	0 - 1	0
RS485 Device Model	<=2	0 - 10	0
Device Number	<=2	0 - 10	0
Device ID Start	<=2	0 - 99	0

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

- <*Index*>: The index of the RS485 device(s).
- <*RS485 Device Type*>: The type of the RS485 device which is defined in the <*Index*>. The index for RS485 devices of the same type should be the same. The following is supported now:
  - 0: No RS485 device.
  - 1: Digital fuel sensor.
- <*RS485 Device Model*>: A numeral to indicate the model of the RS485 device.
  For the RS485 digital fuel sensor, the following models are supported now:
  - 0: Thinktec digital fuel sensor
  - 1: Escort TD500 digital fuel sensor
  - 2: LLS 4 digital fuel sensor
  - 3: LLS 5 digital fuel sensor
  - 4: LLS EX 5 digital fuel sensor
  - 5: TW_BLE (TD-150) fuel sensor
- <*Device Number*>: The number of the RS485 devices which are defined in the <*Index*>.
- <*Device ID Start*>: The start ID of the RS485 device which is defined in the <*Index*>. For example, if the <*Device Number*> is set to 3, the <*Device ID Start*> is 0, the IDs of the RS485 devices specified by <*RS485 Device Type*> and <*RS485 Device Model*> should be configured as 0, 1 and 2. If the <*Device ID Start*> is 90, the IDs of those devices should be configured as 90, 91 and 92.

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

- **+ACK:GTRCS,**

Example: **+ACK:GTRCS,5A0200,865585040007340, ,FFFF,20190525022311,3C00$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' _ '	

Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.8.15.Operator List Configuration

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

- **AT+GTOWL=**

Example: **AT+GTOWL=gv56,1,1,1,46000,30,,,,,FFFF$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
2	Mode	1	0 – 2	0
3	Start Index	<=3	1 – 100	
4	End Index	<=3	1 – 100	
5	Operator List	<=6*100		
6	TCP Connection Timeout	2	30 – 90min	60
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Serial Number	4	0000 – FFFF	
12	Tail Character	1	$	$

✧ <*Mode*>: The working mode of this function.
- 0: Disable this function.
- 1: White list configuration. The parameter <*Operator List*> is white list.
- 2: Forbidden list configuration. The parameter <*Operator List*> is forbidden list.

✧ <*Start Index*>: A numeral to indicate the first index of the list operator numbers to be input. For example, if it is **1**, the device will update the list operators from the **1**st one. If it is empty, there should be no list number.

✧ <*End Index*>: A numeral to indicate the last index of the list operator numbers to be input. For example, if it is **2**, the device will update the list operators until the **2**nd one. If it is empty,

there should be no list number.

- ✧ <*Operator List*>: A list of PLMN codes for network operators. The PLMN code is comprised of mobile country code (MCC) and mobile network code (MNC), each consisting of 3 digits. The last digit of MNC can be omitted (e.g. "460010" or "46001" represents the PLMN of "CHINA UNICOM"). And two adjacent operator codes are separated with ',**'**. The number of the operators in the list is determined by the parameters <*Operator Start*> and <*Operator End*>. For example, if <*Operator Start*> is **1** and <*Operator End*> is **2**, the operator list should include **2** operator codes (empty value acceptable) and the two numbers are separated by with ',**'**. MCCFF type code is used to identify operators across a whole country. For example, "460FF" covers the mobile network operators all across China.
- ✧ <*TCP Connection Timeout*>: The timeout period for the terminal to establish connection to the TCP server.

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

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

- ➢ **+ACK:GTOWL,**

Example: **+ACK:GTOWL,5A0200,135790246811220,,FFFF,20140605140622,001F$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.8.16.Configuration File Version

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

- ➢ **AT+GTFVR=**

Example:

AT+GTFVR=gv56,1,0000,,,,,,,,,,0010$				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
2	Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
3	Configuration Version	4	0000 – 9999	
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Digital Signature	32	'0' – '9' 'a' – 'z' 'A' – 'Z'	
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Generation Time	14	YYYYMMDDHHMMSS	
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Configuration Name*>: The name of the configuration file.
- <*Configuration Version*>: The version number of the configuration file. The first two characters indicate the major version number, and the last two characters indicate the minor version number.
- <*Digital Signature*>: The parameter is used to confirm the validity of subsequent commands.
- <*Generation Time*>: The time when the configuration file is generated.

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

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

- **+ACK:GTFVR,**

Example: **+ACK:GTFVR,5A0200,135790246811220,,0012,20090214093254,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	14	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.3.Report

This section defines the formats of the report messages. Due to the size limit of an SMS message (160 bytes), it is recommended to carefully set the <*Report Composition Mask*> in **AT+GTCFG** to limit the length of the report message which contains GNSS position information and is transmitted via SMS. Otherwise the report message will be truncated to fit the length of an SMS message.

3.3.1.Position Related Report

- **+RESP:GTTOW,**

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

- **+RESP:GTDIS,**

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

- **+RESP:GTIOB,**

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

- **+RESP:GTSPD,**

If the speed alarm is enabled, the device will send the message **+RESP:GTSPD** to the backend server when the speed of the device which meets the alarm condition is detected.

- **+RESP:GTSOS,**

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

- **+RESP:GTRTL,**

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

- **+RESP:GTDOG,**

The protocol watchdog reboot message.

- **+RESP:GTIGL,**

The location message when the ignition is on/off.

- **+RESP:GTHBM,**

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

- **+RESP:GTVGL,**

The location message for virtual ignition on and ignition off.

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

Example:

+RESP:GTTOW,5A0200,865585040006631,,,00,1,2,0.0,207,27.0,117.129208,31.838817,20190521061457,0460,0000,550B,B969,00,0.0,20190521141500,004A$

+RESP:GTDIS,5A0200,865585040007340,,,21,1,1,0.0,150,77.4,117.129515,31.839323,20190525075746,0460,0000,550B,B969,00,128.0,20190525075747,3EC1$

+RESP:GTIOB,5A0200,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTSPD,5A0200,865585040006649,,,00,1,1,0.0,359,93.2,117.129182,31.839600,20190524050731,0460,0000,550B,B969,00,45.6,20190524050731,2E5F$

+RESP:GTSOS,5A0200,865585040006649,,,10,1,1,0.0,359,100.5,117.129378,31.838762,20190525082926,0460,0000,550B,B969,00,128.0,20190525162927,355F$

+RESP:GTRTL,5A0200,865585040006649,,,00,1,1,0.1,184,103.9,117.128558,31.840730,20190524021124,0460,0000,550B,3C6C,00,1.8,20190524021125,2C43$

+RESP:GTDOG,5A0200,865585040006649,,,02,1,1,0.0,3,35.9,117.129222,31.839445,20190525064522,0460,0000,550B,B969,00,128.0,20190525064523,3385$

+RESP:GTIGL,5A0200,865585040006649,,,01,1,1,0.2,170,19.2,117.129385,31.839228,20190525064623,0460,0000,550B,B969,00,128.0,20190525064624,3391$

+RESP:GTHBM,5A0200,865585040006649,,,11,1,1,28.5,135,9.1,117.099183,31.778235,20190524025012,0460,0000,5619,16F1,00,22.3,20190524025012,2CD8$

+RESP:GTVGL,5A0200,865585040006649,,,41,1,1,0.1,88,50.0,117.127447,31.836968,20190524062448,0460,0000,550B,3D93,00,68.4,20190524062448,2F62$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved			
Report ID / Report Type	2	XY(X∈{0 - 4|7}, Y∈{0 - 5})	
Number	1	1	

GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

Report ID has different meanings in different messages as listed below.

- The ID of digital input port which triggers the report messages **+RESP:GTSOS**. The value range is 1-2.
- The ID of the bound IO which triggers the report message **+RESP:GTIOB**. The range is 0 – 1.
- The ID of the digital input port which triggers the reboot message **+RESP:GTDOG**. The valid value range is 0 - 2.
- The speed level at which the harsh behavior is detected in the message **+RESP:GTHBM**. 3 means high speed, 2 means medium speed and 1 means low speed.
- The value of <*Ignition Detection Mode*> which indicates the trigger source of the message **+RESP:GTVGL**.

  0: Hard-wired ignition detection mode.

  1: Motion status to simulate ignition status.

  2: External power voltage mode (virtual ignition detection).

3: Reserved.
4: Accelerometer mode (virtual ignition detection).
7: Combined detection mode (virtual ignition detection).

- The ID of Digital Input status which triggers the report message **+RESP:GTDIS**. The range is 1 - 2 or 5.

For other messages, it will always be 0.

Report Type has different meanings in different messages as listed below.

- In the **+RESP:GTDIS** report message generated by a digital input
  0: The current logic status of the input port is "Disable status".
  1: The current logic status of the input is "Enable status".
- In the **+RESP:GTIOB** report message generated by bound IO
  0: The current logic status of the bound IO does not meet the alarm condition.
  1: The current logic status of the bound IO meets the alarm condition.
- In the speed alarm message **+RESP:GTSPD**
  0: Outside the predefined speed range
  1: Inside the predefined speed range
- In the protocol watchdog reboot message **+RESP:GTDOG**
  1: Reboot message for time based working mode
  2: Reboot message for ignition on working mode
  3: Message for input triggered reboot
  4: Reboot message for GSM watchdog
  5: Reboot message for GPRS watchdog
- In the harsh behavior monitoring message **+RESP:GTHBM**
  0: Harsh braking behavior
  1: Harsh acceleration behavior
- In the (virtual) ignition on/off location messages **+RESP:GTIGL** and **+RESP:GTVGL.**
  0: Ignition off
  1: Ignition on

For other messages, it will always be 0.

✧ <*Number*>: The number of the GNSS position(s) included in the report message. Generally, it is 1.
✧ <*GNSS Accuracy*>: A numeral to indicate the GNSS fix status and HDOP of the GNSS position. 0 means the current GNSS fix fails and the last known GNSS position is used. A non-zero value (1 - 50) means the current GNSS fix is successful and represents the HDOP of the current GNSS position.
✧ <*Speed*>: The current speed. Unit: km/h.
✧ <*Azimuth*>: The azimuth of the GNSS fix.
✧ <*Altitude*>: The height above the sea level.
✧ <*Longitude*>: The longitude of the current position.
✧ <*Latitude*>: The latitude of the current position.
✧ <*GNSS UTC Time*>: The UTC time obtained from the GNSS chip.
✧ <*MCC*>: Mobile country code. It is 3 digits in length and ranges from 000 – 999.
✧ <*MNC*>: Mobile network code. It is 3 digits in length and ranges from 000 – 999.

- <*LAC*>: Location area code in hex format.
- <*Cell ID*>: Cell ID in hex format.
- <*Position Append Mask*>: A bitwise numeral to control whether to include the corresponding fields in each position after <*Cell ID*>.
- <*Satellites Used*>: If bit 0 of <*Position Append Mask*> in **AT+GTCFG** is enabled, this part will be showed and it includes the number of satellites used for the current position.
- <*Mileage*>: The current total mileage.

➢ **+RESP:GTFRI,**

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

Example:
+RESP:GTFRI,5A0200,865585040006631,,,10,1,1,0.0,91,56.5,117.129162,31.838887,20190524205208,0460,0000,550B,B969,00,0.4,,,,100,210100,,,,20190524205208,15D9$
+RESP:GTFRI,5A0200,865585040006649,,,31,1,1,28.3,4,42.5,117.128700,31.837608,20190524062528,0460,0000,550B,3D93,00,68.5,00003:29:04,,,100,220300,,,,20190524062528,2F69$

+RESP:GTFRI,5A0200,865585040006649,,,40,1,1,33.2,78,24.9,117.240132,31.853487,20190524080129,0460,0000,5665,27D0,00,81.2,00003:55:32,,,100,220300,,,,20190524080129,3013$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	''0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
External Power Voltage	<=5	0 - 99999(mV)	
Report ID / Report Type	2	XY(X∈{1 - 5}, Y∈{0 - 6})	
Number	<=2	1 – 15	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	

LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0 – 15	
Mileage	<=9	0.0 - 4294967.0(km)	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input	<=5	0 - 30000(mV)|F(0 - 100)	
Reserved	0		
Backup Battery Percentage	<=3	0 - 100	
Device Status	6	(HEX)	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*External Power Voltage*>: The voltage of the external power supply. If the command **AT+GTEPS** is used to configure the device to report the external power supply voltage periodically with fixed report, the device will send the current voltage along with the **+RESP:GTFRI** message to the backend server. If the device is not configured as such by the command **AT+GTEPS**, this field will be empty.
- <*Report ID / Report Type*>: I t indicates the working mode of the fixed report and the type of the message.

  Report ID has the following meanings.
  - 1: Fixed time report.
  - 2: Fixed distance report.
  - 3: Fixed mileage report.
  - 4: Fixed time and mileage report.
  - 5: Fixed time or mileage report.

  Report Type has the following meanings.
  - 0: Normal fixed report.
  - 1: Corner report which indicates that the device just turns around a corner.
  - 2: FRI report frequency change which indicates that the device enters into Geo-Fence or roaming status.

- 3: Corner report when FRI report frequency changes.
- 4: Mileage report when fixed report is in mode 5.
- 5: Reserved.
- 6: Mileage report when fixed report is mode 5 and **AT+GTFFC** works.

✧ <*Number*>: The number of the GNSS position(s) included in the report message. In the message **+RESP:GTFRI**, it may include one or two positions. If there are multi-positions in one **+RESP:GTFRI** message, information of the items displayed in the green part will repeat.

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

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

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

The current motion status of the device:

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

The input status: A bitwise hex integer to represent the logic status of digital input. The low bit represents the ignition detection input and the high bit represents the digital input 1-2. 0 means “Disable status”, and 1 means “Enable status”.

The output status: A bitwise hex integer to represent the logic status of digital output. The low bit represents digital output 1. 0 means “Disable status”, and 1 means “Enable status”.

✧ <*Position Append Mask*>: A bitwise numeral to control whether to include the corresponding fields in each position after <*Cell ID*>.

✧ <*Satellites Used*>: If bit 0 of <*Position Append Mask*> in **AT+GTCFG** is enabled, this part will be showed and it includes the number of satellites used for the current position.

➢ **+RESP:GTERI,**

If the bit value in <*ERI Mask*> in the **AT+GTFRI** command is not 0, the device will send the message **+RESP:GTERI** instead of **+RESP:GTFRI** to the backend server.

Example:

/*1-wire bus connected with no device*/
+RESP:GTERI,5A0200,865585040015467,,00000002,,10,1,0,0.0,268,-5.7,117.129005,31.838708,20190518101026,0460,0000,550B,B969,00,85.8,,,,53,110000,,0,20190518101314,0200$

/*1-wire bus connected with four devices*/
+RESP:GTERI,5A0200,865585040007340,,00000002,,10,1,1,0.0,4,29.5,117.129218,31.837908,20190521084630,0460,0000,550B,B969,00,0.2,,,,100,210100,,4,2811829D0A00002C,1,01EC,28FF0C41030000E2,1,01B8,28FFE671A3150449,1,01B4,28FFA180A315040F,1,01B4,20190521084632,0715$

+RESP:GTERI,5A0200,865585040006177,,00000100,,10,1,1,0.0,310,41.4,117.130133,31.839175,20190521085018,0460,0000,550B,B969,00,0.0,,,,100,110000,,2,1,1,0,1,001F,TD_100109,04D7E63D6DFD,1,350,25,9,1,0,1,001F,TD_100114,B339808571D9,1,350,25,20190521085019,02CC$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
ERI Mask	8	(HEX)	
External Power Supply	<=5	0 - 99999(mV)	
Report ID / Report Type	2	XY(X∈{1 - 5}, Y∈{0 - 6})	
Number	<=2	1 – 15	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	

Satellites Used (optional)		1	0-15	
Mileage		<=9	0.0 - 4294967.0(km)	
Hour Meter Count		11	HHHHH:MM:SS	
Analog Input		<=5	0 - 30000(mV)|F(0 - 100)	
Reserved		1		
Backup Battery Percentage		<=3	0 - 100	
Device Status		<=10	(HEX)	
Reserved		0		
1-wire Data (Optional)	1-wire Device Number	<= 2	0 – 19	
	1-wire Device ID	16		
	1-wire Device Type	2		
	1-wire Device Data	<= 60		
CAN Data (Optional)		<=1000		
Fuel Sensor Data (Optional)	Sensor Number	<=3	0 – 100	
	Sensor Type	<= 2	10 – 13|20	
	Percentage (Optional)	<= 5	0 – 100.0	
	Volume (Optional)	<= 5	0 – 10000.0	
RS485 Sensor Data (Optional)	RS485 Fuel Sensor Number	<=2	0 - 10	
	Sensor Model	<=2	0 - 99	
	Sensor Logical ID	<= 2	0 - 109	
	Volume	<= 5	0 - 10000	
	Temperature	<=2	-70 - 255	
Bluetooth Accessory Data (Optional)	Bluetooth Accessory Number	<=2	0 - 10	
	Index	1	0 - 9	
	Accessory Type	1	0 – 4|6|7|8|10|11|13|17	
	Accessory Model	1	0	
	Raw Data	<=8		
	Accessory Append	<=4	(HEX)	

	Mask			
	Accessory Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
	Accessory MAC	12	(HEX)	
	Accessory Status	1	0|1	
	Accessory Battery Level	<=4	0 – 5000(mV)	
	Accessory Temperature	<=2	-40 – 80(℃)	
	Enhanced Temperature	<=5	-40.00 – 80.00(℃)	
	Accessory Humidity	<=2	0 –100%(rh)	
	Accessory Output status	2	00 – 03	
	Accessory Digital Input status	2	00 – 01	
	Accessory Analog Input voltage	<=2	0– 32000(mV)	
	Accessory Mode	<=2	0 - 10	
	Accessory Event	1	0 - 2	
	Magnet ID	2	00 – FF	
	MAG Event Counter	<=5	0 – 32767	
	Magnet state	1	0 – 1	
	Accessory Battery Percentage	<=3	0 – 100%	
	Relay State	1	0 – 1	
Send Time		14	YYYYMMDDHHMMSS	
Count Number		4	0000 – FFFF	
Tail Character		1	$	$

✧ <*1-wire Device Number*>: The number of 1-wire devices connected to the device. If it is 0, the fields <*1-wire Device ID*>, <*1-wire Device Type*>, and <*1-wire Device Data*> will not be displayed. If more than one 1-wire device is connected, the fields <*1-wire Device ID*>, <*1-wire Device Type*>, and <*1-wire Device Data*> will repeat to show the information of all connected 1-wire devices. If Bit 1 of <*ERI Mask*> in **AT+GTFRI** is enabled, the information

items contained in the <*1-wire Data*> field will be displayed; otherwise, the <*1-wire Data*> field information will not be displayed.

- <*1-wire Device ID*>: It indicates the device ID read from the 1-wire device.
- <*1-wire Device Type*>: It indicates the type of the 1-wire device.
  - 1: Temperature sensor.
  - 2: iButton sensor.
  - 3: HTDZ sensor.

  Note: The message **+RESP:GTERI** will report iButton information only when the **AT+GTIDA** function is enabled in the authorized state.
- <*1-wire Device Data*>: It indicates the data read from the 1-wire devices.
  - 1: Temperature sensor. If the device is a temperature sensor, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix A). To get the real temperature in degrees Celsius, please convert the data to a decimal value according to the calculation in Appendix A first and then multiply the decimal value by 0.0625.
  - 3: HTDZ sensor. If the device is a HTDZ sensor, this parameter indicates the temperature and humidity value.

1-wire Device Data	Data Mask	1	00 – 03	
	Humidity	2	0000 – FFFF	
	Temperature	2	0000 – FFFF	

- <*Data Mask*>: A bitwise numeral to control whether to include the corresponding fields in each position after <*1-wire Device Data*>.
  - Bit 0 for <*Humidity*> Humidity data = <*Humidity*>*100/65535
  - Bit 1 for <*Temperature*> Temperature = <*Temperature*>*0.0625

  Note: A bit of 1 indicates valid data, while a bit of 0 indicates invalid data.
- <*CAN Data*>: If Bit 2 of <*ERI Mask*> in **AT+GTFRI** is set to 1, the data got from CAN device will be displayed.
- <*RS485 Fuel Sensor Number*>: This parameter indicates the number of RS485 digital fuel sensors connected to the device.
- <*Sensor Model*>: This parameter indicates the model of the fuel sensor. Please refer to the command **AT+GTRCS** for detailed information.
- <*Sensor Logical ID*>: This parameter indicates the logical address to specify RS485 digital fuel sensor. Please refer to the parameter <*Device ID Start*> in the command **AT+GTRCS** for detailed information.
- <*Volume*>: It is read from digital fuel sensor and used to calculate the oil pressure. If the digital fuel sensor is removed for more than a few minutes, this field will be null.
- <*Temperature*>: It indicates the temperature measured by digital fuel sensor.
- <*Bluetooth Accessory Number*>: It indicates the number of Bluetooth accessories connected with the device.
- <*Index*>: The index of the Bluetooth accessory.
- <*Accessory Type*>: The type of the Bluetooth accessory.
- <*Accessory Model*>: The model of the Bluetooth accessory.

✧ <*Raw Data*>: The data is read from Bluetooth accessory. It varies depending on <*Accessory Type*> and <*Accessory Model*>.

- Fuel sensor: It is a decimal value which indicates the fuel level.
  For Mechatronics fuel sensor, if <*Fuel Level Format*> is set to 0, it indicates the original value of fuel level. If <*Fuel Level Format*> is set to 1, it indicates the percentage of fuel level and the value starts with character 'F' ("FXX").
- WTS300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate battery voltage (unit: 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, and the unit is Celsius.
- TEMP ELA: It is a two-byte hexadecimal Temperature value.
- WTH300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate temperature. And the 2 lower bytes of the hexadecimal value indicate humidity. The high byte is the integer part and the low byte is the fractional part. Temperature is equal to the low byte divided by 256 plus the high byte, and the unit is Celsius. Humidity is equal to the low byte divided by 256 plus the high byte, and the unit is RH.
- Escort Angle Sensor: It is a four-byte hexadecimal value. The first byte in higher 2-byte of the hexadecimal value is reserved byte, the value is 00. The second byte in higher 2-byte of the hexadecimal value indicate Event Notification of Angle sensor. And the 2 lower bytes of the hexadecimal value indicate Tilt Angle of sensor. The specific definitions are as follows:

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

- Mechatronics Angle Sensor: It is an eight-byte hexadecimal value. The specific definitions are as follows:

Reserved	1	00	00
X-plane angle	1	-90 - 90	
Y-plane angle	1	-90 - 90	
Z-plane angle	1	-90 - 90	
Sensor status	1	0 – FF	
Single events	2	0 - FFFF	
Complex events	2	0 - FFFF	

- RHT ELA: It is a four-byte hexadecimal value. The 2 lower bytes of the hexadecimal value indicate temperature. And the 2 higher bytes of the hexadecimal value indicate humidity.
- MAG ELA: It is a four-byte hexadecimal value. The 2 lower bytes of the hexadecimal value indicate mag data. And the 2 higher bytes of the hexadecimal value indicate

mag ID.

- Relay sensor: It is a four-byte hexadecimal value. It indicates the current state of the relay.
- WTH301: It is a four-byte hexadecimal value. The 2 lower bytes of the hexadecimal value indicate temperature. And the 2 higher bytes of the hexadecimal value indicate humidity. Humidity is equal to the 2 higher bytes divided by 100, and the unit is RH. Temperature is equal to the 2 lower bytes divided by 100, and the unit is Celsius.

✧ <*Accessory Name*>: The name of the Bluetooth accessory.
✧ <*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 Battery Level*>: It indicates the level of the remaining battery in the Bluetooth accessory. If it indicates the percentage of the remaining battery, the value will start with the character 'F' ("FXX").
✧ <*Accessory Temperature*>: It indicates the temperature measured by the Bluetooth accessory.
✧ <*Enhanced Temperature*>: It instructs Bluetooth accessories to measure high-precision temperature.
Note: Temperature alarm uses integer value.
✧ <*Accessory Humidity*>: It indicates the humidity measured by the Bluetooth accessory.
✧ <*Accessory Output status*>: The status of Bluetooth accessory output. Each bit indicates the status of one output. For example, 0X01 indicates that Output ID 5 is enabled and Output ID 6 is disabled.
✧ <*Accessory Digital Input status*>: The status of Bluetooth accessory digital input.
✧ <*Accessory Analog Input voltage*>: The status of Bluetooth accessory Analog Input Voltage.
✧ <*Accessory Mode*>: The operating mode of angle sensor.
✧ <*Magnet ID*>: ID corresponding to different magnet sensors.
✧ <*MAG Event Counter*>: The total number of times detected by the magnet sensor.
✧ <*Magnet state*>: The state of the two parts of the magnet sensor.
- 0: Separate
- 1: Closed

✧ <*Accessory Battery Percentage*>: Percentage of Bluetooth accessory's battery power.
✧ <*Relay state*>: The current state of the relay sensor.

Note: The item denoted with "(Optional)" indicates the item is controlled by the parameter <*ERI Mask*>.

➢ **+RESP:GTEPS,**

If 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.

The above report messages have the same format as shown below.

Example:
+RESP:GTEPS,5A0200,865585040006649,,11983,01,1,1,0.0,312,42.5,117.129308,31.838448,20190525074240,0460,0000,550B,B969,00,128.0,20190525084241,34BE$

+RESP:GTAIS,5A0200,865585040007340,,14055,10,1,1,0.0,150,77.4,117.129515,31.839323,20190525075319,0460,0000,550B,B969,00,6.5,20190525075320,3EB6$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' _ '	
External Power / Analog Input VCC	<=5	0 - 99999(mV)	
Report ID / Report Type	2	XY(X∈{0,1,5}, Y∈{0|1})	
Number	1	1	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	

Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*External Power / Analog Input VCC*>: The value of the external power supply voltage or the analog input voltage. When the voltage of the analog input meets the alarm condition as set by the command **AT+GTEPS** or **AT+GTAIS**, the device will send the current analog input voltage with the **+RESP:GTEPS** or **+RESP:GTAIS** message to the backend server.
- <*Report ID / Report Type*>: It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

  Report ID has different meanings as follows:
  - The ID of the analog input port which triggers the report message **+RESP:GTEPS**. The value is 0.
  - The ID of the analog input port which triggers the report message **+RESP:GTAIS**. The range is 1 or 5.

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

➢ **+RESP:GTLBC,**

If <*Location by Call*> in the command **AT+GTCFG** is 1 or 3 and <*Mode*> in **AT+GTBVS** is 0, the device will get and send the current position to the backend server via the message **+RESP:GTLBC** when there is an incoming call.

