GV300 @Track Air Interface Protocol

GSM/GPRS/GPS Tracker

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Contents

Contents 2
0. Revision History 5
1. Overview 11
1.1. Scope of This Document 11
1.2. Reference 11
1.3. Terms and Abbreviations 11
2. System Architecture 12
3. Message Description 13
3.1. Message Format 13
3.2. Command And Acknowledgement 14
3.2.1. Server Connection 14
3.2.1.1. Bearer Setting Information 14
3.2.1.2. Backend Server Registration Information 15
3.2.1.3. Quick Start Settings 19
3.2.2. Device Configuration 20
3.2.2.1. Global Configuration 20
3.2.2.2. Auto-unlock PIN 24
3.2.2.3. Time Adjustment 25
3.2.2.4. Outside Working Hours 26
3.2.2.5. Protocol Watchdog 29
3.2.2.6. Settings for Preserving Special Logical State 31
3.2.2.7. Over-the-air Configuration Update 32
3.2.3. Position Related Report 34
3.2.3.1. Fixed Report Information 34
3.2.3.2. Frequency Change of Fixed Report Information 37
3.2.4. Alarm Settings 39
3.2.4.1. Tow Alarm Configuration 39
3.2.4.2. Geo-Fence Information 41
3.2.4.3. Polygon Geo-Fence 43
3.2.4.4. Roaming Detection Configuration 45
3.2.4.5. Speed Alarm 49
3.2.4.6. Buzzer Alarm Configuration 51
3.2.4.7. Overspeed Alarm 52
3.2.4.8. SOS Function 54
3.2.4.9. Voice Monitoring 56
3.2.4.10. Excessive Idling Detection 58
3.2.4.11. Start / Stop Report 59
3.2.4.12. Harsh Behavior Monitoring 61
3.2.4.13. Jamming Detection 64
3.2.4.14. Jamming Behavior Setting 65
3.2.4.15. Crash Detection and Acceleration Report 68

Queclink Confidential

3.2.4.16. Binding SIM Card 70
3.2.5. IO Application 71
3.2.5.1. Digital Output 71
3.2.5.2. Digital Input Port Setting 74
3.2.5.3. Input / Output Port Binding 76
3.2.5.4. External Power Supply Monitoring 78
3.2.5.5. Analog Input Port Setting 80
3.2.6. Serial Port Application 84
3.2.6.1. Serial Port Setting 84
3.2.6.2. Transparent Data Transmission 88
3.2.6.3. AC100 Device Setting 89
3.2.6.4. External Digital Fuel Sensor 91
3.2.6.5. ID Authentication 93
3.2.6.6. Temperature Alarm 95
3.2.6.7. Uart Data Transfer 97
3.2.6.8. Fuel Sensor Calibration Table 99
3.2.6.9. Camera Setting Command 101
3.2.6.10. Taking Picture Command 103
3.2.6.11. Main Serial Port Setting 104
3.2.6.12. CANBUS Device Configuration 106
3.2.6.13. CANBUS Alarm Setting 111
3.2.6.14. UFSxxx FOTA Upgrade 119
3.2.6.15. FTP Server Information 120
3.2.6.16. Output Expansion 122
3.2.6.17. Input Expansion 123
3.2.6.18. CAN100 FOTA Upgrade 125
3.2.7. Other Settings 126
3.2.7.1. Real Time Operation 126
3.2.7.2. Hour Meter Counter 131
3.2.7.3. White List 132
3.2.7.4. Command String Storage 133
3.2.7.5. User Defined Function 134
3.2.7.6. MS Band Selection 139
3.2.7.7. GPS-Assisted Motion Measurement 140
3.3. Report 142
3.3.1. Position Related Report 142
3.3.2. Device Information Report 159
3.3.3. Report for Real Time Querying 162
3.3.3.1. +RESP:GTGPS 162
3.3.3.2. +RESP:GTALM 163
3.3.3.3. +RESP:GTALC 164
3.3.3.4. +RESP:GTCID 202
3.3.3.5. +RESP:GTCSQ 202
3.3.3.6. +RESP:GTVER 203

Queclink Confidential

3.3.3.7. +RESP:GTBAT 204
3.3.3.8. +RESP:GTIOS 205
3.3.3.9. +RESP:GTTMZ 205
3.3.3.10. +RESP:GTAIF 206
3.3.3.11. +RESP:GTALS 207
3.3.3.12. +RESP:GTGSV 208
3.3.3.13. +RESP:GTUVN 209
3.3.3.14. +RESP:GTCVN 210
3.3.3.15. +RESP:GTCSN 211
3.3.4. Event Report 211
3.3.5. Data Report 242
3.3.6. Buffer Report 243
3.3.7. Transparent Data Transmission 244
3.3.8. Data Transmission Based on Specified Terminator Character or Data Length 246
3.3.9. Report with Google Maps Hyperlink 248
3.3.10. Uart Data Transfer 249
3.3.11. Crash Data Packet 251
3.3.12. Crash GPS Information 253
3.3.13. Acceleration Data Packet 254
3.3.14. CANBUS Device Information Report 256
3.3.15. UFSxxx FOTA Upgrade Report 262
3.4. Heartbeat 263
3.5. Server Acknowledgement 264
4. HEX Format Report Message 265
4.1. Hex Report Mask 265
4.2. Acknowledgement +ACK 273
4.3. Location Report +RSP 276
4.4. Information Report +INF 294
4.5. Event Report +EVT 300
4.6. Data Report +DAT 345
4.7. Heartbeat Data +HBD 347
4.8. Buffer Report in HEX Format 348
4.9. Crash Data Packet 348
4.10. Acceleration Data Packet 350
4.11. CANBUS Device Information Report 351
Appendix: Message Index 359

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0. Revision History

Revision	Date	Author	Description of Change
1.01	2014-04-08	Eric Xu	Initial
2.01	2014-09-28	Eric Xu	1. Changed **+RESP:GTPNL** to Reserved.
2.02	2015-01-10	Page Zhong	1. Added the command **AT+GTCRA** for crash detection. 2. Added *<+CRD Mask>* in the command **AT+GTHRM**. 3. Added *<Turn and Brake Threshold>*, *<Turn and Brake Duration>*, *<Acceleration Threshold>*, *<Acceleration Duration>*, and changed *<Enable>* to *<Mode>* for which three modes (2-4) are added in the command **AT+GTHBM**.
3.01	2015-02-09

			command **AT+GTFRI**.
	2015-04-07	Mickey Shi	3. Added the description for the **+RESP:GTUVN** in the hex report message.
	2015-04-09	Mickey Shi	4. Changed the <*Min. Threshold*> and <*Max. Threshold*> range in the command **AT+GTAIS**.
	2015-04-10	Mickey Shi	5. Updated the parameter <*Input ID Mask*> of the command **AT+GTUDF**.
4.02	2015-04-17	Eric Xu	1. Changed UFS100 to UFSxxx in the <*Digit Fuel Sensor Type*> of the **AT+GTURT**. 2. Added DUT-E SUM type in the <*Digit Fuel Sensor Type*> of the **AT+GTURT**.
	2015-04-21	Eric Xu	3. Added Bit 14 in <*Event Mask*> of **AT+GTCFG** for the message **+RESP:GTEXP**. 4. Added the <*Report Sensor Data*> parameter in the **AT+GTEFS** command for reporting raw data from fuel sensor by message **+RESP:GTFSD**. 5. Modified <*Known Roaming Event Mask*> parameter in the **AT+GTRMD** command**.**
	2015-04-21	Mickey Shi	6. Updated protocol version.
4.03	2015-04-24	Mickey Shi	1. Updated the default password in every command.
		Eric Xu	2. Added <*CAN Data*> in the +RSP in HEX format. 3. Added Note for <*ERI Mask*> in the **AT+GTFR**I command.
	2015-05-14	Mickey Shi	4. Moved the **AT+GTBZA** to the front of the **AT+GTSPA**. 5. Added two fault codes in <*HW Fault Code*> of the **+RESP:GTEXP**. 6. Updated the Contents.
4.04	2015-05-19	Mickey Shi	1. Updated protocol version to 4.04.
5.01	2015-06-08	Mickey Shi	1. Added the **AT+GTFTP** command and the **+RESP:GTFTP** message. 2. Added the <*Server Type*> parameter in **AT+GTCMS**. 3. Added Garmin Protocol Reference.
	2015-06-10	Mickey Shi	4. Added <*Ignition State*> and <*Speed*> in **+RESP:GTLBC**. 5. Added the <*Start Time*> and <*End Time*> fields in **AT+GTGEO**. 6. Added the <*Behavior Duration*> field in **AT+GTHBM**.

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	2015-06-11	Mickey Shi	7. Added <*Output Direction*> field in **AT+GTRTO**. 8. Added <*Need Ack*> field in **AT+GTDAT**. 9. Added the message type **AT+GTFTP** in +ACK. 10. Added PEO mask in **AT+GTPDS**. 11. Added PEO-Fence state in the message **+RESP:GTUDT**.
5.02	2015-06-13 2015-06-15 2015-06-17	Mickey Shi Mickey Shi Mickey Shi	1. Updated protocol version to R5.02. 2. Updated the **Google Maps Hyperlink** message description. 3. Added <*Total Distance Impulses*> in CANBUS HEX message.
5.03	2015-06-18	Mickey Shi	1. Updated protocol version to R5.03.
5.04	2015-06-24	Mickey Shi	1. Modified <*File Name*> description in **+RESP:GTFTP** HEX message. 2. Updated protocol version to R5.04.
5.05	2015-06-26 2015-07-09	Mickey Shi Mickey Shi	1. Updated protocol version to R5.05. 2. Added **+RESP:GTCRA** in Event Report.
5.06	2015-07-09	Mickey Shi	1. Updated protocol version to R5.06.
6.00	2015-08-06	Eric Xu Page Zhong Eric Xu Eric Xu	1. Added parameters <*Inpeo Mask*> and <*Outpeo Mask*> in the command **AT+GTUDF**. 2. Expanded the length of <*Data*> in command **AT+GTDAT** to 1280. 3. Added <*Ex Detection Frequency IGF*> parameter in the **AT+GTEFS** command. 4. Added the **AT+GTBSE** command.
6.01	2015-08-18 Eric Xu 2015-08-21	Alan Dong Alan Dong	1. Added the command **AT+GTSIM**. 2. Used Bit 34 for "No change of SIM card" and Bit 35 for "SIM card change" in the command **AT+GTUDF**. 3. Modified the range of <*Enter Jamming Timer Threshold*> to "0 – 3600" in the command **AT+GTJDC**. 4. Added the <*Report ID*> parameter in the **AT+GTSPD** command. 5. Used Bit 51 of "SIM" for parameter <*Configuration Mask Table*> in the command **AT+GTRTO.**

6.02	2015-08-25 2015-08-31 2015-09-02	Alan Dong Alan Dong Page Zhong	1. Modified the description of parameter <*Mode*>, parameter <*ICCID*> and parameter <*Output Status*> in the command **AT+GTSIM**. 2. Added the message type **AT+GTSIM** for parameter <*Message Type*> in "+ACK" HEX Report. 3. Added **AT+GTURT** mode 17. 4. Added commands **AT+GTOEX** and **AT+GTIEX**. 5. Added the value range '9 – C' for related output and input in all AT commands.
6.03	2015-09-11 2015-09-14	Page Zhong Eric Xu	1. Used Bit 26 of <*+RSP Mask*> and <*+EVT Mask*> for <*EIO100 IO Status*> in the command **AT+GTHRM**. 2. Added <*Voltage Margin Error*> and <*Debounce Voltage Threshold*> parameters in the command **AT+GTEPS**.
7.00		Page Zhong	1. Updated protocol version to R7.00.
7.01	2015-10-20	Bing Ye	1. Added "White List for SMS" in <*Call Filter*> parameter of **AT+GTWLT**.
7.02	2015-11-05	Bing Ye	1. Added the command **AT+GTUPC**.
7.03	2015-11-27 2015-12-03	Alan Dong	1. Added the command **AT+GTCLT** and **+RESP:GTCLT**. 2. Added hex report in **AT+GTCLT** function.
7.04	2015-12-03 2015-12-07 2015-12-07	Eric Xu Alan Dong Bing Ye	1. Added CAN data mask in the <*ERI Mask*> of the **AT+GTFRI** command. 2. Modified hex report in **AT+GTCLT** function. 3. Added hex report in **AT+GTUPC** function.
8.00	2016-01-08 2016-01-20 2016-01-21 2016-01-22	Eric Xu Bing Ye Bing Ye Eric Xu	1. Added the <*CAN Report Expansion Mask*> parameter in the **AT+GTCAN** command. 2. Added log-out event in **AT+GTIDA**. 3. Added the exec result to the second serial port when the **AT+GTDAT** command is executed on the second serial port. 4. Added Old RFID in <*RFID Type*> parameter of the **AT+GTURT** command.
8.01	2016-02-01 2016-02-02 2016-02-02 2016-02-03	Page Zhong Bing Ye Alan Dong Alan Dong	1. Added parameter <*EHD Support*> in the command **AT+GTCMS**. 2. Added parameter <*Report GPS Information*> in command **AT+GTCRA** and **+RESP:GTCRG**. 3. Added the <*CAN Report Expansion Mask*> parameter in the **AT+GTCLT** command. 4. Modified the range of <*High RPM*

			threshold> in **AT+GTCLT**.
8.02	2016-02-18	Bing Ye	1. Added mode 3 in <*Output Direction*> parameter of **AT+GTRTO.**
8.03	2016-02-23 2016-02-24 2016-03-02	Bing Ye Bing Ye Eric Xu	1. Added VD RFID in <*RFID Type*> parameter of the **AT+GTURT** command. 2. Added <*RFID*> in +RSP and +EVT messages in hex format. 3. Modified the description for <*Output Direction*> in the **AT+GTRTO** message.
9.00	2016-04-08	Eric Xu	1. Changed the range of <*Motion Threshold*> in the **AT+GTTOW** command and the range is set to 2 - 9. 2. Added <*Time Unit*> parameter in the **AT+GTSSR** command.
9.01	2016-04-27 2016-04-28	Page Zhong Bing Ye	1. Added command **AT+GTGAM**. 2. Added <*MPN/MPF Validity Time*> parameter in the **AT+GTEPS** command.
9.02	2016-05-10	Page Zhong	1. Added the parameter <*Digital Fuel Sensor Type*> in message **+RESP:GTEXP**.
10.00	2016-06-21	Bing Ye	1. Updated protocol version to R10.00.
10.01	2016-07-05	Bing Ye	1. Added <*IGF Fuel Update*> parameter in the **AT+GTAIS** command.
10.02	2016-07-07 2016-07-12	Bing Ye Bart Yuan	1. Added the command **AT+GTCFU** and **+RESP:GTCFU**. 2. Added a new parameter in the command **AT+GTMON** to specify the ring number before the incoming call is answered.
10.03	2016-07-12 2016-07-13	Bing Ye Bing Ye	1. Added "CSN" in <*Sub Command*> of **AT+GTRTO** and **+RESP:GTCSN** message. 2. Added <*Release Fuel Cut-off Timer*> parameter in **AT+GTJBS**.
10.04	2016-08-11	Bing Ye	1. Changed the default value of <*Motion Speed Threshold*> in **AT+GTGAM** to 25.
11.00	2016-08-19	Bing Ye	1. Updated protocol version to R11.00.
12.00	2016-10-17 2016-11-02 2016-11-09	Eric Xu Carr Zhu Carr Zhu	1. Modified the **+RESP:GTVER** message format of the +INF HEX message. 2. Added sleep_mode 3 in <*Enable Sleep*> of the **AT+GTURT** command. 3. Added RFID Type 4 to support DR100 of the **AT+GTURT** command.
12.01	2016-11-21	Eric Xu	1. Added the <*Check Interval*> parameter in the **AT+GTFRI** command.
12.02	2016-12-02	Carr Zhu	1. Added <*IGN Sample Count*> and <*Ex Fuel*

			Loss Alarm IGN> to the **AT+GTEFS** command. 2. Added support for backup server domain name function.

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1. Overview

1.1. Scope of This Document

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

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

1.2. Reference

Garmin_FMI Protocol Reference

SN	Document Name	Remark
[1]	@Track Air Interface for Garmin-FMI Protocol	The air protocol interface between GV300 and Garmin

1.3. 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

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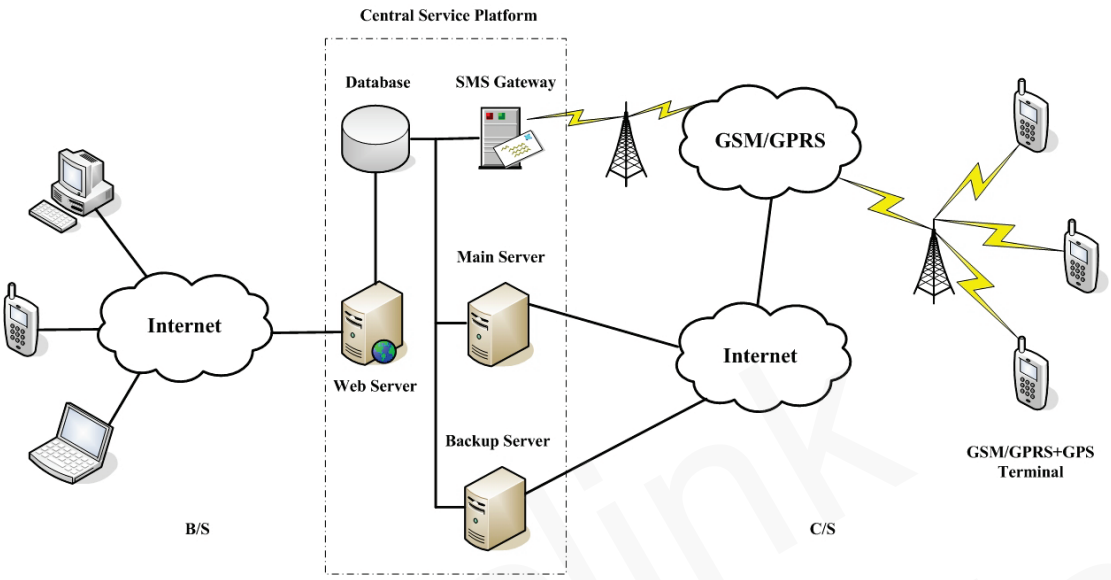
2. System Architecture



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

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3. Message Description

3.1. Message Format

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

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

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

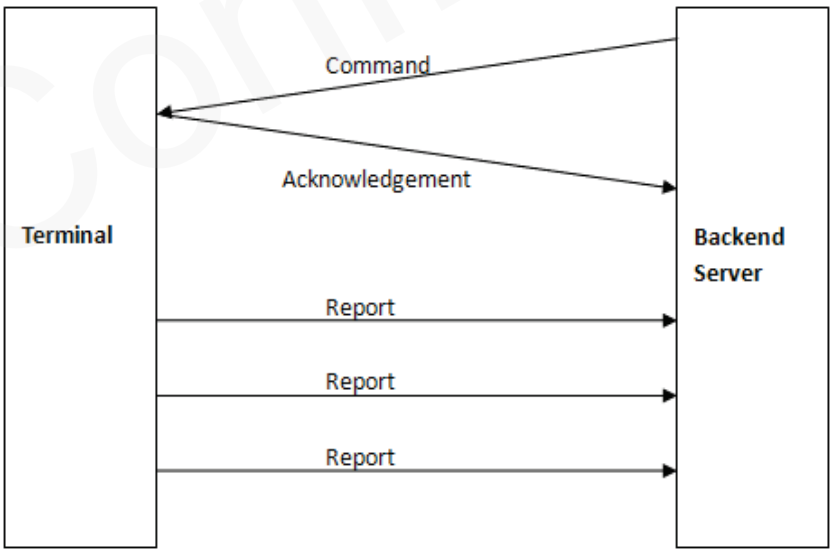

Figure 1: @Tracker Protocol Message Flow

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=gv300,cmnet,,,wapnet,,,,0000$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Backup APN	<=40		
Backup APN User Name	<=30		
Backup APN Password	<=30		
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 "gv300".

✧ <*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.

✧ <*Backup APN*>: Backup access point name (APN). If the <*APN*> doesn't work, the <*Backup APN*> will be used.

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

✧ <*Backup APN Password*>: The backup 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 for the command.
- <*Tail Character*>: A character which indicates the end of the command. And it must be '$'.

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

- **+ACK:GTBSI,**

Example: **+ACK:GTBSI,250504,135790246811220,,0000,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Protocol Version*>: The protocol version that the terminal conforms to. The first two characters represent the device type. As shown in the example in the table above, "**25**" means GV300 New Version. The middle two characters represent the major version number of protocol and the last two characters represent the minor version number of protocol. And both version numbers are hex digits. For example, "**020A**" means version 2.10.
- <*Unique ID*>: The IMEI of the terminal.
- <*Device Name*>: The specified name of the device.
- <*Serial Number*>: The 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-incrementing 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 which indicates the end of the command. It must be '$'.

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

3.2.1.2.Backend Server Registration Information

The command **AT+GTSRI** is used to configure how to report all the messages, including the server

information and the communication method between the backend server and the terminal. If the terminal is configured correctly, it should be able to report data to the backend server.

➢ **AT+GTSRI=**

Example: **AT+GTSRI=gv300,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$** **AT+GTSRI=gv300,3,,1,some.host.name,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Report Mode	1	0 – 7	0
Reserved	0		
Buffer Mode	1	0|1|2	1
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP / Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	0
Enable SACK	1	0|1|2	0
Protocol Format	1	0|1	0
Enable SMS ACK	1	0|1	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 0: Stop mode.
- 1: TCP short-connection preferred mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. And if it fails

to establish TCP connection to the backend server (both Main Server and Backup Server), it will try to send data via SMS to the SMS gateway.

- 2: TCP short-connection forced mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. If the terminal fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the memory buffer if the buffer report function is enabled. Otherwise the data is 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 the heartbeat data. The backend server should respond to the heartbeat data from the terminals.
- 4: UDP mode. The terminal will send data to the backend server through the UDP protocol. Receiving protocol commands via UDP is supported if the GPRS network allows it. It is recommended to enable heartbeat and **+RESP:GTPDP** report in the case of receiving commands via UDP.
- 5: Forced SMS mode. Only SMS is used for data transmission.
- 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using 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, or the value of <*Main Server Port*>.
- 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. And if the connection to the backup server is also lost, it will try to connect to the main server again.

✧ <*Buffer Mode*>: The working mode of the buffer report function. If the buffer report function is enabled and the device goes into areas without GSM/GPRS network coverage, it will store all reports locally. If the device goes into 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. Under this working mode, the device will send the buffered messages after real time messages.
- 2: High priority - Enable the buffer report function. Under this working mode, the device will send all the buffered messages before real time messages except the SOS message (**+RESP:GTSOS**).

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

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

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

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

- <*SMS Gateway*>: It is a maximum of 20 characters including the optional national code starting with "+" for sending SMS messages. Short code (for example, 10086) is also supported.
- <*Heartbeat Interval*>: The interval for sending heartbeat messages (**+ACK:GTHBD**) when report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat message will be sent.
- <*Enable SACK*>: This defines whether the backend server should respond to the terminal with a SACK message when receiving a message from the terminal.
  - 0: The backend server does not reply with a SACK message when receiving a message from the terminal.
  - 1: The backend server replies with a SACK message when receiving a message from the terminal.
  - 2: The backend server replies with a SACK message when receiving a message from the terminal, but the terminal does not check the serial number of the SACK message.

  Note: If the terminal receives **+SACK:GTHBD** from the backend server, the terminal must check the serial number of the SACK message **+SACK:GTHBD** regardless of the <*Enable SACK*> value.
- <*Protocol Format*>: This defines the format of the report messages sent from the device to the backend server. 0 means "ASCII format", and 1 means "HEX format".
- <*Enable SMS ACK*>: This defines whether to reply with the ACK confirmation via SMS when the command is sent via SMS.
  - 0: The device will send the ACK confirmation using the mode specified by the <*Report Mode*>.
  - 1: The device will send the ACK confirmation via SMS to the phone number from which the command is sent via SMS.

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

- **+ACK:GTSRI,**

Example: **+ACK:GTSRI, 250504,135790246811220,,0001,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.2.1.3.Quick Start Settings

The command **AT+GTQSS** is used to configure the GPRS and the backend server parameters when it contains all the settings of **AT+GTBSI** and **AT+GTSRI** and its length is within 160 bytes. Otherwise, use the two commands **AT+GTBSI** and **AT+GTSRI** to set those parameters.

- **AT+GTQSS=**

Example: **AT+GTQSS=gv300,cmnet,,,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,0002$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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	
Backup Server IP / Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	0
Enable SACK	1	0|1|2	0
Protocol Format	1	0|1	0
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- **+ACK:GTQSS,**

Example: **+ACK:GTQSS, 250504,135790246811220,,0002,20090214093254,11F0$**			
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	$	$

3.2.2.Device Configuration

3.2.2.1.Global Configuration

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

- **AT+GTCFG=**

Example: **AT+GTCFG=gv300,123456,gv300,,,,,,,,,,,,,,,,,,0,0003$** **AT+GTCFG=gv300,gv300,gv300,1,123.4,,,3F,2,,3FFF,0,1,1,300,0,1,0,1,1F,1,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
New Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv300
Enable ODO	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
Reserved	0		
Event Mask	<=4	0000 – FFFF	3FFF
Pin15 Mode	1	0|1	0
LED On	1	0|1	0
Enable Info Report	1	0|1	0
Info Report Interval	<=5	30 – 86400sec	300
Location by Call	1	0|1|2|3	0
Echo Suppression	1	1|2	1
Backup Battery Charge Mode	1	0|1	0
AGPS Mode	1	0|1	0
GSM Report	4	0000 – FFFF	001F
GPS 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.
- <*Enable ODO*>: Enable / disable the odograph which calculates 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 report messages, especially the composition of GPS information.
  - Bit 0 for <*Speed*>
  - Bit 1 for <*Azimuth*>
  - Bit 2 for <*Altitude*>
  - Bit 3 for GSM tower data, including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*Reserved*> parameter value "00"
  - 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. This mask is valid for all report messages.
- <*Power Saving Mode*>: The mode of power saving function. If the <*Power Saving Mode*> is set to 0, the fixed report will follow <*IGF Report Interval*> when the engine is off. If the <*Power Saving Mode*> is set to 1, the fixed report (**+RESP:GTFRI)**, geo-fence (**+RESP:GTGEO** and **+RESP:GTGIN** / **+RESP:GTGOT**) and speed alarm (**+RESP:GTSPD**) report messages will be

suspended when the device is at a standstill or the engine is off (Auto parking fence and manual parking fence will not be suspended in this case). If the <*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 <*IGF Report Interval*> in **AT+GTFRI** will be followed instead of the fix and send interval of fixed report when the engine is off.

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

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

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

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

✧ <*Pin15 Mode*>: It configures the working mode of the pin 15 on the connector.

- 0: Analog input 1.
- 1: Digital input 3.

✧ <*LED On*>: It configures the working mode of power LED and GPS LED.

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

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

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

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

✧ <*Location by Call*>: It configures how to handle the incoming call if <*Mode*> in **AT+GTMON** is not 2 or 3.

- 0: Just hang up the call.
- 1: Hang up the call and report the current position (**+RESP:GTLBC**).
- 2: Hang up the call and report the current position with a Google Maps link via SMS to the phone number of the incoming call.
- 3: Hang up the call. Send the current position report message (**+RESP:GTLBC**) and report the current position with a Google Maps link through SMS to the phone number of the incoming call at the same time.

✧ <*Echo Suppression*>: It configures one of the two phases for echo suppression.

- 1: Cancel and suppress echo.
- 2: Cancel and force suppress echo.

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

- 0: If the main power supply is connected, charge the backup battery on need.
- 1: If the main power supply is connected, only charge the backup battery when ignition on is detected. The charge process begins 3 minutes after ignition on. The charge process is stopped when the ignition is turned off.