Example:
+RESP:GTLBC,5A0200,865585040006649,,18297916888,1,0.0,357,103.4,117.129323,31.839372,20190525051705,0460,0000,550B,B969,00,128.0,20190525051706,31C8$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Call Number	<=20	(Call Number)	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	

Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

➢ **+RESP:GTGEO,**

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

Example:
+RESP:GTGEO,5A0200,865585040006649,,,20,1,1,59.0,356,12.1,117.097113,31.800533,20190524031433,0460,0000,550B,6B67,00,38.3,20190524031433,2D5B$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' '	
Reserved			
Report ID / Report Type	<=3	XY(X∈{0 - 13}, Y∈{0|1})	
Number	1	1	

GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report ID / Report Type*>: The meanings of this parameter are as follows.

- Report ID: The ID of Geo Fence in HEX format. The range is 0X00 to 0X13.
- Report Type: 0 means “Exit from the Geo-Fence”, and 1 means “Enter the Geo-Fence”.

➢ **+RESP:GTGES,**

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

Example:
+RESP:GTGES,5A0200,865585040006649,,,131,21,1000,5,1,1,0.0,92,41.9,117.257558,31.817500,20190524080822,0460,0000,5501,28DE,00,86.6,20190524080823,3022$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' -	

		',' '_'	
Reserved			
Report ID / Report Type	<=3	XY(X∈{0 - 13}, Y∈{0|1})	
Trigger Mode	<=2	0|21|22	
Radius	<=7	50 - 6000000(m)	
Check Interval	<=5	0|5 - 86400(sec)	
Number	1	1	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

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

➢ **+RESP:GTGIN,**

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

➢ **+RESP:GTGOT,**

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

Example:
+RESP:GTGIN,5A0200,865585040006649,,,,0,07,,,,,1,1,45.8,179,29.9,117.096728,31.811718,20190524055825,0460,0000,550B,6993,00,52.2,20190524055825,2EFB$
+RESP:GTGOT,5A0200,865585040006649,,,,0,07,,,,,1,1,65.9,181,28.8,117.096673,31.809758,20190524055837,0460,0000,550B,6993,00,52.4,20190524055837,2EFD$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved			
Reserved			
Area Type	1	0|1	
Area Mask	8	00000000 - 000FFFFF	
Reserved			
Reserved			
Reserved			
Reserved			
Number	1	1	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	

Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	v	
Tail Character	1	$	$

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

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

➢ **+RESP:GTIDA,**

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

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

Example:
+RESP:GTIDA,5A0200,865585040007340,,,01A6742C01000068,1,1,0,0.0,173,16.4,117.129213,31.838378,20190524092628,0460,0000,550B,B969,00,5.4,,,,,20190524092629,3330$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved			
ID	<=20	(HEX)	
ID Report Type	1	0 - 2	
Number	1	1	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	

Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*ID*>: The ID which is currently read.
- <*ID Report Type*>: The type of reported ID.
  - 0: The ID is unauthorized or the ID Authorization **AT+GTIDA** 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,5A0200,865585040007340,,22,898602c9991730100383,30,0,1,0,,4.16,0,1,,,20190524094001,,,,01,01,+0000,0,20190524094002,3366$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Motion Status	2	11|12|21|22|41|42|1A|16	
ICCID	20	'0' - '9', 'A' - 'Z'	
CSQ RSSI	<=2	0 - 31|99	
CSQ BER	<=2	0 - 7	
External Power Supply	1	0|1	
External Power Voltage	<=5	0 - 99999(mV)	
Reserved	0		
Backup Battery Voltage	<=4	0.00 - 4.50(V)	
Charging	1	0|1	
LED On	1	1|2	
Reserved	0		
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Digital Input	2	00 - 07	
Digital Output	2	00 - 01	
Time Zone Offset	5	+/- HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Motion Status*>: The current motion status of the device.

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

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

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

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

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

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

- 0: Not connected.
- 1: Connected.

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

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

✧ <*Charging*>: It indicates whether the backup battery is charging when the main power supply is connected.

- 0: Not charging.
- 1: Charging.

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

✧ <*Digital Input*>: A bitwise hex integer to represent the logic status of a digital input. Each bit represents the status of a digital input (ignition detection or digital input 1-2). For each bit, 0 means “Disable status”, and 1 means “Enable status”.

✧ <*Digital Output*>: A bitwise hex integer to represent the logic status of a digital output. Each bit represents the status of a digital output (digital output 1). For each bit, 0 means “Disable status”, and 1 means “Enable status”.

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

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

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

3.3.3.Report for Real Time Querying

3.3.3.1.+RESP:GTGPS

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

➢ **+RESP:GTGPS,**

Example: **+RESP:GTGPS,5A0200,865585040006649,,,,,007F,,,20190525062452,20190525062453,3327$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Report Composition Mask	4	(HEX)	
Reserved	0		
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Report Composition Mask*>: Please refer to <*Report Composition Mask*> of the **AT+GTCFG** command.

3.3.3.2.+RESP:GTALM

After the device receives the command **AT+GTRTO** to read the configurations and the length of configuration message is greater than 1400 bytes. It will send the configurations to the backend server by the message **+RESP:GTALM**. This message is only sent via GPRS even if the report mode is forced SMS mode. The **+RESP:GTALM** message does not support the HEX report.

➢ **+RESP:GTALM,**

Example:

+RESP:GTALM,5A0200,865585040005682,,6,1,BSI,cmnet,,,,,,,SRI,3,,2,60.174.225.171,10015,,0,
,5,1,0,0,,30,0.0.0.0,0.0.0.0,CFG,gv56,,1,399.3,,,007F,0,,00003DEF,0,1,1,300,0,1,0,1,000F,0,TOW,
0,10,1,300,0,0,0,0,2,3,2,,,,,,,,,EPS,0,250,250,0,0,0,0,0,0,0,0,0,5,DIS,0,1,0,,0,2,0,0,0,,,,,,,,,OUT,0,,,
,,,,IOB,0,0,0,0,0,0,0,0,,,,,1,0,0,0,0,0,0,0,,,,,TMA,+0000,0,,,,,FRI,5,0,,1,0000,0000,,60,1000,1000,,
0,1800,00000000,,,,GEO,0,0,,,50,0,0,0,0,0,0,0,0,,1,0,,,50,0,0,0,0,0,0,0,0,,2,0,,,50,0,0,0,0,0,0,0,0,
,3,0,,,50,0,0,0,0,0,0,0,0,,4,0,,,50,0,0,0,0,0,0,0,0,,5,0,,,50,0,0,0,0,0,0,0,0,,6,0,,,50,0,0,0,0,0,0,0,0,,
7,0,,,50,0,0,0,0,0,0,0,0,,8,0,,,50,0,0,0,0,0,0,0,0,,9,0,,,50,0,0,0,0,0,0,0,0,,10,0,,,50,0,0,0,0,0,0,0,0,
,11,0,,,50,0,0,0,0,0,0,0,0,,12,0,,,50,0,0,0,0,0,0,0,0,,13,0,,,50,0,0,0,0,0,0,0,0,,14,0,,,50,0,0,0,0,0,0
,0,0,,15,0,,,50,0,0,0,0,0,0,0,0,,16,0,,,50,0,0,0,0,0,0,0,0,,17,0,,,50,0,0,0,0,0,0,0,0,,18,0,,,50,0,0,0,
0,0,0,0,0,,19,0,,,50,0,0,0,0,0,0,0,0,,SPD,0,0,0,60,300,0,0,0,0,,,,,,,,,,,SOS,0,0,,0,0,0,0,,,,,PIN,1,,,,,,
,OWH,0,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,,DOG,0,60,30,0200,,1,0,,60,60,,AIS,1,0,0,0,0,,0,0,
0,0,0,,,,,,,,0,,IDL,0,2,1,0,,,,0,0,0,0,,,,,HMC,0,00000:00:00,,,,,,,,HBM,0,,,100,0,0,,60,0,0,,,0,0,,0,0
,0,0,,,,,URT,0,12,8,1,0,0,,,,JDC,0,25,,5,10,10,,0,0,0,0,,WLT,0,,,,,,,,,,,,,,HRM,,,6F,FE7FBF,FE7FBF,FF
7D,EF,7D,,,,CRA,0,50,50,50,0,500,500,0,0,0,0,,20190530020420,1F73$

+RESP:GTALM,5A0200,865585040005682,,6,2,FFC,0,0,0,,,,,,,30,500,500,300,,0,,,,,1,0,0,,,,,,,30,5
00,500,300,,0,,,,,2,0,0,,,,,,,30,500,500,300,,0,,,,,3,0,0,,,,,,,30,500,500,300,,0,,,,,4,0,0,,,,,,,30,500,
500,300,,0,,,,,SSR,0,2,1,5,0,,,,IDA,0,1,50,,30,0,30,,,,0,0,0,0,,,,,0,5
1,100,,,30,0,30,,,,0,0,0,0,,,,,0,101,150,,,
,,,,,,,30,0,30,,,,0,0,0,0,,,,,0,151,200,,,30,0,30,,,,0,0,0,0,,,,,0,201,25
0,,30,0,30,,,,0,0,0,0,,,,,ACD,0,0,0,0,0,0,,,,,PDS,0,0,,,,,,,BZA,0,,,,0,
0,0,,,0,0,0,,,0,0,0,,,0,0,0,,,,,,,,,SPA,0,50,,60,0,,,70,,60,0,,,90,,60,0,,,110,,60,0,,,,,,,,,TMP,0,0,,,,0,0,,
,2,10,,,0,0,0,0,,,,,1,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,2,0,,,,0,0,,,2,10,,,0,0,0,0,,,,,3,0,,,,0,0,,,2,10,,,0,0,0,0,
,,,,RMD,0,,
,,,,,3DEF,,,3DEF,,,,,0,0,0,0,,,20190530020420,1F74$

+RESP:GTALM,5A0200,865585040005682,,6,3,PEO,0,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,1,0,0,0,,,,,,
,,,,,,,,,,,,,,0,0,0,0,0,0,,,,2,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,3,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,4,0,0,
0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,5,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,6,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,7
,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,8,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,9,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,
0,,,,10,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,11,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,12,0,0,0,,,,,,,,,,,,,,,,,,,0
,0,0,0,0,0,,,,13,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,14,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,15,0,0,0,,,,,,,,,
,,,,,,,,,,0,0,0,0,0,0,,,,16,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,17,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,18,0,0
,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,19,0,0,0,,,,,,,,,,,,,,,,,,,0,0,0,0,0,0,,,,CMD,0,0,,,,,,0,1,,,,,,0,2,,,,,,0,3,,,,,
,0,4,,,,,,0,5,,,,,,0,6,,,,,,0,7,,,,,,0,8,,,,,,0,9,,,,,,0,10,,,,,,0,11,,,,,,0,12,,,,,,0,13,,,,,,0,14,,,,,,0,15,,,,,,0,16
,,,,,,0,17,,,,,,0,18,,,,,,0,19,,,,,,0,20,,,,,,0,21,,,,,,0,22,,,,,,0,23,,,,,,0,24,,,,,,0,25,,,,,,0,26,,,,,,0,27,,,,,,0,
28,,,,,,0,29,,,,,,0,30,,,,,,0,31,,,,,,20190530020421,1F75$

+RESP:GTALM,5A0200,865585040005682,,6,4,UDF,0,0,0000000000000000,0,00000,00000,000
00000,0,00000,00000,,,0,1,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,2,
0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,3,0000000000000000,0,0000

0,00000,00000000,0,00000,00000,,,0,4,0000000000000000,0,00000,00000,00000000,0,00000,
00000,,,0,5,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,6,0000000000000
000,0,00000,00000,00000000,0,00000,00000,,,0,7,0000000000000000,0,00000,00000,000000
00,0,00000,00000,,,0,8,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,9,000
0000000000000,0,00000,00000,00000000,0,00000,00000,,,0,10,0000000000000000,0,00000,0
0000,00000000,0,00000,00000,,,0,11,0000000000000000,0,00000,00000,00000000,0,00000,0
0000,,,0,12,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,13,000000000000
0000,0,00000,00000,00000000,0,00000,00000,,,0,14,0000000000000000,0,00000,00000,0000
0000,0,00000,00000,,,0,15,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,16
,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,17,0000000000000000,0,000
00,00000,00000000,0,00000,00000,,,0,18,0000000000000000,0,00000,00000,00000000,0,000
00,00000,,,0,19,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,20,00000000
00000000,0,00000,00000,00000000,0,00000,00000,,,20190530020421,1F76$

+RESP:GTALM,5A0200,865585040005682,,6,5,0,21,0000000000000000,0,00000,00000,000000
00,0,00000,00000,,,0,22,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,23,0
000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,24,0000000000000000,0,0000
0,00000,00000000,0,00000,00000,,,0,25,0000000000000000,0,00000,00000,00000000,0,0000
0,00000,,,0,26,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,27,000000000
0000000,0,00000,00000,00000000,0,00000,00000,,,0,28,0000000000000000,0,00000,00000,0
0000000,0,00000,00000,,,0,29,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,
0,30,0000000000000000,0,00000,00000,00000000,0,00000,00000,,,0,31,0000000000000000,0
,00000,00000,00000000,0,00000,00000,,,BVS,0,,,,,,,BTS,0,,GV56_BT,04,,,1903,0003,,,,,,,BMS,0,
0,BT_SENSOR,,0003,1,,1,,,,0,0,,,,,1,0,BT_SENSOR,,0003,1,,1,,,,0,0,,,,,2,0,BT_SENSOR,,0003,1,,1,
,,,0,0,,,,,3,0,BT_SENSOR,,0003,1,,1,,,,0,0,,,,,UPC,0,10,0,0,0,,0,,0,00000000,ASC,50,10,2,,,,,0,0,0,
0,,GAM,1,1,25,10,60,60,,,,,VVS,13500,600,10,,,AVS,20,30,,,,RCS,0,,0,0,0,0,,,,,,20190530020421,
1F77$

+RESP:GTALM,5A0200,865585040005682,,6,6,BAS,0,0,0,,FFFFFFFFFFFF,001F,30,,,,,,0,0,0,,FFFFF
FFFFFFF,001F,30,,,,,,0,0,0,,FFFFFFFFFFFF,001F,30,,,,,,0,0,0,,FFFFFFFFFFFF,001F,30,,,,,,0,0,0,,FFFFF
FFFFFFF,001F,30,,,,,,0,0,0,,FFFFFFFFFFFF,001F,30,,,,,,0,0,0,,FFFFFFFFFFFF,001F,30,,,,,,0,0,0,,FFFFF
FFFFFFF,001F,30,,,,,,0,0,0,,FFFFFFFFFFFF,001F,30,,,,,,0,0,0,,FFFFFFFFFFFF,001F,30,,,,,,2019053002
0422,1F78$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Total Packets	<=2	1 - 25	
Current Packet	<=2	1 - 25	
Configurations	< 1500		

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Total Packets*>: The total number of **+RESP:GTALM** messages.
- <*Current Packet*>: The sequence number of the current packet.
- <*Configurations*>: The current configurations of the device. If the length of device configuration is greater than 1400 bytes, the configuration information will be sent through multiple **+RESP:GTALM** messages.

  Note: The length of every **+RESP:GTALM** message (including header and tail) is less than or equal to (<=) 1400 characters.

3.3.3.3.+RESP:GTALC

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

- **+RESP:GTALC,**

Example:

+RESP:GTALC,5A0200,865585040005682,,40200800203F033B,0,1,BSI,cmnet,,,,,,,SRI,3,,2,60.174.225.171,10015,,0,,5,1,0,0,,30,0.0.0.0,0.0.0.0,CFG,gv56,,1,402.7,,,007F,0,,00003DEF,0,1,1,300,0,1,0,1,000F,0,TOW,0,10,1,300,0,0,0,0,2,3,2,,,,,,,,,EPS,0,250,250,0,0,0,0,0,0,0,0,0,5,IOB,0,0,0,0,0,0,0,0,,,,,1,0,0,0,0,0,0,0,,,,,TMA,+0000,0,,,,,OWH,0,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,,DOG,0,60,30,0200,,1,0,,60,60,,AIS,1,0,0,0,0,,0,0,0,0,0,,,,,,,,,0,,IDL,0,2,1,0,,,,0,0,0,0,,,,,HMC,0,00000:00:00,,,,,,,,,HBM,0,,,100,0,0,,60,0,0,,,0,0,,0,0,0,0,,,,,SSR,0,2,1,5,0,,,,RMD,0,,3DEF,,,3DEF,,,,,0,0,0,0,,,BTS,0,,GV56_BT,04,,,1903,0003,,,,,,,AVS,20,30,,,,20190530021250,1F87$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Configuration Mask	<=16	(HEX)	
Next Packet	1	0 - 1	0
Current Packet	<=2	1 - 20	1
BSI	3	BSI	BSI
APN	<=40	(ASCII)	

APN User Name	<=30	(ASCII)	
APN Password	<=30	(ASCII)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SRI	3	SRI	SRI
Report Mode	1	0 - 7	
Reserved	0		
Buffer Mode	1	0 - 2	
Main Server IP / Domain Name	<=60	(ASCII)	
Main Server Port	<=5	0 - 65535	0
Backup Server IP / Domain Name	<=60	(ASCII)	
Backup Server Port	<=5	0 - 65535	0
SMS Gateway	<=20	(Call Number)	
Heartbeat Interval	<=3	0|2 - 360(min)	
SACK Enable	1	0|1	
Protocol Format	1	0|1	0
SMS ACK Enable	1	0|1	0
Reserved	0		
Connection Life	<=3	0|10 - 600(sec)	30
Primary DNS Server	<=15	(IP)	0.0.0.0
Secondary DNS server	<=15	(IP)	0.0.0.0
CFG	3	CFG	CFG
Password	4 – 6	'0' - '9', 'a' - 'z', 'A' - 'Z'	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z'	
ODO Enable	1	0|1	
ODO Initial Mileage	<=9	0.0 - 4294967.0(km)	
Reserved	0		

Reserved	0		
Report Composition Mask	4	(HEX)	
Power Saving Mode	1	0 - 2	
Position Append Mask	4	(HEX)	
Event Mask	4	(HEX)	
Pin Mask	1	0|1	0
LED On	1	1|2	
Info Report Enable	1	0|1	
Info Report Interval	<=5	30 - 86400(sec)	
Location by Call	1	0 - 3	
Backup Battery On	1	0|1	1
Backup Battery Charge Mode	1	0|1	
AGPS Mode	1	0|1	0
Cell Info Report	4	(HEX)	
GNSS Lost Time	2	0 - 30(min)	0
TOW	3	TOW	TOW
Tow Enable	1	0|1	
Engine Off to Tow	<=2	5 - 15(min)	
Fake Tow Delay	<=2	0 - 10(min)	
Tow Interval	<=5	30 - 86400(sec)	
Tow Output ID	1	0|1	
Tow Output Status	1	0|1	
Tow Output Duration	<=3	0 - 255(*100ms)	
Tow Output Toggle Times	<=3	0 - 255	
Rest Duration	<=3	1 - 255(*15sec)	
Motion Duration	<=2	1 - 10(*100ms)	
Motion Threshold	1	1 - 9	
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0 - 2	
Min Threshold	<=5	250 - 28000(mV)	
Max Threshold	<=5	250 - 28000(mV)	
Sample Period	<=2	0 - 12(*2sec)	
Debounce Time	1	0 - 5(sec)	
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Sync with FRI	1	0|1	
Voltage Margin Error	<=3	0 - 100(*10mv)	0
Debounce Voltage Threshold	<=3	0 - 100(*100mv)	0
MPF Validity Time	<=2	0 - 20(sec)	5
DIS	3	DIS	DIS
Input Working Mode	1	0|1	0
Enable	1	0|1	0
Debounce Time	<=2	1– 20(*10ms)	0
Reserved	0		
Ignition Detection Mode	1	0 - 4	0
Input ID 2	1	2	2
Enable	1	0|1	0
Debounce Time	<=2	0 - 20(*10ms)	0
Validity Time	<=2	0|1 - 12(*2sec)	0
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OUT	3	OUT	OUT
DOS Report	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB	3	IOB	IOB
IOB ID	1	0|1	0
Input Mask	1	(HEX)	
Trigger Mask	1	(HEX)	
Input Sample Period	<=2	0 - 12(*2sec)	
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TMA	3	TMA	TMA
Time Zone	5	+/- HHMM	

Daylight Saving	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 - 5	
Discard No Fix	<=2	0|1	
Reserved	0		
Period Enable	1	0|1	
Begin Time	4	HHMM	
End Time	4	HHMM	
Check Interval	<=5	0 – 86400sec	
Send Interval	<=5	5 - 86400(sec)	
Distance	<=5	50 - 65535(m)	
Mileage	<=5	50 - 65535(m)	
Reserved	0		
Corner Report	<=3	0 - 180	
IGF Report Interval	<=5	0|5 - 86400(sec)	
ERI Mask	8	00000000-FFFFFFFF	
Continue Time	<=2	0 – 10 (min)	
Reserved	0		
Wrap Corner Point	1	0|1	
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 - 3	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 - 6000000(m)	
Check Interval	<=5	0|5 - 86400(sec)	

Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 - 3	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 - 6000000(m)	
Check Interval	<=5	0|5 - 86400(sec)	
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID2	1	2	2
Mode	1	0 - 3	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 - 6000000(m)	
Check Interval	<=5	0|5 - 86400(sec)	
Output ID	1	0|1	
Output Status	1	0|1	

Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID3	1	3	3
Mode	1	0 - 3	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 - 6000000(m)	
Check Interval	<=5	0|5 - 86400(sec)	
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID4	1	4	4
Mode	1	0 - 3	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 - 6000000(m)	
Check Interval	<=5	0|5 - 86400(sec)	
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	

Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID5	1	5	5
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID6	1	6	6
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0

State Mode	1	0|1	0
Reserved	0		
GEO ID7	1	7	7
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID8	1	8	8
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		

GEO ID9	1	9	9
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID10	2	10	10
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID11	2	11	11
Mode	1	0 - 3	0

Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID12	2	12	12
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID13	2	13	13
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000

Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID14	2	14	14
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID15	2	15	15
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID16	2	16	16
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID17	2	17	17
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID18	2	18	18
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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
Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
GEO ID19	2	19	19
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.000000
Latitude	<=10	-90 - 90	0.000000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|5 - 86400(sec)	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

Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
State Mode	1	0|1	0
Reserved	0		
SPD	3	SPD	SPD
Mode	1	0 - 3	
Min Speed	<=3	0 - 400(km/h)	
Max Speed	<=3	0 - 400(km/h)	
Validity	<=4	0 - 3600(sec)	
Send Interval	<=4	30 - 3600(sec)	
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 - 4	
Digital Input ID	1	0 - 2	
SOS Number	<=20	(Call Number)	
Output ID	1	0|1	

Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
Enable Auto-unlock PIN	1	0|1	
PIN	4 - 8	'0' - '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OWH	3	OWH	OWH
Mode	1	0 - 3	
Day of Work	<=2	0 - 7F	
Working Hours Start1	4	HHMM	
Working Hours End1	4	HHMM	
Working Hours Start2	4	HHMM	
Working Hours End2	4	HHMM	
Reserved	0		
Reserved	0		
Digital Input ID	1	0 - 2	
Digital Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0 - 2	
Ignition Frequency	<=3	10 - 120(min)	
Interval	<=2	1 - 30	
Time	4	HHMM	
Reserved	0		
Report Before Reboot	1	0|1	
Input ID	1	0 - 2	
Reserved	0		
GSM Interval	4	0|5 - 1440(min)	60
PDP Interval	4	0|5 - 1440(min)	60
Reserved	0		
AIS	3	AIS	AIS
Analog Input ID1	1	1	1
Mode	1	0 - 2	0
Min Threshold	<=5	0 - 16000(mV)	
Max Threshold	<=5	0 - 16000(mV)	
Sample Rate	<=2	0 - 12(*2sec)	0
Reserved	0		
Output ID	1	0|1	
Output Active	1	0|1	
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		
Voltage Margin Error	3	0 - 100(*10mv)	0
Reserved	0		
IDL	3	IDL	IDL
Mode	1	0|1	
Time to Idling	<=2	1 - 30(min)	
Time to Movement	1	1 - 5(min)	
Debounce Distance	<=4	0|100 - 9999(m)	
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Hour Meter Enable	1	0|1	
Initial Hour Meter Count	11	HHHHH:MM:SS	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
Mode	1	0|1	
Reserved	0		
Reserved	0		
High Speed	<=3	100 - 400(km/h)	
ΔVhb	<=3	0 - 100(km/h)	
ΔVha	<=3	0 - 100(km/h)	
Reserved	0		
Medium Speed	<=3	60 - 100(km/h)	
ΔVmb	<=3	0 - 100(km/h)	
ΔVma	<=3	0 - 100(km/h)	
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 - 100(km/h)	
ΔVla	<=3	0 - 100(km/h)	
Reserved	0		
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
URT	3	URT	URT
Working Mode	<=2	0|21	21

Baud Rate Index	<=2	1 - 12	12
Data Bits	1	7|8	8
Stop Bits	1	1 - 3	1
Parity Bits	1	0 - 4	0
Sleep Enable	1	0|1	0
Reserved	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
JDC	3	JDC	JDC
Mode	1	0 - 2	0
Signal Threshold	<=2	0 - 31	25
Reserved	0		
Jamming Cell Number Threshold	<=2	0 - 99	5
Enter Jamming Timer Threshold	<=4	0 - 3600(sec)	10
Quit Jamming Timer Threshold	<=4	0 - 3600(sec)	10
Reserved	0		
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	
Toggle Times	<=3	0 - 255	
Reserved	0		
WLT	3	WLT	WLT
Call Filter	1	0 - 7	0
Phone Number List	<=20*10	(Call Number)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

HRM	3	HRM	HRM
Reserved	0		
Reserved	0		
ACK Mask	<=2	0 - FF	6F
Response Mask	<=8	0 - FFFFFFFF	FE1FBF
Event Mask	<=8	0 - FFFFFFFF	FE1FBF
Information Mask	<=8	0 - FFFFFFFF	FF7D
HBD Mask	<=2	0 - FF	EF
Crash Data Mask	<=4	0 - FFFF	7D
+CAN Mask	<=8	0 - FFFFFFFF	7FF
Reserved	0		
Reserved	0		
CRA	3	CRA	CRA
Mode	1	0 - 2	0
Threshold_X	<=3	0 - 160	50
Threshold_Y	<=3	0 - 160	50
Threshold_Z	<=3	0 - 160	50
Sampling start	1	0|1	0
Samples before crash	4	1 - 1500	500
Samples after crash	4	1 - 1500	500
Output ID	1	0|1	0
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	0
Toggle Times	<=3	0 - 255	0
Reserved	0		
FFC	3	FFC	FFC
Priority	1	0	0
Mode	1	0 - 3	0
FRI Mode	1	0 - 5	0
Reserved	0		