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

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

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

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

- 0: Do not allow the cell information report.
- 1: Allow the cell information report after failing to get GPS position if cell information is available.
- 2: Report the message **+RESP:GTGSM** after each successful GPS fix if cell information is available.
- 3: Report the message **+RESP:GTGSM** regardless of whether getting GPS position is successful or not if cell information is available.

Bitwise mask to configure which event report should be sent to the backend server.

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

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

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

0 means “Disable this function”.

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

➢ **+ACK:GTCFG,**

Example: **+ACK:GTCFG, 250504,135790246811220,,0003,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.2.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, use this command to make the device auto-unlock the SIM PIN with the pre-set PIN code.

➢ **AT+GTPIN=**

Example: **AT+GTPIN=gv300,1,0000,,,,,,0014$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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 function.
- ✧ *<PIN>*: The code used to unlock the SIM PIN.

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

➢ **+ACK:GTPIN,**

Example: **+ACK:GTPIN, 250504,135790246811220,,0014,20090214093254,11F0$**			
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	$	$

3.2.2.3.Time Adjustment

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

➢ **AT+GTTMA=**

Example: **AT+GTTMA=gv300,-,3,30,0,20090917203500,,,,,0011$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Sign	1	+|–	+
Hour Offset	<=2	0 – 23	

Minute Offset	<=2	0 – 59	
Daylight Saving	1	0|1	
UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character			

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

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

➢ **+ACK:GTTMA,**

Example: **+ACK:GTTMA, 250504,135790246811220,,0011,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.4.Outside Working Hours

To protect the privacy of the driver when he is off duty, the device could be configured to report

empty location information outside working hours. The command **AT+GTOWH** is used to define the working hours and the working mode to protect the privacy. If this function is enabled, the device will report empty latitude, empty longitude, empty LAC and empty Cell ID in all the report messages except **+RESP:GTSOS**, **+RESP:GTJDR** and **+RESP:GTJDS**. For **AT+GTMON**, it only reports the **+RESP:GTMON** message (with empty location information) to the backend server and does not make monitoring phone call.

➢ **AT+GTOWH=**

Example: **AT+GTOWH=gv300,1,1F,0900,1200,1300,1730,,,3,1,1,0,0,,,,,0012$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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 – 3|9 – C	0
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 0: Disable this function.

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

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

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

✧ <*Output ID*>, <*Output Status*>, <*Duration*> and <*Toggle Times*>: If this function is enabled and it is outside working hours, the specified wave will be output at the specified output.

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

➢ **+ACK:GTOWH,**

Example: **+ACK:GTOWH, 250504,135790246811220,,0012,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

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

3.2.2.5.Protocol Watchdog

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

➢ **AT+GTDOG=**

Example: **AT+GTDOG=gv300,1,,1,0130,,1,1,,60,60,,0013$** **AT+GTDOG=gv300,2,30,,,,1,2,,60,60,,0013$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1|2	0
Ignition Frequency	<=3	10 – 120 min	60
Interval	<=2	1 – 30 day	30
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0|1	1
Input ID	1	0|1|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 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.

✧ <*Interval*>: The interval for rebooting the device. It is measured in days. Rebooting the device for the first time will ignore this interval.

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

✧ <*Report Before Reboot*>: Whether to report the **+RESP:GTDOG** message before reboot. 0 means "Do not report the message", and 1 means "Report the message". If this function is enabled, the device will initiate a real-time fix before sending the message with the current location information.

✧ <*Input ID*>: The ID of the digital input port which is used to trigger the manual reboot. 0 means "Do not use manual reboot". Only digital input ports 1 and 2 are supported.

✧ <*GSM Interval*>: The interval for rebooting the device in no GSM signal situation. 0 means "Do not reboot the device".

✧ <*PDP Interval*>: The interval for rebooting the device when the device is unable to register GPRS network. 0 means "Do not reboot the device". Before using this parameter, at least one of the two fields <*APN*> and <*Backup APN*> in the command **AT+GTBSI** should not be empty.

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

➢ **+ACK:GTDOG,**

Example: **+ACK:GTDOG, 250504,135790246811220,,0013,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.6.Settings for Preserving Special Logical State

The command **AT+GTPDS** is used to preserve special logical state for the terminal. Enable the function according to the working mode setting, and choose logical state(s) to be saved according to the value of the <*Mask*>.

➢ **AT+GTPDS=**

Example: **AT+GTPDS=gv300,1,1F,,,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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*>: It controls the mode of preserving special logical state(s) of the device.

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

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

Each bit represents a state.

- Bit 0: States of GEO
- Bit 1: Reserved
- Bit 2: State of GPS antenna
- Bit 3: Information of last known position
- Bit 4: State of ignition
- Bit 5: State of wave shape 1
- Bit 6: State of digital input
- Bit 7: State of SPD

- Bit 8: State of SSR
- Bit 9: State of main power
- Bit10: State of PEO

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

➢ **+ACK:GTPDS,**

Example: **+ACK:GTPDS, 250504,135790246811220,,000D,20090214093254,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.2.7.Over-the-air Configuration Update

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

➢ **AT+GTUPC=**

Example: **AT+GTUPC=gv300,0,10,0,0,168,http://www.queclink.com/configure.ini,0,,,,0001$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default value**
Password	4~20	'0'-'9', 'a'-'z', 'A'-'Z'	gv300
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		
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 "gv300".
- <*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** when the configuration is updated over the air.
  - 0:Do not report the message **+RESP:GTUPC**.
  - 1:Report the message **+RESP:GTUPC**.
- <*Update Interval*>: The time interval measured in hours for updating the configuration over the air.
- <*Download URL*>: It specifies the URL to download the configuration file. If the <*Download URL*> ends with "/" which means the URL is just a path without file name, the unit will add <imei>.ini as the file name to complete the URL. If it is greater than 100 bytes in length, error will be returned.
- <*Mode*>: A numeral which indicates the working mode of downloading configuration over the air.
  - 0: Disable this function.
  - 1: Enable this function.

Note:

1. The maximum number of commands in configuration file is 255. If there are more than 255 commands in the configuration file, the device will fail to download the configuration file.
2. Make sure there is only one command per line in the configuration file and there should be a "\r\n" between each command.
3. There should be no space before each command.
4. The configurations containing file should be a plain text file.

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

- **+ACK:GTUPC**

Example: **+ACK:GTUPC, 250504,135790246811220,,0005,20100310172830,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note: If the <*Download URL*> ends with "/" which means the URL is just a path without file name, the unit will add <imie>.ini as the file name to complete the URL. If the URL is greater than 100 bytes in length, error will be returned.

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** or **+RESP:GTERI**).

➢ **AT+GTFRI=**

Example:
AT+GTFRI=gv300,0,,,,,,,,,,,,,,,,0009$
AT+GTFRI=gv300,1,1,,1,1000,2300,,30,,,,,600,,,,,0009$
AT+GTFRI=gv300,2,1,,1,1000,2300,,,500,,,,,,,,,0009$
AT+GTFRI=gv300,3,1,,1,1000,2300,,,,1000,,,,,,,,0009$
AT+GTFRI=gv300,4,1,,1,1000,2300,,60,,300,,,,,,,,0009$

Parameter	Length (Byte)	Range / Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0 – 5	0
Discard No Fix	<=2	0|1	1
Reserved	0		
Enable Period	1	0|1	1
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
Check Interval	<=5	0– 86400sec	0
Send Interval	<=5	1– 86400sec	30
Distance	<=5	50 – 65535m	1000
Mileage	<=5	50 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0|5-86400sec	600

ERI Mask	8	00000000-FFFFFFFF	00000000
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

  Note: If the engine is off, the position report message will be sent to the backend server periodically according to the parameter <*IGF Report Interval*>.
- <*Discard No Fix*>: Disable / enable reporting when there is no GPS fix.
  - 0: Enable reporting.
  - 1: Disable reporting.
- <*Enable Period*>: Disable / enable the time range specified by <*Start time*> and <*End Time*>. If the time range is enabled, the position reporting will be limited within the time range.
- <*Start Time*>: The start time of the scheduled report. The valid format is “HHMM”. The value range of “HH” is “00”–“23”. The value range of “MM” is “00”–“59”.
- <*End Time*>: The end time of the scheduled report. The valid format and range are the same

as those of <*Start Time*>.

- <*Check Interval*>: The time interval for updating GPS position. Its range is 0 – 86400 and the unit is second. If its value is 0, the device will update GPS position according to the value of <*Send Interval*>. 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 the position information. The value range is 1 – 86400 and the unit is second. If <*Report Mode*> in **AT+GTSRI** is set to forced SMS mode, this value should be greater than 15 seconds; otherwise the device will send the position information via TCP short connection.
  Due to the limitation of the maximum report message length, 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 used to determine whether the device is turning around a corner. 0 means "Disable the corner report". In case of other values, the device will compare the current heading with that of the last known corner report. If the difference is greater than or equal to this value, the corner report information will be sent with **+RESP:GTFRI**.
  Note: If FRI multi-point report occurs at the same time with corner report, the corner point will be included in multi-point report message, and the <*Report Type*> of the **+RESP:GTFRI** message will be set to 0.
- <*IGF Report Interval*>: The time interval for fixing and sending the position information when <*Power Saving Mode*> in **AT+GTCFG** is set to 0|2 and the engine is off. Its value range is 0|5 – 86400 and the unit is second.
- <*ERI Mask*>: When the serial port is connected with a peripheral, and the bit for the peripheral is set to 1, the device will report **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure whether to report the data from peripherals via **+RESP:GTERI**.
  - Bit 0 for the <*Digital Fuel Sensor Data*> field in **+RESP:GTERI**
  - Bit 1 for the <*AC100 Data*> field in **+RESP:GTERI**
  - Bit 2 for the <*CAN Data*> field in **+RESP:GTERI** (This mask just works in **+RESP:GTERI** ASCII message)
  - Bit 3 for the <*Percentage*> field in **+RESP:GTERI**. If it is set to 1, the data block <*Fuel Sensor Data*> will appear.
  - Bit 4 for the <*Volume*> field in **+RESP:GTERI**. If it is set to 1, the data block <*Fuel Sensor Data*> will appear.

Note: Bit 3 and Bit 4 are related to **AT+GTFSC**. If none of the calibration table is set or <*Num of Node*> is 0, the percentage and the volume of the fuel will show as reserved in the message **+RESP:GTERI**. Bit 1 is related to AC100 mode of **AT+GTURT**. If <*Working Mode*> in **AT+GTURT** is 5 (used for AC100 devices), the AC100 Device Number information will be included in the message **+RESP:GTERI**.

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

➢ **+ACK:GTFRI,**

Example: **+ACK:GTFRI, 250504,135790246811220,,0009,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.3.2.Frequency Change of Fixed Report Information

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

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

➢ **AT+GTFFC=**

Example: **AT+GTFFC=gv300,0,1,0,30,500,500,300,,,,,0000$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Priority	1	0-4	0
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0|5-86400s	300

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

- <*Priority*>: The priority of the event which triggers the change of fixed report parameters. 0 means "the highest priority".
- <*Mode*>: It specifies the trigger event for the fixed report parameter change.
  - 0: Disable the parameters of the specified priority.
  - 1: Change the fixed report parameters when the device enters into any of the defined Geo-Fence.
  - 2: Change the fixed report parameters when the device enters into known GSM roaming state. (Please refer to the **AT+GTRMD** command for more information.)
  - 3: Change the fixed report parameter when the device enters into unknown GSM roaming state.
- <*FRI Mode*>: If the specified event occurs, the working mode of the fixed report will be changed according to this parameter.
  - 0: Do not change the working mode.
  - 1: Change the working mode to "Fixed Time Report".
  - 2: Change the working mode to "Fixed Distance Report".
  - 3: Change the working mode to "Fixed Mileage Report".
  - 4: Change the working mode to "Optimum Report".
  - 5: Change the working mode to "Fixed Time or Mileage Report".
- <*FRI IGN Report Interval*>: Period of time for sending the position information when 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 mode is fixed distance report. Unit: meter.
- <*FRI Report Mileage*>: The specified path length for sending the position information when the mode is fixed mileage report or optimum report. Unit: meter.
- <*FRI IGF Report Interval*>: Period of time for fixing and sending the position information when the ignition is off and <*Power Saving Mode*> in **AT+GTCFG** is set to 0|2. The value range is 0|5 – 86400 and the unit is second.

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

- **+ACK:GTFFC,**

Example: **+ACK:GTFFC, 250504,135790246811220,,0009,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**

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

3.2.4.Alarm Settings

3.2.4.1.Tow Alarm Configuration

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

➢ **AT+GTTOW=**

Example: **AT+GTTOW=gv300,1,5,0,120,1,0,5,10,4,10,4,,,,,,,,,000B$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Enable Tow	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 – 3|9 – C	
Tow Output Status	1	0|1	
Tow Output Duration	<=3	0 – 255 (×100ms)	0
Tow Output Toggle Times	<=3	0 – 255	0
Rest Duration	<=3	1 – 255 (×15sec)	2
Motion Duration	<=2	1 – 10 (×100ms)	3
Motion Threshold	1	2 – 9	2
Reserved	0		
Reserved	0		

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

- <*Enable Tow*>: Enable or disable tow alarm (**+RESP:GTTOW**).
  - 0: Disable the tow alarm function.
  - 1: Enable the tow alarm function.
- <*Engine Off to Tow*>: A time parameter used to measure whether the device is considered to be towed after the engine is turned off. If the motion sensor doesn't detect stillness within the specified time after the engine is turned off, the device is being towed.
- <*Fake Tow Delay*>: If the motion sensor detects movement after the engine is turned off and stillness is detected, the device enters into a state called fake tow. If the device stays in fake tow longer than the 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. If <*Tow Interval*> is less than 60s, the GPS will keep working.
- <*Tow Output ID*>: The ID of the output port to output the specified wave shape when tow event is detected.
- <*Tow Output Status*>: Please refer to the parameter <*Output1–4 Status*> in Chapter 3.2.5.1.
- <*Tow Output Duration*>: Please refer to the parameter <*Duration*> in Chapter 3.2.5.1.
- <*Tow Output Toggle Times*>: Please refer to the parameter <*Toggle Times*> in Chapter 3.2.5.1.
- <*Rest Duration*>: A time parameter to measure whether the device enters stillness status. The status of the device will be changed to stillness if the motion sensor detects stillness and the stillness status is maintained for a period of time longer than the time specified by the parameter <*Rest Duration*>.
- <*Motion Duration*>: A time parameter to measure whether the device enters motion status. The status of the device will be changed to motion if the motion sensor detects motion and the motion status 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, 250504,135790246811220,,000B,20090214093254,11F0$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.2.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 geo fencing terminal enters or exits the area, a notification is generated. The notification contains information about the location of the terminal and will be sent to the backend server.)

➢ **AT+GTGEO=**

Example: AT+GTGEO=gv300,0,3,121.412248,31.187891,1000,600,1,1,0,0,0,0,,,000A$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
GEO ID	<=2	0 – 19	
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0|5 – 86400sec	0
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	
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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
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 device reporting the Geo-Fence message **+RESP:GTGEO** to the backend server.
  - 0: Disable the zone's Geo-Fence function.
  - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
  - 2: Exiting the zone. The report will be generated only when the terminal exits the Geo-Fence.
  - 3: Report 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 region. The format is "(–) xxx.xxxxxx" and the value range is from "–180.000000" to "180.000000". The unit is degree. West longitude is represented as a negative starting with the sign "–" and east longitude is represented as a positive without "+".
- <*Latitude*>: The latitude of a point which is defined as the center of the circular Geo-Fence region. The format is "(–) xx.xxxxxx" and the value range is from "–90.000000" to "90.000000". The unit is degree. South latitude is represented as a negative starting with the minus sign "–" and north latitude is represented as a positive without "+".
- <*Radius*>: The radius of the circular Geo-Fence region. The value range is (50 – 6000000) and the unit is meter.
- <*Check Interval*>: The interval of GPS checking for the Geo-Fence alarm.
- <*Trigger Mode*>: A numeral to indicate the working mode of the geofencing function.
  - 0: Disable auto trigger mode.
  - 21: Auto parking fence. Automatically set up Geo-Fence after ignition off. In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is turned off. 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: Manual parking fence. Manually enable Geo-Fence after ignition off. In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when ignition is turned 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 the specified trigger mode is activated or when the Geo-Fence is cancelled.
  - 0: Disable the reporting of **+RESP:GTGES**.
  - 1: Enable the reporting of **+RESP:GTGES**.
- <*Start Time*>: The time to start monitoring the device when it enters the Geo-Fence or departs from the Geo-Fence. The valid format is "HHMM". The value range of "HH" is "00"–"23". The value range of "MM" is "00"–"59".
- <*End Time*>: The time to end monitoring the device when it enters the Geo-Fence or departs from the Geo-Fence. The valid format and range are the same as those of <*Start Time*>.

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

- **+ACK:GTGEO,**

Example: **+ACK:GTGEO, 250504,135790246811220,,0,000A,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GEO ID	<=2	0 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
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 will be sent to the backend server.)

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

- **AT+GTPEO=**

Example:

AT+GTPEO=gv300,0,0,1,3,121.412240,31.187801, 121.412248,31.187891,121.412258,31.187991,600,1,1,0,0,,,,,000B$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
GEO ID	1	0 – 19	0
Mode	1	0 – 3	0
Start Point	2	1-10	1
End Point	2	3-10	3
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Check Interval	<=5	0|5 – 86400sec	0
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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 device reporting the polygon Geo-Fence message to the backend server.
  - 0: Disable the zone's Geo-Fence function.
  - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
  - 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
  - 3: Report 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 format is "(–)xxx.xxxxxx" and the value range is from "–180.000000"

to “180.000000”. The unit is degree. West longitude is represented as a negative starting with the minus sign “–” and east longitude is represented as a positive without “+”.

- <*Latitude*>: The latitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The format is “(–)xx.xxxxxx” and the value range is from “–90.000000” to “90.000000”. The unit is degree. South latitude is represented as a negative starting with the minus sign “–” and north latitude is represented as a positive without “+”.

  Note: If more sets of <*Longitude*> and <*Latitude*> are needed, adjust <*Start Point*> and <*End Point*> to define appropriate setup.
- <*Check Interval*>: The interval of GPS checking for the Geo-Fence alarm.

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

- **+ACK:GTPEO,**

Example: **+ACK:GTPEO, 250504,135790246811220,,0,000B,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GEO ID	1	0 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.2.4.4.Roaming Detection Configuration

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

- **AT+GTRMD=**

Example: **AT+GTRMD=gv300,0,,,,,1,2,46000F,46002F,,,1,1,,,,2,2,,,,1f,,,1f,,,,,0,0,0,0,,,0001$** **AT+GTRMD=gv300,1,,,,,1,3,46000,46002,46003,,,2,2,46007,,,1,1,46001,,,3fff,,,2ff,,,,,0,0,0,0,,,0002$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300

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		
Black Operator Start	1	1-20	
Black Operator End	1	1-20	
Black Operator List	<=6*20		
Reserved	0		
Reserved	0		
Known Roaming Event Mask	<=6	000000 – FFFFFF	7FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	<=6	000000 – FFFFFF	7FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	

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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 which indicates the first index of the whitelist operator numbers to be input. For example, if the value is 1, it will update the white list of operators from the 1st one. If the parameter is empty, there should be no whitelist number following the empty value.
- <*Operator End*>: A numeral which indicates the last index of the whitelist operator numbers to be input. For example, if the value is 2, it will update the white list of operators until the 2nd one. If the parameter 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 depends on the parameters <*Operator Start*> and <*Operator End*>. For example, if <*Operator Start*> is 1 and <*Operator End*> is 2, the operator list should include 2 operator numbers (empty value acceptable) and the two numbers are separated by with ','. 'MCCFF' type code is used to identify operators across a whole country. For example, '460FF' covers the mobile network operators all across China.
- <*Roaming Operator List*>: It is 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 except that 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 should be sent to the backend server when GSM roaming state is detected. If the roaming state is "Known Roaming", the <*Known Roaming Event Mask*> will be valid; if the roaming state is "Unknown Roaming", the <*Unknown Roaming Event Mask*> will be valid.
  - Bit 0 for **+RESP:GTPNA**
  - Bit 1 for **+RESP:GTPFA**
  - Bit 2 for **+RESP:GTMPN**
  - Bit 3 for **+RESP:GTMPF**

- Bit 4 Reserved
- Bit 5 for **+RESP:GTBPL**
- Bit 6 for **+RESP:GTBTC**
- Bit 7 for **+RESP:GTSTC**
- Bit 8 for **+RESP:GTSTT**
- Bit 9 for **+RESP:GTANT**
- Bit 10 for **+RESP:GTPDP**
- Bit 11 for the power on **+RESP:GTRTL**
- Bit 12 for the ignition report **+RESP:GTIGN** and **+RESP:GTIGF**
- Bit 13 for the ignition on location report **+RESP:GTIGL**
- Bit 14 for **+RESP:GTEXP**
- Reserved

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

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

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

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

➢ **+ACK:GTRMD,**

Example: **+ACK:GTRMD, 250504,135790246811220,,0000,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note: Only an AT command string of no more than 180 bytes could be accepted by the device in the case of sending the command via Manage Tool (there is no such size limit in the case of sending the command via GPRS).

As **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 <*Start Index*> and <*End Index*> settings. Also a color alert will occur on Command Text Box which turns yellow if there is a length of over 180 bytes when Manage Tool is used.

3.2.4.5.Speed Alarm

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

➢ **AT+GTSPD=**

Example: **AT+GTSPD=gv300,1,80,120,60,300,1,1,0,0,,,,,,,,,,,000C$** **AT+GTSPD=gv300,2,80,120,60,300,1,1,0,0,,,,,,,,,,,000C$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1|2|3|4	0
Min. Speed	<=3	0 – 400km/h	0
Max. Speed	<=3	0 – 400km/h	0
Validity	<=4	0 – 3600sec	60
Send Interval	<=4	30 – 3600sec	300
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Report ID	<=2	0 – 15	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	

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Tail Character	1	$	$

- <*Mode*>: The working mode of the speed alarm function.
  - 0: Disable speed alarm.
  - 1: Report speed alarm if the current speed enters the speed range specified by <*Min. Speed*> and <*Max. Speed*>.
  - 2: Report speed alarm if the current speed exits the speed range specified by <*Min. Speed*> and <*Max. Speed*>.
  - 3: Report speed alarm only once if the current speed enters or exits the speed range specified by <*Min. Speed*> and <*Max. Speed*>. In this mode, <*Send Interval*> will be ignored.
  - 4: Report speed alarm if the speed enters or exits the speed range. But the backend server will not receive the **+RESP:GTSPD** message for speed exiting from the speed range unless it has received the alarm for speed entering the speed range at first. In this mode, <*Send Interval*> will be ignored.
- <*Min. Speed*>: The lower speed limit.
- <*Max. Speed*>: The upper speed limit.
- <*Validity*>: If the speed meets the alarm condition and is maintained for a period of time longer than the time that is specified by <*Validity*>, the speed alarm will be triggered.
- <*Send Interval*>: The time interval for sending the speed alarm message.
- <*Report ID*>: It indicates the type of speed alarm. The <*Report ID*> parameter data is reported via the **+RESP:GTSPD** message.

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

- **+ACK:GTSPD,**

Example: **+ACK:GTSPD, 250504,135790246811220,,000C,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.6.Buzzer Alarm Configuration

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 using those alarms, configure the output ID which connects with the buzzer and enable it.
The following event can trigger the buzzer alarm defined by this command: Overspeed alarm (Please refer to the command **AT+GTSPA**.)

➢ **AT+GTBZA=**

Example: **AT+GTBZA=gv300,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,,0000$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Output ID	1	0|2|3	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0|1	
Duration	<=3	0 – 255 (×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 2 Output Status	1	0|1	
Duration	<=3	0 – 255 (×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 3 Output Status	1	0|1	
Duration	<=3	0 – 255 (×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 4 Output Status	1	0|1	
Duration	<=3	0 – 255 (×100ms)	0

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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 output port which connects with the buzzer.

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

➢ **+ACK:GTBZA,**

Example: **+ACK:GTBZA, 250504,135790246811220,,000D,20090214093254,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.7.Overspeed Alarm

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

➢ **AT+GTSPA**

Example: **AT+GTSPA=gv300,1,20,,2,1,,,40,,2,2,,,60,,2,3,,,80,,2,4,,,,,,,,,000C$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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		

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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. This mode will check the speed and trigger the buzzer alarm during speedup or slowdown.
  - 2: Warning mode. This mode will only check the speed and trigger the buzzer alarm during speedup.
- <*Speed Threshold*>: The minimum speed to trigger the buzzer alarm.
- <*Validity*>: If the speed meets the alarm condition and is maintained for a period of time longer than the time that is 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, 250504,135790246811220,,000D,20090214093254,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.8.SOS Function

This command is used to configure the specified input port for emergency. When an emergency

occurs, the end user can use this input port to trigger the emergency call and report the position message **+RESP:GTSOS** to the backend server. A specified wave shape can be configured to output at a specified output port. The volumes for both the microphone and speaker during the SOS phone call are configurable.

➢ **AT+GTSOS=**

Example: **AT+GTSOS=gv300,1,1,+8613812341234,1,1,0,0,,,,,000D$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0 – 4	0
Digital Input ID	1	0 – 3|9 – C	0
SOS Number	<=20		
Output ID	1	0 – 3|9 – C	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
SOS Microphone	2	0 – 10	5
SOS Speaker	1	0 – 7	4
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: The working mode of the 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 first and then make SOS call(s).
- 4: Send the current position to the SMS gateway via SMS and make SOS call(s).

✧ <*Digital Input ID*>: ID of the digital input port which triggers the SOS function. 0 means "Disable the SOS function". 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.

✧ <*SOS Microphone*>: It is used to set the volume of the microphone. 0 means "Disable microphone".

✧ <*SOS Speaker*>: It is used to set the volume of the speaker. 0 means "Disable speaker".

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

➢ **+ACK:GTSOS,**

Example: **+ACK:GTSOS, 250504,135790246811220,,000D,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.9.Voice Monitoring

The command **AT+GTMON** is used to configure the parameters for stealth voice monitoring. It supports both outgoing call and incoming call. If this functions is triggered, the device will send the message **+RESP:GTMON** to the backend server according to the <*Send Alarm Message*> setting or SMS by default.

➢ **AT+GTMON=**

Example: **AT+GTMON=gv300,1,+8613812341234,5,0,2,,,,000E$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 –20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0–3	0
Stealth Phone Number	<=20		
Stealth Microphone	2	0 – 10	5
Stealth Speaker	1	0 – 7	0
Send Alarm Message	1	0|1|2	2
Output ID	1	0 – 3|9 – C	0

Output Status	1	0|1	
Ring Number	1	0-8	0
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of the stealth voice monitoring function.
  - 0: Disable the stealth voice monitoring function.
  - 1: The device will make the stealth call to the phone number specified in <*Stealth Phone Number*>, but it will not answer incoming calls.
  - 2: The device will answer incoming call and start the stealth voice monitoring.
  - 3: The device combines mode 1 and 2. It will make stealth calls to the <*Stealth Phone Number*> and answer incoming calls.
- <*Stealth Phone Number*>: The phone number to which the stealth voice call is made.
- <*Stealth Microphone*>: It is used to set the volume of the microphone. 0 means "Disable microphone".
- <*Stealth Speaker*>: It is used to set the volume of the speaker. 0 means "Disable speaker".
- <*Send Alarm Message*>: It specifies the method of sending the monitoring alarm.
  - 0: Do not send the **+RESP:GTMON** message. Only make the monitoring phone call.
  - 1: Follow the <*Report Mode*> in the command **AT+GTSRI**. If it is set to send alarm through GPRS, the alarm message will be sent after the monitoring phone call as the phone call will block the GPRS from sending the message.
  - 2: Send monitoring alarm through SMS to the backend server.
- <*Output ID*>: The ID of the output port to output the wave shape 1 when a call is answered.
- <*Output Status*>: Please refer to the parameter <*Output1–4 Status*> in Chapter 3.2.5.
- <*Ring Number*>: This parameter defines the number of rings before answering an incoming call automatically. 0 means auto answer directly without any ringing.