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

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

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

Reserved	0		
SSR	3	SSR	SSR
Mode	1	0|1	0
Time to Stop	<=2	1 - 30(min)	2
Time to Start	1	1 - 5(min)	1
Start Speed	<=2	1 - 10(km/h)	5
Long Stop	<=5	0 - 43200(min)	0
Reserved	0		
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Mode	1	0 - 2	0
Start Index	<=3	1 - 250	1
End Index	<=3	1 - 250	25
ID Number List	<=8*20	'0' - '9', 'a' - 'f', 'A' - 'F'	
Timeout After Ignition Off	<=3	0|15 - 600(sec)	30
Report Mode	1	0 - 7	0
ID Validity Time	<=3	15 - 600(sec)	30
Reserved	0		
Reserved	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
ID List Type	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
…			

Start Index	1	1 - 250	226
End Index	1	1 - 250	250
ID Number List	<=8*20	(Hex)	
Timeout After Ignition Off	<=3	15 - 600(sec)	30
Report Mode	1	0 - 7	0
ID Validity Time	<=3	15 - 600(sec)	30
Reserved	0		
Reserved	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
ID List Type	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
ACD	3	ACD	ACD
iButton Timer	<=2	0 - 10(sec)	0
Output ID	1	0|1	0
Output Status	1	0|1	0
Duration	<=3	0 - 255(*100ms)	0
Toggle	<=3	0 - 255	0
Temperature Timer	<=3	0|10 - 255(sec)	0
Humidity Timer	<=3	0|10– 255(s)	0
Reserved			
Reserved			
Reserved			
Reserved			
PDS	3	PDS	PDS

Mode	1	0 - 2	0
Mask	4	(HEX)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BZA	3	BZA	BZA
Output ID	1	0|1	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 - 2	0
Speed Threshold 1	<=3	0 - 400(km/h)	50
Reserved	0		
Validity	<=4	0 - 3600(sec)	60
Alarm Type	1	0 - 4	0
Reserved	0		
Reserved	0		
Speed Threshold 2	<=3	0 - 400(km/h)	70
Reserved	0		
Validity	<=4	0 - 3600(sec)	60
Alarm Type	1	0 - 4	0
Reserved	0		
Reserved	0		
Speed Threshold 3	<=3	0 - 400(km/h)	90
Reserved	0		
Validity	<=4	0 - 3600(sec)	60
Alarm Type	1	0 - 4	0
Reserved	0		
Reserved	0		
Speed Threshold 4	<=3	0 - 400(km/h)	110

Reserved	0		
Validity	<=4	0 - 3600(sec)	60
Alarm Type	1	0 - 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
VMS	3	VMS	VMS
Virtual Ignition Mode	1	0 | 1 | 2 | 4 | 7	0
Virtual Ignition On Mask	2	00 - 03	3
Virtual Ignition Off Mask	2	00 - 03	3
Virtual Ignition On Logic	1	0|1	1
Reserved	0		
OEX	3	OEX	OEX
Output Expansion Type	1	1	1
Bind BAS Index	1	0 – 9	0
Reserved	0		
Output ID	1	0|5 – 6	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOS Report	1	0 – 1	0
Output ID	1	0|5 – 6	0
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOS Report	1	0 – 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TMP	3	TMP	TMP
Alarm ID	1	0 - 3	
Mode	1	0 - 3	0
Sensor ID	16	'0' - '9', 'a' - 'f', 'A' - 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 - 125(℃)	0
High Temperature	<=3	-55 - 125(℃)	0
Reserved	0		
Reserved	0		
Validity	<=2	1 - 10	2
Send Interval	<=2	0 - 60	10
Reserved	0		
Reserved	0		
Output ID	1	0|1	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	(ASCII)	
Reserved	0		
Reserved	0		
Roaming Operator List	<=6*100	(ASCII)	
Reserved	0		
Reserved	0		
Black List Operator	<=6*20	(ASCII)	
Reserved	0		
Reserved	0		
Known Roaming Event Mask	<=6	(HEX)	3FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	<=6	(HEX)	3FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0|1	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
PEO ID	<=2	0 - 19	0
Mode	1	0 - 3	0
Start Point	2	1 - 10	
End Point	2	3 - 10	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
…			
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Check Interval	<=5	0|5 - 86400(sec)	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
State Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
CAN	3	CAN	CAN
Mode	1	0|1	
CAN Report Interval	<=5	0|5 – 86400sec	
CAN Report Interval IGF	<=5	0|5 – 86400sec	
CAN Report Mask	8	0 - FFFFFFFF	
Additional Event	1	0|1	
Reserved	0		
CAN Report Expansion Mask	8	0 - FFFFFFFF	
Reserved	0		
Electric Report Mask	<=8	0 – FFFFFFFF	

CMD	3	CMD	CMD
Mode	1	0 - 1	0
Stored Cmd ID	3	0 - 31	
Command String	200		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UDF	3	UDF	UDF
Mode	1	0 - 2	0
Group ID	<=2	0 - 31	
Input ID Mask	<=16	(HEX)	
Debounce time	<=5	0 - 86400(s)	0
Inzizo Mask	<=5	(HEX)	0
Outzizo Mask	<=5	(HEX)	0
Stocmd ID Mask	<=8	(HEX)	
Stocmd Ack	1	0|1	0
Inpeo Mask	<=5	(HEX)	0
Outpeo Mask	<=5	(HEX)	0
Reserved			
Reserved			
BVS	3	BVS	BVS
Mode	1	0 - 2	0
Match Headset MAC	12	(HEX)	
Match BT Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' ', '.'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BTS	3	BTS	BTS

Mode	1	0|1	0
Reserved	0		
Bluetooth Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	GV56_BT
Bluetooth Service	2	(HEX)	04
Reserved	0		
Reserved	0		
Bluetooth Report Mask	4	(HEX)	1903
Bluetooth Event Mask	4	(HEX)	0003
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		
BMS	3	BMS	BMS
Index	1	0 - 3	
Mode	1	0|1	0
Peripheral Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	BT_SENSOR
Peripheral MAC Address	12	(HEX)	
Data Mask	4	0000 - 0003	0003
Service UUID Type	1	1|2	1
Service UUID	4|32	(HEX)	

Characteristic UUID Type	1	1|2	1
Characteristic UUID	4|32	(HEX)	
Reserved	0		
Reserved	0		
Data Format	1	0|1	0
Send Interval	<=5	0 - 86400(*5sec)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IEX	3	IEX	IEX
Input Expansion Type	1	1	1
Bind BAS Index	1	0 – 9	0
Input Number	1	0 - 1	
Input ID	1	0|5	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UPC	3	UPC	UPC
Max Download Retry	1	0 - 3	0
Download Timeout	<=2	5 - 30(min)	10
Download Protocol	1	0	0
Enable Report	1	0|1	0
Update Interval	<=4	0 - 8760(h)	0
Download URL	<=100	URL	
Mode	1	0|1	0

Reserved	0		
Extended Status Report	1	0|1	
Identifier Number	8	(HEX)	
Reserved	0		
Update Status Mask	1	(HEX)	
CLT	3	CLT	CLT
Group ID	<=2	0 –19	
Mode	1	0|1	
Debounce Time	<=3	0 – 255(×1s)	
CAN Data Mask	8	0 - FFFFFFFF	
Alarm Mask 1	<=8	0 – FFFFFFFF	
Alarm Mask 2	<=8	0 – FFFFFFFF	
Alarm Mask 3	<=8	0 – FFFFFFFF	
High RPM Threshold	<=3	1 – 100(x100 rpm)	
Low RPM Threshold	<=3	0 – 99(x100 rpm)	
CAN Report Expansion Mask	8	0 - FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ASC	3	ASC	ASC
Brake Speed Threshold	<=3	30 - 400(km/h)	50
Delta Speed Threshold	<=2	5 - 72(km/h)	10
Delta Heading Threshold	1	0 - 5	2
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Output ID	1	0|1	0
Output Status	1	0|1	
Duration	<=3	0 - 255(*100ms)	0
Toggle Times	<=3	0 - 255	0
Reserved	0		
GAM	3	GAM	GAM
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5 - 50(km/h)	25
Motion Cumulative Time	<=3	10 - 100(sec)	10
Motionless Cumulative Time	<=3	10 - 250(sec)	60
GNSS Fix Failure Timeout	<=4	5 - 1800(sec)	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
VVS	3	VVS	VVS
Ignition On Voltage	<=5	250 - 28000(mV)	13500
Voltage Offset	<=4	200 - 2000(mV)	600
Debounce	<=3	5 - 255(*2sec)	10
Smart Voltage Adjustment	1	0|1	
Ignition Off Debounce	<=3	5 - 255(*2sec)	
AVS	3	AVS	AVS
Sensor Rest Duration	<=3	1 - 255(sec)	20
Sensor Motion Validity	<=3	1 - 255(sec)	30
Reserved	0		
Reserved	0		
Reserved	0		
FVR	3	FVR	FVR

Configuration Name	<=40	‘0’ – ‘9’, ‘a’ – ‘z’, ‘A’ – ‘Z’, ‘-’, ‘_’	
Configuration Version	4	0000 – 9999	
Command Mask	32	(HEX)	
GEO ID Mask	16	(HEX)	
Stocmd ID Mask	16	(HEX)	
Group ID Mask	16	(HEX)	
Digital Signature	32	‘0’ – ‘9’, ‘a’ – ‘z’, ‘A’ – ‘Z’	
PEO ID Mask	16	(HEX)	
Reserved	0		
Reserved	0		
Reserved	0		
Generation Time	14	YYYYMMDDHHMMSS	
RCS	3	RCS	RCS
Index	1	0	0
Reserved	0		
RS485 Device Type	1	0 - 1	0
RS485 Device Model	<=2	0 - 10	
Device Number	<=2	0 - 10	0
Device ID Start	<=2	0 - 99	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
BAS	3	BAS	BAS
Index	1	0 - 9	0
Accessory Type	1	0 – 4|6|7|8|10|11|13|17	0
Accessory Model	1	0 - 5	0
Accessory Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' _ '	

Accessory MAC	12	(HEX)	FFFFFFFFFFFF
Accessory Append Mask	<=4	(HEX)	0F
Read Interval	<=5	10 - 86400(sec)	30
Low Voltage Threshold	<=4	0 – 5000(mV)	
Reserved	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved	0		
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
…			
Index	1	0 - 9	9
Accessory Type	1	0 – 4|6|7|8|10|11|13|17	0
Accessory Model	1	0 - 5	0
Accessory Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' '	
Accessory MAC	12	(HEX)	FFFFFFFFFFFF
Accessory Append Mask	<=4	(HEX)	0F
Read Interval	<=5	10 - 86400(sec)	30
Low Voltage Threshold	<=4	0 – 5000(mV)	
Reserved	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		

Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved	0		
Output ID	1	0|1	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
VMS	3	VMS	VMS
Virtual Ignition Mode	1	0 | 1 | 2 | 4 | 7	0
Virtual Ignition On Mask	2	00 - 03	3
Virtual Ignition Off Mask	2	00 - 03	3
Virtual Ignition On Logic	1	0|1	1
Reserved			
BID	3	BID	BID
Index	1	0 - 2	0
Enable	1	0|1	
Beacon ID Model	1	0 - 2	0
Append Mask	<=4	(HEX)	1F
Low Voltage Threshold	<=4	0 – 5000(mV)	2400
Reserved	0		
Start Index	<=3	1 - 300	
End Index	<=3	1 - 300	
MAC List	<=12*75		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		

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		
Index	1	0|1	1
Enable	1	0|1	
Beacon ID Model	1	0 - 9	0
Append Mask	<=4	(HEX)	1F
Low Voltage Threshold	<=4	0 – 5000(mV)	2400
Reserved	0		
Start Index	<=3	1 - 300	
End Index	<=3	1 - 300	
MAC List	<=12*75		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
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		
AEX	3	AEX	AEX
Analog Input Expansion Type	1	0	0

Bind BAS Index	1	0 – 9	0
Analog Input Number	1	0 - 1	
Analog Input ID	1	0|5	0
Mode	1	0|1|2	0
Min Threshold	<=5	8000 – 32000 (mV)	8000
Max Threshold	<=5	8000 – 32000 (mV)	32000
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OWL	3	OWL	OWL
Mode	1	0 - 2	
Operator List 1	6		
…..			
Operator List 100	6		
TCP Connection Timeout	2	30 – 90min	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HUM	3	HUM	HUM
Alarm ID	1	0 - 3	
Mode	1	0 - 3	0
Sensor ID	16	(HEX)	
Reserved	0		
Reserved	0		
Low humidity	<=3	0 – 100(%)	0
High humidity	<=3	0 – 100(%)	0
Reserved	0		

Reserved	0		
Validity	<=2	1 - 10	2
Send Interval	<=2	0 - 60	10
Reserved	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		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

✧ <*Current Packet*>: It indicates the index of **+RESP:GTALC**.

3.3.3.4.+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**. Configuration information varies with different AT Commands. For example, to get FRI configuration, set **AT+GTRTO=gv56,2,FRI,,,,,0015$.**

➢ **+RESP:GTALS,**

Example: **+RESP:GTALS,5A0200,865585040005682,,FRI,5,0,,1,0000,0000,,60,1000,1000,,0,1800,00000000,,,,20190530021559,1F8D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	

Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Sub AT Command	3	'a' - 'z', 'A' - 'Z'	
Mode	1	0 – 4	
Discard No Fix	<=2	0|1	
Reserved	0		
Period Enable	1	0|1	
Start Time	4	HHMM	
End Time	4	HHMM	
Reserved	0		
Send Interval	<=5	5 - 86400(sec)	
Distance	<=5	50 - 65535(m)	
Mileage	<=5	50 - 65535(m)	
Reserved	0		
Corner Report	<=3	0 - 180	
IGF Report Interval	<=5	0|5 - 86400(sec)	
ERI Mask	8	(HEX)	00000000
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.3.3.5.+RESP:GTCID

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

- **+RESP:GTCID,**

Example:
+RESP:GTCID,5A0200,865585040006649,,898600c5121495604536,20190525062801,3332$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
ICCID	20	'0' - '9', 'a' - 'z', 'A' - 'Z'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.3.3.6.+RESP:GTCSQ

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

➢ **+RESP:GTCSQ,**

Example: **+RESP:GTCSQ,5A0200,865585040006649,,30,0,20190525062403,331D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
CSQ RSSI	<=2	0 - 31|99	
CSQ BER	<=2	0 - 7	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

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

99	Unknown

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

3.3.3.7.+RESP:GTVER

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

➢ **+RESP:GTVER,**

Example: **+RESP:GTVER,5A0200,865585040006649,,GV56RS,0209,0102,20190525060753,32AE$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Device Type	10	'0' - '9', 'a' - 'z', 'A' - 'Z'	
Software Version	4	(HEX)	
Hardware Version	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

✧ <*Software Version*>: The software version of the device. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.

✧ <*Hardware Version*>: The hardware version of the device. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.

3.3.3.8.+RESP:GTBAT

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

➢ **+RESP:GTBAT,**

Example: **+RESP:GTBAT,5A0200,865585040006649,,1,0,,4.12,0,1,20190525062315,3316$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
External Power Supply	1	0|1	
External Power Voltage	<=5	0 - 99999(mV)	
Reserved	0		
Backup Battery Voltage	<=4	0.00 - 4.50(V)	
Charging	1	0|1	
LED On	1	1|2	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.3.3.9.+RESP:GTIOS

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

- **+RESP:GTIOS,**

Example: **+RESP:GTIOS,5A0200,865585040006649,,,0,,00,00,20190525062303,3314$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	0		
Analog Input VCC1	<=4	0 - 30000(mV)	
Reserved	0		

Digital Input Status	2	00 - 07	
Digital Output Status	2	00 - 01	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.3.3.10.+RESP:GTTMZ

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

- **+RESP:GTTMZ,**

Example: **+RESP:GTTMZ,5A0200,865585040006649,,+0000,0,20190525061153,32CD$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Time Zone Offset	5	+/-HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.3.3.11.+RESP:GTCVN

After the device receives the command **AT+GTRTO** to get the version number of the CAN100, it will send the information to the backend server via the message **+RESP:GTCVN**.

- **+RESP:GTCVN,**

Example: **+RESP:GTCVN,250504,869158008709145,gv300,2.2.1d,,,,,20150323013841,2166$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	

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	(HEX)	
Tail Character	1	$	$

✧ <*CAN100 SW Version*>: The SW version of the CAN100 device.

3.3.3.12.+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 backend server via the message **+RESP:GTCSN**.

➢ **+RESP:GTCSN,**

Example: **+RESP:GTCSN,250504,869158008709145,gv300,11385 ,,,,,20150323013841,2166$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
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	(HEX)	
Tail Character	1	$	$

✧ <*CAN100 Serial Number*>: The Serial Number of the CAN100 device.

3.3.3.13.+RESP:GTQBI

After the device receives the command **AT+GTRTO** to query local Bluetooth information and peripheral Bluetooth device information, it will send the information to the backend server via the message **+RESP:GTQBI**.

➢ **+RESP:GTQBI,**

Example:
+RESP:GTQBI,5A0200,865585040006649,,7805410018AF,GV56RS_BT2,,15,F485821724CD,,-48,780541001833,,-42,780541000523,,-72,78054100B3DA,,-88,78054100B31F,,-66,78054100B359,,-85,7805410017FB,,-86,4EF450781EDE,,-68,78054100BDD0,,-99,780541000544,,-85,F591B0517936,,-99,B339808571D9,,-76,E194CD6B81E7,,-73,17F4C381B5CD,,-98,18FA2D87741A,,-103,,,,20190525062058,3309$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Local Bluetooth MAC	12	(HEX)	
Local Bluetooth Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved		'	
Searched BT Number	2	0 - 20	
Peripheral BT MAC	12	(HEX)	
Peripheral BT Name	<=20	(ASCII)	
Peripheral BT RSSI	<=4		
Reserved	0		
QBI Report Mode	1	0|1	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Searched BT Number*>: The number of peripheral Bluetooth devices that have been found.

- ✧ <*Peripheral BT MAC*>: The corresponding MAC address of peripheral Bluetooth devices.
- ✧ <*Peripheral BT Name*>: The corresponding name of peripheral Bluetooth devices.
- ✧ <*Peripheral BT RSSI*>: The corresponding RSSI signal of peripheral Bluetooth devices.
- ✧ <*QBI Report Mode*>: The report mode of the Bluetooth information.

3.3.3.14.+RESP:GTSCS

After the device receives the command **AT+GTRTO** to get the calibration data, it will send the calibration data to the backend server via the message **+RESP:GTSCS**.

➢ **+RESP:GTSCS,**

Example: **+RESP:GTSCS,5A0201,865585040006649,,2,-0.06,0.88,-0.48,-0.97,0.05,0.22,0.22,0.48,0.85,20190620184328,1F59$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Self Calibration Status	1	0 - 2	
X_Forward	<=5	-1.00 - 1.00	
Y_Forward	<=5	-1.00 - 1.00	
Z_Forward	<=5	-1.00 - 1.00	
X_Side	<=5	-1.00 - 1.00	
Y_Side	<=5	-1.00 - 1.00	
Z_Side	<=5	-1.00 - 1.00	
X_Vertical	<=5	-1.00 - 1.00	
Y_Vertical	<=5	-1.00 - 1.00	
Z_Vertical	<=5	-1.00 - 1.00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- ✧ <*Self Calibration Status*>: The status of the self-calibration for <*Acceleration Data*>.
  - 0: Self-calibration is disabled.

- 1: Self-calibration is not done.
- 2: Self-calibration is successful.

✧ <*X_Forward*>, <*Y_Forward*>, <*Z_Forward*>: The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is Xnew = <*X_Forward*> * X + <*Y_Forward*> * Y + <*Z_Forward*> * Z.

✧ <*X_Side*>, <Y_Side>, <*Z_Side*>: The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in Side direction Ynew is Ynew = <*X_Side*> * X + <*Y_Side*> * Y + <*Z_Side*> * Z.

✧ <*X_Vertical*>, <*Y_Vertical*>, <*Z_Vertical*>: The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in Vertical direction Znew is Znew = <*X_Vertical*> * X + <*Y_Vertical*> * Y + <*Z_Vertical*> * Z.

Note: When <*Self Calibration Status*> is 0 or 1, no calibration factor of the acceleration data will be included in the **+RESP:GTSCS** message. When <*Self Calibration Status*> is 2, the calibration factors of the acceleration data will be included in the **+RESP:GTSCS** message.

3.3.3.15.+RESP:GTAIF

After the device receives the command **AT+GTRTO** to get APN, ICCID, RSSI, cell ID, IP and DNS server information, it will send the information via the message **+RESP:GTAIF** to the backend server. The **+RESP:GTAIF** message does not support the HEX report.

➢ **+RESP:GTAIF,**

Example: **+RESP:GTAIF,5A0201,865585040015335,,cmnet,,,,,,898600c5121495604536,26,0,B969,10.24.221.148,8.8.8.8,211.138.180.3,1,,,,20190702015541,0285$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
APN	<=40	(ASCII)	
APN User Name	<=30	(ASCII)	
APN Password	<=30	(ASCII)	
Reserved			
Reserved			
Reserved			
ICCID	20	'0' - '9', 'A' - 'Z'	

CSQ RSSI	<=2	0 - 31|99	
CSQ BER	<=2	0 - 7|99	
Cell ID	4|8	(HEX)	
IP Address	<=15	(IP)	
Main DNS	<=15	(IP)	
Backup DNS	<=15	(IP)	
Auto APN State	1	0 - 2	
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

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

- <*CSQ BER*>: The quality of the GSM signal. The range is 0-7, and 99 is for unknown strength of signal.
- <*Cell ID*>: The serving cell ID in hex format.
- <*IP Address*>: The IP address of the device.
- <*Main DNS*>: The main DNS server.
- <*Backup DNS*>: The backup DNS server.
- <*Auto APN State*>: The current state of getting APN automatically.
  - 0: The device cannot obtain the APN or the APN obtained cannot activate PDP context.
  - 1: The device has obtained the APN and the APN obtained has already activated PDP context.
  - 2: The device is using the APN set by the command **AT+GTBSI**.

3.3.3.16.+RESP:GTCML

After the device receives the command **AT+GTRTO** to get the car model ID of the CAN100, it will send the information to the backend server via the message **+RESP:GTCML**.

➢ **+RESP:GTCML,**

Example: **+RESP:GTCML,250504,869158008709145,gv300,2.2.1d,,,,,20150323013841,2166$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
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'	
Car Syn Status	1	1 - 4	
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*CAN100 Car Model ID*>: The car model ID of the CAN100 device. If the value is 0, it means that no model has been obtained.

✧ <*CAN100 Car Name*>: Car Name is human readable make and model of the car.

✧ <*Car Syn Status*>: The car synchronization status.

- 1: The synchronization is successful.
- 2: The device is not properly connected to CAN-bus.
- 3: The car is not supported by the firmware version of CAN Chipset.
- 4: CAN Chipset is not responding.

3.3.4.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.

+RESP:GTSTC: Backup battery stops charging.

+RESP:GTBPL: Backup battery low

+RESP:GTSTT: Device motion status indication when the motion status changes

+RESP:GTPDP: GPRS connection establishment report

+RESP:GTIGN: Ignition on report
+RESP:GTIGF: Ignition off report
+RESP:GTIDN: Enter into idling status
+RESP:GTIDF: Leave idling status
+RESP:GTGSM: The report for the information of the serving cell and the neighbor cells
+RESP:GTJDR: Jamming indication
+RESP:GTJDS: Jamming indication
+RESP:GTGSS: GNSS signal status
+RESP:GTCRA: Crash incident report
+RESP:GTSTR: Vehicle enters into Start status.
+RESP:GTSTP: Vehicle enters into Stop status.
+RESP:GTLSP: Vehicle enters into Long Stop status.
+RESP:GTDOS: Wave shape 1 output status change
+RESP:GTRMD: The report for entering or leaving GSM roaming state
+RESP:GTUPC: The report for over-the-air configuration update
+RESP:GTVGN: Virtual ignition on report
+RESP:GTVGF: Virtual ignition off report
+RESP:GTTMP: Temperature alarm
+RESP:GTBCS: The report for Bluetooth connection
+RESP:GTBDS: The report for Bluetooth disconnection
+RESP:GTBAA: Temperature alarm, low voltage alarm or pushbutton event for the Bluetooth accessory
+RESP:GTBID: The report for detection of Bluetooth beacon accessories
+RESP:GTCLT: CANBUS information alarm.
+RESP:GTHUM: Humidity alarm.
+RESP:GTFLA: Unusual fuel consumption alarm.

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

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

Example:
+RESP:GTPNA,5A0200,865585040006649,,20040101000000,335D$
+RESP:GTPFA,5A0200,865585040006649,,20190524062345,2F57$
+RESP:GTPDP,5A0200,865585040006631,,20190522084804,1983$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	

Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

Example:
+RESP:GTMPN,5A0200,865585040006631,,0,0.0,356,47.7,117.129270,31.838160,20190521104925,0460,0000,550B,B969,00,20190521184926,0421$
+RESP:GTMPF,5A0200,865585040006631,,0,0.0,356,47.7,117.129270,31.838160,20190521105025,0460,0000,550B,B969,00,20190521185027,0426$
+RESP:GTBTC,5A0200,865585040006631,,0,0.0,356,47.7,117.129270,31.838160,20190521105045,0460,0000,550B,B969,00,20190521185046,0429$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used	1	0-15	

(optional)			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTCRA,**

Example: **+RESP:GTCRA,5A0200,865585040006276,,00,0,0.7,15,124.7,117.129348,31.839415,20190524072516,0460,0000,550B,B969,00,20190524163517,0027$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Crash Counter	<=2	(HEX)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Crash Counter*>: A parameter to indicate the crash sequence. It combines the report **+RESP:GTCRA** and **+RESP:GTCRD** into one crash event. It rolls from 0x00 to 0xFF.

➢ **+RESP:GTASC,**

Example: **+RESP:GTASC,5A0200,865585040006532,,-0.65,0.76,-0.00,0.54,0.47,0.70,0.54,0.45,-0.71,0,0.0,172,28.2,117.097063,31.797535,20190521065935,0460,0000,550B,6B67,00,20190521065936,01E3$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
X_Forward	<=5	-1.00 - 1.00	
Y_Forward	<=5	-1.00 - 1.00	
Z_Forward	<=5	-1.00 - 1.00	
X_Side	<=5	-1.00 - 1.00	
Y_Side	<=5	-1.00 - 1.00	
Z_Side	<=5	-1.00 - 1.00	
X_Vertical	<=5	-1.00 - 1.00	
Y_Vertical	<=5	-1.00 - 1.00	
Z_Vertical	<=5	-1.00 - 1.00	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Heading	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	

Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*X_Forward*>, <*Y_Forward*>, <*Z_Forward*>: The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is Xnew = <*X_Forward*> * X + <*Y_Forward*> * Y + <*Z_Forward*> * Z.
- <*X_Side*>, <*Y_Side*>, <*Z_Side*>: The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in Side direction Ynew is Ynew = <*X_Side*> * X + <*Y_Side*> * Y + <*Z_Side*> * Z.
- <*X_Vertical*>, <*Y_Vertical*>, <*Z_Vertical*>: The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in Vertical direction Znew is Znew = <*X_Vertical*> * X + <*Y_Vertical*> * Y + <*Z_Vertical*> * Z.

If the <*Mode*> in the **AT+GTJDC** command is set to 1, the device will report the **+RESP:GTJDR** message when jamming is detected.

➢ **+RESP:GTJDR,**

Example: **+RESP:GTJDR,5A0200,865585040006649,,0,4.4,107,-62.9,117.129128,31.839283,20190524033627,0460,0000,550B,B969,00,20190524034110,2DC3$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	

LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

If the <*Mode*> in the **AT+GTJDC** command is set to 2, the device will report the **+RESP:GTJDS** message when jamming is detected.

➢ **+RESP:GTJDS,**

Example: **+RESP:GTJDS,5A0200,865585040006649,,1,0,0.0,183,39.0,117.129512,31.839115,20190524035530,0460,0000,550B,B969,00,20190524042329,2DED$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Jamming Status	1	1|2	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	

Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Jamming Status*>: The current jamming status of the device.

- 1: Quit the jamming state.
- 2: Enter the jamming state.

➢ **+RESP:GTSTC,**

Example: **+RESP:GTSTC,5A0200,865585040006649,,,0,0.0,6,65.4,117.129398,31.838500,20190520121343,0460,0000,550B,B969,00,20190520121344,001D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTBPL,**

Example: **+RESP:GTBPL,5A0200,865585040005401,,3.65,0,0.0,352,52.3,,,20190525105643,,,,,,20190525185644,4844$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Backup Battery Voltage	<=4	0.00 - 4.50(V)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTSTT,**

Example: **+RESP:GTSTT,5A0200,865585040005401,,41,0,0.0,13,93.5,117.129352,31.839187,20190527024909,0460,0000,550B,B969,00,20190527104911,495A$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Motion Status	2	11|12|21|22|41|42|16	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Motion Status*>: The current motion status of the device.

- 16 (Tow): The device attached vehicle is ignition off and it is towed.
- 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
- 12 (Ignition Off Motion): The device attached vehicle is ignition off and it is moving before it is considered to be towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
- 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.

- 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
- 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

➢ **+RESP:GTIGN,**

Example: **+RESP:GTIGN,5A0200,865585040005401,,20,0,0.0,196,105.7,117.129355,31.839032,20190520121410,0460,0000,550B,B969,00,,0.0,20190520121411,0037$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Duration of Ignition Off	<=6	0 - 999999(sec)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	

Tail Character	1	$	$

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

➢ **+RESP:GTVGN,**

Example: **+RESP:GTVGN,5A0200,865585040006649,,00,4,0,0,0.1,88,50.0,117.127447,31.836968,20190524062448,0460,0000,550B,3D93,00,00003:28:24,68.4,20190524062448,2F60$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	2	00	
Report Type	1	0 - 2|4|7	
Duration of Ignition Off	<=6	0 - 999999(sec)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	

Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Report Type*>: This parameter indicates the trigger source of the ignition event.
- 0: Reserved
- 1: Sensor state mode
- 2: External power voltage mode (virtual ignition detection)
- 3: Reserved
- 4: Accelerometer mode (virtual ignition detection)
- 7: Combined detection mode

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

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

➢ **+RESP:GTIGF,**

Example: **+RESP:GTIGF,5A0200,865585040005401,,139,0,0.0,196,105.7,117.129355,31.839032,20190520121350,0460,0000,550B,B969,00,,0.0,20190520121351,0031$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Duration of Ignition On	<=6	0 - 999999(sec)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	

GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

➢ **+RESP:GTVGF,**

Example: **+RESP:GTVGF,5A0200,865585040006649,,00,4,253,0,0.0,0,42.3,117.129258,31.838773,20190525060513,0460,0000,550B,B969,00,00005:31:37,128.0,20190525060514,329E$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	2	00	
Report Type	1	0 - 2|4|7	
Duration of Ignition On	<=6	0 - 999999(sec)	
GNSS Accuracy	1	0	

Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

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

Example:

+RESP:GTIDN,5A0200,865585040006649,,,,0,4.4,107,-62.9,117.129128,31.839283,20190524033627,0460,0000,550B,B969,00,45.6,20190524033917,2DB7$

+RESP:GTSTR,5A0200,865585040006649,,,,0,21.3,181,17.4,117.097305,31.792878,20190524023523,0460,0000,550B,6B69,00,12.2,20190524023523,2C94$

+RESP:GTSTP,5A0200,865585040006649,,,,0,0.0,175,41.2,117.104873,31.830385,20190524061

952,0460,0000,550B,A81E,00,65.4,20190524061952,2F43$
+RESP:GTLSP,5A0200,865585040006649,,,,0,0.0,167,60.3,117.129225,31.839023,20190524092036,0460,0000,550B,B969,00,127.8,20190524092037,310D$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	0		
Reserved	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- **+RESP:GTTMP,**

Example:
+RESP:GTTMP,5A0200,865585040007340,,,0,30,1,0,0.0,4,29.5,117.129218,31.837908,20190521084532,0460,0000,550B,B969,00,0.2,,0,01,00,,,,28FFA180A315040F,,27,20190521084533,071

4$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	0		
External Power VCC	<=5	0 - 32000(mV)	
Report ID / Report Type	2	XY(X∈{0 - 3}, Y∈{0|1})	
Number	1	0|1	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input VCC1	<=5	0 - 30000(mV)	
Digital Input	2	00 - 07	
Digital Output	2	00 - 01	
Reserved	0		
Reserved	0		
Reserved	0		

Temperature Sensor Device ID	16	'0' - '9', 'a' - 'f', 'A' - 'F'	
Reserved	0		
Temperature Sensor Device Data	<=3	-55 - 125(℃)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Report ID / Report Type*>: It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.
  Report ID: The ID of the temperature alarm. The range is 0-3.
  Report Type: 0 means "Outside the predefined temperature range". 1 means "Inside the predefined temperature range".
- <*Temperature Sensor Device ID*>: The ID of the temperature sensor.
- <*Temperature Sensor Device Data*>: The current temperature the sensor detects.

➢ **+RESP:GTHUM,**

Example:
+RESP:GTHUM,5A0200,865585040553343,gv56,,0,00,1,0,0.0,10,29.3,117.128927,31.838702,20230428083354,0460,0000,550B,B7B1,00,0.0,,0,01,00,,,,2E075084D98016AF,,52,20230428174356,00F3$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Reserved	0		
External Power VCC	<=5	0 - 32000(mV)	
Report ID / Report Type	2	XY(X∈{0 - 3}, Y∈{0|1})	
Number	1	0|1	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	

Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input VCC1	<=5	0 - 16000(mV)	
Digital Input	2	00 - 03	
Digital Output	2	00 - 03	
Reserved	0		
Reserved	0		
Reserved	0		
Humidity Sensor Device ID	16	'0' – '9', 'a' – 'f', 'A' – 'F'	
Reserved	0		
Humidity Sensor Device Data	<=3	0 – 100(%)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Report ID / Report Type*>: It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.
  Report ID: The ID of humidity alarm. The range is 0 – 3.
  Report Type: 0 means “Outside the predefined humidity range”. 1 means “Inside the predefined humidity range”.
- <*Humidity Sensor Device ID*>: The ID of the humidity sensor.

✧ <*Humidity Sensor Device Data*>: The current humidity the sensor detects.

➢ **+RESP:GTIDF,**

Example: **+RESP:GTIDF,5A0200,865585040006649,,22,1396,0,0.7,177,28.7,117.129277,31.838717,20190524042407,0460,0000,550B,B969,00,45.6,20190524042407,2DEE$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Motion Status	2	11|12|16|22|1A	
Duration of Idling Status	<=6	0 - 999999(sec)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Motion Status*>: The motion status when the vehicle leaves idling status.

✧ <*Duration of Idling Status*>: The period of time that the vehicle has been in idling status. If the duration is greater than 999999 seconds, it will be reported as 999999 seconds.

➢ **+RESP:GTGSM,**

Example: **+RESP:GTGSM,5A0200,865585040006649,FRI,0460,0000,550b,b96a,37,,0460,0000,550b,9b89,21,,,,,,,,,,,,,,,,,,,,,,0460,0000,550b,b969,27,00,20190525051127,31A9$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Fix Type	3	SOS|RTL|LBC|FRI|GIR|TOW	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Cell ID1	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
RX Level1	<=2	0 - 63	
Reserved	0		
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Cell ID2	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
RX Level2	<=2	0 - 63	
Reserved	1		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Cell ID3	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
RX Level3	<=2	0 - 63	
Reserved	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4	'0' - '9', 'a' - 'f', 'A' - 'F'	

Cell ID4	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
RX Level4	<=2	0 - 63	
Reserved	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Cell ID5	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
RX Level5	<=2	0 - 63	
Reserved	0		
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Cell ID6	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
RX Level6	<=2	0 - 63	
Reserved	0		
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Cell ID	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
RX Level	<=2	0 - 63	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Fix Type*>: A string to indicate what kind of GNSS fix this cell information is for.
  "SOS": This cell information is for SOS request.
  "RTL": This cell information is for RTL request.
  "LBC": This cell information is for LBC request.
  "FRI": This cell information is for FRI request.
  "GIR": This cell information is for the sub command "**C**" in the **AT+GTRTO** command.
- <*MCC (i)*>: MCC of the neighbor cell *i* (*i* is the index of the neighbor cell).
- <*MNC (i)*>: MNC of the neighbor cell *i*.

- <*LAC (i)*>: LAC (in hex format) of the neighbor cell *i*.
- <*Cell ID (i)*>: Cell ID (in hex format) of the neighbor cell *i*.
- <*RX Level (i)*>: The signal strength of the neighbor cell *i*. This parameter is a 6-bit value coded in 1 dB steps:
  0: -110 dBm
  1 to 62: -109 to -48 dBm
  63: -47 dBm
- <*MCC*>: MCC of the serving cell.
- <*MNC*>: MNC of the serving cell.
- <*LAC*>: LAC (in hex format) of the serving cell.
- <*Cell ID*>: Cell ID (in hex format) of the serving cell.
- <*RX Level*>: The signal strength of the serving cell.

Note:

1. It may include information of several neighbor cells (or even no neighbor cell information). If no neighbor cell is found, all the fields of the neighbor cell will be empty.
2. "ffff" in the fields of <*LAC(i)*> and <*Cell ID(i)*> means the device does not know the value.
3. This message cannot be sent via SMS.

➢ **+RESP:GTGSS,**

Example: **+RESP:GTGSS,5A0200,865585040006649,,0,,11,,0,1.9,259,72.5,117.129370,31.839402,20190525045506,0460,0000,550B,B969,00,20190525045807,3173$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
GNSS Signal Status	1	0|1	
Satellite Number	2	0 - 24	
Motion Status	2	11|12|21|22|41|42|16|1A	
Reserved	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	

Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*GNSS Signal Status*>: 0 means "GNSS signal lost or no successful GNSS fix", and 1 means "GNSS signal recovered and successful GNSS fix".
- <*Satellite Number*>: The number of the satellites in use when fix is successful. If fix fails, the parameter field is empty.
- <*Motion Status*>: The current motion status of the device.
  - 16 (Tow): The device attached vehicle is ignition off and it is towed.
  - 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
  - 12 (Ignition Off Motion): The device attached vehicle is ignition off and it is moving before it is considered to be towed.
  - 21 (Ignition on Rest): The device attached vehicle is ignition on and it is motionless.
  - 22 (Ignition on Motion): The device attached vehicle is ignition on and it is moving.
  - 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
  - 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

➢ **+RESP:GTDOS**

Example: **+RESP:GTDOS,5A0200,865585040006649,,1,1,0,66.2,269,26.8,117.101743,31.832103,20190524022146,0460,0000,550B,A81E,00,20190524022146,2C62$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ',	

		'_'	
Wave1 Output ID	1	1|5 - 6	
Wave1 Output Active	1	0|1	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Wave1 Output ID*>: The ID of the Wave Shape 1 output.
- <*Wave1 Output Active*>: The status of the Wave Shape 1 output.

If the GSM roaming state of the device changes, the **+RESP:GTRMD** message will report the current roaming state. The message is defined as an event message.

➢ **+RESP:GTRMD,**

Example: **+RESP:GTRMD,5A0200,865585040006649,,2,0,0.0,180,106.4,,,20190525081521,,,,,,20190525161523,3532$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	

Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Roaming State	1	0 - 3	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

- 0: Home
- 1: Known Roaming
- 2: Unknown Roaming
- 3: Blocking Report

➢ **+RESP:GTUPC,**

Example:
+RESP:GTUPC,5A0200,865585040006649,,0,100,http://www.queclink.com/configure.ini,20190525081515,352D$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Command ID	<=3	0 - 999	

Result	3	100|101|102|103|200|201|202|300|301|302|304|305|306	
Download URL	<=100	(URL)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the result code is 301. It indicates wrong format of command ID when the result code is 302.
- <*Result*>: A numeral to indicate whether the configuration is updated successfully.
  - 100: The update command is starting.
  - 101: The update command is confirmed by the device.
  - 102: The update command is refused by the device.
  - 103: The update process is refused because the battery is low.
  - 200: The device starts to download the package.
  - 201: The device finishes downloading the package successfully.
  - 202: The device fails to download the package.
  - 300: The device starts to update the device configuration.
  - 301: The device finishes updating the device configuration successfully.
  - 302: The device fails to update the device configuration.
  - 303: Reserved.
  - 304: <*Command Mask*>, <*GEO ID Mask*>, <*Stocmd ID Mask*> or <*Group ID Mask*> check fails.
  - 305: The update process is interrupted by abnormal reboot.
  - 306: The update process is interrupted by MD5 verification error.
- <*Download URL*>: The complete URL to download the configuration. It includes the file name.

➢ **+RESP:GTEUC,**

Example: **+RESP:GTEUC,5A0200,865585040006649,,0,200,http://www.queclink.com/configure.ini,88888888,,,,,20190525162106,354A$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Command ID	<=3	0 - 999	
Result	3	100|101|102|103|200|201|202|300|301|302|304|305|306	
Download URL	<=100	(URL)	
Identifier Number	8	(HEX)	
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the result code is 301. It indicates wrong format of command ID when the result code is 302.
- <*Result*>: A numeral to indicate whether the configuration is updated successfully.
  - 100: The update command is starting.
  - 101: The update command is confirmed by the device.
  - 102: The update command is refused by the device.
  - 103: The update process is refused because the battery is low.
  - 200: The device starts to download the package.
  - 201: The device finishes downloading the package successfully.
  - 202: The device fails to download the package.
  - 300: The device starts to update the device configuration.
  - 301: The device finishes updating the device configuration successfully.
  - 302: The device fails to update the device configuration.
  - 303: Reserved
  - 304: <*Command Mask*>, <*GEO ID Mask*>, <*Stocmd ID Mask*> or <*Group ID Mask*> check fails.
  - 305: The update process is interrupted by abnormal reboot.
  - 306: The update process is interrupted by MD5 verification error.
- <*Download URL*>: The complete URL to download the configuration. It includes the file name.
- <*Identifier Number*>: Please refer to parameter <*Identifier Number*> in the command **AT+GTUPC**.

- **+RESP:GTBCS,**
- **+RESP:GTBDS,**

Example:
+RESP:GTBCS,5A0200,865585040006649,,,0,0.0,329,84.3,,,20190525094709,,,,,,1903,GV56RS_BT2,7805410018AF,0,,8ABC18052F59,,,,,20190525174710,36C8$
+RESP:GTBDS,5A0200,865585040006649,,,0,0.0,329,84.3,,,20190525094714,,,,,,1903,GV56RS_BT2,7805410018AF,0,,8ABC18052F59,,,,,20190525174715,36C9$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	

Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Bluetooth Report Mask	4	0000 - FFFF	
Bluetooth Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Bluetooth MAC Address	12	000000000000 - FFFFFFFFFFFF	
Peer Role	1	0|1	
Reserved	0		
Peer MAC Address	12	000000000000 - FFFFFFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	

Tail Character	1	$	$

✧ <*Peer Role*>: The role type of the peripheral device.

- 0: Master
- 1: Slave

The event report message **+RESP:GTBAA** uses the format below.

Example: **+RESP:GTBAA,5A0200,865585040277182,gv56-ZHU2,FF,3,0,0,000A,78054101F4A3,2962,0,0.2,0,85.4,117.129380,31.839252,20200114082808,0460,0000,550B,B1E2,00,20200114082809,0014$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(HEX)	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Index	1	0 – 9|0xFF|0XFE	
Accessory Type	1	0 – 4|6|7|8|10|11|13|17	
Accessory Model / Beacon ID Model	1	0 – 5	
Alarm Type	1	0 – 4|7 – 10|12 – 13|15	
Append Mask	4	(HEX)	
Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC	12	'0' – '9', 'A' – 'F'	
Accessory Status	1	0|1	
Accessory Battery Level	<=4	0 – 5000(mV)	
Accessory Temperature	<=3	-40 – 80(℃)	
Enhanced Temperature	<=5	-40.00- 80.00(℃)	
Accessory Humidity	<=3	0 - 100%(rh)	
Accessory Mode	<=2	0 - 10	
Accessory Event	1	0 - 2	
Magnet ID	2	00-FF	
MAG Event Counter	<=5	0-32767	
Magnet state	1	0-1	

Accessory Battery Percentage	<=3	0 – 100%	
Relay Config Result	1	0 – 4	
Relay state	1	0 – 1	
GNSS Accuracy	1	0	
Speed	<=5	0.0 – 999.9(km/h)	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Index*>: The index of the Bluetooth accessory.
  - The index of the Bluetooth accessory defined in **AT+GTBAS** which triggers the **+RESP:GTBAA** message.

  For WKF300, it is 0xFF. For Beacon, it is 0xFE.
- <*Accessory Type*>: The type of the Bluetooth accessory which is defined in the <*Index*>.
  - 0: No Bluetooth accessory
  - 1: Escort sensor
  - 2: Beacon temperature sensor
  - 3: Bluetooth beacon accessory
  - 6: Beacon Multi-Functional sensor
  - 11: Magnet sensor
  - 13: Relay sensor
- <*Accessory Model / Beacon ID Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBAS** or the model of the Bluetooth beacon accessory which is defined in

AT+GTBID.

- <*Alarm Type*>: The type of the alarm which is generated by the Bluetooth accessory specified by <*Accessory Type*> and <*Accessory Model*> in the **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: Pushbutton event for WKF300 is detected.
  - 7: Humidity alarm: The current humidity value is below <*Low Humidity*> set in the **AT+GTBAS** command.
  - 8: Humidity alarm: The current humidity value is above <*High Humidity*> set in the **AT+GTBAS** command.
  - 9: Humidity alarm: The current temperature value is within the range defined by <*Low Humidity*> and <*High Humidity*>, which are set in the **AT+GTBAS** command.
  - 10: Angle event notification.
  - 12: Magnet event notification.
  - 13: Beacon event notification.
  - 15: Relay event notification.
- <*Append Mask*>: Bitwise mask defined in the **AT+GTBAS** or **AT+GTBID** command to indicate the reported Bluetooth accessory data fields.
  - Bit 0: <*Accessory Name*>
  - Bit 1: <*Accessory MAC*>
  - Bit 2: <*Accessory Status*>
  - Bit 3: <*Accessory Battery Level*>
  - Bit 4: <*Accessory Temperature*>
  - Bit 5: <*Accessory Humidity*>
  - Bit 8: <*Accessory Event Notification Data*>
  - Bit 12: <*MAG Notification Data*>
  - Bit 13: <*Accessory Battery Percentage*>
  - Bit 14: <*Relay Data*>
- <*Accessory Name*>: The name of the Bluetooth accessory.
- <*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 Battery Level*>: The battery voltage of the Bluetooth accessory.
- <*Accessory Temperature*>: Temperature data for the Bluetooth accessory.
- <*Enhanced Temperature*>: High-precision temperature data of Bluetooth accessories.
- <*Accessory Humidity*>: Humidity data for the Bluetooth accessory.
- < *Accessory Mode*>: The operating mode of angle sensor.
- < *Accessory Event*>: The event is generated by the angle sensor.

- <*Magnet ID*>: ID corresponding to different magnet sensors.
- <*MAG Event Counter*>: The total number of times detected by the magnet sensor.
- <*Magnet state*>: The state of the two parts of the magnet sensor.
  - 0: Separate
  - 1: Closed
- <*Accessory Battery Percentage*>: Percentage of Bluetooth accessory's battery power.
- <*Relay State*>: The current state of the WRL300 sensor.
- <*Relay Config Result*>: The number representing the response result of the relay, which is controlled and reported by Bit14 of the **AT+GTBAS** parameter <*Accessory Append Mask*>.
  - 0: Configuration updated successfully.
  - 1: Error in connecting.
  - 2: The current password is incorrect.
  - 3: Password update error.
  - 4: Relay open or close error.

The event report message **+RESP:GTBID** uses the format below.

Example: **+RESP:GTBID,5A0200,865585040015590,gv56,1,0,000A,78054101F4B3,3044,0,0.0,170,21.4,117.129277,31.839272,20200121023327,0460,0000,550B,B96A,00,20200121103328,11CD$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Number	1	0 - 3|0 - 15	
Beacon ID Model	1	0-2	
Append Mask	4	(HEX)	
Accessory MAC	12	(HEX)	
Accessory Battery Level	<=4	0 – 5000(mV)	
Accessory Signal Strength	1	-120 - 0	
Beacon type	1	0-2	
Beacon Data	<=100		
GNSS Accuracy	1	0	
Speed	<=5	0.0 – 999.9(km/h)	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)XXXXX.X(m)	
Longitude	<=11	-180 - 180	

Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used(optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Number*>: The number of the Bluetooth beacon accessories**.**
  - WKF300. The maximum value is 3.
  - iBeacon E6. The maximum value is 15.
  - IDELA. The maximum value is 15.
- <*Beacon ID Model*>: The model of the Bluetooth beacon acc**e***ssory which is d*efined in **AT+GTBID.**
- <*Append Mask*>: Bitwise mask defined in the **AT+GTBID comm**and to indicate the reported Bluetooth beacon accessory data fields.
  - Bit 0: Reserved
  - Bit 1: <*Accessory MAC*>
  - Bit 2: Reserved
  - Bit 3: <*Accessory Battery Level*>
  - Bit 4: Reserved
  - Bit 5: Reserved
  - Bit 6: <*Signal Strength*>
  - Bit 7: <*Beacon Type*> and <*Beacon Data*>
- <*Accessory MAC*>: The MAC address of the Bluetooth beacon accessory.
- <*Accessory Battery Level*>: The battery voltage of the Bluetooth beacon accessory.
- <*Accessory Signal Strength*>: The signal strength of the Bluetooth beacon accessory.
- <*Beacon type*>: Types of beacons.
  - 0: “ID” Format
  - 1: “iBeacon” Format
  - 2: “Eddystone” Format
- <*Beacon Data*>: Select the data format according to <*Beacon Type*>:
  - If <*Beacon Type*> is 0, the data format is as follows:

ID_Mfr_Data	6	(HEX)	

- If <*Beacon Type*> is 1, the data format is as follows:

UUID	16	(HEX)	
Major	2	(HEX)	
Minor	2	(HEX)	

- If <*Beacon Type*> is 2, the data format is as follows:

NID	10	(HEX)	
BID	6	(HEX)	

- **+RESP:GTCLT,**

Example:
+RESP:GTCLT,5A0508,865585040277810,,1,42,0,0,,,207FFFFF,,2,H1958920,0.94,751,0,92,,P26.00,,0,0.33,0.23,0.10,0.20,,,0042,,00,,,00FFFFFF,,,,,,,,349,1418,,0.23,,,53,,,,,,0000,0,0,0,,,0,0.4,0,139.6,117.130150,31.838642,20200519070812,0460,0000,550B,B1E2,00,20200519071829,1921$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Group ID	<=2	0 - 19	
Alarm Mask 1	<=8	(HEX)	
Alarm Mask 2	<=8	(HEX)	
Alarm Mask 3	<=8	(HEX)	
Reserved	0		
Reserved	0		
CANBUS Data Mask	<=8	(HEX)	
VIN	17	'0' – '9', 'A' - 'Z'(except 'I', 'O', 'Q')	
Ignition Key	1	0|1|2	
Total Distance	<=12	H(0 - 21474836)|I(0 - 21474836)	
Total Fuel Used	<=9	0.00 - 999999.99(l)	
Engine RPM	<=5	0 - 16383(rpm)	

Vehicle Speed	<=3	0 – 6553(Km/h)	
Engine Coolant Temperature	<=4	-40 - +215(℃)	
Fuel Consumption	<=10	H (0.0 – 16777216.0)| M(0.0 – 16777216.0)	
Fuel Level	<=7	L(0.00 - 9999.99)|P(0.00 - 100.00)	
Range	<=8	0 - 99999999	
Accelerator Pedal Pressure	<=3	0 - 100(%)	
Total Engine Hours	<=13	0.00 - 4211081215.00(h)	
Total Driving Time	<=13	0.00 - 4211081215.00(h)	
Total Engine Idle Time	<=13	0 .00 - 4211081215.00(h)	
Total Idle Fuel Used	<=13	0.00 - 4294967.00(l)	
Axle Weight 2nd	<=5	0 - 65535(kg)	
Tachograph Information	4	(HEX)	
Detailed Information / Indicators	<=8	(HEX)	
Lights	2	(HEX)	
Doors	2	(HEX)	
Total Vehicle Overspeed Time	<=13	0.00 - 4211081215.00(h)	
Total Vehicle Engine Overspeed Time	<=13	0.00 - 4211081215.00(h)	
CAN Report Expansion Mask	8	(HEX)	
Ad-Blue Level	<=3	0 - 100(L)	
Axle Weight 1st	<=5	0 - 65535(kg)	
Axle Weight 3rd	<=5	0 - 65535(kg)	
Axle Weight 4th	<=5	0 - 65535(kg)	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle	1	0|1	

Motion Signal			
Tachograph Driving Direction	1	0|1	
Analog Input Value	<=5	0 – 99999(mv)	
Engine Braking Factor	<=6	0 - 999999	
Pedal Braking Factor	<=6	0 - 999999	
Total Accelerator Kick-downs	<=6	0 - 999999	
Total Effective Engine Speed Time	<=13	0.00 - 4211081215.00(h)	
Total Cruise Control Time	<=13	0.00 - 4211081215.00(h)	
Total Accelerator Kick-down Time	<=13	0.00 - 4211081215.00(h)	
Total Brake Applications	<=6	0 - 999999	
Tachograph Driver 1 Card Number	<=40	0 - 9999999999	
Tachograph Driver 2 Card Number	<=40	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	<=40	0 - 9999999999	
Expansion Information	4	(HEX)	
Rapid Brakings	<=8	0 – 16711679	
Rapid Accelerations	<=8	0 – 16711679	
Engine Torque	<=3	0 - 100(%)	
Reserved	0		
Reserved	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	

Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- ✧ <*Alarm Mask 1*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Detailed Information / Indicators*> of the **+RESP:GTCAN** message.
- ✧ <*Alarm Mask 2*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Lights*> and <*Doors*> of the **+RESP:GTCAN** message.
- ✧ <*Alarm Mask 3*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Engine RPM*> of the **+RESP:GTCAN** message.