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

- **+ACK:GTMON,**

Example: **+ACK:GTMON, 250504,135790246811220,,000E,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

3.2.4.10.Excessive Idling Detection

The command **AT+GTIDL** is used to detect the engine excessive idling (vehicle stays stationary while ignition is on). To use this command, the ignition signal must be connected to the device. If it is detected that the vehicle is entering into the idle status, 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=gv300,1,2,1,,,,,1,1,0,0,,,,,000F$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1	0
Time to Stationary	2	1 – 30 min	2
Time to Movement	1	1 – 5 min	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3|9 – C	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 period of time specified by this parameter, it is considered to be in idling status.

✧ <*Time to Movement*>: If the vehicle moves again or ignition off is detected and the status is maintained for the period of time specified by this parameter after it enters into idling status, the vehicle is considered to leave idling status.

✧ <*Output ID*>: It specifies the ID of the output port (1 - 3) to output specified wave shape when the vehicle enters into idling status. If it is set to 0, there will be no output wave.

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

➢ **+ACK:GTIDL,**

Example: **+ACK:GTIDL, 250504,135790246811220,,000F,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.11.Start / Stop Report

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

➢ **AT+GTSSR=**

Example: **AT+GTSSR=gv300,1,2,1,5,,,,,000F$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1	0

Time to Stop	<=4	(0– 30 min)| (0 – 1800 Sec)	2min
Time to Start	<=3	(0 – 5 min) | (0 – 300 Sec)	1min
Start Speed	2	1 – 10 Km/h	5
Long Stop	<=5	0 – 43200 min	0
Time Unit	1	0|1	0
Reserved	0		
Reserved	0		
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 rests 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 leave 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 it is detected by the built-in motion sensor that the vehicle is moving with ignition on, the device will start to check the speed from GPS. If the device speed is maintained at a level higher than <*Start Speed*> for a period of time longer than <*Time to Start*>, the vehicle is considered to be in start status. The event message **+RESP:GTSTR** will be reported. 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 abnormal GPS fix status lasts more than 1 minute, use the built-in motion sensor to detect the Start / Stop status only and not to check the speed.
- <*Long Stop*>: After the vehicle enters into stop status and stays in the stop state for the length of time specified by this parameter, the **+RESP:GTLSP** will be sent. 0 means "Disable this function".
- <*Time Unit*>: It controls the time unit of <*Time to Stop*> and <*Time to Start*> parameters.
  - 0: The unit is minute.
  - 1: The unit is second.

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

- **+ACK:GTSSR,**

Example:
+ACK:GTSSR, 250504,135790246811220,,000F,20090214093254,11F0$

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

3.2.4.12.Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh driving behavior with GPS. Two harsh behaviors are monitored, i.e. harsh braking and harsh acceleration. According to the speed read from GPS, 3 levels of speeds are defined including high speed, medium speed and low speed. For each speed level, 2 thresholds of speed change are defined to determine harsh braking and harsh acceleration. If the change of speed within 5 seconds is greater than the corresponding threshold, the device will report the **+RESP:GTHBM** message to the backend server to indicate the harsh behavior. The same harsh behavior within 30 seconds will only be reported once.

➢ **AT+GTHBM=**

Example: **AT+GTHBM=gv300,1,3,,100,21,6,,60,21,6,,,21,15,,1,1,8,3,,,,,0010$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0 – 4	0
Behavior Duration	1	3-5	3
Reserved	0		
High Speed	<=3	100 – 400km/h	100
ΔVhb	<=3	0 – 100km/h	0
ΔVha	<=3	0 – 100km/h	0
Reserved	0		
Medium Speed	<=3	60 – 100km/h	60
ΔVmb	<=3	0 – 100km/h	0

ΔVma	<=3	0 – 100/km/h	0
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100/km/h	0
ΔVla	<=3	0 – 100/km/h	0
Reserved	0		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Turn and Brake Threshold	<=3	30-70	30
Turn and Brake Duration	<=3	40-100(*8ms)	50
Acceleration Threshold	<=3	15-50	20
Acceleration Duration	<=3	50-250(*8ms)	65
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: Detection by GPS only.
  - 2: Enable this function: Detection by motion sensor only. Motion sensor can detect three types of harsh behavior, and the device can provide detailed information about harsh behavior by using GPS, so keep GPS always on to collect all the information needed.
  - 3: Enable this function: Detection by motion sensor or GPS.
  - 4: Enable this function: Detection by motion sensor and GPS.
- <*Behavior Duration*>: The speed change within <*Behavior Duration*>.
- <*High Speed*>, <*Medium Speed*>: If the last known speed of the device read from GPS is greater than or equal to <*High Speed*>, the vehicle that the device is attached to is considered to be at high speed. If the last known speed is less than <*High Speed*> but greater than or equal to <*Medium Speed*>, the vehicle is considered to be at medium speed. If the last known speed is less than <*Medium Speed*>, the vehicle is considered to be at low speed.
- <*ΔVhb*>: The threshold for harsh braking at high speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at high speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at high speed level".
- <*ΔVha*>: The threshold for harsh acceleration at high speed level. If the current speed is

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

- <*ΔVmb*>: The threshold for harsh braking at medium speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at medium speed level. If 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 less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at low speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at low speed level".
- <*ΔVla*>: The threshold for harsh acceleration at low speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at low speed level. If 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 (1 - 3) to output specified wave shape when the harsh behavior is detected. If it is set to 0, there will be no output wave.
- <*Turn and Brake Threshold*>: The threshold for the motion sensor to measure whether the device is in harsh turn or harsh brake state.
- <*Turn and Brake Duration*>: The time parameter to determine whether the device enters harsh turn or harsh brake status. The driver behaviors must be maintained for a period of time longer than the time specified by <*Turn and Brake Duration*> in order for the harsh turn or harsh brake behavior event to be triggered.
- <*Acceleration Threshold*>: The threshold for the motion sensor to measure whether the device is in harsh acceleration state.
- *<Acceleration Duration>:* The time parameter to determine whether the device enters harsh acceleration status. The driver behaviors must be maintained for a period of time longer than the time specified by <*Acceleration Duration*> in order for the harsh acceleration behavior event to be triggered.

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

- **+ACK:GTHBM,**

Example: **+ACK:GTHBM, 250504,135790246811220,,0010,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.13.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=gv300,1,20,,5,10,10,,3,1,0,0,,0019$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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 – 3|9 – C	0
Output Status	1	0|1	
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. This message is reported upon entering into "jamming".
- 2: Enable jamming detection function. If jamming is detected, the device will report the **+RESP:GTJDS** message. This message is reported 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, 250504,135790246811220,,0019,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.14.Jamming Behavior Setting

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

◆ **Jamming Behavior Setting Configure Mode**

➢ **AT+GTJBS=**

Example: **AT+GTJBS=gv300,1,,60,30,1800,1,30,0,0,5,,,001A$**

Parameter	Length (Byte)	Range / Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1	0
Reserved	0		
Siren On Timer (T1)	5	1 – 65535 (×100ms)	10
Siren Off Timer (T2)	5	1 – 65535 (×100ms)	10
Fuel Cut-off Timer (T3)	5	1 – 65535 (sec)	1800
Check Speed	1	0|1	1
Speed Limit	3	0 – 999km/h	30
Output 1 Init State	1	0|1	0
Motion Sensor	1	0|1	0
GPS Fix Failure Timeout Timer	3	1 – 100 (min)	5
Enable Siren	1	0|1	1
Release Fuel Cut-off Timer	4	0 – 1000 (min)	0
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

JBS state.

- *<Release Fuel Cut-off Timer>*: If the device enters into JBS and then cuts off fuel, it will check the current jamming state when the *<Fuel Cut-off Timer (T3)>* condition is met. If the device doesn't quit the jamming state and the value of *<Release Fuel Cut-off Timer>* is greater than 0, the device will release fuel cut-off and the *<Release Fuel Cut-off Timer>* will start to work. When the *<Release Fuel Cut-off Timer>* condition is met, the device will check the current jamming state. If the device doesn't quit the jamming state, it will check the condition and decides whether to cut off fuel again. If the device doesn't quit the jamming state and the value of *<Release Fuel Cut-off Timer>* is 0, the device will maintain fuel cut-off status unless the device quits the jamming state.

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

- **+ACK:GTJBS,**

Example: **+ACK:GTJBS, 250504,135790246811220,,001A,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX8000 – XX80FF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **Jamming Behavior Setting Reset Mode**

- **AT+GTJBS=**

Example: **AT+GTJBS=gv300,2,,,,,001A$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	2	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 2: Jamming Behavior Setting Reset Mode.

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

➢ **+ACK:GTJBS,**

Example: **+ACK:GTJBS, 250504,135790246811220,,001A,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX8000 – XX80FF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.15.Crash Detection and Acceleration Report

The command **AT+GTCRA** is used to configure the parameters for crash detection and acceleration report. When the detection condition for crash event is met, the device will report the **+RESP:GTCRA** event message and data packets **+RESP:GTCRD** to the backend server. If configured to report accelerations to the backend server, the device will report **+RESP:GTACC** with 75 sets of tri-axial acceleration data to the backend server. If configured to report GPS information to the backend server, the device will report **+RESP:GTCRG** with GPS information of 10s before crash and 10s after crash.

➢ **AT+GTCRA=**

Example: **AT+GTCRA=gv300,1,5,,,,,,0,1,10,6,,0019$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1	0

Sensitivity	1	1 – 9	5
Report ACC	1	0|1	0
Report GPS Information	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	
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 / acceleration report function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Sensitivity*>: The sensitivity of the crash detection. The smaller the number is, the more sensitive this function will be.
- <*Report ACC*>: A numeral which indicates whether to report the acceleration data to the backend server.
  - 0: Disable reporting.
  - 1: Enable reporting. The device will report 75 sets of tri-axial acceleration data to the backend server in the message **+RESP:GTACC**.
- <*Report GPS Information*>: A numeral which indicates whether to report the GPS information of 10s before crash and 10s after crash to the backend server.
  - 0: Disable reporting.
  - 1: Enable reporting. The device will report the GPS information of 10s before crash and 10s after crash to the backend server in the message **+RESP:GTCRG**.

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

- **+ACK:GTCRA,**

Example: **+ACK:GTCRA, 250202,135790246811220,,0019,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	

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

3.2.4.16.Binding SIM Card

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

➢ **AT+ GTSIM =**

Example: **AT+ GTSIM =gv300,1, 898600910909f0385552,,,2,1,0,0,,,,,0013$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1|2	0
ICCID	20		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3|9 – C	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*>: A numeral which indicates whether to bind SIM card.

- 0: Do not bind SIM card.
- 1: Bind the current SIM card.
- 2: Bind the specified SIM card by ICCID.

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

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

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

➢ **+ACK: GTSIM,**

Example: **+ACK: GTSIM, 250504,135790246811220,,0013,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.5.IO Application

3.2.5.1.Digital Output

The **AT+GTOUT** command is used to output specified wave shape from the digital output ports. A total of four 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. It supports only wave shape 1.

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

Wave Shape 1:

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

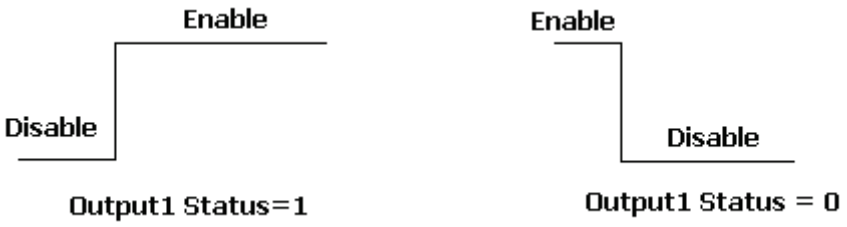

Figure 2: Wave Shape 1

Wave Shape 2:

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

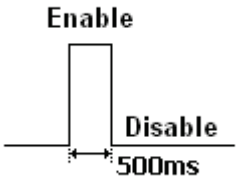

Figure 3: Wave Shape 2

Wave Shape 3:

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

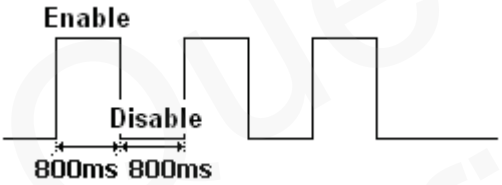

Figure 4: Wave Shape 3

Wave Shape 4:

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

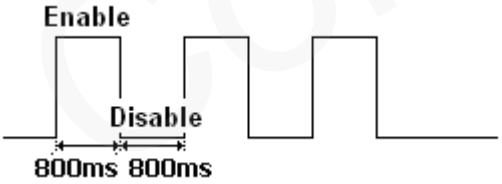

Figure 5: Wave Shape 4

➢ **AT+GTOUT=**

Example: **AT+GTOUT=gv300,1,,,0,0,0,0,5,1,0,,1,1,,,,0004$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**

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Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Output1 Status	1	0|1	0
Reserved	0		
Reserved	0		
Output2 Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Output3 Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
DOS Report	1	0-7	0
Reserved	0		
Long Operation2	<=3	0 – 120min	0
Long Operation3	<=3	0 – 120min	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Output1–3 Status*>: Valid only for the wave shape 1 as shown in **Figure 2** and used to set the final status of the output port.
  - 0: Disable the status.
  - 1: Enable the status.
- <*Duration*>: Please refer to **Figure 2**, **Figure 3**, **Figure 4** and **Figure 5**. Unit: 100ms.
- <*Toggle Times*>: Please refer to **Figure 2**, **Figure 3**, **Figure 4** and **Figure 5**.
  When the <*Duration*> is set to 0, the <*Toggle Times*> must be set to 0 rather than other values; otherwise the command is invalid.
- <*DOS Report*>: Whether or not to report **+RESP:GTDOS** when the status of wave shape 1 output changes.
  - Bit 0: for output 1 (not) to report **+RESP:GTDOS**.
  - Bit 1: for output 2 (not) to report **+RESP:GTDOS**.
  - Bit 2: for output 3 (not) to report **+RESP:GTDOS**.

  For each bit, set it to 1 to enable the report, and 0 to disable the report.
- <*Long Operation2*> and <*Long Operation3*>: The long operation time for output2 and output3. The output wave will be stopped on the special output port after the length of time

specified by the parameters. These two parameters are valid only when the output wave shape is 1 or 4.

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

➢ **+ACK:GTOUT,**

Example: **+ACK:GTOUT, 250504,135790246811220,,0004,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.5.2.Digital Input Port Setting

The command **AT+GTDIS** is used to configure the parameters of 4 digital input ports. The input <*Ignition Detection*> is dedicated to ignition detection. The other three inputs are customizable. If the logical status is changed on one of the three digital input ports, the device will report the message **+RESP:GTDIS** to the backend server.

Before using digital input 3, the <*Pin15 Mode*> in the **AT+GTCFG** command must be set to 1.

➢ **AT+GTDIS=**

Example: **AT+GTDIS=gv300,0,1,,0,1,1,4,,2,1,2,,3,3,,,,,,,0005$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Ignition Detection	1	0	0
Sample Period	<=2	0|1 – 12(×2s)	1
Reserved	0		
No Ignition	1	0|1	0
Input ID 1	1	1	1

Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=2	0|1 – 12(×2s)	0
Input ID 2	1	2	2
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=2	0|1 – 12(×2s)	0
Input ID 3	1	3	3
Sample Period	<=2	0|1 – 12(×2s)	0
Reserved	0		
Validity Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Ignition Detection*>: The ID of the ignition detection port.
- <*Input ID 1-3*>: The digital input port ID.
- <*Sample Period*>: The sampling period of the non-interruptible input port.
- <*Enable*>: Enable or disable the interrupt input.
  - 0: Disable the interrupt input.
  - 1: Enable the interrupt input.
- <*Debounce Time*>: The time for interruptible input port debouncing.
- <*No ignition*>: A numeral to indicate whether ignition signal is connected.
  - 0: Ignition signal is connected.
  - 1: Ignition signal is not connected.
- <*Validity Time*>: The validity time of the input port. 0 means "Do not check the validity time".
- <*Validity Mode*>: The mode of <*Sample Period*> of the non-interruptible input port.
  - 0: Check once when the <*Sample Period*> condition is met.
  - 1: Check every 2 seconds during the whole <*Sample Period*>.

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

- **+ACK:GTDIS,**

Example: +ACK:GTDIS, 250504,135790246811220,,0005,20090214093254,11F0$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.5.3.Input / Output Port Binding

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

➢ **AT+GTIOB=**

Example: AT+GTIOB=gv300,1,F,A,3,1,0,8,3,,,,,0006$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
IOB ID	1	0 – 3	
Input Mask	<=4	0000 – 0F0F	0
Trigger Mask	<=4	0000 – 0F0F	0
Input Sample Period	<=2	0|1 – 12(×2s|×4s)	0
Output ID	1	0 – 3|9 – C	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 ports composition. Each bit, from Bit 0 to Bit 15, represents one digital input port. Set it to 1 to enable corresponding input port and 0 to disable corresponding input port.
  - Bit 0: Ignition detection
  - Bit 1: Digital input 1
  - Bit 2: Digital input 2
  - Bit 3: Digital input 3
  - Bit 4 - Bit 7: Reserved
  - Bit 8: EIO100 input 9
  - Bit 9: EIO100 input A
  - Bit 10: EIO100 input B
  - Bit 11: EIO100 input C
  - Bit 12- Bit 15: Reserved
- <*Trigger Mask*>: Bitwise mask for trigger condition composition of the corresponding input ports. Each bit, from Bit 0 to Bit 15, represents the logical status of the corresponding input port to trigger the IOB event. Set it to 1 to use "enabled status" as the trigger condition and 0 to use "disabled status" as the trigger condition. Only when the logical status of all the input ports in one IO binding meets the trigger condition will the IOB event be triggered.
  - Bit 0: Ignition detection
  - Bit 1: Digital input 1
  - Bit 2: Digital input 2
  - Bit 3: Digital input 3
  - Bit 4 - Bit 7: Reserved
  - Bit 8: EIO100 input 9
  - Bit 9: EIO100 input A
  - Bit 10: EIO100 input B
  - Bit 11: EIO100 input C
  - Bit 12 - Bit 15: Reserved
- <*Input Sample Period*>: The 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".

Note: If the <*Input Mask*> includes EIO100 input(s), <*Input Sample Period*> should be multiplied

by 4s. If <*Output ID*> indicates EIO100 output, only wave shape 1 is supported.

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

➢ **+ACK:GTIOB,**

Example: **+ACK:GTIOB, 250504,135790246811220,,1,0006,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
IOB ID	1	0 – 3	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.5.4.External Power Supply Monitoring

The command **AT+GTEPS** is used to configure the parameters for external power supply monitoring. The device will measure and monitor the voltage of the external power supply. If the voltage of the external power supply meets 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, switch on the internal backup battery in case the voltage of the external power supply drops to a very low level.

➢ **AT+GTEPS=**

Example: **AT+GTEPS=gv300,2,250,12000,3,2,1,1,0,0,1,0,0,,0007$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1|2	0
Min. Threshold	<=5	250 – 32000 mV	
Max. Threshold	<=5	250 – 32000 mV	
Sample Period	<=2	0|1 – 12(×2s)	0

Debounce Time	1	0 – 5 (×1s)	0
Output ID	1	0 – 3|9 – C	
Output Status	1	0|1	
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
MPN / MPF Validity Time	1	0 – 5 (×1s)	0
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of the external power supply monitoring function.
  - 0: Disable the external power supply monitoring function.
  - 1: Enable the external power supply monitoring function. If the current voltage is within the range of (<*Min. Threshold*>, <*Max. Threshold*>), the **+RESP:GTEPS** alarm will be triggered.
  - 2: Enable the external power supply monitoring function. If the current voltage is outside the range of (<*Min. Threshold*>, <*Max. Threshold*>), the **+RESP:GTEPS** alarm will be triggered.
- <*Min. Threshold*>: The lower voltage limit of the external power supply to trigger the alarm.
- <*Max. Threshold*>: The upper voltage limit of the external power supply to trigger the alarm.
- <*Sample Period*>: The period of time 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 (1 - 3) to output specified wave shape when the **+RESP:GTEPS** alarm is triggered. If it is set to 0, there will be no output wave.
- <*Sync with FRI*>: Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the fixed report message.
  - 0: Do not report external power supply voltage with fixed report message.
  - 1. Report external power supply voltage with fixed report message.
- <*Voltage Margin Error*>: This parameter will be used together with <*Min. Threshold*> and <*Max. Threshold*> parameters. It indicates the voltage margin error of the <*Min. Threshold*> and <*Max. Threshold*>. 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 the **+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 EPS 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.

- <*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*>.
- <*MPN / MPF Validity Time*>: The validity time for detecting the device connecting or disconnecting main power supply. 0 means "Do not check the validity time". If <*MPN / MPF Validity Time*> is not 0, and the device remains connected or disconnected with main power supply for the period of time specified by this parameter, the device will report **+RESP:GTMPN** or **+RESP:GTMPF** to the backend server. If it is detected that the device connects or disconnects the main power supply when <*MPN / MPF Validity Time*> is 0, the device will report **+RESP:GTMPN** or **+RESP:GTMPF** to the backend server.

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

- **+ACK:GTEPS,**

Example: **+ACK:GTEPS, 250504,135790246811220,,0007,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.5.5.Analog Input Port Setting

The command **AT+GTAIS** is used to configure the parameters of analog input ports.
Before using analog input 1, <*Pin15 Mode*> in **AT+GTCFG** command must be set to 0.
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=gv300,1,3,0,16000,1,,2,1,0,0,1,,,2,3,250,16000,1,,2,1,0,0,1,,10,30,10,20,1,1,1,FFFF$**

Parameter	Length (Byte)	Range / Format	Default
Password	4～20	'0'～'9' 'a'～'z' 'A'～'Z'	gv300
Analog Input ID1	1	1	1
Mode	1	0|1|2|3|4|5	0
Min. Threshold	<=5	0～16000 mV	
Max. Threshold	<=5	0～16000 mV	
Sample Rate	<=2	0|1～12(×2s)	0
Reserved	0,TBD		
Output ID	1	0 – 3|9 – C	
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		
Analog Input ID2	1	2	2
Mode	1	0|1|2|3|4|5	0
Min. Threshold	<=4	250～16000 mV	
Max. Threshold	<=4	250～16000 mV	
Sample Rate	<=2	0|1～12(×2s)	0
Reserved	0,TBD		
Output ID	1	0～3|9～C	
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		
Fuel Data Debounce	<=3	0 – 150	10
Fuel Sensor Delay	<=3	0 – 600 sec	30
Fuel Loss Alarm	<=2	0 – 50	10

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Fuel Sensor Sample Count	<=3	0 – 150	20
Change Threshold	<=2	0 – 50 %	0
Voltage Margin Error	3	0 – 100(×10mv)	0
IGF Fuel Update	1	0|1	0
Serial Number	4	0000～FFFF	
Tail Character	1	$	$

- <*Analog Input ID 1-2*>: The analog input port ID.
- <*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 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 fuel level sensor to support fuel level reporting and monitoring.
    Note: If the selected mode is 3, then do not choose the wave shape 1 as the specified output port's wave.
  - 4: No alarm mode. The range of the voltage will be ignored, and no alarm will be triggered.
  - 5: Processed voltage mode. The range of the voltage will be ignored, and no alarm will be triggered. However, the voltage value will be processed before being reported.
- <*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.
- <*Sample Rate*>: The sampling period for the analog input port.
- <*Output ID*>: It specifies the ID of the output port (1 - 3) 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 the status.
  - 1: Enable the 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 the function, and 0 to disable it. If the analog input port is used to work with a fuel sensor and the <*Sync with FRI*> is enabled, the device will report the fuel level together with the fixed report message.
- <*Fuel Data Debounce*>: The number of the data discarded when calculating the fuel level.
- <*Fuel Sensor Delay*>: After power on or enabling the fuel level reporting and monitoring function, the fuel sensor will need to delay for the length of time specified here before it can report correct fuel level.
- <*Fuel Loss Alarm*>: If the difference between the current fuel level after ignition on and the

last measured fuel level before the previous ignition off is greater than this value, an abnormal fuel consumption alarm is sent with 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 it must be greater than <*Fuel Data Debounce*>.
- <*Change Threshold*>: This parameter defines the threshold of the value change. The value change must be greater than this threshold defined. This parameter value should not be greater than <*Fuel Loss Alarm*>, or the **+RESP:GTFLA** may be reported incorrectly.
- <*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 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 which meets the condition (5900mv < current voltage < 6100mv) or (11900mv < current voltage < 12100mv) will not be processed. The parameter improves the performance of **AT+GTAIS** report function.
- <*IGF Fuel Update*>: If the value of <*IGF Fuel Update*> is 1, the fuel level will be updated in real time in the **+RESP:GTFRI** after the device detects ignition off. If the value of <*IGF Fuel Update*> is 0, the fuel level will not be updated in real time, but will be updated when the device detects fuel loss alarm.

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

- **+ACK:GTAIS,**

Example: **+ACK:GTAIS, 250504,135790246811220,,0008,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.Serial Port Application

3.2.6.1.Serial Port Setting

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

➢ **AT+GTURT=**

Example: **AT+GTURT=gv300,1,12,8,1,0,0,0,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Working Mode	1	0 – 9|12|14|17	0
Baudrate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 4	0
Sleep Enable	1	0|1|2|3	0
Input ID of Wakeup	0	0|1	0
Reserved (Optional)	0		
Reserved (Optional)	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

RFID Type	<=3	0 – 255	0

Reserved	0		

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

Digital Fuel Sensor Type	1	0 – 6	0
Reserved	0		

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

- 5: Used for AC100 devices.

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

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

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

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

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

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

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

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

CANBUS Device Type	1	0 - 0	0
Reserved	0		

- 14: Used for transferring specified reports via satellite terminal when GSM is not available. In this mode, configure the following settings: 9600 baud rate, with no parity, 1 start bit and 1 stop bit. Supported reports are detailed below.

Report Format	Item
SOS	SOS, TOW, DIS, IOB, SPD, RTL, DOG, IGL, HBM, GEO
FRI	FRI

IGN	IGN, IGF
STT	STT
GIN	GIN, GOT

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

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

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

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

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

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

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

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

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

- 0: Disable the device sleep mode and enable auto online mode.
- 1: Enable the device sleep mode and enable auto online mode.
- 2: Disable the device sleep mode and disable auto online mode.
- 3: Enable the device sleep mode and disable auto online mode.

If the device sleep mode is enabled, the external device must have the ability to wake up the device from the sleep mode by the digital input specified by the parameter <*Input ID for Wakeup*>. If the working mode of **AT+GTURT** is 12, this parameter should be set to 2 or 3.

- <*Input ID for Wakeup*>: The ID of the digital input of GV300 used to wake up the device from the low power mode for serial port communication.
  - 0: Do not use digital input 1 to wake up the device. The digital input 1 is used as an interrupt port.
  - 1: The Old RFID uses digital input 1 to wake up the device. The parameter of the digital input 1 should be set by the command **AT+GTDIS** and the <*Validity Time*> of digital input 1 must be set to 0.
- <*Digital Fuel Sensor Type*>: The type of digital fuel sensor connected with serial port.
  - 0: EPSILON ES2 or ES4.
  - 1: LLS 20160.
  - 2: DUT-E.
  - 3: QFS100.
  - 4: UFSxxx.
  - 5: Reserved.
  - 6: DUT-E SUM.
- <*RFID Type*>: The type of RFID connected with serial port.
  - 0: Old RFID. 9600 baud rate, 8 data bits, 1 stop bit, and no parity.
  - 1: Reserved.
  - 2: MR2. 9600 baud rate-, 8 data bits, 1 stop bit, and no parity.
  - 3: VD RFID: 9600 baud rate, 8 data bits, 1 stop bit, and no parity.
  - 4: DR 100: 19200 baud rate, 8 data bits, 1 stop bit, and no parity.
- <*Format*>: It controls the format of data transfer from auxiliary serial port to backend server when <*Working Mode*> is 6.
  - 0: Short format.
  - 1: Long format.
- <*Interval*>: If the <*Working Mode*> is 7 or 8 and no data is received for a period of time longer than the <*Interval*>, the data in UART buffer will be sent.
- <*Terminator Character*>: When auxiliary serial port receives this character, data in front of the <*Terminator Character*> will be packed into the message **+RESP:GTDTT** and sent to the backend server. This parameter is enabled when <*Working Mode*> is 6.
- <*Length*>: The maximum length of data in the message **+RESP:GTDTT** when <*Working Mode*> is 7 or 8.

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

- **+ACK:GTURT,**

Example: **+ACK:GTURT, 250504,135790246811220,,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	$	$

3.2.6.2.Transparent Data Transmission

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

Before using this command, use the **AT+GTURT** command to set the parameters of the second serial port.

➢ **AT+GTDAT=**

Example: **AT+GTDAT=gv300,0,,data to the backend server,,,,,0017$** **AT+GTDAT=gv300,1,,data to the serial port,,,,,0017$** **AT+GTDAT=gv300,2,,data to the backend server,,,,,0011$** **AT+GTDAT=gv300,3,,data to the serial port,,,,,0017$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Command Type	1	0|1|2|3	
Reserved	0		
Data	<=1280	ASCII Code	
Need Ack	1	0|1	
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 means "Send message to the backend server with **+RESP:GTDAT (Short Format)**".

- 1 means "Send the pure data directly to the serial port".
- 2 means "Send message to the backend server with **+RESP:GTDAT (Long Format)**".
- 3 means "Send the pure data directly to the serial port without CRLF".

✧ <*Data*>: Data to be transferred between the backend server and the equipment connected to the second serial port of the device. The <*Data*> can't include the character '$' if it will be sent to backend server while the value of <*Enable SACK*> in **AT+GTSRI** and **AT+GTQSS** is 1.

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

- 0: Do not need the ACK report.
- 1: Need the ACK report.

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

➢ **+ACK:GTDAT,**

Example: **+ACK:GTDAT, 250504,135790246811220,,0017,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.3.AC100 Device Setting

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

➢ **AT+GTACD**

Example: **AT+GTACD=gv300,1,2,0,10,3,10,,,,,0005$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
iButton Timer	<=2	0|1 – 10(s)	0

Output ID	1	0-3	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
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*iButton Timer*>: The interval for searching the iButton ID.
  Note: The iButton ID number is in the opposite order with the number printed on iButton. The ID structure is composed of <1 Byte Family ID> + <6 Byte Serial Number> + <1 Byte CRC>. The first byte of ID number is iButton's family ID.
- <*Temperature Timer*>: The interval for reading the temperature sensor value. When more than one temperature sensor is connected to 1-Wire, the device will read the temperature from the temperature sensors one by one based on sensor ID every time the <*Temperature Timer*> condition is met.

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

- **+ACK:GTACD,**

Example: **+ACK:GTACD, 250504,135790246811220,,0005,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.4.External Digital Fuel Sensor

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

➢ **AT+GTEFS=**

Example: **AT+GTEFS=gv300,,,,15,10,,0,5,,,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Reserved	0		
Reserved	0		
Ex Full Value	<= 5	0 – 65535	9999
Ex Fuel Sensor Delay	<=3	0 – 600 sec	30
Ex Fuel Loss Alarm	<=2	0 – 50 %	10
Reserved	0		
Unsolicited Enable Ex	1	0 | 1	0
Ex Detection Frequency	3	5 – 600 sec	10
Ex Filter Factor	1	0 – 9	0
Report Sensor Data	1	0 | 1	0
Ex Detection Frequency IGF	<=2	30-1800s	300
Reserved	0		
IGN Sample Count	<=2	3 – 30	10
Ex Fuel Loss Alarm IGN	<=3	0 – 100 %	5
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Ex Full Value*>: The value read from the sensor when the fuel tank is full.
Note: This value needs to be set for only UFSxxx and DUT-E SUM now, while it is ignored by the other sensors. The unit for UFSxxx is 0.1mm. Set the unit of DUT-E sensors connected to DUT-E SUM to liter. If the **AT+GTEFS** command is executed and <*Ex Full Value*> is not set to the default value, DUT-E can use <*Ex Full Value*> to calculate the percentage of fuel level.

✧ <*Ex Fuel Sensor Delay*>: After the ignition is turned on, the fuel sensor will need to delay for the length of time specified by this parameter before it can report the correct fuel level.

- <*Ex Fuel Loss Alarm*>: If the difference between the current fuel level after ignition off and the last measured fuel level is greater than this value, an abnormal fuel consumption alarm is sent with event message **+RESP:GTFLA**. 0 means "Disable this function".
- <*Unsolicited Enable Ex*>: If enabled, the GV300 device will not send command to the fuel sensor, and the sensor must be set to periodical data output. QFS100 and UFS100 do not support this function.
- <*Ex Detection Frequency*>: If <*Unsolicited Enable Ex*> is disabled, the GV300 device will send READ command to the fuel sensor and read the data based on this parameter setting.
- <*Ex Filter Factor*>: The filter factor of the sensor. Now only QFS100 supports this factor, and for other sensors, this parameter is ignored.
  - 0: No filter
  - 1: 12 seconds
  - 2: 24 seconds
  - 3: 36 seconds
  - 4: 60 seconds
  - 5: 120 seconds
  - 6: 180 seconds
  - 7: 240 seconds
  - 8: 480 seconds
  - 9: 960 seconds
- <*Report Sensor Data*>: A numeral to indicate whether to report raw data from fuel sensor to the backend server with **+RESP:GTFSD**. Only report of the raw data from UFSxxx is supported now.
  - 0: Do not report raw data from fuel sensor.
  - 1: Report raw data from fuel sensor.
- <*Ex Detection Frequency IGF*>: If <*Unsolicited Enable Ex*> is disabled, the GV300 device will send READ command to the fuel sensor and read the data at this frequency while the ignition is off.
- <*IGN Sample Count*>: The count of readings of fuel level used for fuel alarm detection after ignition on. The ignition-on fuel alarm detection time = <*IGN Sample Count*>* <*Ex Detection Frequency*>.
- <*Ex Fuel Loss Alarm IGN*>: If the difference between the current fuel level after ignition on and the last measured fuel level is greater than this parameter value during the time <*IGN Sample Count*> * <*Ex Detection Frequency*>, an abnormal fuel consumption alarm is sent via the event message **+RESP:GTFLA**. 0 means "Disable this function".

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

- **+ACK:GTEFS,**

Example: **+ACK:GTEFS, 250504,135790246811220,,0008,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.5.ID Authentication

The command **AT+GTIDA** is used to protect against unauthorized use. This is achieved through an ID card reader for driver identification, and connecting an external relay (normally closed relay recommended) to cut off the starter or the fuel pump. To use this command, both the ID card reader and the external relay 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=gv300,1,1,2,D2C4FBC5,87654321,45,3,,,,,1,1,0,0,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1|2	0
Start Index	<=2	1 – 250	
End Index	<=2	1 – 250	
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout after Ignition Off	<=3	0 | 15 – 600sec	30
Report Mode	1	0 – 7	0
ID Validity Time	<=3	15 – 600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	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 ID authentication function.
  - 0: Disable this function.
  - 1: Enable this function: Only authorized ID cards can unlock the vehicle.
  - 2: Enable this function: Any ID card can unlock the vehicle.
- <*Start Index*>, <*End Index*>: The index range of the white list to which the ID numbers are to be updated. For example, if the <*Start Index*> is set to 1 and the <*End Index*> is set to 2, then the first two ID numbers in the white list will be updated by the numbers provided in the parameter <*ID Number List*>. The <*Start Index*> and <*End Index*> determine the total amount of ID numbers that will be updated. If either one is empty, there should be no <*ID Number List*> following the empty value. A maximum of 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 quantity of the ID numbers are determined by <*Start Index*> and <*End Index*>.
- <*Timeout after Ignition Off*>: If the ignition is turned off, it will still be authorized for a short time. In this period, re-authentication is not needed. 0 means "Lock the vehicle when the ignition is turned off".
- <*Report Mode*>: The mode of reporting ID.
  - Bit 0: Report the ID which is authorized.
  - Bit 1: Report the ID which is unauthorized.
  - Bit 2: Report the ID which has logged out. (If authorized ID meets the trigger conditions <*ID Validity Time*> and <*Timeout after Ignition Off*>, then **+RESP:GTIDA** report will be sent to indicate the log-out event).

  For each bit, set it to 1 to enable the report, and 0 to disable the report. If <*Report Mode*> is 0, no **+RESP:GTIDA** message will be reported.
- <*ID Validity Time*>: It will remain authorized for this period of time when the ID is valid.
- <*Output ID*>: It specifies the ID of the output port to output specified wave shape when it is authorized. Only the wave shape 1 is supported.

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

- **+ACK:GTIDA,**

Example:

+ACK: GTIDA, 250504,862170013895931,,FFFF,20110101000009,0088$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.2.6.6.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 of the range is detected by the device.

➢ **AT+GTTMP=**

Example: **AT+GTTMP=gv300,0,1,28131A4103000056,,,-20,50,,,2,10,,,1,1,0,0,,,,,000C$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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 – 3	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 the <*Validity*> checking, the device will report temperature alarm every <*Send Interval*> times of temperature reading based on reading timer of temperature sensor. If <*Send Interval*> is set to 0, it will only report the temperature alarm once.

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

- **+ACK:GTTMP,**

Example:

+ACK:GTTMP, 250504,135790246811220,,0,000C,20090214093254,11F0$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'	
Alarm ID	1	0-3	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.7.Uart Data Transfer

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

- **AT+GTUDT=**

Example: **AT+GTUDT= gv300,0,,0,0,,1,,00087FFF,,,,,,, 0000$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1	0
Reserved	0		
IGN Send Interval	<=3	0|5-250	0
Enable IGF Sending	1	0|1	0
Reserved	0		
Event Mask	8	00000000-FFFFFFFF	1
Reserved	0		
Report Composition Mask	8	00000000-FFFFFFFF	00087FFF
Reserved	0		
Reserved	0		
Reserved	0		

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

- <*Mode*>: Enable / disable data transfer via the report message **+RESP:GTUDT** to the serial port.
  - 0: Disable the data transfer.
  - 1: Enable the data transfer.
- <*IGN Send Interval*>: The time interval for sending related information when the ignition is on. The value range is 0|5-250 and the unit is second. 0 means "Disable the information transfer".
- <*Enable IGF Sending*>: Whether to send the related information when the ignition is off. If enabled, it works according to the <*IGF Report Interval*> of **AT+GTFRI** and <*Mode*> of **AT+GTFRI**.
  - 0: Disable the function.
  - 1: Enable the function.
- <*Event Mask*>: Bitwise mask to configure the event triggered for which **+RESP:GTUDT** will be sent to the serial port.
  - Bit 0 for activated GEO.
  - Bit 1 for activated PEO.
  - Bit 2-31 Reserved.
- <*Report Composition Mask*>: Bitwise mask to configure which information should be sent to the serial port.
  - Bit 0 for Protocol Version, Firmware Version
  - Bit 1 for Hardware Version
  - Bit 2 for Unique ID
  - Bit 3 for Device Name
  - Bit 4 for Speed
  - Bit 5 for Azimuth
  - Bit 6 for Altitude
  - Bit 7 for MCC, MNC, LAC, Cell ID, Reserved
  - Bit 8 for Mileage, Reserved
  - Bit 9 for HMC, Reserved.
  - Bit 10 for GSV, External GPS Antenna
  - Bit 11 for GEO State
  - Bit 12 for Analog Input
  - Bit 13 for Digital Input, Motion Status
  - Bit 14 for External Power VCC, Backup Battery Level, Charging
  - Bit 15 for GEO Status Mask
  - Bit 16 for PEO State

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- Bit 17 for PEO Status Mask
- Bit 18 Reserved
- Bit 19 for Send Time
- Bit 20-31 Reserved

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

➢ **+ACK:GTUDT,**

Example: **+ACK:GTUDT, 250504,135790246811220,,0004,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.8.Fuel Sensor Calibration Table

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

➢ **AT+GTFSC=**

Example: **AT+GTFSC=gv300,,0,21,1,,,3,16000,0,10000,50,250,100,,,,,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4～20	'0'～'9' 'a'～'z' 'A'～'Z'	gv300
Reserved			
Table ID	1	0 – 4	1
Sensor Type	<= 2	0 – 6|20 – 21	20
Enable	1	0|1	0
Max. Tank Volume	<= 5	0 –10000	100
Reserved			
Num of Node	<= 2	0|2 – 11	0

Node 1 Value	< = 5	0～99999	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	< = 5	0～99999	
Node N Percentage	<= 2	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000～FFFF	
Tail Character	1	$	$

- *<Table ID>*: The ID of the calibration table that is currently set.
- *<Sensor Type>*: The sensor type for the table. the currently set table
  - 0: EPSILON ES2 or ES4
  - 1: LLS 20160
  - 2: DUT-E
  - 3: QFS100
  - 4: UFSxxx
  - 5: Reserved
  - 6: DUT-E SUM
  - 20: ADC1
  - 21: ADC2
- *<Enable>*: Enable or disable the table. If this table is disabled, the calculation of fuel level will be linearized.
- *<Max. Tank Volume>*: The maximum volume of tank. The unit is Liter.
- *<Num of Node>*: The number of the nodes.
- *<Node N Value>*: The value of this node.
- *<Node N Percentage>*: The corresponding percentage value of this node. This item must be in ascending order beginning with 0% and ending with 100%.

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

- **+ACK:GTFSC,**

Example: +ACK:GTFSC, 250504,135790246811220,,0004,20090214093254,11F0$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.9.Camera Setting Command

AT+GTCMS is used for setting camera parameters.

➢ **AT+GTCMS=**

Example: AT+GTCMS=gv300,0,3,5,150,2,1,0003,,,2,1,1,20,,,,,FFFF$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Camera ID	1	0-3	
Number	<=2	1-10	1
Interval	<=2	1-60s	5
Photo Compression Ratio	<=3	20-250	150
Photo Resolution	1	1-3	2
Digital Input ID	1	0|1-3	0
Attribute Mask	<=4	0000 - FFFF	0x0003
Server Type	1	0|1	0
EHD Support	1	0|1	0
Output ID	1	0 – 3	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	$	$

- <*Number*>: The number of pictures taken in one continuous shooting.
- <*Interval*>: The interval between two pictures in one continuous shooting.
- <*Photo Compression Ratio*>: The compression ratio of picture. Picture quality is better with a smaller compression ratio.
- <*Photo Resolution*>: The resolution of picture.
  - 1: 160*120
  - 2: 320*240
  - 3: 640*480
- <*Digital Input ID*>: The input ID used to trigger photographing.
- <*Attribute Mask*>: The <*Attribute Mask*> in the message **+RESP:GTPHL** and **+RESP:GTPHD** in HEX format.

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

- <*Server Type*>: The server that picture is transferred to.
  - 0: Backend server
  - 1: FTP server
- <*EHD Support*>: Whether to pack picture data by **+RESP:GTEHD** instead of **+RESP:GTPHD** in HEX format. **+RESP:GTEHD** can support a larger picture size in HEX format.

Note: The output settings are used to output special wave when the camera is photographing or trying to photograph and data is being transmitted between camera and GV300 device.

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

- **+ACK:GTCMS,**

Example:
+ACK:GTCMS,250504,862170019025640,,FFFF,20131018074736,003B$

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

3.2.6.10.Taking Picture Command

AT+GTTAP is used for real-time photographing.

➢ **AT+GTTAP=**

Example: **AT+GTTAP=gv300,0,,,1,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Camera ID	1	0-3	
Reserved	0		
Reserved	0		
Photo Resolution	1	1-3	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

➢ **+ACK:GTTAP,**

Example: **+ACK:GTTAP,250504,862170019025640,,FFFF,20131018075847,0057$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.11.Main Serial Port Setting

This command **AT+GTMUT** is used to configure the parameters of the main serial port.

➢ **AT+GTMUT=**

Example: **AT+GTMUT=gv300,0,12,8,1,0,0,,,,,,,0018$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Working Mode	<=2	0|1|11|12	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 Control	1	0|1	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

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

- 0: Use UART as the default communication port.
- 1: Use UART to transfer data via **AT+GTDAT** and other protocol commands.
- 2-10: Reserved.
- 11: Use UART to transfer data via **AT+GTDAT**, and support basic command sending.
- 12: Used UART for CANBUS devices. In this mode, the baud rate must be set to 9600.

Note: If the working mode of **AT+GTMUT** is the same as that of **AT+GTURT**, only the main serial port can work. The device can receive all the AT commands only when it works under mode 0.

✧ <*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. Their values can be 7 or 8.

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

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

✧ <*Sleep Control*>: The device supports low power mode to reduce the power consumption. If the device enters into low power mode, the response to the serial port will be very slow

unless the device is waked up. If the working mode of **AT+GTMUT** is 12, this parameter should be set to 1 (Disable the low power mode).

- 0: Enable the low power mode.
- 1: Disable the low power mode.

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

➢ **+ACK:GTMUT,**

Example: **+ACK:GTMUT, 250504,135790246811220,,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	$	$

3.2.6.12.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=gv300,1,30,60,FFFFFFFF,,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: It controls the mode of CAN function.
  - 0: Disable CAN function.
  - 1: Enable CAN function.
- <*CAN Report Interval*>: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is on. Its value range is 0|5 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTCAN"**.
- <*CAN Report Interval IGF*>: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is off. Its value range is 0|5 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTCAN** in ignition off state.
- <*Additional Event*>: Whether to 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 <*GSM Information*> and Bit 30 <*GPS Information*> in the <*CAN Report Mask*> only control the composition of **+RESP:GTCAN** in ASCII format (not in HEX format). The <*+CAN Mask*> in **AT+GTHRM** controls the GSM information and GPS information in **+RESP:GTCAN** in HEX format. Bit 22 <*Total Distance Impulses*> in this <*CAN Report Mask*> only controls the composition of **+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	<*GPS Information*>	Including <*GPS Accuracy*>, <*Speed*>, <*Azimuth*>, <*Altitude*>, <*Longitude*>, <*Latitude*>, <*GPS UTC Time*>
Bit 29	<*CAN Report Expansion Mask*>	If this bit is set to 1, the parameter <*CAN Report Expansion Mask*> in **GTCAN** is valid. If this bit is set to 0, the parameter <*CAN Report Expansion Mask*> in **GTCAN** is not valid.
Bit 28	Reserved	
Bit 27	Reserved	

Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	*<Total Distance Impulses>*	Vehicle total distance measured in Impulses (if distance from dashboard is not available)
Bit 21	*<Total Vehicle Engine Overspeed Time>*	The total time when 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 decimal number. Each bit indicates information of one door.
Bit 18	*<Lights>*	An 8-bit decimal number. Each bit indicates information of one light.
Bit 17	*<Detailed Information / Indicators>*	A decimal 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>*	Vehicle axle weight
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>*: It expands CANBUS information in the **+RESP:GTCAN** report message. 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	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	*<Rapid Accelerations>*	Total number of rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value)
Bit 21	*<Rapid Brakings>*	Total number of rapid brakings since installation (calculation based on CAN-Logistic's settings of speed decrease time and value)
Bit 20	*<Expansion Information>*	A decimal number. Each bit contains information of one indicator.
Bit 19	*<Registration Number>*	The vehicle registration number
Bit 18	*<Tachograph Driver 2 Name>*	The name of tachograph driver 2

Bit 17	*<Tachograph Driver 1 Name>*	The name of tachograph driver 1
Bit 16	*<Tachograph Driver 2 Card Number>*	The card number of tachograph driver 2
Bit 15	*<Tachograph Driver 1 Card Number>*	The card number of tachograph driver 1
Bit 14	*<Total Brake Applications>*	Counts of applying brake pedal (braking process initiated by brake pedal)
Bit 13	*<Total Accelerator Kick-down Time>*	Total time when accelerator pedal is pressed over 90%
Bit 12	*<Total Cruise Control Time>*	Total time when the vehicle speed is controlled by cruise-control module
Bit 11	*<Total Effective Engine Speed Time>*	Total time when the vehicle engine speed is effective
Bit 10	*<Total Accelerator Kick-downs>*	Counts of accelerator pedal kick-downs (the pedal pressed over 90%)
Bit 9	*<Pedal Braking Factor>*	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

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

➢ **+ACK: GTCAN,**

Example: **+ACK: GTCAN, 250504,135790246811220,,000D,20090214093254,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.13.CANBUS Alarm Setting

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

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

➢ **AT+GTCLT**

Example: **AT+GTCLT=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'	gv300
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 **GTCLT** is valid. If this bit is set to 0, the parameter <*CAN Report Expansion Mask*> in **GTCLT** is not valid.
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	

Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	*<Total Distance Impulses>*	Vehicle total distance measured in impulses (if distance from dashboard is not available)
Bit 21	*<Total Vehicle Engine Overspeed Time>*	The total time when 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 decimal number. Each bit contains information of one door.
Bit 18	*<Lights>*	An 8-bit decimal number. Each bit contains information of a light.
Bit 17	*<Detailed Information/Indicators>*	A decimal number. Each bit contains information of one indicator.
Bit 16	*<Tachograph Information>*	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	*<Axle Weight>*	Vehicle axle weight
Bit 14	*<Total Idle Fuel Used>*	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 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 low RPM event.
- *<CAN Report Expansion Mask>*: It expands CANBUS information in the **+RESP:GTCLT** report message. Bitwise mask to configure the composition of CANBUS expansion information of **+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	Reserved	
Bit 22	*<Rapid Accelerations>*	The number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value)
Bit 21	*<Rapid Brakings>*	The number of total rapid brakings since installation (calculation based on CAN-Logistic's settings of speed decrease time and value)
Bit 20	*<Expansion Information>*	A decimal number. Each bit represents information of one indicator.
Bit 19	*<Registration Number>*	The vehicle registration number
Bit 18	*<Tachograph Driver 2 Name>*	The name of tachograph driver 2
Bit 17	*<Tachograph Driver 1 Name>*	The name of tachograph driver 1
Bit 16	*<Tachograph Driver 2 Card Number>*	The card number of tachograph driver 2
Bit 15	*<Tachograph Driver 1 Card Number>*	The card number of tachograph driver 1
Bit 14	*<Total Brake Applications>*	Counts of applying brake pedal (braking process initiated by brake pedal)
Bit 13	*<Total Accelerator*	Total time when accelerator pedal is pressed over

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

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

- **+ACK: GTCLT,**

Example: **+ACK: GTCLT, 250504,135790246811220,,1,000D,20090214093254,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z', '0'–'9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0'–'9' 'a'–'z' 'A'–'Z''-''_'	
Group ID	<=2	0 –19	0
Serial Number	4	0000–FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000–FFFF	
Tail Character	1	$	$

3.2.6.14.UFSxxx FOTA Upgrade

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

➢ **AT+GTUFS=**

Example: **AT+GTUFS=gv300,3,30,0,,,http://220.178.67.210:8208/GV300/deltabin/csb_des_07_build1116.bin,,,,,0001$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Retry Times	1	0 – 3	0
Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=6	'_', 'a'- 'z', 'A'- 'Z'	
Server Password	<=6	'_', 'a '- 'z', 'A '-'Z'	
Server URL	100	Legal URL	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Retry Times*>: It specifies the maximum time of retries to download the update package upon download failure.

✧ <*Timeout*>: It specifies the expiration timeout of one single downloading. If the download

expires, it is considered to be a failure.

- ✧ <*Protocol Type*>: The protocol used to download the package.
  - 0: HTTP. Only HTTP is supported now.
- ✧ <*Server User Name*>: If the file server uses authentication, the user name is specified here.
- ✧ <*Server Password*>: If the file server uses authentication, the password is specified here.
- ✧ <*Server URL*>: It specifies the URL to download the package.

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

➢ **+ACK: GTUFS,**

Example: **+ACK: GTUFS, 250504,135790246811220,,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	$	$

3.2.6.15.FTP Server Information

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

➢ **AT+ GTFTP =**

Example: **AT+GTFTP=gv300,116.228.146.250,21,SW_RD/Projects/,,,1,,,,,,000B$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Server Address	<=60		
Server Port	<=5	0 – 65535	0
Full Name	<=60		
User Name	<=10		

Login Password	<=10		
Transfer Mode	1	0|1	0
Oper Type	1	0|1	0
Report FTP	1	0|1	0
File Name Prefix	<=20		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Server Address*>: The IP address or the domain name of the FTP server.
- <*Server Port*>: The server port of the FTP server.
- <*Full Name*>: The file path to save pictures.
- <*User Name*>: The user name to login to the FTP server.
- <*Login Password*>: The password to login to the FTP server.
- <*Transfer Mode*>: The mode of transferring picture.
  - 0: Passive mode.
  - 1: Active mode.
- <*Oper Type*>: The transfer mode to transfer picture after transfer fails.
  - 0: Resume transferring the failed picture.
  - 1: Restart transferring the failed picture from the beginning.
- <*Report FTP*>: Whether to report **+RESP:GTFTP** to the backend server after transferring a file.
  - 0: Disable the function.
  - 1: Enable the function.
- <*File Name Prefix*>: The file name prefix of a picture. <*File Name Prefix*> can't be ".jpg" because gv300 uses it as the suffix of the <*File Name*> in the message **+RESP:GTFTP**.

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

- **+ACK:GTFTP,**

Example: **+ACK:GTFTP,250504,862170013988157,,FFFF,20110101000045,0008$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

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

3.2.6.16.Output Expansion

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

➢ **AT+GTOEX=**

Example: **AT+GTOEX=gv300,,,2,9,1,0,0,B,1,0,0,,,1,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Reserved	0		
Reserved	0		
Output Number	1	1 – 4	
Output ID	1	9 – C	
Status	1	0|1	0
Duration	1	0	0
Toggle Times	1	0	0
Reserved	0		
Reserved	0		
DOS Report	1	0 – F	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Output Number*>: The total number of configured EIO100 outputs. In one output

configuration, <*Output ID*>, <*Status*>, <*Duration*>, and <*Toggle Times*> are included.

- <*Output ID*>: The ID of EIO100 output port. The range is 9–C (in HEX format).
- <*DOS Report*>: Whether or not to report **+RESP:GTDOS** when wave shape 1 status of EIO100 output changes. 1 means "Report **+RESP:GTDOS**", and 0 means "Do not report **+RESP:GTDOS**".
  - Bit 0: for EIO100 output 9 (not) to report **+RESP:GTDOS**.
  - Bit 1: for EIO100 output A (not) to report **+RESP:GTDOS**.
  - Bit 2: for EIO100 output B (not) to report **+RESP:GTDOS**.
  - Bit 3: for EIO100 output C (not) to report **+RESP:GTDOS**.

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

- **+ACK:GTOEX,**

Example: **+ACK:GTOEX,250504,862170013988157,,FFFF,20110101000045,0008$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.17.Input Expansion

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

- **AT+GTIEX=**

Example: **AT+GTIEX=gv300,,,2,9,5,B,5,,,,,,,FFFF$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Reserved	0		

Reserved	0		
Input Number	1	1 – 4	
Input ID	1	9 – C	
Sample Period	<=2	0|1 – 12(×4s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- *<Input Number>*: The total number of configured EIO100 inputs. In one configuration, *<Input ID>* and *<Sample Period>* are included.
- *<Input ID>*: The ID of EIO100 input. The range is 9 – C (in HEX format).
- *<Sample Period>*: The sampling period for reading EIO100 input status.