The device reports the data that is controlled by <*Accessory Type*> and <*Accessory Model*> in **AT+GTBAS** from peripheral Bluetooth devices to it via the **+RESP:GTBAR** message.

➢ **+RESP:GTBAR,**

Example:
+RESP:GTBAR,5A0502,135790246811220,,8,7,3,0007,,01014732B2E0,1,03,35F7,30114300000000C05C1640B3602020202020202,0,0.0,170,52.1,117.129015,31.839183,20200729040100,0460,0000,550B,B96A,00,20200729120101,855F$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Index	1	0 - 9	
Accessory Type	1	7	
Accessory Model	1	0 - 4	

Accessory Append Mask	<=4	(HEX)	
Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC	12	(HEX)	
Accessory Status	1	0 - 1	
Accessory Battery Level	<=4	0 – 5000(mV)	
Accessory Temperature	<=3	-40 - 80(℃)	
(Accessory Data)	<=1300		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

- 7: Technoton accessory.

✧ <*Accessory Data*>: There are accessory data para according <*Accessory Type*> and <*Accessory Model*>:

➢ If the <*Accessory Type*> is 7 and <*Accessory Model*> is 0 (DUT-E S7), <*Accessory Model*> is 3 (GNOM DDE S7) or <*Accessory Model*> is 4(GNOM DP S7):

Version	2	(HEX)	

PGN	4	(HEX)	
PGN Data	<= 42	(HEX)	

- If the <*Accessory Type*> is 7 and <*Accessory Model*> is 1 (DFM 100 S7):

Version	2	(HEX)	
PGN1	4	(HEX)	
PGN Data1	<= 42	(HEX)	
PGN2	4	(HEX)	
PGN Data2	<= 42	(HEX)	
PGN3	4	(HEX)	
PGN Data3	<= 42	(HEX)	

- If the <*Accessory Type*> is 7 and <*Accessory Model*> is 2 (DFM 250D S7):

Version	2	(HEX)	
PGN1	4	(HEX)	
PGN Data1	<= 42	(HEX)	
PGN2	4	(HEX)	
PGN Data2	<= 42	(HEX)	
PGN3	4	(HEX)	
PGN Data3	<= 42	(HEX)	
PGN4	4	(HEX)	
PGN Data4	<= 42	(HEX)	

- <*Version*>: It indicates the version of accessory software.
- <*PGNx*>: It means parameter group number.
- <*PGN Datax*>: Different PGN, PGN Data have different data frame formats. It is need to parse according to the TECHNOTON S7 BUS Protocol

Note: If the total number of characters in a single message is too long, **+RESP:GTBAR** will be divided into multiple messages.

CAN 100 FOTA Upgrade Report

The device will send the message **+RESP:GTCFU** to the backend server during the upgrade process.

- **+RESP:GTCFU,**

Example:

+RESP:GTCFU,5A0200,862170011507322,,200,,20140723021417,0014$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Code	3		
New Version (Optional)	<=10	'0'-'9', 'a'-'z'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Code*>: Information code.

- 100/110: Upgrade confirmed to be OK. Start upgrade.
- 101/111: Bluetooth connection is abnormal. Stop upgrade.
- 102/112: Low power or the format of URL is not http. Stop upgrade.
- 103/113: Other upgrade commands are being executed. Stop upgrade.
- 104/114: CAN Chipset response is abnormal.
- 200/210: Start to download package.
- 201/211: Package download succeeds.
- 202/212: Package download fails.
- 300/310: Start upgrade.
- 301/311: Upgrade succeeds
- 302/312: Upgrade fails.
- 303: Invalid upgrade file.

New Version	<=10	'0'-'9', 'a'-'z'	

✧ <*New Version*>: The version of the new firmware in the CAN 100.

Note: The codes listed before "/" as described above in <*Code*> including 100, 101, 102, 103, 104, 200, 201, 202, 300, 301 and 302 indicate the firmware update information, while the codes listed after "/" such as 110, 111, 112, 113, 114, 210, 211, 212, 310, 311 and 312 indicate the configuration update information.

➢ **+RESP:GTFLA,**

Example: **+RESP:GTFLA,5A0400,135790246811220,gv56,,2,92,0,4.3,92,70.0,121.354335,31.222073,20090214013254,6,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Input ID	1	1	
Last Fuel Level	<=3	0 – 100	
Current Fuel Level	<=3	0 – 100	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	-180 – 180	
Latitude	<=10	-90 – 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Input ID*>: The ID of the input to which the fuel sensor is connected.
- ✧ <*Last Fuel Level*>: The fuel level saved before the fuel loss alarm event occurs.
- ✧ <*Current Fuel Level*>: The current fuel level when the fuel loss alarm event occurs.

3.3.5.Buffer Report

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

- ✧ GSM network is not available.
- ✧ GPRS context activation for the TCP or UDP connection fails.

✧ TCP connection establishment with the backend server fails.

The buffered messages will be sent to the backend server when the connection to the server recovers. The buffered reports are saved to the built-in non-volatile memory in case the device is reset. The device can buffer up to 10,000 messages. The total number of buffered MSI and SRI messages should not exceed 10,000.

Detailed information about buffer report is listed below.

✧ Only **+RESP** messages excluding **+RESP:GTPDP**, **+RESP:GTALS**, **+RESP:GTALC** and **+RESP:GTALM** are buffered.

✧ In the buffer report, the original header string "**+RESP**" is replaced by "**+BUFF**" while the other content including the original sending time and count number is kept unchanged.

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

✧ The buffered messages will be sent after real time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 1.

✧ The buffered messages will be sent before real time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 2. The SOS message has the highest priority and is sent before the buffered messages.

Example:

The following is an example of the buffered message:

+BUFF:GTFRI,5A0103,868034001000579,gv56,0,10,1,1,0.4,60,56.6,117.201309,31.833082,20130107182151,0460,0000,5678,2079,00,21188.6,,,,100,210100,,,,20130107182154,01B8$

3.3.6.Report with Google Maps Hyperlink

If <*Location by Call*> in the command **AT+GTCFG** is set to 2 or 3, the device will send its current location to the phone number of the incoming call via SMS with Google Maps hyperlink.

➢ **Google Maps Hyperlink**

Example: gv56: **<http://maps.google.com/maps?q=31.222073,121.354335** **F1 D2009/01/01T00:00:00 I1 S99>**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Google Maps Hyperlink Header	30	http://maps.google.com/maps?q=	http://maps.google.com/maps?q=
Latitude	<=10	-90 - 90	
Longitude	<=11	-180 - 180	

GNSS Fix	<=3	F0|F1 – F50	
GNSS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Ignition State	<=2	I0-I1	
Speed	<=6	V0.0-V999.9km/h	

- ✧ <*GNSS Fix*>: The accuracy of the location information. F0 means no GNSS fix.
- ✧ <*Ignition Status*>: The ignition status of the device.
  - 0: Ignition off.
  - 1: Ignition on.

3.3.7.Crash Data Packet

The message contains 15s tri-axial acceleration data before and after crash at most. When crash accident is detected, tri-axial acceleration data before crash will be reported to backend server in several frames. And the device will continue to record tri-axial data after crash and report the data to backend server in several frames.

- ➢ **+RESP:GTCRD,**

Example:

+RESP:GTCRD,5A0200,865585040006649,,00,02,1,1,004EFFE6FFF0004DFFE7FFF2004DFFE6FFF1004DFFE6FFF1004EFFE6FFF0004DFFE7FFEE004FFFE5FFF5004EFFE7FFF3004DFFE7FFF1004DFFE7FFF2004DFFE8FFF4004DFFE8FFF3004DFFE7FFF2004EFFE8FFF2004CFFE6FFF4004FFFE6FFF5004CFFE8FFF3004CFFE7FFF4004DFFE9FFF7004CFFE9FFF5004DFFE9FFF10049FFE6FFF4004FFFEAFFF9004BFFEAFFF2004BFFE9FFF2004BFFE9FFF3004CFFE9FFF2004AFFE9FFEB004CFFE8FFF3004CFFE7FFF7004CFFE7FFF1004AFFE8FFF1004CFFE9FFF4004CFFE9FFF2004CFFE8FFF2004CFFE8FFF0004CFFE8FFEE004AFFE6FFEF004CFFE7FFED004BFFE8FFEB004CFFE8FFEE004EFFE8FFEF004FFFE7FFEF0050FFE8FFEF0051FFE7FFEF0050FFE8FFEF004FFFE8FFEA0051FFE8FFF0004EFFE7FFED004FFFE8FFEE004EFFE9FFED004EFFE8FFEE004FFFE7FFEE004FFFE7FFEE004EFFE7FFEE004EFFE7FFEE004FFFE7FFEE004FFFE7FFEE004FFFE7FFEE0050FFE6FFEF004FFFE6FFEF004FFFE6FFEF004FFFE7FFEE004FFFE7FFEE0050FFE7FFEF0050FFE6FFF00050FFE6FFF00050FFE6FFF00050FFE7FFEF004FFFE7FFF0004EFFE7FFF0004EFFE7FFF0004FFFE6FFEF004FFFE5FFF0004FFFE7FFF0004FFFE7FFF0004FFFE6FFF1004FFFE5FFF0004EFFE6FFEF004EFFE5FFEE004EFFE6FFED004EFFE6FFEF004EFFE6FFEF004EFFE7FFF0004EFFE6FFEF004DFFE6FFEF004BFFE6FFF80055FFE4FFE9004AFFE7FFEF004DFFEAFFEE004EFFE8FFF0004FFFE7FFF10050FFE6FFF3004FFFE6FFF2004EFFE6FFF2004EFFE7FFF30050FFE7FFF50054FFE5FFF70087FFD2000A0369FF710080,20190525053006,3218$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ',	

		'_'	
Crash Counter	2	(HEX)	
Data Type	2	00 - 7F	
Total Frame	<=2	1 - 15	
Frame Number	<=2	1 - 15	
Data	<=1200	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Crash Counter*>: A parameter to indicate the crash sequence. It combines the report **+RESP:GTCRA** and **+RESP:GTCRD** into one crash event. It rolls from 0x00 to 0xFF.
- <*Data Type*>: A hexadecimal parameter to indicate the time of the data (before crash or after crash) and crash direction (+X, -X, +Y, -Y, +Z, -Z or several of them). Please refer to the following table for the detailed syntax.

Bits	**Description**	**Range**
Bit 0	0: befor crash 1: after crash	0-1
Bit 1	0: X-axis crash not detected 1: X-axis crash detected	0-1
Bit 2	0: X-axis positive direction 1: X-axis negative direction	0-1
Bit 3	0: Y-axis crash not detected 1: Y-axis crash detected	0-1
Bit 4	0: Y-axis positive direction 1: Y-axis negative direction	0-1
Bit 5	0: Z-axis crash not detected 1: Z-axis crash detected	0-1
Bit 6	0: Z-axis positive direction 1: Z-axis negative direction	0-1
Bit 7	Fixed value	0

- <*Total Frame*>: The total number of messages that are sent to the backend server for the crash event.
- <*Frame Number*>: A numeral to indicate the sequence of the current message.
- <*Data*>: There are up to 1200 ASCII characters (12 characters as a group) in one message which includes acceleration samples in 1 second at most. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters represent Z axis acceleration data. The ASCII "0001" is equal to 0x0001 in hex format, and the ASCII "afff" is equal to 0xAFFF in hex format. And they are two's complement. Regarding how to convert the two's complement to the original value, please refer to the Appendix A.

Example:

+RESP:GTCRD,5A0103,359231038715676,,0,3,1,000100010055… ,20120330120443,005C$

This is the oldest XYZ-axis acceleration data:

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

Equal to decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;
+RESP:GTCRD,5A0103,359231038715676,,1,3,3,...fffffff10052,20120330115736,005A$
This is the last XYZ-axis acceleration data:
Conversion to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; Z = 0x0052;
Equal to decimal format: X (axis acceleration data) = -1; Y = -15; Z = 82;

Note: Acceleration of gravity (+g) is 82 in decimal format and –g is -82. The linearized acceleration data 1312 represents +16g and -1312 represents -16g.

3.3.8.Bluetooth Data Report

The device reports the data from peripheral Bluetooth devices connected to it via the **+RESP:GTBDR** message.

- **+RESP:GTBDR,**

Example: **+RESP:GTBDR,5A0200,865585040005401,,,0,0.0,194,131.8,,,20190525100413,,,,,,1903,GV56RS_BT2,780541001833,1,,7805410018AF,ida,0003,2,000034303000100080000080 5F9B34FB,2,000034313100100080000080 5F9B34FB,0,1234567890,,,,,,,,,20190525180414,46E0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Reserved	0		
GNSS Accuracy	<=2	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	

Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Bluetooth Report Mask	4	(HEX)	
Bluetooth Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Bluetooth MAC Address	12	(HEX)	
Peer Role	1	0|1	
Reserved	0		
Peer MAC Address	12	(HEX)	
Peer Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Data Mask	4	0000 - 0003	
Service UUID Type	1	1|2	
Service UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Characteristic UUID Type	1	1|2	
Characteristic UUID	4|32	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Data Format	1	0|1	
Data	<=245	‘0’-‘9’ ‘a’-‘f’ | ASCII	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Data*>: There are maximum 245 ASCII characters in one message which contains data from Bluetooth peer device Characteristic. If <*Data Format*> is 0, the <*Data*> field will be raw data from Bluetooth. If <*Data Format*> is 1, the <*Data*> value will be in Hexadecimal format. For example, if the data is 0x69, it will be shown as 69 in the **+RESP:GTBDR** message.

3.3.9.Transparent Data Transmission

The device supports transparent data transfer between the backend server and the peripheral device connected to its Bluetooth. It supports bi-directional data transmission. In both directions, the data is transparent to the device.

a) Data transfer from the peripheral device to the backend server
If the peripheral device supports the **AT+GTDAT** command, it can transfer data via this command. The peripheral device can send the command **AT+GTDAT** with the data to the Bluetooth. According to the <*Command Type*> of **AT+GTDAT**, the device wraps the corresponding data into the backend server with the **+RESP:GTDAT** message either in short format or in long format.

b) Data transfer from the backend server to the peripheral device
If the backend server needs to send data to the peripheral device, it can send the command **AT+GTDAT** with the data to the device and the device will pick out the raw data and send it to the Bluetooth. The peripheral device can thus get the data from the Bluetooth.

Data to the Backend Server

➢ **+RESP:GTDAT (Short Format),**

Example: **+RESP:GTDAT,5A0200,865585040006649,,123456,20190525175134,36E9$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Data to the Backend Server	<=245	(ASCII)	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTDAT (Long Format),**

Example: **+RESP:GTDAT,5A0200,865585040006649,,3,,,123456,0,0.0,186,75.7,,,20190525095138,,,,,,,,,20190525175139,36EB$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', '_'	
Report Type	1	1 - 4	
Reserved	0		
Reserved	0		
Data to the Backend Server	<=245	(ASCII)	
GNSS Accuracy	<=2	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Report Type*>: It indicates where the data comes from.

- 1: **AT+GTDAT** from main serial port
- 2: **AT+GTDAT** from Bluetooth
- 3: **AT+GTDAT** from over the air
- 4: **AT+GTDAT** triggered by events in **AT+GTUDF**

Data to the serial port or the Bluetooth starts with a new line and is terminated with '\r\n'.

Example:
data to the Bluetooth

3.3.10.CANBUS Device Information Report

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

➢ **+RESP:GTCAN,**

Example:
+RESP:GTCAN,250A04,863286020798295,gv300-gl8-test-sandy,0,1,E07FFFFF,,2,H410120,1714.50,685,2,87,,P83.60,,0,556.89,329.88,227.01,345.96,,,0010,,00,20.08,15.25,007FFFFF,,,,,,,,,280724,584579,62,304.92,0.48,0.04,36232,,,,,,0000,,,,,0,3.4,145,11.0,121.362735,31.206570,20160816023617,0460,0000,1823,2043,00,20160816103618,1316$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Report Type	1	0 - 2	
CANBUS Device State	1	0|1	

CANBUS Report Mask	<=8	(HEX)	
VIN	17	'0' - '9', 'A' - 'Z'(except 'I', 'O', 'Q')	
Ignition Key	1	0 - 2	
Total Distance	<=12	H(0 - 21474836)|I(0 - 21474836)	
Total Fuel Used	<=9	0.00 - 4294967.00(l)	
Engine RPM	<=5	0 - 16383(rpm)	
Vehicle Speed	<=3	0 - 6553(Km/h)	
Engine Coolant Temperature	<=4	-50 - +215(℃)	
Fuel Consumption	<=10	H (0.0 – 16777216.0)| M(0.0 – 16777216.0)	
Fuel Level	<=7	L(0.00 - 9999.99)|P(0.00 - 100.00)	
Range	<=8	0 - 99999999(hm)	
Accelerator Pedal Pressure	<=3	0 - 100(%)	
Total Engine Hours	<=13	0.00 - 4211081215.00(h)	
Total Driving Time	<=13	0.00 - 4211081215.00(h)	
Total Engine Idle Time	<=13	0.00 - 4211081215.00(h)	
Total Idle Fuel Used	<=9	0.0 - 4294967.00(l)	
Axle Weight 2nd	<=5	0 - 65535(kg)	
Tachograph Information	4	(HEX)	
Detailed Information / Indicators	4	(HEX)	
Lights	2	(HEX)	
Doors	2	(HEX)	
Total Vehicle Overspeed Time	<=13	0.00 - 4211081215.00(h)	
Total Vehicle Engine Overspeed Time	<=13	0.00 - 4211081215.00(h)	
CAN Report Expansion	8	(HEX)	

Mask			
Ad-Blue Level	<=3	0 - 100(%)	
Axle Weight 1st	<=5	0 - 65535(kg)	
Axle Weight 3rd	<=5	0 - 65535(kg)	
Axle Weight 4th	<=5	0 - 65535(kg)	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle Motion Signal	1	0|1	
Tachograph Driving Direction	1	0|1	
Analog Input Value	<=5	0 – 99999(mv)	
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 - 42211081215.00(h)	
Total Cruise Control Time	<=8	0.00 - 42211081215.00(h)	
Total Accelerator Kick-down Time	<=8	0.00 - 42211081215.00(h)	
Total Brake Applications	<=6	0 - 999999	
Tachograph Driver 1 Card Number	<=40	0 - 9999999999	
Tachograph Driver 2 Card Number	<=40	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	<=40	0 - 9999999999	
Expansion Information	4	(HEX)	
Rapid Brakings	<=8	0 - 16711679	

Rapid Accelerations	<=8	0 - 16711679	
Engine Torque	<=3	0 - 100(%)	
Service Distance	<=8	-160 635 – 327675km	
DTC Number	<=2	0 – 99	
DTC 1	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
…			
DTC N	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Electric Report Mask	<=8	0 – FFFFFFFF	
Battery Level	<=8	P(0.00 – 100.00)	
Battery Charging Current	<=3	0 – 125 A	
Battery Charging Remaining Time	<=5	0 – 65535 min	
Reserved	0		
Reserved	0		
GNSS Accuracy	<=2	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Position Append Mask	2|4	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	0-15	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Report Type*>: A numeral to indicate the report type.
  - 0: Periodical report
  - 1: Real time request report
  - 2: Ignition on/off report
- <*CANBUS Device State*>: A numeral 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 <*CAN Report Mask*> in **AT+GTCAN**.
- <*VIN*>: Vehicle identification number.
- <*Ignition Key*>: A numeral to indicate the ignition status.
  - 0: Ignition off.
  - 1: Ignition on.
  - 2: Engine on.
- <*Total Distance*>: Vehicle total distance. The number is always increasing. The unit is hectometer (H) or distance impulse (I) (if distance from dashboard is not available).
- <*Total Fuel Used*>: The number of liters of fuel used since vehicle manufacture or device installation. The unit is liter.
- <*Fuel Level*>: The level of fuel in vehicle tank. The unit is liter (L) or percentage (P).
- <*Range*>: The number of hectometers to drive on remaining fuel. The unit is hectometer.
- <*Vehicle Speed*>: The vehicle speed based on wheel. The unit is km/h.
- <*Engine RPM*>: The revolutions per minute. The unit is rpm.
- <*Accelerator Pedal Pressure*>: The unit is percentage.
- <*Engine Coolant Temperature*>: The unit is Celsius. Negative value is preceded by negative sign (-), e.g. “-2”. If 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 since vehicle manufacture or device installation. The unit is hour.
- <*Total Driving Time*>: Time of engine running (non-zero speed) since vehicle manufacture or device installation. The unit is hour.
- <*Total Engine Idle Time*>: Time of engine running during idling status (vehicle at rest) since vehicle manufacture or device installation. The unit is hour.
- <*Total Idle Fuel Used*>: The number of liters of fuel used since vehicle manufacture or device installation. The unit is liter.
- <*Axle Weight 2nd*>: Weight of vehicle’s second axle. The unit is kg.
- <*Tachograph Information*>: Two bytes. The high byte describes driver 2, while the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Validity mark (0 – valid driver data, 1 – no valid data)

R: Reserved

C: Driver card (1 – card inserted, 0 – no card inserted)

T2-T0: Driving time related states:

- 0: Normal / no limits reached.
- 1: 15min before 4½h.
- 2: 4½h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15minute 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*>: A hexadecimal number. 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*>: A hexadecimal number. Each bit contains information of one type of light.

- Bit 0: Running Lights (1 – on, 0 – off).
- Bit 1: Low Beam (1 – on, 0 – off).
- Bit 2: High Beam (1 – on, 0 – off).
- Bit 3: Front Fog Light (1 – on, 0 – off).
- Bit 4: Rear Fog Light (1 – on, 0 – off).
- Bit 5: Hazard Lights (1 – on, 0 – off).
- Bit 6: Reserved.
- Bit 7: Reserved.

✧ <*Doors*>: A hexadecimal number. Each bit contains information of one door.

- Bit 0: Driver Door (1 – opened, 0 – closed).
- Bit 1: Passenger Door (1 – opened, 0 – closed).

- Bit 2: Rear Left Door (1 – opened, 0 – closed)
- Bit 3: Rear Right Door (1 – opened, 0 – closed).
- Bit 4: Trunk (1 – opened, 0 – closed).
- Bit 5: Hood (1 – opened, 0 – closed).
- Bit 6: Reserved.
- Bit 7: Reserved.

✧ <*Total Vehicle Overspeed Time*>: The total time when the vehicle speed is greater than the limit defined in CAN100's configuration.

✧ <*Total Vehicle Engine Overspeed Time*>: The total time when the vehicle engine speed is greater than the limit defined in CAN100's configuration.

✧ <*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*>: Vehicle overspeed signal from the tachograph.

- 0: Overspeed is not detected.
- 1: Overspeed is detected.

✧ <*Tachograph Vehicle Motion Signal*>: The vehicle motion signal in the tachograph.

- 0: Motion is not detected
- 1: Motion is detected.

✧ <*Tachograph Driving Direction*>: Vehicle driving direction from the tachograph.

- 0: Driving forward.
- 1: Driving backward.

✧ <*Analog Input Value*>: The value of analog input. The unit is mV.

✧ <*Rapid Brakings*>: The count of rapid brakings of the vehicle.

✧ <*Engine Braking Factor*>: It measures how often driver brakes with brake pedal or with engine and stores both counts (always increasing). Decreasing speed with no pedal pressed causes an increase in engine braking factor.

✧ <*Pedal Braking Factor*>: It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes an increase in pedal braking factor.

✧ <*Total Accelerator Kick-downs*>: The count of accelerator pedal kick-downs (with the pedal pressed over 90%).

✧ <*Total Effective Engine Speed Time*>: Total time when the vehicle engine speed is effective. The unit is 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 hexadecimal number. Each bit contains information of one indicator.
  - Bit 0: W – webasto (1 – on, 0 – off or not available).
  - Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
  - Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
  - Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
  - Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
  - Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
  - Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
  - Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
  - Bit 8: Reserved.
  - Bit 9: CHK – "check engine" indicator (1 – on, 0 – off or not available)
  - Bit 10: AIR – airbag 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 Brakings*>: The number of total rapid brakings since installation (calculation based on CAN 100 settings of speed decrease time and value).
- <*Rapid Accelerations*>: The number of total rapid accelerations since installation (calculation based on CAN 100 settings of speed increase time and value).
- <*Engine Torque*>: The engine torque. Unit: percentage.
- <*DTC*>: Diagnostic trouble codes read from the vehicle. The protocol is OBD II/SAE J2012.

Each diagnostic trouble code is a 3-byte element in following format:

Byte m									Byte m+1								Byte m+2							
7	6	5	4	3	2	1	0		7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
C1		C2		C3					C4				C5				-	-	-	-	-	T	P	C

- C1 – first DTC character
  - b'00' – P – powertrain
  - b'01' – C – chassis
  - b'10' – B – body
  - b'11' – U – network
- C2 – second DTC character (digit 0 to 3)
- C3, C4, C5 – consecutive DTC characters (hexadecimal digits 0 to F)
- T – DTC status flag: permanent (stored into non-volatile memory)
- P – DTC status flag: pending (detected during current or last driving cycle)
- C – DTC status flag: confirmed (stored)

Each code may have one or multiple status flags set, for example:

0x02 0x2E 0x03 is a code P022E with status pending and confirmed.

0x61 0x99 0x02 is a code C2199 with status pending.