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

- **+ACK:GTIEX,**

Example: **+ACK:GTIEX,250504,862170013988157,,FFFF,20110101000127,0012$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.6.18.CAN100 FOTA Upgrade

The command **AT+ GTCFU** is used to upgrade the firmware in CAN100 over the air.

➢ **AT+GTCFU=**

Example: **AT+GTCFU=gv300,3,30,0,,,http://220.178.67.210:8208/GV65/deltabin/csb_des_07_build1116.bin,,,,,0001$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Retry Times	1	0 – 3	0
Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=6	'_', 'a-z', 'A-Z'	
Server Password	<=6	'_', 'a-z', 'A-Z'	
Server URL	100	Legal URL	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Retry Times*>: It specifies the maximum number of times of retries to download the update package upon download failure.

✧ <*Timeout*>: It specifies the expiration timeout of one single downloading. If the downloading expires, it is considered to be a failure.

✧ <*Protocol Type*>: The protocol used to download the package.

- 0: HTTP. Only HTTP is supported now.

✧ <*Server User Name*>: If the file server uses authentication, specify the user name here.

✧ <*Server Password*>: If the file server uses authentication, specify the password here.

✧ <*Server URL*>: It specifies the URL to download the package.

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

➢ **+ACK: GTCFU,**

Example: **+ACK: GTCFU, 250504,135790246811220,,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.Other Settings

3.2.7.1.Real Time Operation

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

➢ **AT+GTRTO=**

Example: **AT+GTRTO=gv300,A,,,,,,0015$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Sub Command	<=2	0 – 0x13	
AT Command | Configuration Mask	3|16	"SRI"| 0000000000000000 – FFFFFFFFFFFFFFFF	
Output Direction	1	0-3	
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Sub Command>*: Valid value is 0-13.

- 0: ***GPS***. Get the GPS related information via the message **+RESP:GTGPS**.

- 1: ***RTL***. Request the terminal to report its current position immediately via the message **+RESP:GTRTL**.
- 2: ***READ***. Get the current configuration of the terminal via the message **+RESP:GTALL / +RESP:GTALM / +RESP:GTALS /+RESP:GTALC**.
- 3: ***REBOOT***. Reboot the terminal.
- 4: ***RESET***. Reset all parameters to factory settings. Parameters configured by **AT+GTBSI**, **AT+GTSRI, AT+GTCFG, AT+GTTMA**, **AT+GTPIN** and **AT+GTBSE** will not be reset. Also, the buffered messages saved can be deleted.
- 5: ***PWROFF***. Power off the device.
- 6: ***CID***. Get the ICCID of the SIM card which is being used by the terminal via the message **+RESP:GTCID**.
- 7: ***CSQ***. Get the current GSM signal level of the terminal 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 terminal 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, base station ID, RSSI, cell ID, IP and DNS server via the message **+RESP:GTAIF**.
- E: ***GSV***: Request the device to report the GPS fix level.
- 10: ***CAN***. Get CAN information via the message **+RESP:GTCAN**. Only when the working mode of **AT+GTURT** or **AT+GTMUT** is 12 is the **+RESP:GTCAN** report valid.
- 11: ***UVN***. Get the version number information of UFSxxx fuel sensor via the message **+RESP:GTUVN**. Only when the working mode of **AT+GTURT** is 4 and the <*Digital Fuel Sensor Type*> is 4 is the **+RESP:GTUVN** report valid.
- 12: ***CVN***. Get the version number information of CAN100 via the message **+RESP:GTCVN**. It works only when the working mode of **AT+GTURT** or **AT+GTMUT** is 12.
- 13: ***CSN***. Get the serial number information of CAN100 via the message **+RESP:GTCSN**. It works only when the working mode of **AT+GTURT** or **AT+GTMUT** is 12.

✧ <*AT Command / Configuration Mask*>:

- AT Command: To get single AT command configuration when <*Sub Command*> is set to 2, please follow the format in the following example. For instance, to get the configuration of **AT+GTFRI**, set AT+GTRTO=gv300,2,FRI,,,,,0015$, and get it via **+RESP:GTALS**.
- Configuration Mask: If <*Sub Command*> is set to 2, configuration information for a specific configuration mask can be obtained via the message **+RESP:GTALC**. The Configuration Mask must be 16 bytes; if it's less than 16 bytes, add '0' in the high bytes of the Configuration Mask.

Note: To get the integral information of IDA or PEO, please set the Configuration Mask to 0000000780000000, or 0000F00000000000.

Configuration Mask Table:

Mask Bit	Item
Bit63	Reserved
Bit62	Reserved
⋮	Reserved
Bit 59	GAM
Bit 58	Reserved
Bit 57	CLT
Bit 56	UPC
Bit 55	IEX
Bit 54	OEX
Bit 53	BSE
Bit 52	Reserved
Bit 51	SIM
Bit 50	UDF
Bit 49	CMD
Bit 48	Reserved
Bit 47	FTP
Bit 46	CAN
Bit 45	CMS
Bit 44	PEO
Bit 43	RMD
Bit 42	FSC
Bit 41	TMP
Bit 40	UDT
Bit 39	MUT
Bit 38	Reserved
Bit 37	SPA
Bit 36	BZA
Bit 35	Reserved
Bit 34	Reserved

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Bit 33	PDS
Bit 32	ACD
Bit 31	IDA
Bit 30	EFS
Bit 29	SSR
Bit 28	JBS
Bit 27	FFC
Bit 26	CRA
Bit 25	HRM
Bit 24	WLT
Bit 23	JDC
Bit 22	URT
Bit 21	HBM
Bit 20	HMC
Bit 19	IDL
Bit 18	AIS
Bit 17	DOG
Bit 16	OWH
Bit 15	PIN
Bit 14	MON
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

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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, use the last three letters of the protocol command. For example, to reset configuration of the **AT+GTFRI** command, send the command "**AT+GTRTO=gv300,4,FRI,,,,,000F$**". The buffered messages saved can be deleted with the command "**AT+GTRTO=gv300,4,BUF,,,,,000F$**". Configuration of the commands **AT+GTBSI**, **AT+GTSRI**, **AT+GTQSS**, **AT+GTCFG**, **AT+GTTMA**, **AT+GTDAT**, **AT+GTPIN**, **AT+GTTAP** and **AT+GTBSE** can not be reset by this command.

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

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

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

➢ **+ACK:GTRTO,**

Example: **+ACK:GTRTO, 250504,135790246811220,,IOS,0015,20090214093254,11F1$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub Command	<=6	Sub Command String	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.2.7.2.Hour Meter Counter

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

➢ **AT+GTHMC=**

Example: **AT+GTHMC=gv300,1,12345:12:34,,,,,,,,,0018$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Enable Hour Meter	1	0|1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

✧ <*Initial Hour Meter Count*>: It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00. 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, 250504,135790246811220,,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	$	$

3.2.7.3.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, voice monitoring and SMS functions.

➢ **AT+GTWLT=**

Example: AT+GTWLT=gv300,7,1,2,13813888888,13913999999,,,,,0018$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
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*>: It configures the working mode of this function.

- Bit 0: White list for location by call.
- Bit 1: White list for voice monitoring.
- Bit 2: White list for SMS. Gateway Number and SOS Number will ignore the white list function.

For each bit, set it to 1 to enable the function, and 0 to disable it. If the values of Bit 0, Bit 1 and Bit 2 are all 0, disable this function and allow any phone number to use the location by call, voice monitoring function and SMS functions.

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

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

Note: For modes 2 and 3, if the value of the parameter <*Call Filter*> for the White List function is different from 0, the device will only answer incoming calls from the predefined phone numbers.

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

➢ **+ACK:GTWLT,**

Example: **+ACK:GTWLT, 250504,135790246811220,,0018,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.2.7.4.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=gv300,1,1,AT+GTRTO=gv300,0,,,,,,000B$,,,,,0005$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv300
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*>: The working mode of storing command string.
- 0: Delete the stored command.
- 1: Add the stored command.

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

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

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

➢ **+ACK:GTCMD**

Example: **+ACK:GTCMD, 250504,135790246811220,,0005,20100310172830,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.7.5.User Defined Function

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

➢ **AT+GTUDF=**

Example: **AT+GTUDF=gv300,1,1,FFFFFFFF,30,0,0,FFFFFFFF,1,,,,,0005$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv300
Mode	1	0-2	0
Group ID	<=2	0 – 31	
Input ID Mask	<=16	0-FFFFFFFFFFFFFFFF	
Debounce Time	<=5	0-86400(s)	0
Inzizo Mask	<=5	00000-FFFFF	0
Outzizo Mask	<=5	00000-FFFFF	0
Stocmd ID Mask	<=8	0-FFFFFFFF	
Stocmd Ack	1	0|1	0
Inpeo Mask	<=5	00000-FFFFF	0
Outpeo Mask	<=5	00000-FFFFF	0
Reserved			
Reserved			
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

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

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

ID	**Mask Bit**	**Item**
1	**Bit 0**	Power on finished
2	**Bit 1**	Ignition on
3	**Bit 2**	Ignition off
4	**Bit 3**	Attached to the GPRS network
5	**Bit 4**	Not attached to the GPRS network
6	**Bit 5**	Registered on GSM network
7	**Bit 6**	Not Registered on GSM network
8	**Bit 7**	Network roaming

9	**Bit 8**	Network non-roaming
10	**Bit 9**	SIM card is locked
11	**Bit 10**	GPS is on
12	**Bit 11**	GPS 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**	Digital input 2 is low
20	**Bit 19**	Digital input 2 is high
21	**Bit 20**	Digital input 1 is low
22	**Bit 21**	Digital input 1 is high
23	**Bit 22**	SIM card is inserted
24	**Bit 23**	SIM card is not inserted
25	**Bit 24**	GPS external antenna is inserted
26	**Bit 25**	GPS external antenna is not inserted
27	**Bit 26**	Inside the speed range
28	**Bit 27**	Outside the speed range
29	**Bit 28**	Messages need to be sent
30	**Bit 29**	No messages need to be sent
31	**Bit 30**	Digital input 3 is low
32	**Bit 31**	Digital input 3 is high
33	**Bit 32**	Backup battery inserted
34	**Bit 33**	No backup battery
35	**Bit 34**	No change of SIM card
36	**Bit 35**	SIM card change

- <*Debounce Time*>: The debounce time for input events before the specified stored commands are executed.
- <*Inzizo Mask*>: The bitwise mask to indicate the input events within the circular 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*>: The bitwise mask to indicate the input events outside the circular 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 state of the group becomes TRUE (i.e. all the included input events 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, 250504,135790246811220,,0005,20100310172830,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.7.6.MS Band Selection

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

- **AT+GTBSE=**

Example: **AT+GTBSE=gv300,12,,,,,,,0014$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Preferred Band	2	0-12	12
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

➢ **+ACK:GTBSE,**

Example: **+ACK:GTBSE,250504,135790246811220,,0014,20090214093254,11F0$**			
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	$	$

3.2.7.7.GPS-Assisted Motion Measurement

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

➢ **AT+GTGAM=**

Example: **AT+GTGAM=gv300,1,1,10,10,10,5,,,,,0006$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**

Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GPS Fix Failure Timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: The working mode of the GPS-assisted motion measurement function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Speed Mode*>: It is combines with GPS speed to measure the status of movement.
  - 0: Disable the function.
  - 1: Enable the function.
- <*Motion Speed Threshold*>: The speed threshold which is combined with GPS speed to measure the status of movement.
- <*Motion Cumulative Time*>: If the average speed in <*Motion Cumulative Time*> is higher than <*Motion Speed Threshold*>, the device is considered to be in motion status.
- <*Motionless Cumulative Time*>: If the average speed in <*Motionless Cumulative Time*> is lower than <*Motion Speed Threshold*>, the device is considered to be in motionless status.
- <*GPS Fix Failure Timeout*>: If the time of GPS fix is more than <*GPS Fix Failure Timeout*>, the device will update motion status by motion sensor again.

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

- **+ACK:GTGAM,**

Example: **+ACK:GTGAM,250504,135790246811220,,1,0006,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
IOB ID	1	0 – 3	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3. Report

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

3.3.1.Position Related Report

- **+RESP:GTTOW,**

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

- **+RESP: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 combination is set 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 within the alarm range is detected .

- **+RESP:GTSOS,**

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

- **+RESP:GTRTL,**

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

- **+RESP:GTDOG,**

The protocol watchdog reboot message.

- **+RESP:GTIGL,**

The location message for ignition on and ignition off.

- **+RESP:GTHBM,**

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

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

Example:

+RESP:GTTOW,250504,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTDIS,250504,135790246811220,,,20,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTIOB,250504,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTSPD,250504,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTSOS,250504,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTRTL,250504,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTDOG,250504,135790246811220,,,01,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTIGL,250504,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTHBM,250504,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTHBM,250504,135790246811220,,,11,1,1,24.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID / Report Type	2	X(0-4|9-C)X(0-5)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

Report ID has different meanings in different messages as follows:

- The ID of digital input port which triggers the report message **+RESP:GTDIS** and **+RESP:GTSOS**. The range is 1 – 3 and 9 – C.
- The ID of the bound IO which triggers the report message **+RESP:GTIOB**. The range is 0 – 3.
- The ID of the digital input port which triggers the reboot message **+RESP:GTDOG**. The valid value is 1 or 2.

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

For other messages, it will always be 0.

- The type of speed alarm which triggers the report message **+RESP:GTSPD**. The range is 0 – 0xF.

Report type has different meanings in different messages as follows:

- In the **+RESP:GTDIS** report message generated by the digital input
  0: The current logical status of the input port is "disabled status".
  1: The current logical status of the input is "enabled status".
- In the **+RESP:GTIOB** report message generated by bound IO
  0: The current logical status of the bound IO does not meet the alarm condition.
  1: The current logical status of the bound IO meets the alarm condition.
- In the message of speed alarm **+RESP:GTSPD**
  0: Outside of the predefined speed range
  1: Inside of the predefined speed range
- In the protocol watchdog reboot message **+RESP:GTDOG**
  1: Reboot message for time based working mode
  2: Reboot message for ignition on working mode
  3: Reboot message for input triggered reboot
  4: Reboot message for GSM watchdog reboot
  5: Reboot message for GPRS watchdog reboot
- In the ignition on and ignition off message **+RESP:GTIGL**
  0: The engine is ignition on.
  1: The engine is ignition off.
- In the harsh behavior monitoring message **+RESP:GTHBM**
  0: Harsh braking behavior
  1: Harsh acceleration behavior
  2: Harsh turn behavior
  3: Harsh braking and turn behavior
  4: Harsh acceleration and turn behavior
  5: Unknown harsh behavior

For other messages, it will always be 0.

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

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

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

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

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

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

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

- <*GPS UTC Time*>: The UTC time obtained from the GPS chip.
- <*MCC*>: Mobile country code. It is 3 digits in length and ranges from 000–999.
- <*MNC*>: Mobile network code. It is 3 digits in length and ranges from 000–999.
- <*LAC*>: Location area code in hex format.
- <*Cell ID*>: The cell ID in hex format.
- <*Mileage*>: The current total mileage.

➢ **+RESP:GTFRI,**

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

Example: **+RESP:GTFRI,250504,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,12345:12:34,,,80,210100,,,,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' '-' '_'	
External Power VCC	<=5	0 – 32000 mV	
Report ID / Report Type	2	X(1-5)X(0-6)	
Number	1	1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	

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Hour Meter Count	11	HHHHH:MM:SS	
Analog Input 1	<=5	0～16000 mV | F0 – F100	
Analog Input 2	<=5	25～16000 mV | F0 – F100	
Backup Battery Percentage	<=3	0 – 100	
Device Status	<=10	0000000000 – 0F0FFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

  Report ID has several meanings as follows.
  - 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: Change of FRI report frequency which indicates that the terminal enters into Geo-Fence status or roaming status
  - 3: Corner report when FRI report frequency changes
  - 4: Mileage report when fixed report is mode 5
  - 5: Reserved
  - 6: Mileage report when fixed report is mode 5 and FFC works
- <*Number*>: The number of the GPS positions included in the report message. In the message **+RESP:GTFRI**, it is always 1.
- <*Hour Meter Count*>: If the hour meter counter function is enabled by the command **AT+GTHMC**, total hours the meter counts when the engine is on will be reported in this field. It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from

00000:00:00–99999:00:00. If the function is disabled, this field will be empty.

- <*Analog Input 1-2*>: The voltage of the analog input 1 and 2 or the fuel level measured by the fuel sensor connected to the corresponding analog input port. If the command **AT+GTAIS** is configured for the device to report the analog input 1 or 2 information periodically with fixed report, the device will send the current voltage of the analog input 1 or 2 or the fuel level with the format of "FXX" along with the **+RESP:GTFRI** message to the backend server. If **AT+GTAIS** is not configured, this field will be empty.
- <*Backup Battery Percentage*>: The current volume of the backup battery in percentage.
- <*Device Status*>: The state of the device. From left to right, the first two characters indicate EIO100 input status, the second two characters indicate EIO100 output status, the third two characters indicate the current motion state of the device, the fourth two characters indicate the status of input ports, and the last two characters indicate the status of output ports.

  The current motion states 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 as being towed.
  - 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
  - 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
  - 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
  - 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

  Regarding both digital IO status and EIO100 IO status, for each bit, 0 means "disabled status", and 1 means "enabled status". If EIO100 device is not connected or the mode of **AT+GTURT** is not for EIO100, the optional bits will not be included.

Mask Bit	**Item**
Bit 39 (Optional)	Reserved
… (Optional)	Reserved
Bit 35 (Optional)	EIO100 input C
Bit 34 (Optional)	EIO100 input B
Bit 33 (Optional)	EIO100 input A
Bit 32 (Optional)	EIO100 input 9
…(Optional)	Reserved
Bit 27 (Optional)	EIO100 output C
Bit 26 (Optional)	EIO100 output B
Bit 25 (Optional)	EIO100 output A
Bit 24 (Optional)	EIO100 output 9
Bit 16-23	Motion state of the device
…	Reserved
Bit 11	Digital input 3
Bit 10	Digital input 2

Bit 9	Digital input 1
Bit 8	Ignition detection
…	Reserved
Bit 3	Reserved
Bit 2	Digital output 3
Bit 1	Digital output 2
Bit 0	Digital output 1

➢ **+RESP:GTERI,**

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

Example:

/*1wire bus connect only one device*/
+RESP:GTERI,250504,862170011501234,,00000002,,10,1,1,0.0,0,43.6,117.198435,31.845227,20120728025538,0460,0000,5663,0358,00,0.0,,,,0,220100,2,1,FD0000034129ED28,2,01A2,20120728025540,0010$

/*1wire bus connect two devices*/
+RESP:GTERI,250504,862170011501234,,00000002,,10,1,0,3.2,0,64.7,117.198613,31.845190,20120728025304,0460,0000,5663,0358,00,0.0,,,,0,210100,2,2,3C00000340FD1128,2,019E,FD0000034129ED28,2,01AC,20120728025310,000A$

/*Digit fuel sensor*/
+RESP:GTERI,250504,862170010196747,,00000001,,10,1,4,0.1,0,102.6,117.198663,31.845033,20120725122922,0460,0000,5663,39BF,00,0.0,,,,0,410000,1,008B,20120725122928,004A$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ERI Mask	8	00000000 – FFFFFFFF	
External Power Supply	<=5	0 – 32000 mV	
Report ID / Report Type	2	X(1-5)X(0-6)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	

Altitude		<=8	(–)xxxxx.x m	
Longitude		<=11	(–)xxx.xxxxxx	
Latitude		<=10	(–)xx.xxxxxx	
GPS UTC Time		14	YYYYMMDDHHMMSS	
MCC		4	0XXX	
MNC		4	0XXX	
LAC		4	XXXX	
Cell ID		4	XXXX	
Reserved		2	00	
Mileage		<=9	0.0 – 4294967.0 km	
Hour Meter Count		11	HHHHH:MM:SS	
Analog Input 1		<=5	0～16000 mV | F0 – F100	
Analog Input 2		<=5	25～16000 mV | F0 – F100	
Backup Battery Percentage		<=3	0 – 100	
Device Status		<=10	0000000000 – 0F0FFFFFFF	
UART Device Type		<= 2	0 - 99	
Digital Fuel Sensor Data (Optional)		<= 20		
AC100 Data (Optional)	AC100 Device Number	<= 2	0 - 19	
	1-wire Device ID	16		
	1-wire Device Type	2		
	1-wire Device Data	<= 40		
CAN Data (Optional)		<=1000		
Fuel Sensor Data (Optional)	Sensor Number	<=3	0 – 100	
	Sensor Type	<= 2	0 –6|20 – 21	
	Percentage (Optional)	<= 5	0 –100.0	
	Volume (Optional)	<= 5	0 –10000.0	

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

- *<UART Device Type>*: The type of device connected to the second serial port.
  - 0: No device connected.
  - 1: Digital fuel sensor.
  - 2: AC100 1-wire bus.
  - 5: CANBUS Device.
- *<Digital Fuel Sensor Data>*: The raw data read from the digital fuel sensor. If Bit 0 of *<ERI Mask>* in **AT+GTFRI** is enabled, this field will be displayed; otherwise, this field will not be displayed.
- *<AC100 Device Number>*: The number of 1-wire devices connected to AC100. If it is 0, the following fields *<1-wire Device ID>*, *<1-wire Device Type>*, and *<1-wire Device Data>* will not be displayed. If there are more than one 1-wire devices connected, the following fields *<1-wire Device ID>*, *<1-wire Device Type>*, and *<1-wire Device Data>* will appear repeatedly showing the information of all connected 1-wire devices. If Bit 1 of *<ERI Mask>* in **AT+GTFRI** is enabled, the information contained in the *<AC100 Data>* field will be displayed; otherwise, the *<AC100 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.
- *<1-wire Device Data>*: It indicates the data read from the 1-wire devices. If the device is a temperature sensor, then this parameter indicates the temperature value. To convert the two-byte value in hex to decimal, multiply it by 0.0625 to get the temperature value in degrees Celsius. If the first 5 bits of the high byte are all 1, then the temperature value is below zero degrees Celsius and the value is represented in two's complement format. To obtain the temperature in decimal, plus the hexadecimal data by 1 and then multiply it by 0.0625 to get the value in degrees Celsius.
- *<CAN Data>*: If Bit 2 of *<ERI Mask>* in **AT+GTFRI** is enabled, the corresponding information will be displayed, including the data got from CAN device.

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

➢ **+RESP:GTEPS,**

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

➢ **+RESP:GTAIS,**

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

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

Example:
+RESP:GTEPS,250504,135790246811220,,13500,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTAIS,250504,135790246811220,,1980,11,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power / Analog Input VCC	<=5	0 – 32000 mV /0-16000 mV	
Report ID / Report Type	2	X(0-2)X(0-1)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*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*>: The report ID and the report type in hex format. 4 high bits indicate report ID and 4 low bits indicate 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 1-2.

  Report type has two meanings as shown below:
  - 0: Outside the predefined range.
  - 1: Inside the predefined range.
- ✧ <*Number*>: The number of the GPS positions included in the report message. Generally, it is 1.

➢ **+RESP:GTLBC,**

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

Example: **+RESP:GTLBC,250504,135790246811220,,+8613800000000,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Call Number	<=20	phone number	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	

GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

➢ **+RESP:GTIDA,**

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

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

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

Example: **+RESP:GTIDA,250504,862170013895931,,,D2C4FBC5,1,1,1,0.8,0,22.2,117.198630,31.845229,20120802121626,0460,0000,5663,2BB9,00,0.0,,,,,20120802121627,008E$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
ID	<=20	'0' – '9' 'A' – 'F'	
ID Report Type	1	0|1|2	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	

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

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

➢ **+RESP: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,250504,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID / Report Type	<=3	X(0-13)X(0-1)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<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 0 to 13.
- Report Type: 0 indicates “Exit from the Geo-Fence”; 1 indicates “Enter the Geo-Fence”.

➢ **+RESP:GTGES**

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

Example:
+RESP:GTGES,250504,135790246811220,gv300,,00,0,100,30,11,1,1,24.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length (byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF,	

		X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID / Report Type	<=3	X(0-13)X(0-1)	
Trigger Mode	<=3	0|21|22	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0|5 – 86400sec	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- Report ID: The ID of Geo-Fence in HEX format. The range is 0 to 13.
- Report Type: 0 indicates "Current Parking-Fence is inactive"; 1 indicates "Current Parking-Fence is active".

➢ **+RESP:GTGIN**

If 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 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,250504,135790246811220,,,,100,0,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$.
+RESP:GTGOT,250301,135790246811220,,,,100,0,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Reserved			
Area Type	1	0|1	
Area Mask	8	00000000-000FFFFF	
Reserved			
Reserved			
Reserved			
Reserved			
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	

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

✧ *<Area Mask>*: It indicates report text 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.

✧ *<Area Type>*: This text is for polygon or circular area. 0 means "Polygon".

3.3.2.Device Information Report

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

➢ **+RESP:GTINF,**

Example: **+RESP:GTINF,250504,135790246811220,,16,898600810906F8048812,16,0,1,12000,,4.40,0,0,0,0,20090214013254,0,1300,2000,00,00,+0800,0,20090214093254,11F0$**			
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' '-' '_'	
State	2	11|12|21|22|41|42|1A|16	
ICCID	20		
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	

External Power Supply	1	0|1	
External Power VCC	<=5	0 – 32000mV	
Reserved	1		
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0|1	
LED On	1	0|1	
Reserved	1		
External GPS Antenna	1	0|1|3	
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Pin15 Mode	1	0|1	
Analog Input VCC1	<=5	F0~F100/0~16000mV	
Analog Input VCC2	<=5	F0~F100/0~16000mV	
Digital Input	<=4	0000 – 0F0F	
Digital Output	<=4	0000 – 0F07	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*State*>: The current motion state of the device.

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

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

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

CSQ RSSI	Signal Strength (dBm)

0	<-133
1	-111
2 – 30	-109 – -53
31	>-51
99	Unknown

- <*CSQ BER*>: The quality of the GSM signal. The range is 0-7, and 99 is for unknown strength of signal.
- <*External Power Supply*>: Whether the external power supply is connected.
  - 0: Not connected.
  - 1: Connected.
- <*External Power Supply VCC*>: The voltage of the external power supply.
- <*Backup Battery VCC*>: The voltage of the backup battery. The value of this field is only valid when the external power is not connected.
- <*Charging*>: Whether the backup battery is charging when the main power supply is connected.
  - 0: Not charging.
  - 1: Charging.
- <*External GPS Antenna*>: The status of the external GPS antenna.
  - 0: The external GPS antenna of the device is working.
  - 1: The external GPS antenna of the device is detected in open circuit state.
  - 3: The external GPS antenna of the device is in unknown state.
- <*Last Fix UTC Time*>: The UTC time of the latest successful GPS fix.
- <*Pin15 Mode*>: The current working mode of pin 15.
- <*Analog Input VCC1*>: The voltage of the analog input 1.
- <*Analog Input VCC2*>: The voltage of the analog input 2.
- <*Digital Input*>: A bitwise hex integer to represent the logical status of the digital input. For each bit, 0 means "disabled status", and 1 means "enabled status". If EIO100 device is not connected or the mode of **AT+GTURT** is not for EIO100, the optional bit(s) will not be included.

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

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

included.

Mask Bit	Item
Bit 15 (Optional)	Reserved
…(Optional)	Reserved
Bit 11 (Optional)	EIO100 output C
Bit 10 (Optional)	EIO100 output B
Bit 9 (Optional)	EIO100 output A
Bit 8 (Optional)	EIO100 output 9
…	Reserved
Bit 2	Digital output 3
Bit 1	Digital output 2
Bit 0	Digital output 1

- <*Time Zone Offset*>: The time offset of the local time zone from the UTC time.
- <*Daylight Saving*>: The current setting of the daylight saving.
  - 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 GPS information, it will send the GPS information to the backend server via the message **+RESP:GTGPS**.