- <*Battery Level*>: The battery charge level for electric vehicles. The unit is percentage (P).
- <*Battery Charging Current*>: A numerical value is used to indicate the electric car's battery charging current. The unit is ampere.
- <*Battery Charging Remaining Time*>: A numerical value is used to show time remaining for

the battery of electric vehicle to be fully charged by connected charger.

3.4.Heartbeat

Heartbeat is used to maintain the connection between the device and the backend server in GPRS communication. The heartbeat package is sent to the backend server at the interval specified by <*Heartbeat Interval*> in the **AT+GTSRI** command.

➢ **+ACK:GTHBD,**

Example: **+ACK:GTHBD,5A0200,865585040005435,,20190521211228,28BA$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' ' '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

➢ **+SACK:GTHBD,**

Example: **+SACK:GTHBD,5A0200,11F0$** **+SACK:GTHBD,,11F0$**			
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 just send an empty field to decrease the length of the heartbeat data acknowledgement.

✧ <*Count Number*>: The backend server uses the <*Count Number*> extracted from the heartbeat package from the device as the <*Count Number*> in the server acknowledgement

of the heartbeat package.

3.5.Server Acknowledgement

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

➢ **+SACK:**

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

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

4.HEX Format Report Message

From this version, the @Track protocol starts to support report messages in HEX format. For all the commands, they are still using the ASCII format as described above. By default, the device uses ASCII format report messages. The backend server could use the **AT+GTQSS** or **AT+GTSRI** command to enable the HEX format report messages by setting the <*Protocol Format*> to 1.

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

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

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

At the end of each HEX report message, the device uses 0x0D and 0x0A to mark the end.

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

4.1.Hex Report Mask

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

➢ **AT+GTHRM=**

Example: **AT+GTHRM=gv56,,,7F,FE7FFF,FE7FFF,FF7F,FF,7F,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv56
Reserved	0		
Reserved	0		
+ACK Mask	2	00– FF	6F
+RSP Mask	8	00000000 – FFFFFFFF	FE7FBF
+EVT Mask	8	00000000 – FFFFFFFF	FE7FBF

+INF Mask	<=8	00000000 – FFFFFFFF	FF7D
+HBD Mask	2	00 – FF	EF
+CRD Mask	4	0000–FFFF	7D
+CAN Mask	8	00000000 – FFFFFFFF	7FF
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	<*RFID Length*>
Bit 26	Reserved
Bit 25	<*CAN Data*>
Bit 24	<*RFID*>
Bit 23	<*Total Hour Meter Count*>

Bit 22	*<Current Hour Meter Count>*
Bit 21	*<Total Mileage>*
Bit 20	*<Current Mileage>*
Bit 19	*<Satellite Information>*
Bit 18	*<Motion Status>*
Bit 17	*<Digital IO Status>*
Bit 16	Reserved
Bit 15	Reserved
Bit 14	*<Analog Input1 Voltage>*
Bit 13	*<Analog Input Mode>*
Bit 12	*<External Power Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<Unique ID>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<MCC / MNC / LAC / Cell ID / Reserved>*
Bit 2	*<Altitude>*
Bit 1	*<Azimuth>*
Bit 0	*<Speed>*

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

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	*<RFID Length>*

Bit 26	Reserved
Bit 25	*<CAN Data>*
Bit 24	*<RFID>*
Bit 23	*<Total Hour Meter Count>*
Bit 22	*<Current Hour Meter Count>*
Bit 21	*<Total Mileage>*
Bit 20	*<Current Mileage>*
Bit 19	*<Satellite Information>*
Bit 18	*<Motion Status>*
Bit 17	*<Digital IO Status>*
Bit 16	Reserved
Bit 15	Reserved
Bit 14	*<Analog Input1 Voltage>*
Bit 13	*<Analog Input Mode>*
Bit 12	*<External Power Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<Unique ID>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<MCC / MNC / LAC / Cell ID / Reserved>*
Bit 2	*<Altitude>*
Bit 1	*<Azimuth>*
Bit 0	*<Speed>*

✧ *<+INF Mask>*: Component mask of the information report message. Bit 8 - Bit 15 indicate which groups of information items are included when the device reports the message **+RESP:GTINF**.

Mask Bit	**Item**

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

✧ *<INF Expansion Mask>*: Component mask of the information report message. Bit 0 - Bit 15 indicate which groups of information items are included when the device reports the message **+RESP:GTINF**.

Mask Bit	Item
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	**+RESP:GTSCS**
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	**+RESP:GTCML**
Bit 5	Reserved

Bit 4	Reserved
Bit 3	**+RESP:GTCSN**
Bit 2	**+RESP:GTCVN**
Bit 1	Reserved
Bit 0	Reserved

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

Mask Bit	Item
Bit 7	<*UID*>
Bit 6	<*Count Number*>
Bit 5	<*Send Time*>
Bit 4	<*Unique ID*>
Bit 3	<*Firmware Version*>
Bit 2	<*Protocol Version*>
Bit 1	<*Device Type*>
Bit 0	<*Length*>

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

Mask Bit	Item
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	<*Count Number*>
Bit 5	<*Send Time*>
Bit 4	<*Firmware Version*>

Bit 3	*<Protocol Version>*
Bit 2	*<Device Type>*
Bit 1	*<Unique ID>*
Bit 0	*<Length>*

✧ *<+CAN Mask>*: Component mask of the CANBUS Information packet in HEX format.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Reserved
Bit 20	Reserved
Bit 19	Reserved
Bit 18	Reserved
Bit 17	Reserved
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*

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

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

- **+ACK:GTHRM,**

Example: **+ACK:GTHRM,5A0200,865585040006276,,0086,20190524162009,0087$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', ' - ', ' '	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

4.2.Acknowledgement +ACK

- **+ACK,**

Example: **2B41434B016F245A020002095637550400064009 00FFFF07E30519113B2D371676FD0D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+ACK	+ACK
Message Type	1		
Report Mask	1	00 – FF	
Length	1		

Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
ID	1		
Serial Number	2	0000 – FFFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Message Type*>: It indicates the ID of the command that the device receives.

Command	ID
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
Reserved	3
AT+GTCFG	4
AT+GTTOW	5
AT+GTEPS	6
AT+GTDIS	7
AT+GTOUT	8
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14
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
AT+GTJDC	27
AT+GTIDL	28
AT+GTHBM	29
AT+GTHMC	30
Reserved	31
AT+GTURT	32
Reserved	33
AT+GTWLT	34
AT+GTHRM	35
AT+GTFFC	36
Reserved	37
AT+GTSSR	38
Reserved	39
Reserved	40
Reserved	41
Reserved	42
AT+GTIDA	43
AT+GTACD	44
AT+GTPDS	45
AT+GTCRA	46
AT+GTBZA	47

AT+GTSPA	48
Reserved	49
Reserved	50
AT+GTTMP	51
AT+GTFSC	52
AT+GTRMD	53
AT+GTPEO	54
Reserved	55
Reserved	56
AT+GTCAN	57
Reserved	58
Reserved	59
Reserved	60
AT+GTCMD	61
AT+GTUDF	62
Reserved	63
Reserved	64
AT+GTGAM	65
Reserved	66
Reserved	67
AT+GTOEX	68
AT+GTIEX	69
AT+GTUPC	70
AT+GTCLT	71
Reserved	72
Reserved	73
AT+GTCFU	74
Reserved	75
Reserved	76
Reserved	77

AT+GTVVS	78
AT+GTAVS	79
AT+GTASC	80
AT+GTFVR	81
Reserved	82
AT+GTBVS	83
AT+GTBTS	84
AT+GTBMS	85
Reserved	86
Reserved	87
Reserved	88
Reserved	89
Reserved	90
Reserved	91
Reserved	92
Reserved	93
Reserved	94
Reserved	95
Reserved	96
Reserved	97
Reserved	98
Reserved	99
AT+GTRCS	100
Reserved	101
AT+GTVMS	102
AT+GTBAS	103
Reserved	104
Reserved	105
Reserved	106
Reserved	107

Reserved	108
AT+GTBID	109
Reserved	…
AT+GTAEX	116
AT+GTOWL	117
Reserved	…
AT+GTMSI	136
Reserved	…
AT+GTHUM	143

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

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

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

Device Name	**g**	**v**	**5**	**5**				
HEX	**67**	**76**	**35**	**35**	**00**	**00**	**00**	**00**

- <*ID*>: The sub-command ID of **AT+GTRTO** or the ID of **AT+GTIOB** or **AT+GTGEO**. For others, set it to 0.
- <*Send Time*>: The local time to send the acknowledgement message. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

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

- <*Checksum*>: The CRC16 checksum of data between the fields of <*Message Header*> and <*Checksum*> (exclude <*Message Header*> and <*Checksum*>).

4.3.Location Report +RSP

Location report messages including **+RESP:GTTOW**, **+RESP:GTEPS**, **+RESP:GTAIS, +RESP:GTDIS**,

+RESP:GTIOB, **+RESP:GTFRI**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTDOG**, **+RESP:GTIGL**, **+RESP:GTVGL**, **+RESP:GTGES**, **+RESP:GTGIN**, **+RESP:GTGOT**, and **+RESP:GTHBM** use the format below.

➢ **+RSP,**

Example: **2B5253500700FE3FFF00615A020002096776353652532D4264300A000001002109100102000000100084054C5638054C563807E30519083400000000000000000000000000000007F05000F3700000006271F07E30519103401455ED3CB0D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 ~ 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Report ID / Report Type	1		
Number	1	1	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	

Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

Message	**ID**
+RESP:GTRTL (PNL)	Reserved
+RESP:GTTOW	1
Reserved	2
+RESP:GTLBC	3
+RESP:GTEPS	4
+RESP:GTDIS	5

+RESP:GTIOB	6
+RESP:GTFRI	7
+RESP:GTGEO	8
+RESP:GTSPD	9
+RESP:GTSOS	10
+RESP:GTRTL	11
+RESP:GTDOG	12
Reserved	13
+RESP:GTAIS	14
+RESP:GTHBM	15
+RESP:GTIGL	16
+RESP:GTIDA	17
+RESP:GTERI	18
Reserved	19
+RESP:GTGIN	20
+RESP:GTGOT	21
Reserved	22
Reserved	23
Reserved	24
Reserved	25
+RESP:GTVGL	26

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

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

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

Device Name	**g**	**v**	**5**	**5**				

HEX	**67**	**76**	**35**	**35**	**00**	**00**	**00**	**00**

- <*Analog Input Mode*>: The mode of analog input ports. The high byte is reserved, and the low 4 bits of the low byte are for analog input 1.
- <*Digital Input Status*>: The status mask for ignition detection input and digital input 1-2.

Input Status Mask	**ID**
Ignition Detection	0x01
Digital Input 1	0x02
Digital Input 2	0x04
Reserved	

- <*Digital Output Status*>: The status mask for digital output 1.

Output Status Mask	**ID**
Digital Output 1	0x01
Reserved	
Reserved	
Reserved	

- <*Motion Status*>: The current motion status of the device.
- <*Satellites in Use*>: Number of satellites being used for tracking, the high nibble is reserved and the low nibble is valid.
- <*Report ID / Report Type*>: The high nibble is for <*Report ID*> and the low nibble is for <*Report Type*>.
- <*Speed*>: 3 bytes in total. The first two bytes are for the integer part of the speed and the last byte is for the fractional part. The fractional part has 1 digit.
- <*Longitude*>: The longitude of the current position. 4 bytes in total. The longitude is converted to an integer with 6 implicit decimals and the 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. 4 bytes in total. The latitude is converted to an integer with 6 implicit decimals and the integer is reported in HEX format. If the value of the latitude is a negative, it is represented in 2's complement format.

Latitude 31.164503	**31164503**			
HEX	**01**	**DB**	**88**	**57**

- <*Altitude*>: The altitude from GNSS. If the altitude is negative, it is represented in 2's complement format. Unit: meter.
- <*GNSS UTC Time*>: UTC time obtained from the GNSS chip. 7 bytes in total. The first two bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

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

✧ <*Current Mileage*>: 3 bytes in total. The first two bytes are for the integer part of the current mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Current Mileage	0		0
HEX	00	00	00

✧ <*Total Mileage*>: 5 bytes in total. The first four bytes are for the integer part of the total mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Total Mileage	0				0
HEX	00	00	00	00	00

✧ <*Total Hour Meter Count*>: 6 bytes in total. The first four bytes represent the hour part, the fifth byte represents the minute part, and the sixth byte represents the second part.

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

✧ <*CAN Data*>: Please refer to the **+RESP:GTCAN** report in hex format. <*CAN Data*> includes fields from <*CANBUS Device State*> to <*Engine Torque*>. This field can be analyzed as per the **+RESP:GTCAN** report.

The location report message **+RESP:GTFRI** uses the format below.

➢ **+RSP,**

Example:
2B 52 53 50 07 00 FE 3F BF 00 61 5A 04 00 05 0C 56 37 55 04 00 02 0B 09 5E 30 02 00 00 03 00 42 08 10 01 01 00 00 05 00 CA 00 10 06 FB 3F A7 01 E5 D4 8F 07 E3 05 1C 05 39 16 04 60 00 00 55 0B B9 69 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 05 1C 05 39 17 00 D8 B6 5D 0D 0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1	0x18	0x18
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 ~ 100	
External Power Voltage	2		

Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Report ID / Report Type	1		
Number	1	1 – 15	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	

CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*Position Append Mask*>: A bitwise numeral to control whether to include the corresponding fields in each position after <*Cell ID*>.
- ✧ <*Satellites Used*>: If bit 0 of <*Position Append Mask*> in **AT+GTCFG** is enabled, this part will be showed and it includes the number of satellites used for the current position.

The location report message **+RESP:GTLBC** uses the format below.

Example:
2B5253500300FE7FFF006A5A020002096776353652532D42642FEF0000000002004208007018297918248F01010000040000005F06FB3FFD01E5D3E707E30519050D2F04600000550BB969000000000000007F03000000000000050A3107E30519050D3040F97B3D0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 ~ 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42	

		0x16 | 0x1A	
Satellites in Use	1		
Report ID / Report Type	1		
Number Length / Number Type	1		
Phone Number	<=10		
Number	1	1	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	

Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Number Length / Number Type*>: The high nibble is for <*Number Length*> and the low nibble is for <*Number Type*>. <*Number Length*> is the total number of bytes which is equal to the length of the <*Phone Number*> in bytes plus the length of the parameter <*Number Length / Number Type*>. <*Number Type*> indicates if there is a '+' sign before the phone number. 1 means "with the sign", and 0 means "without the sign".

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

✧ <*Phone Number*>: Not more than 10 bytes. In each byte, the high nibble and low nibble are used to represent one digit of the phone number respectively. If there is no digit for the last low nibble to represent, fill in 0xF.

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

The location report message **+RESP:GTSOS** uses the format below.

Example:
2B5253500A00FE7FFF00645A020002096776353652532D4264301900000000200410C1000010100000000B7008E06FB410501E5D3E207E30519081D1A04600000550BB9690000000000000007F05000000000000006172407E30519101D1B44DEDC3C0D0A

Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 ~ 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	

Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Report ID / Report Type	1		
Reserved	1	00	00
Number	1	1	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The location report message **+RESP:GTGEO** uses the format below.

- **+RSP,**

Example:
2B5253500800FE7FFF00635A020002096776353652532D4264301000000000100220F000101003A070163000806FAC51E01E529BF07E30518030E0004600000550072BA00002400000000240600 2A32000000002A3207E30518030E003C6DCDAC0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 ~ 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Report ID / Report Type	1		
Number	1	1	
GNSS Accuracy	1	0|1 – 50	

Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Report ID / Report Type*>: Bit 0 is used for Report Type. Bit 1 – 3 are used as 3 high bits of Report ID, and Bit 4 – 7 as 4 low bits of Report ID.

- Report ID: The ID of Geo Fence in HEX format. The range is 0 to 19.
- Report Type: 0 indicates “Exit from the Geo-Fence”; 1 indicates “Enter the Geo-Fence”.

The location report messages **+RESP:GTGIN** and **+RESP:GTGOT** use the format below.

➢ **+RSP,**

Example:
2B5253501400FE7FFF006C5A020002096776353652532D42642FFE000000000300220B00010000000000000007010100000010049003C06FB3A0201E5CC0107E30518061839046000005 50B38A7000000000000004307000000000000031C2907E305180618393E7A8EFF0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Area Type	1	0-1	
Mask Group	1	01-1F	
Area Mask Group 1	8	0000000000000001-0000 0000000FFFFF	
Area Mask Group 2	8	0000000000000001-0000 0000000FFFFF	
Number	1	1	
GNSS Accuracy	1	0|1 – 50	

Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Mask Group*>: The bitwise mask to determine whether to report <*Area Mask Group*>. Bit 0 is for Area Mask Group 1 and Bit 1 is for Area Mask Group 2. 1 means “Report the information”, and 0 means “Do not report the information”.
- <*Area Mask Group 1–2*>: The bitwise mask for trigger condition composition of the corresponding PEO or GEO ID. Each bit, from Bit 0 to Bit 19, represents the logic status of the corresponding PEO or GEO ID to trigger the entering or exiting event. 1 means that the event of the PEO or GEO ID set is triggered and 0 means the event of the PEO or GEO ID set is not triggered. In a group, if no event of PEO ID is triggered, the bitwise mask will be null.

The location report message **+RESP:GTIDA** uses the format below.

- **+RSP,**

Example: **2B5253501100FE7FBF006D5A020002095637550400072200640000000000000000110E000801A67FD1010000F401010000000000C4006E06FB40E501E5D6F407E30518083137046000005 50BB9690000002080000000504000000000000000000007E3051808313932AC194B0D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0 – 100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Report ID / Report Type	1	00	00
ID Length	1	4|8	
ID	<=20	'0' – '9' 'A' – 'F'	
ID Report Type	1	0|1	
Number	1	1	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	

Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*ID*>: The ID which is currently read.
- <*ID Report Type*>: The type of reported ID.
  - 0: The ID is unauthorized.
  - 1: The ID is authorized.
  - 2: The ID has logged out.

The location report message **+RESP:GTERI** uses the format below.

- **+RSP,**

Example:

2B5253501200FE2FBF0000010200E75A020002095637550400072200640000010021 0C1000042811829D0A00002C0102019F28FF0C41030000E20102019C28FFE671A31504490102019C28FFA180A315040F0102019703010100010100 1F54445F3130303130390004D7E63D6DFD01015E180501000101001F54445F31303031313400B339808571D901015E190901000101001F54445F3130303131 3400B339808571D900015E18010100000000AA004E06FB407501E5D41707E30518050A1A04600000550BB969000002060000000501000000000000000000007E30518050A1B2FBC5F5C0D0A

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	5A	5A
Protocol Version		2	0000 – FFFF	
Firmware Version		2	0000 – FFFF	
Unique ID		8	IMEI	
Battery Level		1	0~100	
External Power Supply Voltage		2		
Analog Input Mode		2		
Analog Input1 Voltage		2		
Digital Input Status		1	00 – 07	
Digital Output Status		1	00 – 01	
Motion Status		1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use		1		
Report ID / Report Type		1		
Reserved		1	00	00
1-wireData (Optional)	1-wire Device Number	1	0 - 19	
	1-wire Device ID	8		
	1-wire Device Type	1	00 – FF	
	Device Data Length	1	00 – FF	
	1-wire Device Data	<= 30		

Fuel Sensor Data (Optional)	Sensor Number	1	0 –99	
	Sensor Type	1	10 – 13|20	
	Reserved	1	0x00	
	Percentage (Optional)	2	0 – 100	
	Volume (Optional)	2	0 – 10000	
RS485 Sensor Data (Optional)	RS485 Fuel Sensor Number	1	00 – FF	
	Sensor Model	1	00 – FF	
	Sensor Logical ID	1	00 – FF	
	Volume	2	00 – FFFF	
	Temperature	1	00 – FF	
Bluetooth Accessory Data (Optional)	Bluetooth Accessory Number	1	0 – 10	
	Index	1	0 - 9	
	Accessory Type	1	0 – 4|6|7|8|10|11|13|17	
	Accessory Model	1	0 - 5	
	Raw Data Length	1	0 - FF	
	Raw Data			
	Accessory Append Mask	2	0 - FFFF	
	Accessory Name	<=21		
	Accessory MAC	6	000000000000 - FFFFFFFFFFFF	
	Accessory Status	1	0 - 1	
	Accessory Battery Level	2	0 – 5000(mV)	
	Accessory Temperature	1	-40 – 80(℃)	
	Enhanced 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	0 - 32000 (mV)	
	Accessory Mode	1	0 - 10	
	Accessory Event	1	0 - 2	
	Magnet ID	1	00-FF	
	MAG Event Counter	2	0-32767	
	Magnet state	1	0-1	
	Accessory Battery Percentage	1	0 – 100%	
	Relay state	1	0-1	
Number		1	0 - 1	
GNSS Accuracy		1	0|1 – 50	
Speed		3	0.0 – 999.9km/h	
Azimuth		2	0 – 359	
Altitude		2		
Longitude		4		
Latitude		4		
GNSS UTC Time		7	YYYYMMDDHHMMSS	
MCC		2	0000 – FFFF	
MNC		2	0000 – FFFF	
LAC		2	0000 – FFFF	
Cell ID		2	0000 – FFFF	
Position Append Mask		1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)		1	00-0F	
Current Mileage		3	0.0 –65535.0 km	
Total Mileage		5	0.0 – 4294967.0 km	
Current Hour Meter Count		3	HHMMSS	
Total Hour Meter Count		6	HHHHHHHHMMSS	
RFID Length		1	0 – 20	
RFID		<=20	'0' – '9' 'A' – 'Z'	

CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*1-wire Device Number*>: The number of 1-wire devices connected to the device. If it is 0, the fields <*1-wire Device ID*>, <*1-wire Device Type*>, <*Device Data Length*>, and <*1-wire Device Data*> will not be displayed. If there is more than one 1-wire device connected, the fields <*1-wire Device ID*>, <*1-wire Device Type*>, <*Device Data Length*> and <*1-wire Device Data*> will repeat to show the information of each connected 1-wire device. If Bit 1 of <*ERI Mask*> in **AT+GTFRI** is enabled, the information contained in the <*1-wire Data*> field will be displayed; otherwise, the <*1-wire Data*> related information will not be displayed.
- <*1-wire Device ID*>: It indicates the device ID read from the 1-wire device.
- <*1-wire Device Type*>: It indicates the type of the 1-wire device.
  - 1: Temperature sensor
  - 2: iButton sensor
  - 3: HTDZ sensor

  Note: The message **+RESP:GTERI** will report iButton information only when the **AT+GTIDA** function is enabled in the authorized state.
- <*Device Data Length*>: It indicates the length of <*1-wire Device Data*>.
- <*1-wire Device Data*>: It indicates the data read from the 1-wire devices.
  - 1: Temperature sensor. If the device is a temperature sensor, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix A). To get the real temperature in degrees Celsius, please convert the data to a decimal value according to the calculation in Appendix A first and then multiply the decimal value by 0.0625.
  - 3: HTDZ sensor. If the device is a HTDZ sensor, this parameter indicates the Temperature and humidity value.

1-wire Device Data	Data Mask	1	00 - 03	
	Humidity	2	0000 - FFFF	
	Temperature	2	0000- FFFF	

- <*Data Mask*>: A bitwise numeral to control whether to include the corresponding fields in each position after <*1-wire Device Data*>.
  - Bit 0 for <*Humidity*> Humidity data = <*Humidity*>*100/65535
  - Bit 1 for <*Temperature*> Temperature = <*Temperature*>*0.0625

Note: A bit of 1 indicates valid data, while a bit of 0 indicates invalid data.

- <*RS485 Fuel Sensor Number*>: This parameter indicates the number of RS485 digital fuel sensor connected to the device.
- <*Sensor Model*>: This parameter indicates the model of the fuel sensor. Please refer to command **AT+GTRCS** for detailed information.

- <*Sensor Logical ID*>: This parameter indicates the logical address to specify RS485 digital fuel sensor. Please refer to the parameter <*Device ID Start*> in the command **AT+GTRCS** for detailed information.
- <*Volume*>: It is read from digital fuel sensor and used to calculate the oil pressure. If the digital fuel sensor is removed for more than a few minutes, this field will change to 0XFFFF.
- <*Temperature*>: It indicates the temperature measured by digital fuel sensor. If the digital fuel sensor is removed for more than a few minutes, this field will change to 0XFF.
- <*Bluetooth Accessory Number*>: It indicates the number of accessories connected with the device.
- <*Index*>: The Index of the Bluetooth accessory.
- <*Accessory Type*>: The type of the Bluetooth accessory.
- <*Accessory Model*>: The model of the Bluetooth accessory.
- <*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*>.
  - Fuel sensor: It is a decimal value which indicates the fuel level.
    For Mechatronics fuel sensor, if <*Fuel Level Format*> is set to 0, it indicates the original value of fuel level. If <*Fuel Level Format*> is set to 1, it indicates the percentage of fuel level and the value starts with character 'F' ("FXX").
  - WTS300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate battery voltage (unit: 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, and the unit is Celsius.
  - TEMP ELA: It is a two-byte hexadecimal Temperature value.
  - WTH300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate temperature. And the 2 lower bytes of the hexadecimal value indicate humidity. The high byte is the integer part and the low byte is the fractional part. Temperature is equal to the low byte divided by 256 plus the high byte, and the unit is Celsius. Humidity is equal to the low byte divided by 256 plus the high byte, and the unit is RH.
  - Escort Angle Sensor: It is a four-byte hexadecimal value. The first byte in higher 2-byte of the hexadecimal value is reserved byte, the value is 00. The second byte in higher 2-byte of the hexadecimal value indicate Event Notification of Angle sensor. And the 2 lower bytes of the hexadecimal value indicate Tilt Angle of sensor. The specific definitions are as follows:

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

  - Mechatronics Angle Sensor: It is an eight-byte hexadecimal value. The specific definitions are as follows:

Reserved	1	00	00

X-plane angle	1	-90 - 90	
Y-plane angle	1	-90 - 90	
Z-plane angle	1	-90 - 90	
Sensor status	1	0 – FF	
Single events	2	0 - FFFF	
Complex events	2	0 - FFFF	

- RHT ELA: It is a four-byte hexadecimal value. The 2 lower bytes of the hexadecimal value indicate temperature. And the 2 higher bytes of the hexadecimal value indicate humidity.
- MAG ELA: It is a four-byte hexadecimal value. The 2 lower bytes of the hexadecimal value indicate mag data. And the 2 higher bytes of the hexadecimal value indicate mag ID.
- Relay sensor: It is a four-byte hexadecimal value. It indicates the current state of the relay.
- WTH301: It is a four-byte hexadecimal value. The 2 lower bytes of the hexadecimal value indicate temperature. And the 2 higher bytes of the hexadecimal value indicate humidity. Humidity is equal to the 2 higher bytes divided by 100, and the unit is RH. Temperature is equal to the 2 lower bytes divided by 100, and the unit is Celsius.