- **+RESP:GTGPS,**

Example: **+RESP:GTGPS,250504,135790246811220,,0,,,0000,,0,20090214013254,20090214093254,11F0$**			
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' '-' '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Reserved	0		

External GPS Antenna	1	0|1|3	
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report Composition Mask*>: Please refer to <*Report Composition Mask*> of the **AT+GTCFG** command.

3.3.3.2.+RESP:GTALM

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

➢ **+RESP:GTALM,**

Example: **+RESP:GTALM,250504,862170013894694,,16,1,BSI,cmnet,,,,,,,SRI,3,,1,116.228.146.250,8186,192.0.0.0,0,,0,0,0,0,0,,,CFG,gv300,gv300,0,0.0,0,,003F,1,,3FFF,0,0,0,300,0,1,0,0,001F,0,TOW,0,10,1,300,0,0,0,0,2,3,2,,,,,,,,,EPS,0,0,0,0,0,0,0,0,0,0,0,,,,DIS,0,1,,0,1,0,0,0,2,0,0,0,3,0,,0,,,,,OUT,0,,,,,,,IOB,0,0,0,0,0,0,0,0,0,,,,,1,0,0,0,0,0,0,0,0,,,,,2,0,0,0,0,0,0,0,0,,,,,3,0,0,0,0,0,0,0,0,,,,,TMA,+0000,0,,,,,FRI,0,1,,1,0000,0000,180,30,1000,1000,,0,600,00000000,,,,20130508122835,0009$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Total Packets	2	25	
Current Packet	<=2	1 – 25	
Configurations	< 1500		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Total Packets*>: The total number of **+RESP:GTALM.**
- <*Current Packet*>: The sequence number of the current packet.
- <*Configurations*>: The current configuration of the device. The 1st message contains configuration for the commands from **BSI** to **FRI**, the 2nd is for the commands from **GEO** to **DOG**, the 3rd is for the commands from **AIS** to **EFS**, the 4th to 8th messages are for the command **IDA**, the 9th is for the commands from **ACD** to **PDS**, the 10th is for the commands from **BZA** to **FSC**, the 11th is for the command **RMD**, the 12th to 15th messages are for the command **PEO**, the 16th is for the commands from **CMS** to **FTP**, the 17th to 20th messages are for the command **CMD**, the 21th to 22th messages are for the command **UDF**, the 23th is for the commands from **SIM** to **UPC**, the 24th is for the command **CLT**, and the last message is for the command **GAM**.

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

3.3.3.3.+RESP:GTALC

After the device receives the command **AT+GTRTO** to read the configurations, it will send corresponding configuration information to the backend server via the message **+RESP:GTALC** according to the configuration mask. 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,250A03,863286020871050,gv300n,1FFFFB,1,1,BSI,cmnet,,,,,,,SRI,3,,2,180.167.27.58,7009,0.0.0.0,0,,120,1,1,0,,,CFG,gv300,gv300n-GL8-LEAF-TEST,1,4597.6,,,007F,1,,393C,0,0,0,300,0,1,0,0,001F,0,TOW,1,5,0,30,0,0,0,0,2,3,4,,,,,,,,,EPS,2,1150,1600,1,0,0,0,0,0,1,0,0,0,DIS,0,1,,1,1,0,0,0,2,0,0,0,3,0,,0,,,,,OUT,0,,,,,,,IOB,0,0,0,0,0,0,0,0,0,,,,,1,0,0,0,0,0,0,0,0,,,,,2,0,0,0,0,0,0,0,0,,,,,3,0,0,0,0,0,0,0,,,,,TMZ,-0600,0,,,,,FRI,1,0,,1,0000,0000,,5,1000,1000,,30,86400,00000000,,,,GEO,0,0,,,50,0,0,0,0,0,0,0,0,0000,0000,1,0,,,50,0,0,0,0,0,0,0,0,0000,0000,2,0,,,50,0,0,0,0,0,0,0,0,0000,0000,3,0,,,50,0,0,0,0,0,0,0,0,0000,0000,4,0,,,50,0,0,0,0,0,0,0,0,0000,0000,5,0,,,50,0,0,0,0,0,0,0,0,0000,0000,6,0,,,50,0,0,0,0,0,0,0,0,0000,0000,7,0,,,50,0,0,0,0,0,0,0,0,0000,0000,8,0,,,50,0,0,0,0,0,0,0,0,0000,0000,9,0,,,50,0,0,0,0,0,0,0,0,0000,0000,10,0,,,50,0,0,0,0,0,0,0,0,0000,0000,11,0,,,50,0,0,0,0,0,0,0,0,0000,0000,12,0,,,50,0,0,0,0,0,0,0,0,0000,0000,13,0,,,50,0,0,0,0,0,0,0,0,0000,0000,14,0,,,50,0,0,0,0,0,0,0,0,0000,0000,15,0,,,50,0,0,0,0,0,0,0,0,0000,0000,16,0,,,50,0,0,0,0,0,0,0,0,0000,0000,17,0,,,50,0,0,0,0,0,0,0,0,0000,0000,18,0,,,50,0,0,0,0,0,0,0,0,0000,0000,19,0,,,50,0,0,0,0,0,0,0,0,0000,0000,SPD,2,0,50,0,300,0,0,0,0,0,,,,,,,,,,SOS,0,0,,0,0,0,0,5,4,,,MON,0,,5,0,2,0,0,0,PIN,1,1234,,,,,,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,,,2,0,250,250,0,,0,0,0,0,0,,10,30,10,20,0,0,0,IDL,0,2,1,,,,,0,0,0,0,,,,,HMC,0,00000:00:00,,,,,,,,,20160804014950,98BF$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF,	

		X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Configuration Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Next Packet	1	0-1	0
Current Packet	<=2	1-20	1
BSI	3	BSI	BSI
APN	<=40		
APN User Name	<=30		
APN Password.	<=30		
Backup APN	<=40		
Backup APN User Name	<=30		
Backup APN Password	<=30		
Reserved	0		
SRI	3	SRI	SRI
Report Mode	1	0 – 7	0
Reserved	0		
Buffer Mode	1	0|1|2	1
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP / Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	0
Enable SACK	1	0|1|2	0
Protocol Format	1	0|1	0
Enable SMS ACK	1	0|1	0
Reserved	0		

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Reserved	0		
CFG	3	CFG	CFG
Password	4–20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv300
Enable ODO	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
Reserved	0		
Event Mask	4	0000 – FFFF	3FFFF
Pin15 Mode	1	0|1	0
LED On	1	0|1	0
Enable Info Report	1	0|1	0
Info Report Interval	<=5	30 – 86400sec	300
Location by Call	1	0|1|2	0
Echo Suppression	1	1|2	1
Backup Battery Charge Mode	1	0|1	0
AGPS Mode	1	0|1	0
GSM Report	4	0000 – FFFF	000F
GPS Lost Time	2	0 – 30min	0
TOW	3	TOW	TOW
Tow Enable	1	0|1	0
Engine Off to Tow	<=2	5 – 15min	10
Fake Tow Delay	<=2	0 – 10min	1
Tow Interval	<=5	30 – 86400sec	300
Tow Output ID	1	0 – 3|9 – C	0
Tow Output Status	1	0|1	0
Tow Output Duration	<=3	0 – 255(×100ms)	0

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Tow Output Toggle Times	<=3	0 – 255	0
Rest Duration	<=3	1 – 255(×15sec)	2
Motion Duration	<=2	1 – 10(×100ms)	3
Motion Threshold	1	2 – 9	2
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0|1|2	0
Min. Threshold	<=5	250 – 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 – 3|9 – C	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
MPN/MPF Validity Time	1	0 – 5 (×1s)	0
DIS	3	DIS	DIS
Ignition Detection	1	0	0
Sample Period	<=2	0|1 – 12(×2s)	1
Reserved	0		

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Reserved	0		
Input ID 1	1	1	1
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=2	0|1 – 12(×2s)	0
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
Input ID 3	1	3	3
Sample Period	<=2	0|1 – 12(×2s)	0
Reserved			
Validity Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OUT	3	OUT	OUT
DOS Report	1	0-7	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB	3	IOB	IOB
IOB ID0	1	0	0
Input Mask	1	0000 – 0F0F	0
Trigger Mask	1	0000 – 0F0F	0
Input Sample Period	<=2	0|1 – 12(×2s|×4s)	0

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

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Reserved	0		
Reserved			
IOB ID3	1	3	3
Input Mask	1	0000 – 0F0F	0
Trigger Mask	1	0000 – 0F0F	0
Input Sample Period	<=2	0|1 – 12(×2s|×4s)	0
Output ID	1	0 – 3|9 – C	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			
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	0
Discard No Fix	<=2	0|1	1
Reserved	0		
Enable Period	1	0|1	1
Begin Time	4	HHMM	0000
End Time	4	HHMM	0000
Check Interval	<=5	0 – 86400sec	0
Send Interval	<=5	0|5 – 86400sec	30

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Distance	<=5	300 – 65535m	1000
Mileage	<=5	300 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0|5-86400sec	600
ERI Mask	8	00000000-FFFFFFFF	00000000
Reserved	0		
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID1	1	1	1
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0

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Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID2	1	2	2
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID3	1	3	3
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0

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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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID4	1	4	4
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID5	1	5	5
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

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Trigger Mode	<=2	0|21|22	0
Trigger Report	1	0|1	0
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID6	1	6	6
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID7	1	7	7
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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

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Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID8	1	8	8
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID9	1	9	9
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000

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GEO ID10	2	10	10
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID11	2	11	11
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID12	2	12	12
Mode	1	0 – 3	0

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Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID13	2	13	13
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID14	2	14	14
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000

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Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID15	2	15	15
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID16	2	16	16
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0

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Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID17	2	17	17
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID18	2	18	18
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0

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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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
GEO ID19	2	19	19
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 | 5 – 86400sec	0
Output ID	1	0 – 3|9 – C	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
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
SPD	3	SPD	SPD
Mode	1	0|1|2|3|4	0
Min Speed	<=3	0 – 400km/h	0
Max Speed	<=3	0 – 400km/h	0
Validity	<=4	15 – 3600sec	60
Send Interval	<=4	30 – 3600sec	30
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

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Report ID	<=2	0 – 15	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 4	0
Digital Input ID	1	0 – 3|9 – C	0
SOS Number	<=20		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
SOS Microphone	2	0 – 10	5
SOS Speaker	1	0 – 7	4
Reserved	0		
Reserved	0		
MON	3	MON	MON
Mode	1	0 – 3	0
Stealth Phone Number	<=20		
Stealth Microphone	2	0 – 10	5
Stealth Speaker	1	0 – 7	0
Send Alarm Message	1	0|1|2	2
Output ID	1	0 – 3|9 – C	0

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Output Status	1	0|1	
Ring Number	1	0-8	0
PIN	3	PIN	PIN
Enable Auto-unlock PIN	1	0|1	1
PIN	1	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OWH	3	OWH	OWH
Mode	1	0|1|2|3	0
Day of Work	<=2	0 – 7F	1F
Working Hours Start1	4	HHMM	0900
Working Hours End1	4	HHMM	1200
Working Hours Start2	4	HHMM	1300
Working Hours End2	4	HHMM	1800
Reserved	0		
Reserved	0		
Digital Input ID	1	0 – 3|9 – C	0
Digital Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0|1|2	0

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Ignition Frequency	<=3	10 – 120min	60
Interval	<=2	1 – 30	30
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0|1	1
Input ID	1	0|1|2	0
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|1|2|3|4|5	0
Min. Threshold	<=5	0～2700|0~16000mV	0
Max. Threshold	<=5	0～2700|0~16000mV	0
Sample Period	<=2	0|1 – 12(×2s)	0
Reserved	0		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0|1	0
Reserved	0		
Reserved	0		
Analog Input ID2	1	2	2
Mode	1	0|1|2|3|4|5	0
Min. Threshold	<=5	25～2700|250~16000mV	250
Max. Threshold	<=5	25～2700|250~16000mV	250
Sample Period	<=2	0|1 – 12(×2s)	0
Reserved	0		

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Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0|1	0
Reserved	0		
Fuel Data Debounce	<=3	0 – 150	10
Fuel Sensor Delay	<=3	0 – 600 sec	30
Fuel Loss Alarm	<=2	0 – 50	10
Fuel Sensor Sample Count	<=3	0 – 150	20
Change Threshold	<=2	0 – 50 %	0
Voltage Margin error	3	0 – 100(×10mv)	0
IGF Fuel Update	1	0|1	0
IDL	3	IDL	IDL
Mode	1	0|1	0
Time to Idling	2	1 – 30 min	2
Time to Movement	1	1 – 5 min	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3|9 – C	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		
HMC	3	HMC	HMC

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Enable Hour Meter	1	0|1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
Enable HBM	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	100 – 400km/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 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

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Turn and Break Threshold	<=3	30-70	30
Turn and Break Duration	<=3	40-100(*8ms)	50
Acceleration Threshold	<=3	15-50	20
Acceleration Duration	<=3	50-250(*8ms)	65
URT	3	URT	URT
Working Mode	1	0 – 9	0
Baudrate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 4	0
Enable Sleep	1	0|1	0
Input ID of Wakeup	0	0|2	0
Digit Fuel Sensor Type	1	0 - 6	0
Format	1		0
Interval	4	1-3600sec	
Terminator Character	2	0x00-0xFF	0D
Length	4	1-640|1280	
JDC	3	JDC	JDC
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	<=3	0 – 300 sec	10
Quit Jamming Timer Threshold	<=4	0 – 3600 sec	10
Reserved	0		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0

Toggle Times	<=3	0 – 255	0
Reserved	0		
WLT	3	WLT	WLT
Call Filter	1	0|1|2|3	
Start Index	<=2	1 – 10	
End Index	<=2	1 – 10	
Phone Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HRM	3	HRM	HRM
Reserved	0		
Reserved	0		
ACK Mask	1	'0' – '9' 'a' – 'f' 'A' – 'F'	7F
Response Mask	4	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFFFFFF
Event Mask	4	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFFFFFF
Information Mask	2	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFF
HBD Mask	1	'0' – '9' 'a' – 'f' 'A' – 'F'	FF
DAT Mask	<=8	00000000 – FFFFFFFF	7F
Reserved	0		
Reserved	0		
Reserved	0		
CRA	3	CRA	CRA
Mode	1	0|1	0
Sensitivity	1	1 – 9	5
Report ACC	1	0|1	0
Report GPS Information	1	0|1	0
Reserved	0		
Reserved	0		

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

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

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Reserved			
Reserved			
JBS	3	JBS	JBS
Mode	1	0|1	0
Reserved	0		
Siren On Timer (T1)	5	1 – 65535(sec)	60
Siren Off Timer (T2)	5	1 – 65535(sec)	30
Fuel Cut-off Timer (T3)	5	1 – 65535(sec)	1800
Check Speed	1	0|1	1
Speed Limit	3	0 – 999km/h	30
Output 1 Init State	1	0|1	0
Motion Sensor	1	0|1	0
GPS Fix Failure Timeout Timer	3	1 – 100(min)	5
Enable Siren	1	0|1	1
Release Fuel Cut-off Timer	4	0 – 1000(min)	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
Time Unit	1	0|1	0
Reserved	0		
Reserved	0		
EFS	3	EFS	EFS
Reserved	0		
Reserved	0		
Ex Full Value	<= 5	0 – 65535	9999
Ex Fuel Sensor Delay	<=3	0 – 600 sec	30

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Ex Fuel Loss Alarm	<=2	0 – 50 %	10
Reserved	0		
Unsolicited Enable Ex	1	0 | 1	0
Ex Detection Frequency	3	5 – 600 sec	10
Ex Filter Factor	1	0 – 9	0
Report Sensor Data	1	0 | 1	0
Ex Detection Frequency IGF	<=2	30-1800s	300
Reserved	0		
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Enable	1	0|1	0
Start Index	<=2	1 – 250	
End Index	<=2	1 – 250	
ID Number 1	<=2		
⋮			
ID Number 250	<=3		
Timeout after Ignition Off	<=3	0 | 15 – 600sec	30
Report Mode	1	0|1|2|3	0
ID Validity Time	<=3	15 – 600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0-3	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		

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Reserved	0		
ACD	3	ACD	ACD
I-button Timer	<=2	1 – 10(s)	0
Output ID	1	0-3	0
Output status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle	<=3	0 – 255	0
Temperature Timer	<=3	10– 255(s)	0
Reserved			
Reserved			
Reserved			
Reserved			
PDS	3	PDS	PDS
Mode	1	0|1|2	0
Mask	4	0000-FFFF	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BZA	3	BZA	BZA
Output ID	1	0|2|3	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		

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

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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		
FSC	3	FSC	FSC
Reserved			
Table ID	1	0 – 4	1
Sensor Type	<= 2	0 – 6|20 – 21	20
Enable	1	0|1	0
Max. Tank Volume	<= 5	0 –10000	100

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Reserved			
Num of Node	<= 2	0|2 – 11	0
Node 1 Value	< = 5	0～99999	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	< = 5	0～99999	
Node N Percentage	<= 2	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
RMD	3	RMD	RMD
Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Home Operator List	<=6*10		
Reserved	0		
Reserved	0		
Roaming Operator List	<=6*100		
Reserved	0		
Reserved	0		
Black Operator List	<=6*20		
Reserved	0		
Reserved	0		

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Known Roaming Event Mask	<=6	000000 – FFFFFF	7FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	<=6	000000 – FFFFFF	7FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	
Duration	<=3	0～255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
PEO	3	PEO	PEO
GEO ID	1	0 – 19	0
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
…			
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Check Interval	<=5	0|5 – 86400sec	0
Output ID	1	0 – 3|9 – C	0
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
CMS	3	CMS	CMS
Camera ID	1	0-3	
Number	<=2	1-10	1
Interval	<=2	1-60s	5
Photo Compression Ratio	<=3	20-250	150
Photo Resolution	1	1-3	2
Digital Input ID	1	0|1-3	0
Attribute Mask	<=4	0000 - FFFF	0x0003
Server Type	1	0|1	0
EHD Support	1	0|1	0
Output ID	1	0 – 3	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		
CAN	3	CAN	CAN
Mode	1	0|1	1
CAN Report Interval	<=5	0|30 – 86400sec	0
CAN Report Interval IGF	<=5	0|30 – 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		
Reserved	0		

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FTP	3	FTP	FTP
Server Address	<=60		
Server Port	<=5	0 – 65535	21
Full Name	<=60		
User Name	<=10		
Login Password	<=10		0
Transfer Mode	1	0|1	0
Oper Type	1	0|1	0
Report FTP	1	0|1	0
File Name Prefix	<=20		
Reserved	0		
Reserved	0		
CMD	3	CMD	CMD
Mode	1	0-1	0
Stored Cmd ID	3	0 – 31	
Command String	200		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UDF	3	UDF	UDF
Mode	1	0-2	0
Group ID	<=2	0 – 31	
Input ID Mask	<=16	0-FFFFFFFFFFFFFFFF	
Debounce time	<=5	0-86400(s)	0
Inzizo Mask	<=5	00000-FFFFF	0
Outzizo Mask	<=5	00000-FFFFF	0
Stocmd ID Mask	<=8	0-FFFFFFFF	
Stocmd Ack	1	0|1	0
Inpeo Mask	<=5	00000-FFFFF	0

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Outpeo Mask	<=5	00000-FFFFF	0
Reserved			
Reserved			
SIM	3	SIM	SIM
Mode	1	0|1|2	0
ICCID	20		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3|9 – C	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		
BSE	3	BSE	BSE
Preferred Band	2	0-12	12
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OEX	3	OEX	OEX
Reserved	0		
Reserved	0		
Output Number	1	1 – 4	
Output ID	1	9 – C	
Status	1	0|1	0

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Duration	1	0	0
Toggle Times	1	0	0
Reserved	0		
Reserved	0		
DOS Report	1	0 – F	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IEX	3	IEX	IEX
Reserved	0		
Reserved	0		
Input Number	1	1 – 4	
Input ID	1	9 – C	
Sample Period	<=2	0|1 – 12(×4s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UPC	3	UPC	UPC
Max. Download Retry	1	0 – 3	0
Download Timeout	<=2	5 – 30 min	10
Download Protocol	1	0	0
Enable Report	1	0|1	0
Update Interval	<=4	0 – 8760 hour	0
Download URL	<=100	URL	
Mode	1	0|1	0
Reserved	0		

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Reserved	0		
Reserved	0		
CLT	3	CLT	CLT
Group ID	<=2	0 –19	0
Mode	1	0|1	0
Debounce Time	<=3	0 – 255(×1s)	0
CAN Data Mask	8	0 - FFFFFFFF	000FFFFF
Alarm Mask 1	<=8	0 – FFFFFFFF	0
Alarm Mask 2	<=8	0 – FFFFFFFF	0
Alarm Mask 3	<=8	0 – FFFFFFFF	0
High RPM Threshold	<=3	1 – 100(x100 rpm)	30
Low RPM Threshold	<=3	0 – 99(x100 rpm)	8
CAN Report Expansion Mask	8	0 - FFFFFFFF	001FFFFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GAM	3	GAM	GAM
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5-50km/h	10
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GPS Fix Failure Timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		

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

- <*Next Packet*>: Whether the following information packet is the last one or not.
  - 0: The following packet is the last information packet.
  - 1: The following packet is not the last information packet.
- <*Current Packet*>: It indicates the index of **+RESP:GTALC**.

3.3.3.4.+RESP:GTCID

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

➢ **+RESP:GTCID,**

Example: **+RESP:GTCID, 250504,135790246811220,,898600810906F8048812,20090214093254,11F0$**			
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' '-' '_'	
ICCID	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.5.+RESP:GTCSQ

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

➢ **+RESP:GTCSQ,**

Example:

+RESP:GTCSQ, 250504,135790246811220,,16,0,20090214093254,11F0$			
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' '-' '_'	
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

3.3.3.6.+RESP:GTVER

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

➢ **+RESP:GTVER,**

Example: **+RESP:GTVER, 250504,135790246811220,,Gv300,0100,0101,20090214093254,11F0$**			
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' '-' '_'	

Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Software Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Device Type*>: The type of the device.
- <*Software Version*>: The software version of the device. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.
- <*Hardware Version*>: The hardware version of the device. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.

3.3.3.7.+RESP:GTBAT

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

- **+RESP:GTBAT,**

Example: **+RESP:GTBAT, 250504,135790246811220,,1,12000,,4.40,0,0,20090214093254,11F0$**			
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' '-' '_'	
External Power Supply	1	0|1	
External Power VCC	<=5	0 – 32000mV	
Reserved	0		
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0|1	
LED On	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.8.+RESP:GTIOS

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

➢ **+RESP:GTIOS,**

Example: **+RESP:GTIOS, 250504,135790246811220,,0,1200,1300,00,00,20090214093254,11F0$**			
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' '-' '_'	
Pin15 Mode	1	0|1	
Analog Input VCC1	<=4	0 – 16000 mV	
Analog Input VCC2	<=4	25 – 16000 mV	
Digital Input	4	0000 – 0F0F	
Digital Output	4	0000 – 0F07	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.9.+RESP:GTTMZ

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

➢ **+RESP:GTTMZ,**

Example: **+RESP:GTTMZ, 250504,135790246811220,,+0800,0,20090214093254,11F0$**			
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' '-' '_'	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.10.+RESP:GTAIF

After the device receives the command **AT+GTRTO** to get the **AIF**, it will send the information via the message **+RESP:GTAIF** to the backend server. The **+RESP:GTAIF** does not support the HEX report.

➢ **+RESP:GTAIF,**

Example: **+RESP:GTAIF,250504,862170010903183,,,,,cmnet,,,898602a5121106029714,20,0,0358,10.194.113.168,211.138.180.2,211.136.17.108,,,,,20120716051300,0181$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Backup APN	<=40		
Backup APN User Name	<=30		
Backup APN Password	<=30		
ICCID	20		
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	

Cell ID	4		
IP Address	7	0.0.0.0	
Main DNS	7	0.0.0.0	
Backup DNS	7	0.0.0.0	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

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

3.3.3.11.+RESP:GTALS

After the device receives the command **AT+GTRTO** to get sub AT command configuration information, it will send the configuration information to the backend server via the message **+RESP:GTALS**. Configuration information varies with different AT Commands. For example, to get FRI configuration, set **AT+GTRTO=gv300,2,FRI,,,,,0015$**.

- **+RESP:GTALS,**

Example:
+RESP:GTALS,250504,862170010822169,gv300,FRI,1,0,,0,0000,0000,180,30,1000,1000,,40,60,00000000,,,,20121205072258,00C3$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub AT Command	3	'a' – 'z' 'A' – 'Z' '	
Mode	1	0 – 4	
Discard No Fix	<=2	0|1	
Reserved	0		
Enable Period	1	0|1	
Start Time	4	HHMM	
End Time	4	HHMM	
Check Interval	<=5	30 – 86400sec	
Send Interval	<=5	5 – 86400sec	
Distance	<=5	50 – 65535m	
Mileage	<=5	50 – 65535m	
Reserved	0		
Corner Report	<=3	0 – 180	
IGF Report Interval	<=5	0|5-86400sec	
ERI Mask	8	00000000-FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.12.+RESP:GTGSV

After the device receives the command **AT+GTRTO** to get the satellite information, it will send the satellite information via the message **+RESP:GTGSV** to the backend server.

➢ **+RESP:GTGSV,**

Example: **+RESP:GTGSV,250504,359464036001111,,11,30,24,31,30,32,28,32,29,12,0,14,17,16,18,20,0,22,24,24,0,25,0,20120305101643,000F$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	20		
SV Count	2	0-24	
SV ID	2	> =0	
SV Power	2	> =0	
……			
SV ID	2	> =0	
SV Power	2	> =0	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*SV Count*>: The count of satellites the GPS finds.
✧ <*SV ID*>: The satellite ID. In case of no satellite, fill in the field with zero.
✧ <*SV Power*>: Satellite power. In case of no satellite, fill in the field with zero.

3.3.3.13.+RESP:GTUVN

After the device receives the command **AT+GTRTO** to get the version number of the UFSxxx fuel sensor, it will send the information to the backend server via the message **+RESP:GTUVN**.

➢ **+RESP:GTUVN,**

Example: **+RESP:GTUVN, 250504,869158008709145,gv300,2,02,B,,,,,20150323013012,2153$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sensor Protocol Version	1		
Sensor SW Version	2		
Sensor HW Version	1		
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- *<Sensor Protocol Version>*: The protocol version of the UFSxxx fuel sensor.
- *<Sensor SW Version>*: The SW version of the UFSxxx fuel sensor.
- *<Sensor HW Version>*: The HW version of the UFSxxx fuel sensor.

3.3.3.14.+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	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CAN100 SW Version	<=7	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			

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

✧ *<CAN100 SW Version>*: The SW version of the CAN100 device.

3.3.3.15.+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	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CAN100 Serial Number	<=10	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<CAN100 Serial Number>*: The Serial Number of the CAN100 device.

3.3.4.Event Report

The following event reports are triggered when certain events occur.