✧ <*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 Battery Level*>: The battery voltage of the Bluetooth accessory.

✧ <*Accessory Temperature*>: Temperature data of the Bluetooth accessory.

✧ <*Enhanced Temperature*>: It instructs Bluetooth accessories to measure high-precision temperature.

Note: Temperature alarm uses integer value.

✧ <*Accessory Humidity*>: Humidity data of the Bluetooth accessory.

✧ <*Accessory Output status*>: The status of Bluetooth accessory output. Each bit indicates the status of one output. For example, 0X01 indicates that Output ID 5 is enabled and Output ID 6 is disabled.

✧ <*Accessory Digital Input status*>: The status of Bluetooth accessory digital input.

✧ <*Accessory Analog Input voltage*>: The status of Bluetooth accessory Analog Input Voltage.

✧ <*Accessory Mode*>: The operating mode of angle sensor.

✧ <*Magnet ID*>: ID corresponding to different magnet sensors.

✧ <*MAG Event Counter*>: The total number of times detected by the magnet sensor.

✧ <*Magnet state*>: The state of the two parts of the magnet sensor.

- 0: Separate
- 1: Closed

✧ <*Accessory Battery Percentage*>: Percentage of Bluetooth accessory's battery power.

✧ <*Relay state*>: The current state of the relay sensor.

Note: The item denoted with "(Optional)" indicates the item is controlled by the parameter <*ERI Mask*>.

4.4.Information Report +INF

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

➢ **+INF,**

Example:
2B494E4601FF7D00855637550400072200 5A020002090102000000000000000000000000000000004000041000D0107E30519153A350000007F003C003C0000000000D00000103364898602C99917301003831F000000000003046000005 50BB96A002D04600000550B9B89001704600000550BB969001F07E30519153A3544819C460D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+INF	+INF
Message Type	1		
Report Mask	2	0000 – FFFF	
INF Expansion Mask	2	0000 – FFFF	
Length	2		
Unique ID	8	IMEI / Device Name	
Device Type	1	5A	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	**+RESP:GTVER**
Reserved	2	0000	
Reserved	2	0000	
Reserved	1	00	**+RESP:GTIOS**
Analog Input1 Voltage	2		
Reserved	2	0000	
Reserved	1	00	
Reserved	2	0000	

Reserved	2	0000	
Reserved	2	0000	
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Reserved	1	00	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	**+RESP:GTGPS**
Reserved	1	00	
Satellites in Use	1		
Power Saving Enable/ OWH Mode/ Outside Working Hours/ AGPS	1		
Last Fix UTC Time	7	YYYYMMDDHHMMSS	
Reserved	1	00	
FRI Discard No Fix	1	0|1	
Report Composition Mask	2		
IGN Interval	2		
IGF Interval	2		
Reserved	4	00000000	
Reserved	1	00	
External Power Supply/ Backup Battery On/ Charging/ LED State/ Backup Battery Charge Mode	1		**+RESP:GTBAT**
External Power Voltage	2	0	
Backup Battery Voltage	2	0 – 4500mV	
Backup Battery Level	1	00	
ICCID	10	ICCID	**+RESP:GTCID**
CSQ RSSI	1	0 – 31 | 99	**+RESP:GTCSQ**
CSQ BER	1	0 – 7	
Time Zone Offset Sign/	1		**+RESP:GTTMZ**

Daylight Saving Enable			
Time Zone Offset	2	HHMM	
GIR Trigger Type	1		**+RESP:GTGIR**
Cell Number	1		
MCC	2		
MNC	2		
LAC	2		
Cell ID	2		
Reserved	1		
RX Level	1		
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		
CAN100 Sync Status	1	1-4	
Self Calibration Status	1	0|1|2	**+RESP:GTSCS**
X_Forward	1	-100 - 100	
Y_Forward	1	-100 - 100	
Z_Forward	1	-100 - 100	
X_Side	1	-100 - 100	
Y_Side	1	-100 - 100	
Z_Side	1	-100 - 100	
X_Vertical	1	-100 - 100	
Y_Vertical	1	-100 - 100	
Z_Vertical	1	-100 - 100	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	

Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Message Type*>: The ID of a specific information report message.

Message	ID
+RESP:GTINF	1
+RESP:GTGPS	2
+RESP:GTCID	4
+RESP:GTCSQ	5
+RESP:GTVER	6
+RESP:GTBAT	7
+RESP:GTIOS	8
+RESP:GTTMZ	9
+RESP:GTGIR	10
+RESP:GTCVN	13
+RESP:GTCSN	20
+RESP:GTCML	26
+RESP:GTSCS	28

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

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

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

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

Device Name	**g**	**v**	**5**	**5**				
HEX	**67**	**76**	**35**	**35**	**00**	**00**	**00**	**00**

✧ <*Device Type*>: If <*Message Type*> is 6(**+RESP:GTVER**) in the message, Bit 2(<*Device Type*>) in <*+INF Mask*> will be forced to be 1. Thus in this case, the field will always be present in the hex report of **+RESP:GTVER**.

✧ <*Protocol Version*>: If <*Message Type*> is 6(**+RESP:GTVER**) in the message, Bit 3(<*Protocol Version*>) in <*+INF Mask*> will be forced to be 1. Thus in this case, the field will always be

present in the hex report of **+RESP:GTVER**.

- <*Firmware Version*>: If <*Message Type*> is 6(**+RESP:GTVER**) in the message, Bit 4(<*Firmware Version*>) in <*+INF Mask*> will be forced to be 1. Thus in this case, the field will always be present in the hex report of **+RESP:GTVER**.
- <*Power Saving Enable / OWH Mode / Outside Working Hours / AGPS*>: The highest bit, or Bit 7, is reserved, Bit 5 and Bit 6 are for <*Power Saving Enable*>, Bit 4 and Bit 3 are for <*OWH Mode*>, and Bit 2 is for <*Outside Working Hours*>. Bit 0 is for <*AGPS*>. <*Outside Working Hours*> is used to indicate whether the device is currently working outside working hours. 1 means "outside working hours".
- <*External Power Supply / Backup Battery On / Charging / LED State / Backup Battery Charge Mode*>: The highest bit, or Bit 7, is for <*External Power Supply*> which indicates whether the external power supply is connected to the device. Bit 6 is for <*Backup Battery On*> and indicates whether the backup battery is working. Bit 5 is for <*Charging*> which indicates whether the backup battery is currently charging. Bit 4 is for <*LED State*>, indicating at least one LED indicator is either flashing or steady on when it is 1 and both LED indicators are off when it is 0. Bit 0 is for <*Backup Battery Charge Mode*>.
- <*ICCID*>: The ICCID is a 20-digit string. In the HEX format message, every 4 bits are used to represent one digit of the 20 digits of the ICCID.

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

- <*Time Zone Offset Sign / Daylight Saving Enable*>: Bit 1 is for <*Daylight Saving Enable*> and 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 from UTC time. 1 means "negative offset".
- <*GIR Trigger Type*>: A string to indicate what kind of GNSS fix this cell information is for.
  "SOS": This cell information is for SOS request.
  "RTL": This cell information is for RTL request.
  "LBC": This cell information is for LBC request.
  "TOW": This cell information is for TOW request.
  "FRI": This cell information is for FRI request.
  "GIR": This cell information is for the sub command "**C**" in the **AT+GTRTO** command.

Trigger Type	**ID**
SOS	1
RTL	2
LBC	3
TOW	4
FRI	5
GIR	6

- <*Cell Number*>: The number of cells. It also indicates the number of cell information groups. One cell information group consists of MCC, MNC, LAC, and Cell ID.

4.5.Event Report +EVT

Event report messages including **+RESP:GTPNA**, **+RESP:GTPFA**, **+RESP:GTMPN**, **+RESP:GTMPF**, **+RESP:GTBTC**, **+RESP:GTSTC**, **+RESP:GTSTT**, **+RESP:GTPDP**, **+RESP:GTIDN**, **+RESP:GTASC**, **+RESP:GTSTR**, **+RESP:GTBCS, +RESP:GTBDS, +RESP:GTBDR, +RESP:GTSTP** and **+RESP:GTLSP** use the format below.

➢ **+EVT,**

Example: **2B4556540900FE7FBF00625A020002095637550400072200640000000000000100220D0100000000002005606FB406601E5D46407E30518072B1304600000550BB969000002080000000503000000000000000007E30518072B1431C04D2B0D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 - 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Number	1	1	

GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Message Type*>: The ID of a specific event report message.

Message	ID
+RESP:GTPNA	1
+RESP:GTPFA	2
+RESP:GTMPN	3

+RESP:GTMPF	4
Reserved	5
+RESP:GTBPL	6
+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
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
+RESP:GTJDR	20
+RESP:GTGSS	21
+RESP:GTFLA	22
+RESP:GTSTR	23
+RESP:GTSTP	24
+RESP:GTCRA	25
Reserved	26
+RESP:GTDOS	27
+RESP:GTGES	28
+RESP:GTLSP	29
+RESP:GTTMP	30
Reserved	31
+RESP:GTJDS	32
+RESP:GTRMD	33

Reserved	34
Reserved	35
Reserved	36
Reserved	37
Reserved	38
Reserved	39
+RESP:GTUPC	40
+RESP:GTCLT	41
+RESP:GTCFU	42
Reserved	43
+RESP:GTASC	44
Reserved	45
Reserved	46
Reserved	47
Reserved	48
Reserved	49
+RESP:GTVGN	50
+RESP:GTVGF	51
+RESP:GTBCS	52
+RESP:GTBDS	53
+RESP:GTBDR	54
Reserved	55
Reserved	56
Reserved	57
Reserved	58
Reserved	59
Reserved	60
Reserved	61
Reserved	62
Reserved	63

Reserved	64
+RESP:GTBAA	65
Reserved	66
+RESP:GTBID	67
Reserved	68
Reserved	69
+RESP:GTBAR	70
Reserved	…
+RESP:GTHUM	88

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

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

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

Device Name	**g**	**v**	**5**	**5**				
HEX	**67**	**76**	**35**	**35**	**00**	**00**	**00**	**00**

- <*RFID Length*>: This is the length of the <*RFID*>. It is controlled by Bit 27 (for <*RFID Length*>) in <*+RSP Mask*>, and the default value of Bit 27 in <*+RSP Mask*> is 0.
- <*RFID*>: It is the card ID of RFID that is supported by the device. If Bit 27 (for <*RFID Length*>) in <*+RSP Mask*> is set to 1, the length of this field is defined by <*RFID Length*>. If Bit 27 (for <*RFID Length*>) in <*+RSP Mask*> is 0, its length is always 4 bytes.

RFID	**0**			
HEX	**00**	**00**	**00**	**00**

Note: If the device does not get the card ID and Bit 27 (for <*RFID Length*>) in <*+EVT Mask*> is 1, the <*RFID Length*> will be 0 and the <*RFID*> will be empty.

The event report message **+RESP:GTBPL** uses the format below.

- **+EVT,**

Example:
2B4556540600FE7FFF00645A020002096776353652532D42170000000000000000001A0F0E5F0100000000154004306FB3E3001E5D8C407E30518020A1504600000550BB96900000000000000000

60000000000000000007E30518020A163B56E8370D0A			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 ~ 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Backup Battery Voltage	2	0 – 4500 mV	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	

MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report messages **+RESP:GTIGN** and **+RESP:GTIGF** use the format below. For these two messages, the <*Total Mileage*> and <*Current Mileage*> fields will always be present regardless of the <*+EVT Mask*> setting.

- **+EVT,**

Example:
2B4556540D00FE7FFF00665A020002096776353652532D42642FD4000000000100220F0000000301000000000154004306FB3E3001E5D8C407E3051802080F04600000550BB969000000000000000000600000000000000000007E305180208113B486B6E0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 ~ 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	

Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report messages **+RESP:GTVGN** and **+RESP:GTVGF** use the format below. For these two messages, the <*Total Mileage*> and <*Current Mileage*> fields will always be present regardless of the <*+EVT Mask*> setting.

- **+EVT,**

Example:
2B4556543200FE7FFF00685A020002096776353652532D425D0000000000000100220400040000032010000000001630037 06FB43B001E5D38307E30518061A3004600000550B6EEA000000000000044010000000000000003211207E305180622153E9FF2D60D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	

Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Reserved	1	00	
Report Type	1	0-4	
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTJDR** uses the format below.

- **+EVT,**

Example:
2B4556541400FE7FFF00625A020002096776353652532D425F0000000000000000120401000000014E002A06FB406301E5D4CB07E30518032416046000005 50BB969000000000000002C0400070A00000001090D07E305180330233CDC8D7D0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0 - 100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Number	1	1	
GNSS Accuracy	1	0	0

Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTJDS** uses the format below.

- **+EVT,**

Example:
2B4556542000FE7FFF00635A0200020967763536525 32D42642FA70000000001002204010100000C00014E004A06FB40B601E5D44707E3051803373204600000550BB969000000000000002C04001C1900000001252607E3051804171A3D0BC9CC0D0A

Parameter	Length (byte)	Range/Format	Default

Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Jamming Status	1	1|2	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	

Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Jamming Status*>: The current jamming status of the device.

- 1: Quit the jamming state.
- 2: Enter the jamming state.

The event report message **+RESP:GTCRA** uses the format below.

➢ **+EVT,**

Example: **2B4556541900FE7FFF00635A020002096776353652532D42642FC8000000000100220402010000C00014E004A06FB40B601E5D44707E3051803373204600000550BB969000000000000002C0400010A000000010A1707E3051803380E3CF88C510D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	

Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Crash Counter	1	0x00 – 0xFF	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter	3	HHMMSS	

Count			
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Crash Counter*>: A parameter to indicate the crash sequence. It combines the report **+RESP:GTCRA** and **+RESP:GTCRD** into one crash event. It rolls from 0x00 to 0xFF.

The event report message **+RESP:GTASC** uses the format below.

➢ **+EVT,**

Example:
2B4556542C00FE7FFF006B5A020002096776353652532D4264300D000000000100220F00CC549D0A06F4ACCC0100001C0100BB000906FABDF801E5082507E3051806030C04600000550B6B690000090300000036010 00F1E00000003072407E3051806030D3E234D620D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	

Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
X_Forward	1	-100-100	
Y_Forward	1	-100-100	
Z_Forward	1	-100-100	
X_Side	1	-100-100	
Y_Side	1	-100-100	
Z_Side	1	-100-100	
X_Vertical	1	-100-100	
Y_Vertical	1	-100-100	
Z_Vertical	1	-100-100	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTUPD** uses the format below. For this message, the <*Protocol Version*> and <*Firmware Version*> will always be present regardless of the <*+EVT Mask*> setting.

- **+EVT,**

Example:
2B4556540F00FE1FBF00615A02000209565022000B315C01622CC900004105012C000100000001000000004306FC59ED01E5BC0907DD011F0A050E046000015504582B00000000000000000304000000000003034000207DD011F0300300027F70C0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	

Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Code	2		
Retry	1		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	

Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTIDF** uses the format below.

- **+EVT,**

Example:
2B4556541100FE7FFF00665A020002096776353652532D42642F980000000001002209000001330100000000144005206FB401D01E5D40D07E30518042338046000005508B9690000000300000 02C07002837000000013208 07E305180423393D2E9F080D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Duration of Idling	4		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	

Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTDAT** uses the format below.

- **+EVT,**

Example:
2B45565412003E7FBF01505A0400050C56375504000E0007642FD8000000000100210800F53131
3131313131313131313131313131313131313131313131313131313131313131313131313131
3131313131313131313131313131313131313131313131313131313131313131313131313131
3131313131313131313131313131313131313131313131313131313131313131313131313131
3131313131313131313131313132323232323232323232323232323232323232323232323232
3232323232323232323232323232323232323232323232323232323232323232323232323232

3232323232323232323232323232323232323232323232323232323233333333333333333333333333 33333333333333333333401000000000163004206FB40A101E5D2BE07E305130239020460000 0550 BB969000000001000000550007E305130A390325DFE4800D0A			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0 - 100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Data Length	2		
Data			
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		

Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Data Length*>: It indicates the length of the <*Data*> parameter.

The event report message **+RESP:GTGSS** uses the format below.

➢ **+EVT,**

Example:
2B4556541500FE7FBF00675A020002095637550400072200640000000200000500420600000000001000000000A9003D06FB401101E5D3E007E3051B02111C04600000550BB96900000005000000800500000000000000000007E3051B02141D4DEDDDF20D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		

Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
GNSS Signal Status	1	0 | 1	
Reserved	4	00000000	00000000
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	

Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

The event report message **+RESP:GTDOS** uses the format below.

➢ **+EVT,**

Example:
2B4556541B00FE7FBF00645A020002095637550400072200640000000000000000110E0101010000000000C4006E06FB40E501E5D6F407E3051808313704600000550BB969000002080000000504000000000000000000007E3051808313932AD652E0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Wave1 Output ID	1	1| 5 - 6	
Wave1 Ouptut Active	1	0|1	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter	3	HHMMSS	

Count			
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTGES** uses the format below.

➢ **+EVT,**

Example:
2B4556541C00FE7FFF006E5A020002096776353652532D4249000000000000000001A0800130115000003E8000000050101000000138001906FB3E6D01E5D40D07E30518090D2004600000550BB969000000000000007F0100041900000004380B07E30518090D204029D1060D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	

Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Trigger GEO ID	2	0-19	
Trigger GEO Enable	1	0|1	
Trigger Mode	1	0|21|22	
Radius	4	50 – 6000000m	
Check Interval	4	0|5 – 86400sec	
Number	1	1	
GNSS Accuracy	1	0|1	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	

CAN Data	<=360		
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*>: The current parking-fence is active or inactive.
  - 0: The current parking-fence is inactive.
  - 1: The current parking-fence is active.

The event message **+RESP:GTTMP** uses the format below.

- ➢ **+EVT,**

Example:
2B4556541E00FE7FBF006F5A020002095637550400072200640000000000000100210B030028FFA180A315040F00001C0100000000000001C06FB3FDE01E5D15D07E30515090F1304600000550BB969000000020000000003000000000000000000007E30515090F14077386CF0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12	

		0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Temperature Alarm ID	1	0 – 3	
Temperature Status	1	0|1	
Temperature Sensor device ID	8	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	1	00	00
Temperature Sensor device Data	2	-55 – 125℃	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	

RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
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 "Outside the predefined temperature range". 1 means "Inside the predefined temperature range".
- <*Temperature Sensor Device ID*>: The ID of the temperature sensor.
- <*Temperature Sensor Device Data*>: The current temperature the sensor detects.

The event message **+RESP:GTHUM** uses the format below.

- **+EVT,**

Example:
2B4556545800FE7FBF006F5A0D020E0B5637550405352203000000000000000001A0000002E075084D98016AF00003501000000000000000000000000000000000000000000000000000000004600000550BB7B10000000000000000000000000000000007E7041C111217007B8C290D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	

Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
humidity Alarm ID	1	0 – 3	
humidity Status	1	0|1	
humidity Sensor device ID	8	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	1	00	00
humidity Sensor device Data	2	0 – 100(%)	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	

RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*humidity Alarm ID*>: The ID of humidity alarm.
- ✧ <*humidity Status*>: The status of current humidity. 0 means "Outside the predefined temperature range". 1 means "Inside the predefined humidity range".
- ✧ <*humidity Sensor Device ID*>: The ID of the humidity sensor.
- ✧ <*humidity Sensor Device Data*>: The current humidity the sensor detects.

The event report message **+RESP:GTFLA** uses the format below.

- ➢ **+EVT,**

Example:
2B 45 56 54 16 FF FF FF BF 00 67 01 04 02 0C 01 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 00 0C 00 41 10 00 64 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 18 78 08 72 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 01 1E 0A 08 06 00 20 7F F3 0D 0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Device Name	8	IMEI	
Battery Level	1	0 – 100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		

Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Input ID	1	1	
Last Fuel Level	1	0 - 100	
Current Fuel Level	1	0 - 100	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	

CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <*Input ID*>: The ID of the input to which the fuel sensor is connected.
- ✧ <*Last Fuel Level*>: The fuel level saved before the fuel loss alarm event occurs.
- ✧ <*Current Fuel Level*>: The current fuel level when the fuel loss alarm event occurs.

The event report message **+RESP:GTRMD** uses the format below.

- ➢ **+EVT,**

Example:
2B4556542100FE7FFF00635A020002096776353652532D4264301900000000000041090201000000000B7008E054C5638054C563807E3051908100400000000000000000000000000000007F0500000000000006172407E3051910100544AD328C0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42	

		0x16 | 0x1A	
Satellites in Use	1		
Roaming State	1	0-3	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTUPC** uses the format below.

➢ **+EVT,**

Example: **2B4556542800FE7FFF00955A020002096776353652532D4264301C0000000000041090000C8687474703A2F2F36302E3137342E3232352E3137313A31303031352F475635362F64656C746162696E2F392E696E690001000000000B7008E06FB410501E5D3E207E30519080F3A04600000550BB969000000000000007F0500000000000006172407E30519080F3B44AA3AD20D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Command ID	1		
Result	2	100|101|102|103|200|201|202|300|301|302|304|305|306	
Download URL	<=101	Complete URL	
Number	1	1	

GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
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 is the total number of commands when the result code is 301. It is wrong format of command ID when the result code is 302.
- <*Result*>: A numeral to indicate whether the configuration is updated successfully.
  - 100: The update command is starting.
  - 101: The update command is confirmed by the device.

- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.
- 303: Reserved.
- 304: <*Command Mask*>, <*GEO ID Mask*>, <*Stocmd ID Mask*> or <*Group ID Mask*> check fails.
- 305: The update process is interrupted by abnormal reboot.
- 306: The update process is interrupted by MD5 verification error.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name and ends by 0x00.

The event report messages **+RESP:GTBCS** and **+RESP:GTBDS** use the format below.

➢ **+EVT,**

Example:
2B4556543400FE7FFF007D5A020002096776353652532D42642FF8000000000100420019034756353652535F42543200780541001833010078054100 18AF0100000000000000000054C5638054C56380000000000000000000000000000000000000000000000007F0500000000000062E2A07E3051911311A46720CC30D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		

Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Bluetooth Report Mask	2	0000 – FFFF	
Bluetooth Name	<=21	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth MAC Address	6	000000000000 – FFFFFFFFFFFF	
Peer Role	1	0|1	
Reserved	1	00	00
Peer MAC Address	6	000000000000 – FFFFFFFFFFFF	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	

Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTBDR** uses the format below.

- **+EVT,**

Example:
2B4556543600FE7FFF00B25A020002096776353652532D42642FDD00000000100420E19034756353652535F42543200780541001833010078054100 18AF6964610000030200003430000010008000000805F9B34FB02000034310000100080000 0805F9B34FB00000A313233343536373839300100000000000B40094054C5638054C563807E3051909362900000000000000000000000000000007F0500000000000062E2A07E3051911362A469F6C7A0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		

Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Bluetooth Report Mask	2	0000 – FFFF	
Bluetooth Name	<=21	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth MAC Address	6	000000000000 – FFFFFFFFFFFF	
Peer Role	1	0|1	
Reserved	1	00	00
Peer MAC Address	6	000000000000 – FFFFFFFFFFFF	
Peer Device Name	<=21	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Data Mask	2	0000-0003	
Service UUID Type	1	1|2	
Service UUID	2|16	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Characteristic UUID Type	1	1|2	
Characteristic UUID	2|16	0000 – FFFF|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	
Data Format	1	0|1	
Data Length	2	0000 - FFFF	
Data	<= 245|123	‘0’-‘9’ ‘a’-‘f’ | ASCII	
Number	1	1	

GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTBAA** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 01 00 FC 1F BF 00 5C 5A 81 01 01 01 56 32 54 03 00 5F 41 05 00 00 00 42 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E2 01 11 06 39 03 00 51 C2 E2 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	5A	5A
Protocol Version	2	(HEX)	
Firmware Version	2	(HEX)	
Unique ID	8	(IMEI)	
Battery Level	1	0 - 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	11|12|16|1A|21|22|41|42	
Satellites in Use	1		
Index	1	0 - 9|0xFF|0XFE	
Accessory Type	1	0 – 4|6|7|8|10|11|13|17	
Accessory Model | Beacon ID Model	1	0|2|5	
Alarm Type	1	0 – 4|7 – 10|12|15	
Append Mask	2	0000 – FFFF	
Accessory Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Accessory MAC	6	'0' – '9' 'A' – 'F'	
Accessory Status	1	0 - 1	
Accessory Battery Level	2	0 - 5000(mV)	
Accessory Temperature	1	-40 - 80(℃)	
Enhanced Temperature	2	-40.00-80.00(℃)	
Accessory Humidity	1	0-100%(rh)	
Accessory Mode	1	0 - 10	

Accessory Event	1	0 - 2	
Magnet ID	2	00-FF	
MAG Event Counter	2	0-32767	
Magnet state	1	0-1	
Accessory Battery Percentage	1	0 – 100%	
Relay Config Result	1	0-4	
Relay state	1	0-1	
Number	1	1	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

- The index of Bluetooth accessory defined in **AT+GTBAS** which triggers the **+RESP:GTBAA** message.

For WKF300, it is 0xFF.

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

- 0: No Bluetooth accessory.
- 1: Escort sensor.
- 2: Beacon temperature sensor.
- 3: Bluetooth beacon accessory.
- 6: Beacon Multi-Functional Sensor.
- 11: Magnet Sensor.
- 13: Relay Sensor.

✧ <*Accessory Model / Beacon ID Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBAS** or the model of the Bluetooth beacon accessory which is defined in **AT+GTBID**.

✧ <*Alarm Type*>: The type of the alarm which is generated by the Bluetooth accessory specified by <*Accessory Type*> and <*Accessory Model*> in the **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: Pushbutton event for WKF300 is detected.
- 7: Humidity alarm: The current humidity value is below <*Low Humidity*> set in the **AT+GTBAS** command.
- 8: Humidity alarm: The current humidity value is above <*High Humidity*> set in the **AT+GTBAS** command.
- 9: Humidity alarm: The current temperature value is within the range defined by <*Low Humidity*> and <*High Humidity*>, which are set in the **AT+GTBAS** command.
- 10: Angle event notification.
- 12: Magnet event notification.
- 15: Relay event notification.

✧ <*Append Mask*>: Bitwise mask defined in the **AT+GTBAS** or **AT+GTBID** command to indicate the reported Bluetooth accessory data fields.