+RESP:GTPNA: Power on report

+RESP:GTPFA: Power off report
+RESP:GTMPN: The report for connecting main power supply
+RESP:GTMPF: The report for disconnecting main power supply
+RESP:GTBTC: Backup-battery-starts-charging report
+RESP:GTSTC: Backup-battery-stops-charging report
+RESP:GTBPL: Backup battery low
+RESP:GTSTT: Device motion state indication when the motion state changes
+RESP:GTANT: External GPS antenna status indication when the state changes
+RESP:GTMON: Indication of the device being voice-monitored
+RESP:GTPDP: GPRS connection establishment report
+RESP:GTIGN: Ignition on report
+RESP:GTIGF: Ignition off report
+RESP:GTIDN: Enter into idling status
+RESP:GTIDF: Leave idling status
+RESP:GTJDR: Jamming indication
+RESP:GTJDS: Jamming indication
+RESP:GTGSM: The report for the information of the serving cell and the neighbour cells
+RESP:GTGSS: GPS signal status
+RESP:GTCRA: Crash incident report
+RESP:GTSTR: Vehicle enters into start status
+RESP:GTSTP: Vehicle enters into stop status
+RESP:GTLSP: Vehicle enters into long stop status
+RESP:GTFLA: Unusual fuel consumption alarm
+RESP:GTDOS: Status of wave shape 1 output changes
+RESP:GTTMP: Temperature alarm
+RESP:GTRMD: The report for entering or leaving GSM roaming state
+RESP:GTPHL: Reporting location information before reporting photo data
+RESP:GTFTP: Reporting location information after transferring a file to FTP server
+RESP:GTEXP: Reporting malfunction information of digital fuel sensor
+RESP:GTUPC: Reporting information about UPC
+RESP:GTCLT: CANBUS information alarm

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

- **+RESP:GTPNA,**
- **+RESP:GTPFA,**
- **+RESP:GTPDP,**

Example:
+RESP:GTPNA, 250504,135790246811220,,20090214093254,11F0$
+RESP:GTPFA, 250504,135790246811220,,20090214093254,11F0$

+RESP:GTPDP, 250504,135790246811220,,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' '-' '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTMPN,**
- **+RESP:GTMPF,**
- **+RESP:GTBTC,**
- **+RESP:GTCRA,**

Example:
+RESP:GTMPN,250504,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTMPF,250504,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTBTC,250504,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTCRA,250506,863286020195260,gv300,0,2.1,345,72.5,117.201503,31.833105,20150702123654,0460,0000,5678,2079,00,20150702123655,1237$

Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	

MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

If the <*Mode*> is set to 1 in the **AT+GTJDC** command, the device will report the **+RESP:GTJDR** message when jamming is detected.

➢ **+RESP:GTJDR,**

Example: **+RESP:GTJDR,250504,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00

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

If the <*Mode*> is set to 2 in the **AT+GTJDC** command, the device will report the **+RESP:GTJDS** message when jamming is detected.

➢ **+RESP:GTJDS,**

Example: **+RESP:GTJDS,250504,135790246811220,,2,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'	
Jamming Status	1	1|2	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Jamming Status>*: The current jamming status of the device.

- 1: Quit the jamming state.
- 2: Enter the jamming state.

➢ **+RESP:GTSTC,**

Example: **+RESP:GTSTC,250504,135790246811220,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTBPL,**

Example: **+RESP:GTBPL,250504,135790246811220,,3.53,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Backup Battery VCC	<=4	0.00 – 4.50 V	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTSTT,**

Example: **+RESP:GTSTT,250504,135790246811220,,16,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11|12|21|22|41|42|16	

GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*State*>: The current movement state of the device.

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

➢ **+RESP:GTANT,**

Example: **+RESP:GTANT,250504,135790246811220,,0,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External GPS Antenna	1	0|1|3	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*External GPS Antenna*>: The current state of the external GPS antenna.

- 0: The external GPS antenna of the device is working.
- 1: The external GPS antenna of the device is in open circuit state.
- 3: The external GPS antenna of the device is in unknown state.

➢ **+RESP:GTMON,**

Example: **+RESP:GTMON,250504,135790246811220,,+8613812341234,15,0,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Stealth Phone Number / Incoming Call Number	<=20		

MON Type	1	1| 2	
Stealth Microphone	<=2	0 – 10	5
Stealth Speaker	1	0 – 7	0
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Stealth Phone Number / Incoming Call Number*>: If <*MON Type*> is set to 1, <*Stealth Phone Number*> set by **AT+GTMON** will be filled in this field; if <*MON Type*> is set to 2, the number of the incoming call which launches voice monitoring will be filled in this field.
- <*MON Type*>: The type of voice monitoring.
  - 1: The current call is an outgoing call for voice monitoring.
  - 2: The current call is an incoming call for voice monitoring.

➢ **+RESP:GTIGN,**

Example: **+RESP:GTIGN,250504,135790246811220,,1200,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00, 12345:12:34,2000.0,20090214093254,11F0$**			
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' '-' '_'	
Duration of Ignition Off	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Duration of Ignition Off*>: The duration since last time the ignition is turned off. If it is greater than 999999 seconds, it will be reported as 999999 seconds.
- <*Hour Meter Count*>: If the hour meter counter function is enabled by the command **AT+GTHMC**, total hours the meter counts when the engine is on will be reported in this field. If the function is disabled, this field will be reserved. 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,250504,135790246811220,,1200,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00, 12345:12:34,2000.0,20090214093254,11F0$**			
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' '-' '_'	
Duration of Ignition On	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- *<Duration of Ignition On>*: The duration since last time the ignition is turned on. If it is greater than 999999 seconds, it will be reported as 999999 seconds.
- *<Hour Meter Count>*: If the hour meter counter function is enabled by the command **AT+GTHMC**, total hours the meter counts when engine is on will be reported in this field. If the function is disabled, this field will be filled with '00'. It is formatted with 5 hour digits, 2 minute digits and 2 second digits and ranges from 00000:00:00 – 99999:00:00.

➢ **+RESP:GTIDN,**

Example: **+RESP:GTIDN,250504,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF,	

		X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTIDF,**

Example: **+RESP:GTIDF,250504,135790246811220,,22,300,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion State	2	11|12|16|22	

Duration of Idling Status	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Motion State*>: The current motion state when the vehicle leaves idling status.
- <*Duration of Idling Status*>: The time that the vehicle has been in idling status. If it is greater than 999999 seconds, it will be reported as 999999 seconds.

➢ **+RESP:GTGSM**

Example: **+RESP:GTGSM,250504,135790246811220,FRI,0460,0000,1878,0871,20,,0460,0000,1878,0152,16,,,,,,,,,,,,,,,,,,,,,,,,,0460,0000,1878,0873,57,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Fix Type	3	SOS|RTL|LBC|TOW|FRI|GIR|ERI	
MCC1	4	0XXX	
MNC1	4	0XXX	

LAC1	4		
Cell ID1	4		
RX Level1	2	0-63	
Reserved	0		
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
Cell ID2	4		
RX Level2	2	0-63	
Reserved	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		
Cell ID3	4		
RX Level3	2	0-63	
Reserved	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
Cell ID4	4		
RX Level4	2	0-63	
Reserved	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	4		
RX Level5	2	0-63	
Reserved	0		
MCC6	4	0XXX	
MNC6	4	0XXX	

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LAC6	4		
Cell ID6	4		
RX Level6	2	0-63	
Reserved	0		
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	4		
RX Level	2	0-63	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Fix Type*>: A string to indicate what type of GPS fix this cell information is for.
  "SOS": This cell information is for SOS request.
  "RTL": This cell information is for RTL request.
  "LBC": This cell information is for LBC request.
  "TOW": This cell information is for TOW request.
  "FRI": This cell information is for FRI request.
  "GIR": This cell information is for sub command "**C**" in **AT+GTRTO** command.
  "ERI": This cell information is for ERI request.
- <*MCC(i)*>: MCC of the neighbor cell *i* (*i* is the index of the neighbor cell).
- <*MNC(i)*>: MNC of the neighbor cell *i*.
- <*LAC(i)*> : LAC in hex format of the neighbor cell *i*.
- <*Cell ID(i)*>: Cell ID in hex format of the neighbor cell *i*.
- <*RX Level(i)*> : The signal strength of the neighbor cell *i*. This parameter is a 6-bit value coded in 1 dB steps:
  0: -110 dBm
  1 to 62: -109 to -48 dBm
  63: -47 dBm
- <*MCC*>: MCC of the serving cell.
- <*MNC*>: MNC of the serving cell.
- <*LAC*>: LAC in hex format of the serving cell.
- <*Cell ID*>: Cell ID in hex format of the serving cell.
- <*RX Level*>: The signal strength of the serving cell.

Note:

1. It may include information of several neighbor cells (or even no neighbor cell information). If no neighbor cell is found, all the fields of the neighbor cell will be empty.
2. "ffff" in the fields of <*LAC(i)*> and <*Cell ID(i)*> means the terminal doesn't know the value.
3. This message cannot be sent via SMS.

➢ **+RESP:GTGSS**

Example: **+RESP:GTGSS,250504,135790246811220,,1,9,11,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Signal Status	1	0 | 1	
Satellite Number	2	0 – 24	
Device State	2	11|12|21|22|41|42|16|1A	
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*GPS Signal Status*>: 0 means "GPS signal lost or no successful GPS fix", and 1 means "GPS signal recovered or successful GPS fix".
- <*Satellite Number*>: The number of the satellites in view when fix is successful. The parameter is reserved if fix fails.
- <*Device State*>: The current movement state of the device.
  - 16 (Tow): The device attached vehicle is ignition off and it is towed.
  - 1A (Fake Tow): The device attached vehicle is ignition off and it might be towed.
  - 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
  - 12 (Ignition Off Motion): The device attached vehicle is ignition off and it is moving before it is considered as being towed.
  - 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
  - 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.
  - 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected.
  - 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected.

- **+RESP:GTSTR,**
- **+RESP:GTSTP,**
- **+RESP:GTLSP,**

Example:
+RESP:GTSTR,250504,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
+RESP:GTSTP,250504,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
+RESP:GTLSP,250504,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	

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

➢ **+RESP:GTFLA**

Example: **+RESP:GTFLA,250504,135790246811220,,2,92,70,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Input ID	1	0|1|2	
Last Fuel Level	<=4	0 – 100	
Current Fuel Level	<=4	0 – 100	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	

MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Input ID*>: The ID of the input to which the fuel sensor is connected. 0 means "Connected with serial port".
- <*Last Fuel Level*>: The fuel level saved before last ignition off or when FLA event occurs.
- <*Current Fuel Level*>: The fuel level when the FLA event occurs.

➢ **+RESP:GTDOS**

Example: **+RESP:GTDOS,250504,862170010190559,,2,0.0,57.7,117.201371,31.833041,20121015085137,0460,0000,5663,5A02,,2,1,20121015085153,0149$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Wave1 Output ID	1	1-3|9-C	
Wave1 Ouptut Active	1	0|1	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Wave1 Output ID*>: The ID of the output with wave shape 1.
- <*Wave1 Output Active*>: The status of wave shape 1 output.

➢ **+RESP:GTTMP**

Example: **+RESP:GTTMP,250504,862170013894694,,,0,01,1,0,0.0,0,39.0,117.201299,31.833024,20130627054006,0460,0000,5678,2D7E,00,0.0,,0,0,01,01,,,,28131A4103000056,,28,20130627054009,0028$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
External Power VCC	<=5	0 – 32000 mV	
Report ID / Report Type	2	X(0-3)X(0-1)	
Number	1	0 – 1	
GPS Accuracy	<=2	0	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input VCC1	<=5	0 – 16000 mV	
Analog Input VCC2	<=5	0 – 16000 mV	
Digital Input	4	0000 – 0F0F	
Digital Output	4	0000 – 0F0F	
Reserved	0		
Reserved	0		
Reserved	0		
Temperature Sensor Device ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Temperature Sensor Device Data	<=3	-55 – 125℃	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- *<Report ID / Report Type>*: The report ID and the type are in hex format. 4 high bits indicate report ID and 4 low bits indicate report type.
  Report ID: The ID of temperature alarm. The range is 0-3.
  Report Type: 0 means "Outside of the predefined temperature range". 1 means "Inside of the predefined temperature range".
- *<Temperature Sensor Device ID>*: The ID of the temperature sensor.
- *<Temperature Sensor Device Data>*: The current temperature the sensor detects.

If the GSM roaming state of the device changes, the current roaming state will be reported in the **+RESP:GTRMD** message. The message will be defined as an event message.

- **+RESP:GTRMD,**

Example:

+RESP:GTRMD,250504,862170011507322,,1,0,0.0,0,83.9,117.201281,31.833017,20130917071326,0460,0000,5678,2079,00,20130917071330,00A4$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Roaming State	1	0-3	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Roaming State*>: A numeral to indicate the roaming state.

- 0: Home
- 1: Known roaming
- 2: Unknown roaming
- 3: Blocking report

➢ **+RESP:GTPHL,**

This message is used for reporting location information before reporting photo data, and is only sent via GPRS even if the report mode is forced SMS mode.

Example:

+RESP:GTPHL,250504,862170019025640,,0,,20131018075847,0,0.0,0,69.4,117.201431,31.833073,20131018075848,0460,0000,5678,2D7E,00,,,,,20131018075849,0058$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Camera ID	1	0-3	
Reserved	0		
Photo Time	14	YYYYMMDDHHMMSS	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

- **+RESP:GTFTP,**

Example:

+RESP:GTFTP,250504,862170011507322,,1,862170011507322_20140606080837.jpg,0,1.3,0,87.6,117.201577,31.832981,20140606080843,0460,0000,5678,2D7E,00,20140606080903,002B$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
File Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '.'	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<File Name>*: The name of the file transferred to FTP server. The suffix is ".jpg".

➢ **+RESP:GTEXP,**

This message is used for reporting the malfunction information of digital fuel sensor.

Example:
+RESP:GTEXP,250901,135790246811220,,2,,0,0004,0,0.0,0,74.1,117.201527,31.832957,20160510012210,0460,0000,5665,47A1,00,20160510012212,0063$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Digital Fuel Sensor Type	1	2|4	
Reserved			
Reserved Parameters	<=3		
HW Fault Code	4	0 – FFFF	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 –999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Digital Fuel Sensor Type>*: For details, please refer to *<Digital Fuel Sensor Type>* in **AT+GTURT**.

✧ *<HW Fault Code>*: The malfunction code has different meanings for different digital fuel sensors.

For DUT-E:

- Bit 0: Sensor is not calibrated (the difference between calibration frequencies of signal generator for minimum and maximum fuel levels is 100 Hz).
- Bit 1: Sensor is not calibrated for maximum fuel level.
- Bit 2: Signal generator is not functioning. Possible short circuit in measuring probe

tubes.

- Bit 3: The difference between calibration values for minimum and maximum fuel levels in the sensor is less than 5 Hz.
- Bit 4: EEPROM error. Hardware failure of the sensor.
- Bit 5: Current frequency of the signal generator is more than fixed one when calibrating for minimum fuel level (the difference is more than 100 Hz).
- Bit 6 - 15: Reserved.

For UFSxxx:

- Bit 0: The detector of the fuel sensor is not connected or the signal extension cable is broken.
- Bit 1: The detector of the fuel sensor is detached from the fuel tank.
- Bit 2: The input power source is too low.
- Bit 3: Abnormal reset of the system.
- Bit 4: The value of analog output is abnormal.
- Bit 5: The current fuel level is in the blind zone.
- Bit 6 - 15: Reserved.

➢ **+RESP:GTUPC:**

Example: **+RESP:GTUPC,250504,135790246811220,,1,http://www.queclink.com/configure.ini,20150201000000,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9','a'-'z','A'-'Z'	
Command ID	<=3		
Result	3	100|101|102|103|200|201|202|300|301|302	
Download URL	<=100	Complete URL	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

✧ <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the response code is 301. It indicates wrong format of command ID when the response code is 302.

✧ <*Result*>: A numeral to indicate whether the configuration is updated successfully.

- 100: The update command is starting.
- 101: The update command is confirmed by the device.
- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.

- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name.

If the CANBUS Alarm report function is enabled by the command **AT+GTCLT**, <*Alarm Mask 1*>, <*Alarm Mask 2*> and <*Alarm Mask 3*> meet each trigger condition at the same time, and the trigger event duration time is longer than <*Debounce Time*>, the **+RESP:GTCLT** alarm message will be sent.

➢ **+RESP:GTCLT,**

Example: **+RESP:GTCLT,250504,862170010190559,,1,FFFFFFFF,FFFFFFFF,1fff,1G1JC5444R7252367,1,0,FFFFDFFF,8045,181,140,30,0,20,1,2,29008200,10,20,30,20130628044803,010F$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Group ID	<=2	0 – 19	
Alarm Mask 1	<=8	0 – FFFFFFFF	
Alarm Mask 2	<=8	0 – FFFFFFFF	
Alarm Mask 3	<=8	0 – FFFFFFFF	
Reserved	0		
Reserved	0		
CANBUS Data Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9''A' - 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0|1|2	
Total Distance	<=12	H(0 – 99999999)/I(0 –2147483647)	
Total Fuel Used	<=9	0.00 –999999.99l	
Engine RPM	<=5	0 – 16383 rpm	

Vehicle Speed	<=3	0 - 455Km/h	
Engine Coolant Temperature	<=4	-40 – +215 ℃	
Fuel Consumption	<=5	0.0 – 999.9L/100km | Inf | NaN	
Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100.00)	
Range	<=8	0 – 99999999	
Accelerator Pedal Pressure	<=3	0 – 100%	
Total Engine Hours	<=8	0.00 – 99999.99h	
Total Driving Time	<=8	0.00 – 99999.99h	
Total Engine Idle Time	<=8	0 .00– 99999.99h	
Total Idle Fuel Used	<=9	0.00 –999999.99l	
Axle Weight	<=5	0 –65535kg	
Tachograph Information	4	00-FFFF	
Detailed Information / Indicators	4	00-FFFF	
Lights	2	0-FF	
Doors	2	0-FF	
Total Vehicle Overspeed Time	<=8	0.00 – 99999.99h	
Total Vehicle Engine Overspeed Time	<=8	0.00 – 99999.99h	
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	
Ad-Blue Level	<=3	0-100L	
Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle	1	0|1	

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Motion Signal			
Tachograph Driving Direction	1	0|1	
Analog Input Value	<=5	0-99999mv	
Engine Braking Factor	<=6	0-999999	
Pedal Braking Factor	<=6	0-999999	
Total Accelerator Kick-downs	<=6	0-999999	
Total Effective Engine Speed Time	<=8	0.00 – 99999.99h	
Total Cruise Control Time	<=8	0.00 – 99999.99h	
Total Accelerator Kick-down Time	<=8	0.00 – 99999.99h	
Total Brake Applications	<=6	0-999999	
Tachograph Driver 1 Card Number	<=10	0-9999999999	
Tachograph Driver 2 Card Number	<=10	0-9999999999	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=10	0-9999999999	
Expansion Information	4	00-FFFF	
Rapid Brakings	<=6	0-999999	
Rapid Accelerations	<=6	0-999999	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 –999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	

Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

CAN100 FOTA Upgrade Report

The device will send the message **+RESP:GTCFU** to the backend server during the upgrade process.

➢ **+RESP:GTCFU:**

Example: **+RESP:GTCFU, 250504,862170011507322,,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)	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Code*>: Information code.

- 100: Confirm ok. Start upgrade.
- 101: Baud rate error. UART does not work for CAN100. Stop upgrade.
- 102: The upgrading process is refused because of low power or an incorrect URL.
- 200: Start download package.

- 201: Package download succeeds.
- 202: Package download fails.
- 300: Start upgrade.
- 301: Upgrade successful. The reserved parameter is used as follows.

New Version	<=10	'0'-'9', 'a'-'z'	

- 302: Upgrade fails.

✧ *<New Version>*: The version of the new firmware in the CAN100.

3.3.5.Data Report

The following reports are triggered when certain data needs to be sent.

➢ **+RESP:GTPHD,**

This message is used for reporting photo data and only sent via GPRS even if the report mode is forced SMS mode.

Example: **+RESP:GTPHD,250504,862170019025640,,0,,20131018075847,20,20,8,AP/V/9k=,,,,,20131018075950,006C$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Camera ID	1	0-3	
Reserved	0		
Photo Time	14	YYYYMMDDHHMMSS	
Total Frames	<=3		
Current Frame Index	<=3		
Photo Data Length	<=3		
Photo Data	<=684		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

- ✧ <*Total Frames*>: The total frames of one picture.
- ✧ <*Current Frame Index*>: The index of the current frame.
- ✧ <*Photo Data Length*>: The length of picture data in the current frame.

➢ **+RESP:GTFSD,**

This message is used for reporting fuel sensor data.

Example: **+RESP:GTFSD,250504,862170016790444,,39,*QL,407D,01,00000,0132,0014,00000,0229#,,,,,20141021021206,0018$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Data Length	2		
Sensor Data	<=128	ASCII Code	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

- ✧ <*Data Length*>: The length of <*Sensor Data*>.
- ✧ <*Sensor Data*>: The fuel data from fuel sensor. It starts with '*' and ends with '#'.

3.3.6.Buffer Report

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

- ✧ GSM network is not available.
- ✧ GPRS context activation for the TCP or UDP connection fails.

- Establishment of the TCP connection with the backend server fails.

These messages will be sent to the backend server when connection to the server is recovered again. The buffered reports are saved to the built-in non-volatile memory in case the device is reset. The terminal can buffer up to 10,000 messages (160 bytes per message).

Detailed information about buffer report is listed below.

- Only **+RESP** messages excluding **+RESP:GTPDP**, **+RESP:GTALC**, **+RESP:GTALL** 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 remains unchanged.
- Buffered messages will be sent only via GPRS by TCP or UDP protocol. They cannot be sent via SMS. If the current report is forced SMS mode, the buffered message will not be sent until the report mode is changed to TCP or UDP.
- The buffered messages will be sent after the real-time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 1.
- The buffered messages will be sent before the real-time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 2. The SOS message has the highest priority and is sent before the buffered messages.

Example:

The following is an example of the buffered message:

+BUFF:GTFRI,250504,863286020684354,gv300,,10,1,1,0.0,0,0.5,121.392413,31.164143,20160804044602,0460,0000,1877,03A3,00,104.8,,,,100,210100,,,,20140804044611,2E78$

3.3.7.Transparent Data Transmission

The device supports transparent data transfer between the backend server and the peripheral device connected to its second serial port. GV300 supports bi-directional data transmission. In both directions, the data is transparent to the device.

a) Transfer data from the peripheral device to the backend server

According to the <*Working Mode*> of the command **AT+GTURT**, there are two ways for the peripheral device to communicate with GV300.

If the peripheral device supports the **AT+GTDAT** command, it can transfer data via this command. The peripheral device can send the command **AT+GTDAT** with the data to the serial port. According to the <*Command Type*> of **AT+GTDAT**, the device wraps the corresponding data into the backend server with the **+RESP:GTDAT** message either in short format or in long format.

b) Transfer data from the backend server to the peripheral device

If the backend server needs to send data to the peripheral device, it can send the command **AT+GTDAT** with the data to GV300 and GV300 will pick out the pure data and send it to the second serial port. The peripheral device can thus get the data from the serial port.

Data to the Backend Server

- **+RESP:GTDAT (Short Format),**

Example: +RESP:GTDAT, 250504,135790246811220,,data,20111222122137,0017$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Data to the Backend Server	<=1280	ASCII Code	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTDAT (Long Format)**

Example: +RESP:GTDAT,250504,135790246811220,,3,,,1645026150,0,0.5,0,29.4,121.390923,31.164295,20111222022935,0460,0000,1806,2142,00,,,,,20111222022938,001A$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Report Type	1	0|1|2|11	
Reserved	0		
Reserved	0		
Data to the Backend Server	<=1280	ASCII Code	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	

GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report Type*>: The <*Report Type*> is determined by the <*Working Mode*> of **AT+GTURT** or **AT+GTMUT**.

- 0: Disable the second serial port.
- 1: **AT+GTDAT**. (When the <*Working Mode*> in **AT+GTURT** or **AT+GTMUT** is 1)
- 2-10: Reserved.
- 11: **AT+GTDAT** from main serial port. (When the <*Working Mode*> in **AT+GTMUT** is 11)

Data to the second serial port starts with a new line and is terminated with '\r\n'.

Example:
data to the serial port

3.3.8.Data Transmission Based on Specified Terminator Character or Data Length

The device supports data transfer from the peripheral device to the backend server. According to the <*Working Mode*> of the command **AT+GTURT**, there are two ways for the peripheral device to communicate with GV300.

Data to the backend server

➢ **+RESP:GTDTT (Short Format)**

Example:
+RESP:GTDTT, 250504,359464040000411,,8,12345678,20121225024543,003D$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Data Type	1	0-1	
Data Length	<=4	1-1280	
Data to the Backend Server	<=1280		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTDTT (Long Format)**

Example: **+RESP:GTDTT,250504,359464040000411,,6,,,8,12345678,0,,,,0,0,,0460,0000,5678,5D7B,00,,,,,20121225025048,0048$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Data Type	1	0-1	
Data Length	4	1-1280	
Data to the Backend Server	<=1280		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	

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

- <*Data Type*>: 0 means "binary data", and 1 means "binary data written in hexadecimal ASCII format".
- <*Data Length*>: It represents the length of the original data.
- <*Data to the Backend Server*>: It is hexadecimal data if **AT+GTURT** <*Mode*> is 7, and pure HEX data as is input through UART if <*Mode*> is 6 or 8.

3.3.9.Report with Google Maps Hyperlink

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

- **Google Maps Hyperlink**

Example: **gv300:** **<http://maps.google.com/maps?q=31.222073,121.354335** **F1 D2009/01/01T00:00:00>**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

Google Maps Hyperlink Header	30	http://maps.google.com/maps?q=	http://maps.google.com/maps?q=
Latitude	<=10	(–)xx.xxxxxx	
Longitude	<=11	(–)xxx.xxxxxx	
GPS Fix	<=3	F0|F1 – F50	
GPS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Battery Percentage	<=6	B0-B100	
Ignition Status	2	I0|I1	
Speed	<=6	V0.0 – S999.9 km /h	

- <*GPS Fix*>: The accuracy of the location information. F0 means "No GPS fix".
- <*Battery Percentage*>: The percentage of the backup battery.
- <*Ignition Status*>: The status of ignition. 0 means "Ignition off", and 1 means "Ignition on".
- <*Speed*>: The current speed. Unit: km/h.

3.3.10.Uart Data Transfer

If the parameter <*Mode*> in **AT+ GTUDT** is enabled, the device will send the message **+RESP:GTUDT** to the serial port according to send interval. If the GEO-Fence event occurs, the device will also send the message **+RESP:GTUDT** to the serial port.

- **+RESP:GTUDT,**

Example: **+RESP:GTUDT,250504,0B50,0102,,862170010190559,,0,,1,1,0.0,0,41.8,117.021458,31.832807,20130609060028,0460,0000,5678,2D7E,00,0.0,,,,1,12,,,,00,00,21,0,0.00,0,,,,,20130609060032,060D$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Firmware Version			
Hardware Version			
Reserved			
Unique ID	15	IMEI	
Device Name			
Report Type	1	0|1|2	

Report ID	<=2	0-99	
Number	1	1	
GPS Accuracy	<=2	0|1-50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Reserved			
HMC	11	HHHHH:MM:SS	
Reserved			
External GPS Antenna	1	0|1|3	
GSV Number	<=2	00-FF	
GEO-Fence State	1	0|1	
Analog Input VCC1	<=5	0~16000mV | F0 – F100	
Analog Input VCC2	<=5	25~16000mV | F0 – F100	
Digital Input	4	0000 – 0F0F	
Digital Output	4	0000 – 0F07	
Motion Status	1	0x11|0x12|0x16|0x1A|0x41|0x42|0x21|0x22	
External Power VCC	<=5	0 – 32000 mV	
Backup Battery Level	<=4	0.00 – 4.50 V	
Charging	1	0|1	
GEO Status Mask	5	00000 – FFFFF	

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PEO-Fence State	1	0|1	
PEO Status Mask	5	00000 – FFFFF	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Report Type*>: A numeral to indicate the type of the report.
  0: Timer event triggered.
  1: GEO-Fence event triggered.
  2: PEO-Fence event triggered.
- <*Report ID*>: GEO-Fence / PEO-Fence event triggered report ID. It's in HEX format.
- <*GEO-Fence State*>: The activated GEO-Fence state. 0 means "Outside the GEO-Fence", and 1 means "Inside the GEO-Fence".
- <*GEO Status Mask*>: GEO status mask. Bit 0 to Bit 19 represent the status of GEO 0 to 19 respectively. 0 means "Outside of the GEO-Fence" or "The status is unknown", and 1 means "Inside the GEO-Fence".
- <*PEO-Fence State*>: The activated PEO-Fence state. 0 means "Outside the PEO-Fence", and 1 means "Inside the PEO-Fence".
- <*PEO Status Mask*>: Bit 0 - Bit 19 represent the status of PEO 0 - 19 respectively. 0 means "Outside of the PEO-Fence" or "The status is unknown", and 1 means "Inside the PEO-Fence".