- Bit 0: <*Accessory Name*>
- Bit 1: <*Accessory MAC*>
- Bit 2: <*Accessory Status*>

- Bit 3: <*Accessory Battery Level*>
- Bit 4: <*Accessory Temperature*>
- Bit 5: <*Accessory Humidity*>
- Bit 8: <*Accessory Event Notification Data*>
- Bit 12: <*MAG Notification Data*>
- Bit 13: <*Accessory Battery Percentage*>
- Bit 14: <*Relay Data*>

✧ <*Accessory Name*>: The name of the Bluetooth accessory which ends with '\0'(0x00). If the accessory name is not found, this filed will be filled 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 Battery Level*>: The battery voltage of the Bluetooth accessory.

✧ <*Accessory Temperature*>: Temperature data of the Bluetooth accessory.

✧ <*Enhanced Temperature*>: It instructs Bluetooth accessories to measure high-precision temperature.

Note: The current temperature value. A total of 2 bytes. The longitude is converted to an integer with 2 implicit decimals, and the integer is reported in HEX format. If the longitude value is negative, it is expressed in 2's complement format.

Temperature 16.66	**1666**	
HEX	**06**	**82**

✧ <*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.

✧ <*Magnet ID*>: ID corresponding to different magnet sensors.

✧ <*MAG Event Counter*>: The total number of times detected by the magnet sensor.

✧ <*Magnet state*>: The state of the two parts of the magnet sensor.

- 0: Separate
- 1: Closed

✧ <*Accessory Battery Percentage*>: Percentage of Bluetooth accessory's battery power.

✧ <*Relay state*>: The current state of the relay sensor.

✧ <*Relay Config Result*>: The number representing the response result of the relay, which is controlled and reported by Bit14 of the **AT+GTBAS** parameter <*Accessory Append Mask*>.

- 0: Configuration updated successfully.
- 1: Error in connecting.
- 2: The current password is incorrect.
- 3: Password update error.
- 4: Relay open or close error.

The event report message **+RESP:GTBID** uses the format below.

➢ **+EVT,**

Example: **2B 45 56 54 01 00 FC 1F BF 00 5C 4C 81 01 01 01 56 32 54 03 00 5F 41 05 00 00 00 42 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E2 01 11 06 39 03 00 51 C2 E2 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	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Battery Level	1	0 – 100	
External Power Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Number	1	0 - 3|0 - 15	
Beacon ID Model	1	0|1	
Append Mask	2	0000 – FFFF	
Accessory MAC	6	'0' – '9' 'A' – 'F'	
Accessory Battery Level	2	0 – 5000mV	
Accessory Signal Strength	1	-120 - 0	
Beacon Type	1	0-2	
Beacon Data	<=100		

Number	1	1	
GNSS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
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 accessories.

- WKF300. The maximum value is 3.
- iBeacon E6. The maximum value is 15.
- IDELA. The maximum value is 15.

✧ <*Beacon ID Model*>: The model of the Bluetooth beacon accessory which is defined in

AT+GTBID.

- <*Append Mask*>: Bitwise mask defined in the **AT+GTBID** command to indicate the reported Bluetooth beacon accessory data fields.
  - Bit 0: Reserved
  - Bit 1: <*Accessory MAC*>
  - Bit 2: Reserved
  - Bit 3: <*Accessory Battery Level*>
  - Bit 4: Reserved
  - Bit 5: Reserved
  - Bit 6: <*Signal Strength*>
  - Bit 7: <*Beacon Type*> and <*Beacon Data*>
- <*Accessory MAC*>: The MAC address of the Bluetooth beacon accessory.
- <*Accessory Battery Level*>: The battery voltage of the Bluetooth beacon accessory.
- <*Accessory Signal Strength*>: The signal strength of the Bluetooth beacon accessory.
- <*Beacon type*>: Types of beacons.
  - 0: "ID" Format
  - 1: "iBeacon" Format
  - 2: "Eddystone" Format
- <*Beacon Data*>: Select the data format according to <*Beacon Type*>:
  - If <*Beacon Type*> is 0, the data format is as follows:

ID_Mfr_Data	6	(HEX)	

  - If <*Beacon Type*> is 1, the data format is as follows:

UUID	16	(HEX)	
Major	2	(HEX)	
Minor	2	(HEX)	

  - If <*Beacon Type*> is 2, the data format is as follows:

NID	10	(HEX)	
BID	6	(HEX)	

The event report message **+RESP:GTCLT** uses the format below.

- **+EVT,**

Example:
2B4556542900FE7FBF00624F0700080256375504024D5100642FAD000000000100210C010000000000C0002206FB403801E5D3B507E4031207393704600000550BB7B10000000100000003B0500000000000000000007E403120739382EB6F9820D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT

Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Group ID	1	00– 19	
Alarm Mask 1	4	00000000 – FFFFFFFF	
Alarm Mask 2	4	00000000 – FFFFFFFF	
Alarm Mask 3	4	00000000 – FFFFFFFF	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	

MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Group ID*>: The ID of CANBUS alarm group. The CANBUS alarm function supports settings of a total of 20 groups.
- <*Alarm Mask 1*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Detailed Information / Indicators*> of the **+RESP:GTCAN** message.
- <*Alarm Mask 2*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Lights*> and <*Doors*> of the **+RESP:GTCAN** message.
- <*Alarm Mask 3*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Engine RPM*> of the **+RESP:GTCAN** message.

The event report message **+RESP:GTBAR** uses the format below.

- **+EVT,**

Example:
2B4556544100FE7FBF00794F0603071F56375504000F3B0013000000000000000000110F03020003001F575453333030007805410 1E546010C2D1C0100000000000000A506FB3F2301E5D66A07E4011508251A04600000550BB96A0000000000000000000000000000000000000000007E4011508251B0199FF800D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	5A	5A
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		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Index	1	0 - 9	
Accessory Type	1	7	
Accessory Model	1	0 - 4	
Append Mask	2	0000 – FFFF	
Accessory Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Accessory MAC	6	'0' – '9' 'A' – 'F'	
Accessory Status	1	0 - 1	
Accessory Battery Level	2	0 - 5000(mV)	
Accessory Temperature	1	-40 - 80(℃)	
(Accessory Data)	<=650		
Number	1	1	

GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	
CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Accessory Data*>: There are accessory data para according <*Accessory Type*> and <*Accessory Model*>:

➢ If the <*Accessory Type*> is 7 and <*Accessory Model*> is 0 (DUT-E S7) or <*Accessory Model*> is 4 (GNOM DP S7):

Version	1	00 - FF	
PGN	2	0000 - FFFF	

PGN Data	21	00000000000000000000 00000000000000000000 - FFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFF	

➢ If the <*Accessory Type*> is 7 and <*Accessory Model*> is 3(GNOM DDE S7):

Version	1	00 - FF	
PGN	2	0000 - FFFF	
PGN Data	20	00000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF	

➢ If the <*Accessory Type*> is 7 and <*Accessory Model*> is 1 (DFM 100 S7):

Version	1	00 - FF	
PGN1	2	0000 - FFFF	
PGN Data1	20	00000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF	
PGN2	2	0000 - FFFF	
PGN Data2	20	00000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF	
PGN3	2	0000 - FFFF	
PGN Data3	20	00000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF	

➢ If the <*Accessory Type*> is 7 and <*Accessory Model*> is 2 (DFM 250DS7):

Version	1	00 - FF	
PGN1	2	0000 - FFFF	
PGN Data1	20	00000000000000000000 0000000000000000000 - FFFFFFFFFFFFFFFFFFFFF	

		FFFFFFFFFFFFFFFF	
PGN2	2	0000 - FFFF	
PGN Data2	20	00000000000000000000 00000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF	
PGN3	2	0000 - FFFF	
PGN Data3	20	00000000000000000000 00000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF	
PGN4	2	0000 - FFFF	
PGN Data4	20	00000000000000000000 00000000000000000000 - FFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF	

The event report message **+RESP:GTCFU** uses the format below.

- **+EVT,**

Example:
2B4556544100FE7FBF00794F0603071F56375504000F3B00130000000000000000110F03020003001F575453333030007805410 1E546010C2D1C0100000000000000A506FB3F2301E5D66A07E4011508251A04600000550BB96A00000000000000000000000000000000000000007E4011508251B0199FF800D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	4F	4F
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		

Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 01	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
Satellites in Use	1		
Code	2		
Reserved	1	00	00
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID Length	1	0 – 20	
RFID	<=20	'0' – '9' 'A' – 'Z'	

CAN Data	<=360		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

4.6.Heartbeat Data +HBD

➢ **+HBD,**

Example: **2B484244EF205A020002095637550400072200 07E30519080B103EED3A880D0A**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	5A	5A
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

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

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

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

Device Name	g	v	5	5				
HEX	67	76	35	35	00	00	00	00

If the mask of <*UID*> in the <*+HBD Mask*> of **AT+GTHRM** is set to 0, the heartbeat message will not include device name or IMEI information. If the mask of <*UID*> is set to 1, the heartbeat message will include device name or IMEI information according to the mask of <*Device Name*>.

4.7.Crash Data Packet +CRD

➢ **+CRD,**

Example:
2B435244007F02805A020002096776353652532D42006001010258001C004A0001001C004B000
1001C004D0000001D004D0001001C004B0004001A004A00040019004B0004001A004C0002001
9004B00040019004E00020019004D0003001C004D00060019004C0003001C004E0006001C004C
0006001C004D0006001C004D0006001D00500007001D004F0007001D00510007001D00510008
001E00520007001D00540006001E00550006001E00560006001F00560007001E00560005001D00
580004001D005A0002001D00580004001D00550005001C00560005001A00540004001B0055000
2001B00540003001A00510004001B00510005001A00500005001900510005001900500005001 9
004F0005001A004F00060018004E00040019005000030019005000030019004D0005001C004E00
06001E00500008001D004F0007001E00520008001F00530009001F00520009001F005300090020
005500090020005400090 01F00520009001F00510009001E00500008001F004F0008001D005100
07001E004E0008001F004E0006001D004F0006001E004C0006001F004E0004001B004C00010019
004B00000019004A000100190049000100180048000000160048000000150046000000150045 00
000014004400000013004300000014004300020012004100020012004200040014004500050016
00470004001500460005001400490004001400 4C00010015004E000000150051000000160055FF
FF00160058FFFE00160058FFFD0016005AFFFD0017005CFFFC0017005EFFFA00160060FFF900170
062FFF800160062FFF800140062FFF500140069FFF7FFFF0076FFF3FFB9009BFFB5FE6E00F3FE51F
E9E0151FD5007E3051803302D3CDEECDE0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+CRD	+ CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	5A	5A
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI / Device Name	
Crash Counter	1	0x00 – 0xFF	

Data Type	1	0x00-0x7F	
Total frame	1	1-8	
Frame Number	1	1-8	
Data length	2	0-1200	
Data	<=1200		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Report Mask*>: Please refer to the <*+CRD Mask*> in **AT+GTHRM**.
- <*Unique ID*>: If Bit 1 of <*+CRD Mask*> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

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

Device Name	**g**	**v**	**5**	**5**				
HEX	**67**	**76**	**35**	**35**	**00**	**00**	**00**	**00**

- <*Data Type*>: A hexadecimal parameter to indicate the time of the data (before crash or after crash) and crash direction (+X, -X, +Y, -Y, +Z, -Z or several of them). Please refer to the following table for the detailed syntax.

Bits	Description		Range
Bit 0	0: before crash	1: after crash	0-1
Bit 1	0: X-axis crash not detected	1: X-axis crash detected	0-1
Bit 2	0: X-axis positive direction	1: X-axis negative direction	0-1
Bit 3	0: Y-axis crash not detected	1: Y-axis crash detected	0-1
Bit 4	0: Y-axis positive direction	1: Y-axis negative direction	0-1
Bit 5	0: Z-axis crash not detected	1: Z-axis crash detected	0-1
Bit 6	0: Z-axis positive direction	1: Z-axis negative direction	0-1
Bit 7	Fixed value		0

- <*Total Frame*>: The total number of the messages that are sent to the backend server for the crash event.
- <*Frame Number*>: A numeral to indicate the sequence of the current message.

✧ <*Data*>: There are a maximum of 1200 bytes in one frame which includes acceleration samples in 2 seconds at most. There are 6 bytes in a group. The first 2 bytes of these 6 bytes represent X axis acceleration data, the middle 2 bytes represent Y axis acceleration data and the last 2 bytes are for Z axis acceleration data. And they are two's complement. Regarding how to convert the two's complement to the original value, please refer to the Appendix A.

4.8.Buffer Report in HEX Format

When a HEX format message goes into the local buffer, the device will replace the 2nd byte of the report message with 'B'. Thus, **+BSP** is buffered report for **+RSP**, **+BNF** is buffered report for **+INF**, **+BRD** is buffered report for **+CRD** and **+BVT** is buffered report for **+EVT**. The remaining part of the report messages is kept unchanged.

4.9.CANBUS Device Information Report

The CANBUS device information report message **+RESP:GTCAN** uses the format below.

➢ **+CAN,**

Example:
2B43414E01000007FF009B250A040B0E67763330302D676C0100C00FFFFF000000000000000000000000000000000000000000002000BE37D000000323806A90028005A0000000000005728000000431400000F78002000000020E0000000111000000006100001D0C2D110D00BF7FFF3F1F000000000000003906FC5A4601E5BBF507E00811080637046000005663B6550007E0081108063A03B2C3D60D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+CAN	+CAN
Message Type	1		
Report Mask	4	0x00000000 – 0xFFFFFFFF	
Length	2		
Device Type	1	5A	5A
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 – 21474836)/I(0 – 214748364)	
Total Fuel Used	5	0.00 –4294967.00	
Engine RPM	2	0 – 16383 rpm	
Vehicle Speed	2	0 - 6553Km/h	
Engine Coolant Temperature	2	-50 – +215 ℃	
Fuel Consumption	5	H (0.0 – 16777216.0)| M(0.0 – 16777216.0)	
Fuel Level (Liter)	5	L(0.00 – 999999.99)	
Fuel Level (Percentage)	5	P(0.00 – 100.00)	
Range	4	0 – 99999999hm	
Accelerator Pedal Pressure	2	0 – 100%	
Total Engine Hours	5	0.00 –4211081215.00h	
Total Driving Time	5	0.00 –4211081215.00h	
Total Engine Idle Time	5	0.00 –4211081215.00h	
Total Idle Fuel Used	5	0.00 –4294967.00l	
Axle Weight 2nd	2	0 – 65535kg	
Tachograph Information	2	00-FFFF	
Detailed Information / Indicators	2	00-FFFF	
Lights	1	0x00-0xFF	
Doors	1	0x00-0xFF	0
Total Vehicle Overspeed Time	5	0 –4211081215.00h	
Total Vehicle Engine Overspeed Time	5	0 –4211081215.00h	
Total Distance Impulses	4	0– 21474836	
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 –4211081215.00h	
Total Cruise Control Time	5	0.00 –4211081215.00h	
Total Accelerator Kick-down Time	5	0.00 –4211081215.00h	
Total Brake Applications	4	0-999999	
Tachograph Driver 1 Card Number	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Card Number	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Expansion Information	2	0x0000-0xFFFF	
Rapid Brakings	4	0-16711679	
Rapid Accelerations	4	0-16711679	
Engine Torque	4	0 – 100%	

Service Distance	4	-160 635 – 327675km	
DTC Number	1	00 – 99	
DTC 1	3	'0' – '9' 'a' – 'z' 'A' – 'Z'	
…			
DTC N	3	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Electric Report Mask	4	0x00000000 – 0xFFFFFFFF	
Battery Level	2	0.00 – 100.00	
Battery Charging Current	1	0 – 125 A	
Battery Charging Remaining Time	2	0 – 65535 min	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Position Append Mask	1|2	00|01|81|0000|0001|0081	
Satellites Used (optional)	1	00-0F	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Character	2	0x0D 0x0A	0x0D 0x0A

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

Message	ID
+RESP:GTCAN	1

- <*Report Mask*>: Please refer to <*+CAN Mask*> in **AT+GTHRM**.
- <*Length*>: The length of the whole message from header to the tail characters.
- <*Unique ID*>: If Bit 1 of <*+CAN Mask*> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

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

Device Name	g	v	3	0	0	n		
HEX	67	76	33	30	30	6E	00	00

- <*Report Type*>: A numeral to indicate the report type.
  - 0: Periodic report
  - 1: Real time request report
  - 2: Ignition on/off report
- <*CANBUS Device State*>: A numeral to indicate the state of communication 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 <*CAN Report Mask*> in **AT+GTCAN**.
- <*VIN*>: Vehicle identification number.
- <*Total Distance*>: Vehicle distance. The number is always increasing. The unit is hectometer. If it is set to 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 fractional part. The fractional part has 2 digits.
- <*Engine Coolant Temperature*>: The engine coolant temperature of the vehicle. 2 bytes in total. If this value is negative, it is represented in 2's complement format.
- <*Fuel Level (Liter)*>: 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 fractional part. The fractional 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 fractional part. The fractional 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 L/100km is represented as FE, and the unit 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 by multiplying it by 10 and 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 fractional part. The fractional part has 2 digits.
- <*Total Driving Time*>: 5 bytes in total. The first 4 bytes are for the integer part of the total driving time and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Engine Idle Time*>: 5 bytes in total. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Idle Fuel Used*>: 5 bytes in total. The first 4 bytes are for the integer part of the total idle fuel used and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Tachograph Information*>: Two bytes. The high byte describes driver 2, and the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Validity mark (0 – valid driver data, 1 – no valid data)

R: Reserved

C: Driver card (1 – card inserted, 0 – no card inserted)

T2-T0: Driving time related states:

- 0: Normal / no limits reached.
- 1: 15min before 4½h.
- 2: 4½h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15 minutes before 16h (without 8h rest during the last 24h).
- 6: 16h reached.
- 7: Other limit.

W1-W0: Driver working states:

- 0: Rest - sleeping.
- 1: Driver available – short break.
- 2: Work – loading, unloading, working in an office.
- 3: Driver – behind the wheel.

- <*Detailed Information / Indicators*>: 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*>: A hexadecimal number. 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*>: A hexadecimal number. Each bit contains information of one door.

- Bit 0: Driver Door (1 – opened, 0 – closed).
- Bit 1: Passenger Door (1 – opened, 0 – closed).
- Bit 2: Rear Left Door (1 – opened, 0 – closed)
- Bit 3: Rear Right Door (1 – opened, 0 – closed).
- Bit 4: Trunk (1 – opened, 0 – closed).
- Bit 5: Hood (1 – opened, 0 – closed).
- Bit 6: Reserved.
- Bit 7: Reserved.

✧ <*Total Vehicle Overspeed Time*>: 5 bytes in total. The first 4 bytes are for the integer part of the total vehicle overspeed time and the last byte is for the fractional part. The fractional part has 2 digits.

✧ <*Total Vehicle Engine Overspeed Time*>: 5 bytes in total. The first 4 bytes are for the integer part of the total vehicle engine overspeed time and the last byte is for the fractional part. The fractional part has 2 digits.

✧ <*Total Distance Impulses*>: Vehicle distance in impulses. The number is always increasing. The unit is imp. If it is set to 0, the distance in imp is not available.

✧ <*Ad-Blue Level*>: The level of Ad-Blue. 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*>: Vehicle overspeed signal from the tachograph.

- 0: Overspeed is not detected.
- 1: Overspeed is detected.

✧ <*Tachograph Vehicle Motion Signal*>: The vehicle motion signal in the tachograph.

- 0: Motion is not detected
- 1: Motion is detected.

✧ <*Tachograph Driving Direction*>: Vehicle driving direction from the tachograph.

- 0: Driving forward.
- 1: Driving backward.

✧ <*Analog Input Value*>: The value of analog input. The unit is mv.

- <*Engine Braking Factor*>: It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with no pedal pressed causes an increase of the engine braking factor.
- <*Pedal Braking Factor*>: It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes an increase of pedal braking factor.
- <*Total Accelerator Kick-downs*>: The count of accelerator pedal kick-downs (with the pedal pressed over 90%).
- <*Total Effective Engine Speed Time*>: Total time when the vehicle engine speed is effective. The unit is hour. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Cruise Control Time*>: Total time when vehicle speed is controlled by cruise-control module. The unit is hour. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Accelerator Kick-down Time*>: Total time when accelerator pedal is pressed over 90%. The unit is hour. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- <*Total Brake Applications*>: The count of 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 by 0x00.
- <*Tachograph Driver 2 Card Number*>: The card number of tachograph driver 2. The value is a numeric string and ends by 0x00.
- <*Tachograph Driver 1 Name*>: The name of tachograph driver 1. The value is a name string and ends by 0x00.
- <*Tachograph Driver 2 Name*>: The name of tachograph driver 2. The value is a name string and ends by 0x00.
- <*Registration Number*>: The vehicle registration number. The value is a numeric string and ends by 0x00.
- <*Expansion Information*>: A hexadecimal number. Each bit contains information of one indicator.
    - Bit 0: W – webasto (1 – on, 0 – off or not available).
    - Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
    - Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
    - Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
    - Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
    - Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
    - Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
    - Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
    - Bit 8: Reserved.
    - Bit 9: CHK – “check engine” indicator (1 – on, 0 – off or not available)
    - Bit 10: AIR – airbags indicator (1 – on, 0 – off or not available)
    - Bit 11: SC – service call indicator (1 – on, 0 – off or not available)
    - Bit 12: OLL – oil level low indicator (1 – on, 0 – off or not available)
- <*Rapid Brakings*>: The number of total rapid brakings since installation (calculation based on

CAN 100 settings of speed decrease time and value).

- <*Rapid Accelerations*>: The number of total rapid accelerations since installation (calculation based on CAN 100 settings of speed increase time and value).
- <*Send Time*>: The local time to send the acknowledgement message. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

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

Appendix A: Two's Complement

For a positive value, the two's complement is itself. Take 17 as an example. Its hex format is 0x11 and the two's complement for it is 0x11. For a negative value, the following gives detailed calculations.

-X is a negative value.
Firstly, get to know the number of bits for the negative value N, then the two's complement for it is:

2^N - X

For example, to use 16 bits to represent -100, the two's complements for it should be:

2^16 – 100 = 65436 = 0xFF9C

Above is two's complement for -100 in hex format.

On the contrary, the two's complement can also be converted to the hex value that it represents in a similar way.

1. Get to know the number of bits for the two's complement.
2. Get the sign of the value, positive or negative. If the highest bit is 1, it is a negative value. If the highest bit is 0, it is a positive value.
3. If it is a positive value, there is no need for conversion. It is the value.
4. If it is a negative value, get the real value through the following calculation:

   -(2^N – X)

   Where:

   N is the number of bits for the two's complement.

   X is the value that is converted from the two's complement directly.

For example, if the number of bits for the two's complement is 16 and the two's complement is 0xFF9C, then it is a negative value as the highest bit is 1, and the detailed calculation for it is:

-(2^16 – 0XFF9C) = -100

Appendix B: Message Index

✧ **Command and ACK**

AT+GTBSI
+ACK:GTBSI
AT+GTSRI
+ACK:GTSRI
AT+GTQSS
+ACK:GTQSS
AT+GTCFG
+ACK:GTCFG
AT+GTOUT
+ACK:GTOUT
AT+GTDIS
+ACK:GTDIS
AT+GTIOB
+ACK:GTIOB
AT+GTEPS
+ACK:GTEPS
AT+GTFRI
+ACK:GTFRI
AT+GTGEO
+ACK:GTGEO
AT+GTTOW
+ACK:GTTOW
AT+GTSPD
+ACK:GTSPD
AT+GTSOS
+ACK:GTSOS
AT+GTIDL
+ACK:GTIDL
AT+GTHBM
+ACK:GTHBM
AT+GTTMA
+ACK:GTTMA
AT+GTOWH
+ACK: GTOWH
AT+GTDOG
+ACK:GTDOG
AT+GTPIN
+ACK:GTPIN
AT+GTRTO
+ACK:GTRTO
AT+GTHMC

+ACK:GTHMC
AT+GTWLT
+ACK:GTWLT
AT+GTPDS
+ACK:GTPDS
AT+GTSSR
+ACK:GTSSR
AT+GTBZA
+ACK:GTBZA
AT+GTSPA
+ACK:GTSPA
AT+GTRMD
+ACK:GTRMD
AT+GTFFC
+ACK:GTFFC
AT+GTCMD
+ACK:GTCMD
AT+GTUDF
+ACK:GTUDF
AT+GTJDC
+ACK:GTJDC
AT+GTUPC
+ACK:GTUPC
AT+GTPEO
+ACK:GTPEO
AT+GTGAM
+ACK:GTGAM
AT+GTVVS
+ACK:GTVVS
AT+GTAVS
+ACK:GVAVS
AT+GTCRA
+ACK:GTCRA
AT+GTASC
+ACK:GTASC
AT+GTAIS
+ACK:GTAIS
AT+GTBTS
+ACK:GTBTS
AT+GTDAT
+ACK:GTDAT
AT+GTURT
+ACK:GTURT
AT+GTRCS

+ACK:GTRCS
AT+GTBAS
+ACK:GTBAS
AT+GTVMS
+ACK:GTVMS
AT+GTFVR
+ACK:GTFVR
AT+GTBID
+ACK:GTBID

✧ **Position Related Report**

+RESP:GTTOW
+RESP:GTEPS
+RESP:GTDIS
+RESP:GTIOB
+RESP:GTFRI
+RESP:GTGEO
+RESP:GTSPD
+RESP:GTSOS
+RESP:GTRTL
+RESP:GTLBC
+RESP:GTDOG
+RESP:GTIGL
+RESP:GTHBM
+RESP:GTDOS
+RESP:GTGES
+RESP:GTGIN
+RESP:GTGOT
+RESP:GTVGL

✧ **Device Information Report**

+RESP:GTINF

✧ **Report for Querying**

+RESP:GTGPS
+RESP:GTALC
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTIOS
+RESP:GTTMZ
+RESP:GTALS
+RESP:GTALM

+RESP:GTSCS
+RESP:GTAIF

✧ **Event Report**

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN
+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTPDP
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF
+RESP:GTGSM
+RESP:GTGSS
+RESP:GTCRA
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTRMD
+RESP:GTUPC
+RESP:GTEUC
+RESP:GTVGN
+RESP:GTVGF
+RESP:GTBCS
+RESP:GTBDS
+RESP:GTBAA
+RESP:GTBID

✧ **Crash Data Packet**

+RESP:GTCRD

✧ **Acceleration Data Packet**

+RESP:GTACC

✧ **Heartbeat**

+ACK:GTHBD
+SACK:GTHBD

✧ **Server Acknowledgement**

+SACK

✧ **Hex Format Report Message**

+ACK

+RSP

+EVT

+INF

+HBD

+CRD