3.3.11.Crash Data Packet

The **+RESP:GTCRD** message contains 10s tri-axial acceleration data before crash and after crash. When crash accident is detected, the 10s tri-axial acceleration data before crash will be reported to the backend server packed with three frames. And the device will continue to record 10s tri-axial data and report it to backend server packed with another three frames.

- **+RESP:GTCRD,**

Example:

+RESP:GTCRD,250504,359231038715676,,0,3,1,0001000100550001000200510000000000550000000100520001000100560001000100530000000000540000000100510001000000540000000100530001000100550001000000530001000100540000000300510000000100530001ffff0053000000010053000100000052000000000054000300010053000 2ffff00530001000100520000000200510001000300530001000000530001ffff00540000000100520000000300550002000100530001000000520001000100550001000100540001ffff00530000000200530000000020056ffff000000530000000000520001000000520001000200520002000100540000000100 54ffff0002005200000001 00510001ffff00530002ffff00540001fffe00520001ffff00530000000200520000000200520002000

1005200010001005600010001005200 01ffff00530001000200560001ffff00510001000100550001000100 53ffffffff00520000ffff00520001000200530002000100540001000000550001000200530001000000530000000100530001000100520000ffff00510001000000520002000000520002ffff00520001000200530000000200540000000000540001fffe00530001ffff00520001000100520001000100530001000100520000,20120330120443,005C$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Data Type	1	0 | 1	
Total Frame	1	3	
Frame Number	1	1 -3	
Data	1000	'0'-'9' 'a'-'f'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Data Type*>: Whether the data reported to the backend server is recorded before or after crash.
  - 0: Before crash.
  - 1: After crash.
- <*Total Frame*>: The total number of messages that are sent to the backend server for the crash event.
- <*Frame Number*>: A numeral to indicate the sequence of the current message.
- <*Data*>: There are at most 1000 ASCII characters in the message with 12 characters in a group. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data. The ASCII "0001" represents HEX value 0x0001, so it means the acceleration is 1. And the ASCII "fffd" represents HEX value 0xFFFD which is the complement of -3, so it means the acceleration is -3.

Example:

+RESP:GTCRD,250301,359231038715676,,0,3,1,000100010055… ,20120330120443,005C$

This is the earliest XYZ-axis acceleration data:

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

Decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;

+RESP:GTCRD,250301,359231038715676,,1,3,3,...ffffff10052,20120330115736,005A$

This is the latest XYZ-axis acceleration data:
Convert to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; Z = 0x0052;
Decimal format: X (axis acceleration data) = -1; Y = -15; Z = 82;

Note: Acceleration of gravity (+g) is 82 in decimal format and –g is -82. The linearized acceleration data 1312 represents +16g and -1312 represents -16g.

3.3.12.Crash GPS Information

The **+RESP:GTCRG** message contains 10s GPS information before crash and after crash. When crash is detected, the 10s GPS information before crash will be reported to the backend server. And the device will continue to record the 10s GPS information after crash and report the packed data to the backend server.

➢ **+RESP:GTCRG**

Example:
+RESP:GTCRG,250801,135790246811220,,1,10,1,1,19.1,165,54.8,121.390739,31.164275,20160202060648,2,1,24.8,176,51.3,121.390733,31.164220,20160202060649,3,1,14.0,173,47.3,121.390729,31.164224,20160202060650,4,1,8.5,173,46.4,121.390737,31.164227,20160202060651,5,1,8.1,194,46.1,121.390725,31.164225,20160202060652,6,1,12.3,229,46.6,121.390690,31.164227,20160202060653,7,1,17.6,258,43.9,121.390635,31.164223,20160202060654,8,1,6.8,268,43.8,121.390672,31.164269,20160202060655,9,1,2.2,229,44.8,121.390701,31.164282,20160202060656,10,1,2.8,229,44.3,121.390709,31.164306,20160202060657,20160202060658,01A8$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Data Type	1	0 | 1	0
GPS Validity Number	2	0 – 10	
GPS Point Index	<=2	1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	

GPS UTC Time	14	YYYYMMDDHHMMSS	
……			
GPS Point Index	<=2	10	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- *<Data Type>*: The data reported to the backend server is recorded before crash or after crash.
  - 0: Before crash.
  - 1: After crash.
- *<GPS Validity Number>*: The number of the successfully fixed GPS positions included in the report message.
- *<GPS Point Index>*: The index of GPS point.

3.3.13.Acceleration Data Packet

The device will report the message every 3 seconds, and record 25 XYZ-axis acceleration data per second.

➢ **+RESP:GTACC,**

Example:
+RESP:GTACC,250202,868034001591569,gv300,0000fffb00590003fffb00580001fffd00560002fff
c00560002fffb0054ffffffb005a0001fffa00580002fffb0056fffefffb0059ffffffb005afffefffb00590
001fffd005bffffffd00540000fffd00580003fffd0059ffffffc00560000fffa00580001fffb00580003ff
fc00590001fffb005800020000059fffefffb00560000fffc00590003fffa00550000fffe0059ffffffd0
0590001fffd00560000fffe00570002fffa0059fffefffe0059fffefffc0058fffefffc00580001fffc005900
02fffa0057ffffffd00580000fff900590001fffa0058fffefffb00570000fffa00580000fffc0058ffffffd
00560000fffd00580000fffb00570000fffc00570002fffd005bffffffff00590001fffb0057fffefffb0057
0001fffb00580002000200570002fff900580001fffc0057ffffffb00580002fffa00580004fffb00580

004fffb00590001fffe00560001fffc0057ffffffe00580002fffc00580004fffb00580000fffa0058fffcffb00580000fffb00590002fffb005afffefffb00580000fffb00570001fffc005c0002fffb00560002fffd0055ffffffb00590002fffe00580000fffb005a0001fffe00580001fffc005a,,,,20130830031904,04E7$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Data	12*75	'0'-'9' 'a'-'f'	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Data*>: There are 12*75 ASCII characters in the message with 12 characters in a group. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data. The ASCII "0001" represents HEX value 0x0001, so it means the acceleration is 1. And the ASCII "fffd" represents HEX value 0xFFFD which is the complement of -3, so it means the acceleration is -3.

Example:

+RESP:GTACC, 250202, 868034001591569 ,000100010055… ,,,20120330120443,005C$

This is the earliest XYZ-axis acceleration data:

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

Decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;

+RESP:GTACC, 0F0105, 868034001591569 , fffffff10052… ,,,20120330120443,005C$

This is the latest XYZ-axis acceleration data:

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

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

Note: Acceleration of gravity (+g) is 82 in decimal format and –g is -82. The linearized acceleration data 1312 represents +16g and -1312 represents -16g.

3.3.14.CANBUS Device Information Report

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

➢ **+RESP:GTCAN,**

Example: **+RESP:GTCAN,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	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Report Type	1	0|1|2	
CANBUS Device State	1	0|1	
CANBUS Report Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0|1|2	
Total Distance	<=12	H(0 – 99999999)/I(0 – 2147483647)	
Total Fuel Used	<=9	0.00 – 999999.99l	
Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 - 455Km/h	
Engine Coolant Temperature	<=4	-40 – +215 ℃	
Fuel Consumption	<=5	L/100km(0.0–999.9)|L/H(0.0 –999.9)	
Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100.00)	
Range	<=8	0 – 99999999hm	
Accelerator Pedal	<=3	0 – 100%	

Pressure			
Total Engine Hours	<=8	0.00 – 99999.99h	
Total Driving Time	<=8	0.00 – 99999.99h	
Total Engine Idle Time	<=8	0 .00– 99999.99h	
Total Idle Fuel Used	<=9	0.00 –999999.99l	
Axle Weight	<=5	0 – 65535kg	
Tachograph Information	4	00-FFFF	
Detailed Information / Indicators	4	00-FFFF	
Lights	2	0-FF	
Doors	2	0-FF	
Total Vehicle Overspeed Time	<=8	0.00 – 99999.99h	
Total Vehicle Engine Overspeed Time	<=8	0.00 – 99999.99h	
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	
Ad-Blue Level	<=3	0-100%	
Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle Motion Signal	1	0|1	
Tachograph Driving Direction	1	0|1	
Analog Input Value	<=5	0-99999mv	
Engine Braking Factor	<=6	0-999999	
Pedal Braking Factor	<=6	0-999999	
Total Accelerator Kick-downs	<=6	0-999999	
Total Effective Engine	<=8	0.00 – 99999.99h	

Speed Time			
Total Cruise Control Time	<=8	0.00 – 99999.99h	
Total Accelerator Kick-down Time	<=8	0.00 – 99999.99h	
Total Brake Applications	<=6	0-999999	
Tachograph Driver 1 Card Number	<=10	0-9999999999	
Tachograph Driver 2 Card Number	<=10	0-9999999999	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=10	0-9999999999	
Expansion Information	4	00-FFFF	
Rapid Brakings	<=6	0-999999	
Rapid Accelerations	<=6	0-999999	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	

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Count Number	4	0000 – FFFF	
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 the <*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*>: Vehicle axle weight. The unit is kg.
- <*Tachograph Information*>: Two bytes. The high byte describes driver 2, while the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Validity mark (0 – valid driver data, and 1 – no valid data)

R: Reserved

C: Driver card (1 – card inserted, 0 – no card inserted)

T2-T0: Driving time related states:

- 0: Normal / no limits reached.
- 1: 15min before 41h.
- 2: 41h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 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*>: One byte. Each bit contains information of one indicator.

- Bit 0: FL – fuel low indicator (1 – indicator on, 0 – indicator off).
- Bit 1: DS – driver seatbelt indicator (1 – indicator on, 0 – indicator off).
- Bit 2: AC – air conditioning (1 – on, 0 - off).
- Bit 3: CC – cruise control (1 – active, 0 - disabled).
- Bit 4: B – brake pedal (1 – pressed, 0 – released).
- Bit 5: C – clutch pedal (1 – pressed, 0 – released).
- Bit 6: H – handbrake (1 – pulled-up, 0 – released).
- Bit 7: CL – central lock (1 – locked, 0 – unlocked).
- Bit 8: R – reverse gear (1 – on, 0 – off).
- Bit 9: RL – running lights (1 – on, 0 – off).
- Bit 10: LB – low beams (1 – on, 0 – off).
- Bit 11: HB – high beams (1 – on, 0 – off).
- Bit 12: RFL – rear fog lights (1 – on, 0 – off).
- Bit 13: FFL – front fog lights (1 – on, 0 – off).
- Bit 14: D – doors (1 – any door opened, 0 – all doors closed).
- Bit 15: T – trunk (1 – opened, 0 – closed).

✧ <*Lights*>: One byte. Each bit contains information of one 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.

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- <*Doors*>: One byte. Each bit contains information of one door.
  - Bit 0: Driver Door (1 – opened, 0 – closed).
  - Bit 1: Passenger Door (1 – opened, 0 – closed).
  - Bit 2: Rear Left Door (1 – opened, 0 – closed)
  - Bit 3: Rear Right Door (1 – opened, 0 – closed).
  - Bit 4: Trunk (1 – opened, 0 – closed).
  - Bit 5: Hood (1 – opened, 0 – closed).
  - Bit 6: Reserved.
  - Bit 7: Reserved.
- <*Total Vehicle Overspeed Time*>: 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*>: The tachograph overspeed signal. The value 1 indicates "overspeed". The value 0 indicates "no overspeed".
- <*Tachograph Vehicle Motion Signal*>: The tachograph vehicle motion signal. The value 1 indicates "motion". The value 0 indicates "no motion".
- <*Tachograph Driving Direction*>: Vehicle driving direction obtained from tachograph.
- <*Analog Input Value*>: The value of analog input. The unit is mV.
- <*Rapid 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 (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 decimal number. Each bit contains information of one indicator.
  - Bit 0: W – webasto (1 – on, 0 – off or not available).
  - Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
  - Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
  - Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
  - Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
  - Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
  - Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
  - Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
  - Bit 8: 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-Logistic's settings of speed decrease time and value).
- <*Rapid Accelerations*>: The number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value).

3.3.15.UFSxxx FOTA Upgrade Report

The device will send the message **+RESP:GTUFS** to the backend server during the upgrade process.

➢ **+RESP:GTUFS,**

Example: **+RESP:GTUFS,250A04,863286020866449,gv300n,101,,20160817190550,0A3A$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Code	3		
Reserved (Optional)	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Code*>: Information code.

- 100: Confirm ok. Start upgrade.
- 101: Mode error. UART does not work for UFSxxx. Stop upgrade.
- 102: The upgrading process is refused because of low power or an incorrect URL.
- 200: Start downloading package.
- 201: Package download succeeds.
- 202: Package download fails.
- 300: Start upgrade.
- 301: Upgrade successful. The reserved parameter is used as follows.

New Version	2		0

- 302: Upgrade fails.

✧ <*New Version*>: The version of the new firmware in the UFSxxx sensor.

3.4. Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server in the case of communication via GPRS. 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,250301,135790246811220,,20100214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Whenever the backend server receives a heartbeat package, it should reply with an acknowledgement to the device.

➢ **+SACK:GTHBD**

Example: **+SACK:GTHBD,250301,11F0$**

+SACK:GTHBD,,11F0$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Protocol Version*>: The device type and the protocol version that the backend server supports. This field is optional. The backend server can send an empty field to decrease the length of the heartbeat data acknowledgement.
- ✧ <*Count Number*>: The backend server uses the <*Count Number*> extracted from the heartbeat package from the device as the <*Count Number*> in the server acknowledgement of the heartbeat.

3.5. Server Acknowledgement

If server acknowledgement is enabled by the **AT+GTSRI** command, the backend server should reply to the device whenever it receives a message from the device.

➢ **+SACK:**

Example: +SACK:11F0$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Count Number*>: The backend server uses the <*Count Number*> extracted from the received message as the <*Count Number*> in the server acknowledgement.

4. HEX Format Report Message

From this version, the @Tracker protocol starts to support report messages in HEX format. For all the commands, they are still using the ASCII format as described above. By default, the device uses ASCII format report messages. The backend server could use **AT+GTQSS** or **AT+GTSRI** command to enable the HEX format report messages by setting the <*Protocol Format*> to 1.

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

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

The device uses CRC16 method to calculate the checksum of the report data and appends the checksum to the end of the data. The backend server could use this checksum to verify the integrity of the received data.

At the end of each HEX report message, the device uses 0x0D and 0x0A to mark the end.

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

4.1. Hex Report Mask

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

➢ **AT+GTHRM=**

Example: **AT+GTHRM=gv300,,,FF,FFFFFFFF,FFFFFFFF,FF7F,FF,7F,,,,0018$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv300
Reserved	0		
Reserved	0		

+ACK Mask	2	00 – FF	7F
+RSP Mask	8	00000000 – FFFFFFFF	1FEDFFF
+EVT Mask	8	00000000 – FFFFFFFF	1FEDFFF
+INF Mask	<=8	00000000 – FFFFFFFF	FF7F
+HBD Mask	2	00 – FF	FF
+DAT Mask	<=8	00000000 – FFFFFFFF	7F
+CRD Mask	4	0000-FFFF	7D
+CAN Mask	8	00000000 – FFFFFFFF	7FF
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*+ACK Mask*>: Component mask of the acknowledgement received.

Mask Bit	Item
Bit 7	Reserved
Bit 6	*<Count Number>*
Bit 5	*<Send Time>*
Bit 4	*<Device Name>*
Bit 3	*<Firmware Version>*
Bit 2	*<Protocol Version>*
Bit 1	*<Device Type>*
Bit 0	*<Length>*

✧ <*+RSP Mask*>: Component mask of the location report message.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	*<EIO100 IO Status>*

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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	*<GPS Antenna And Satellite Information>*
Bit 18	*<Motion Status>*
Bit 17	*<Digital IO Status>*
Bit 16	Reserved
Bit 15	*<Analog Input2 Voltage>*
Bit 14	*<Analog Input1 Voltage>*
Bit 13	*<Analog Input Mode>*
Bit 12	*<External Power Supply Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<Device Name>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<MCC / MNC / LAC / Cell ID / Reserved>*
Bit 2	*<Altitude>*
Bit 1	*<Azimuth>*
Bit 0	*<Speed>*

✧ *<+EVT Mask>*: Component mask of the event report message.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved

Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	<EIO100 IO Status>
Bit 25	*<CAN Data>*
Bit 24	*<RFID>*
Bit 23	*<Total Hour Meter Count>*
Bit 22	*<Current Hour Meter Count>*
Bit 21	*<Total Mileage>*
Bit 20	*<Current Mileage>*
Bit 19	*<GPS Antenna And Satellite Information>*
Bit 18	*<Motion Status>*
Bit 17	*<Digital IO Status>*
Bit 16	Reserved
Bit 15	*<Analog Input2 Voltage>*
Bit 14	*<Analog Input1 Voltage>*
Bit 13	*<Analog Input Mode>*
Bit 12	*<External Power Supply Voltage>*
Bit 11	*<Battery Level>*
Bit 10	*<Firmware Version>*
Bit 9	*<Protocol Version>*
Bit 8	*<Device Type>*
Bit 7	*<Length>*
Bit 6	*<Device Name>*
Bit 5	*<Count Number>*
Bit 4	*<Send Time>*
Bit 3	*<MCC / MNC / LAC / Cell ID / Reserved>*
Bit 2	*<Altitude>*
Bit 1	*<Azimuth>*
Bit 0	*<Speed>*

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✧ *<+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	*<Device Name>*
Bit 0	*<Length>*

✧ *<INF Expansion Mask>*: Component mask of the information report message. Bit 0 - Bit 15 indicate which groups of information items are included when the device reports the message **+RESP:GTINF**.

Mask Bit	Item
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved

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Bit 8	Reserved
Bit 7	Reserved
Bit 6	Reserved
Bit 5	Reserved
Bit 4	Reserved
Bit 3	**+RESP:GTCSN**
Bit 2	**+RESP:GTCVN**
Bit 1	**+RESP:GTUVN**
Bit 0	**+RESP:GTGSV**

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

Mask Bit	Item
Bit 7	*<UID>*
Bit 6	*<Count Number>*
Bit 5	*<Send Time>*
Bit 4	*<Device Name>*
Bit 3	*<Firmware Version>*
Bit 2	*<Protocol Version>*
Bit 1	*<Device Type>*
Bit 0	*<Length>*

✧ *<+DAT Mask>*: Component mask of data report message.

Mask Bit	Item
Bit 31	Reserved
⋮	Reserved
Bit 7	Reserved
Bit 6	*<Count Number>*
Bit 5	*<Send Time>*
Bit 4	*<Device Name>*
Bit 3	*<Firmware Version>*
Bit 2	*<Protocol Version>*

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Bit 1	*<Device Type>*
Bit 0	*<Length>*

✧ *<+CRD Mask>*: Component mask of the crash data packet.

Mask Bit	Item
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	*<Count Number>*
Bit 5	*<Send Time>*
Bit 4	*<Firmware Version>*
Bit 3	*<Protocol Version>*
Bit 2	*<Device Type>*
Bit 1	*<Device Name>*
Bit 0	*<Length>*

✧ *<+CAN Mask>*: Component mask of the CANBUS Information packet in HEX format.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved

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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,250402,135790246811220,,0019,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' –	

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

4.2. Acknowledgement +ACK

➢ **+ACK,**

Example: **2B 41 43 4B 01 7F 24 25 0A 04 0B 0E 67 76 33 30 30 2D 67 6C 00 00 77 07 E0 08 11 06 1E 0C 03 2B F1 A2 0D 0A**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+ACK	+ACK
Message Type	1		
Report Mask	1	00 – FF	
Length	1		
Device Type	1	25	25
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*>: The ID of the command that the device receives.

Command	ID
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
AT+GTCFG	4
AT+GTTOW	5
AT+GTEPS	6
AT+GTDIS	7
AT+GTOUT	8
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14
AT+GTMON	15
AT+GTRTO	16
AT+GTSIM	19
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
AT+GTURT	32
AT+GTWLT	34

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AT+GTHRM	35
AT+GTFFC	36
AT+GTJBS	37
AT+GTSSR	38
AT+GTEFS	41
AT+GTIDA	43
AT+GTACD	44
AT+GTPDS	45
AT+GTCRA	46
AT+GTBZA	47
AT+GTSPA	48
AT+GTMUT	49
AT+GTUDT	50
AT+GTTMP	51
AT+GTFSC	52
AT+GTRMD	53
AT+GTPEO	54
AT+GTCMS	55
AT+GTTAP	56
AT+GTCAN	57
Reserved	58
AT+GTUFS	59
AT+GTFTP	60
AT+GTCMD	61
AT+GTUDF	62
AT+GTGAM	65
AT+GTBSE	67
AT+GTOEX	68
AT+GTIEX	69
AT+GTUPC	70

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AT+GTCLT	71
Reserved	72
Reserved	73
AT+GTCFU	74

- <*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	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 4 of <+*ACK Mask*> is 1, the device name is used as the unique ID of the device. Please refer to the <*Device Name*> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <*Device Name*> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	**g**	**v**	**3**	**0**	**0**			
HEX	**67**	**76**	**33**	**30**	**30**	**00**	**00**	**00**

- <*ID*>: The ID of sub-command of **AT+GTRTO** or the ID of **AT+GTIOB**, **AT+GTGEO**, **AT+GTCLT** or **AT+GTTMP**. For other commands, 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 for data from <*Message Type*> to <*Count Number*>.

4.3. Location Report +RSP

Location report messages including **+RESP:GTTOW**, **+RESP:GTAIS**, **+RESP:GTDIS**, **+RESP:GTIOB**, **+RESP:GTFRI**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTDOG**, **+RESP:GTIGL**, **+RESP:GTHBM** and **+RESP:GTEPS** use the format below.

- **+RSP,**

Example: 2B5253501507FEFFFF00D7250A040B0E67763330302D676C63000000000000000000010002211A 00010000000000000001010100000000000003606FC5A5501E5BC0307E00811071700046000005 6 635A02000000000000000000000000000000000000000000000000E07FFFFF000000000000000000 00000000000000000000000000000000000000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000000000000000000000000000 0000000000000000007E00811071701034625670D0A			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status / Satellites in View	1		
Report ID / Report Type	1		
Number	1	1	

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GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

Message	ID
Reserved	0
+RESP:GTTOW	1
Reserved	2
+RESP:GTLBC	3
+RESP:GTEPS	4
+RESP:GTDIS	5

+RESP:GTIOB	6
+RESP:GTFRI	7
+RESP:GTGEO	8
+RESP:GTSPD	9
+RESP:GTSOS	10
+RESP:GTRTL	11
+RESP:GTDOG	12
Reserved	13
+RESP:GTAIS	14
+RESP:GTHBM	15
+RESP:GTIGL	16
+RESP:GTIDA	17
+RESP:GTERI	18
Reserved	19
+RESP:GTGIN	20
+RESP:GTGOT	21

- <*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	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 6 of <*+RSP Mask*> is 1, the device name is used as the unique ID of the device. Please refer to the <*Device Name*> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <*Device Name*> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format 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**

- <*Analog Input Mode*>: The mode of analog input ports. The high byte is reserved, the low 4 bits of the low byte are for analog input 1 and the high 4 bits are for analog input 2.
- <*EIO100 Input Status*>: The status of EIO100 inputs. For each bit, 0 means “disabled status”, and 1 means “enabled status”. If EIO100 device is not connected or the mode of **AT+GTURT** is not for EIO100, it is always “00”.
  - Bit 0: for EIO100 input 9

- Bit 1: for EIO100 input A
- Bit 2: for EIO100 input B
- Bit 3: for EIO100 input C
- Bit 4 – 7: Reserved

✧ <*Digital Input Status*>: The status masks of ignition detection, digital input1, digital input2, and digital input3 comprise the byte.

Input Status Mask	ID
Ignition Detection	0x01
Digital Input1	0x02
Digital Input2	0x04
Digital Input3	0x08

✧ <*EIO100 Output Status*>: The status of EIO100 outputs. For each bit, 0 means "disabled status", and 1 means "enabled status". If EIO100 device is not connected or the mode of **AT+GTURT** is not for EIO100, it is always "00".

- Bit 0: for EIO100 output 9
- Bit 1: for EIO100 output A
- Bit 2: for EIO100 output B
- Bit 3: for EIO100 output C
- Bit 4 – 7: Reserved

✧ <*Digital Output Status*>: The status masks of digital output1, digital output2, and digital output3 status comprise the byte.

Input Status Mask	ID
Digital Output1	0x01
Digital Output2	0x02
Digital Output3	0x04

✧ <*External GPS Antenna Status / Satellites*>: The last 2 bits of the high nibble are for <*External GPS Antenna Status*> and the low nibble is for <*Satellites*>.

✧ <*Report ID / Report Type*>: The high nibble is for <*Report ID*> and the low nibble is for <*Report Type*>.

✧ <*Speed*>: 3 bytes in total. The first 2 bytes are for the integer part of the speed and the last byte is for the fractional part. The fractional part has 1 digit.

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

Longitude 121.390847	**121390847**			
HEX	**07**	**3C**	**46**	**FF**

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

Latitude 31.164503	31164503			
HEX	01	DB	88	57

- <*GPS UTC Time*>: UTC time obtained from the GPS chip. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

GPS UTC Time	2011		07	14	08	24	13
HEX	07	DB	07	0E	08	18	0D

- <*Current Mileage*>: 3 bytes in total. The first 2 bytes are for the integer part of the current mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Current Mileage	0		0
HEX	00	00	00

- <*Total Mileage*>: 5 bytes in total. The first 4 bytes are for the integer part of the total mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Total Mileage	0				0
HEX	00	00	00	00	00

- <*Total Hour Meter Count*>: 6 bytes in total. The first 4 bytes represent the hour 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

- <*RFID*>: This is the card ID of Old RFID. 4 bytes in total.

Reserved	0			
HEX	00	00	00	00

- <*CAN Data*>: Please refer to the **+RESP:GTCAN** report in hex format. <*CAN Data*> includes fields from <*CANBUS Device State*> to <*Total Distance Impulses*>. This field can be analyzed as per the **+RESP:GTCAN** report.

The location report message **+RESP:GTLBC** uses the format below.

- **+RSP,**

Example:
2B 52 53 50 03 01 FE FF FF 00 70 25 0C 02 0D 07 67 76 33 30 30 2D 67 6C 64 00 00 00 00 00 00 00 00 01 00 21 1A 00 70 18 85 69 55 08 2F 01 01 00 00 00 01 2F 00 46 06 FC 5A 51 01 E5 BB DF 07 E1 01 03 03 07 3B 04 60 00 00 56 63 5A 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E1 01 03 03 08 00 1C 6C AC 00 0D 0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Report ID / Report Type	1		
Number Length / Number Type	1		
Phone Number	<=10		
Number	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	

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MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Dada	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- *<Number Length / Number Type>*: The high nibble is for *<Number Length>* and the low nibble is for *<Number Type>*. *<Number Length>* is the total number of bytes which is equal to the length of the *<Phone Number>* in bytes plus the length of the parameter *<Number Length / Number Type>*. *<Number Type>* indicates if there is a '+' sign before the phone number. 1 means "with the sign", and 0 means "without the sign".

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

- *<Phone Number>*: Not more than 10 bytes. In each byte, use the high nibble and low nibble to represent one digit of the phone number respectively. If there is no more digit for the last low nibble to represent, fill it with 0xF.

Phone Number 02154450293	**02**	**15**	**44**	**50**	**29**	**3**
HEX	**02**	**15**	**44**	**50**	**29**	**3F**

The location report message **+RESP:GTSOS** uses the format below.

- **+RSP,**

Example:
2B 52 53 50 0A FF FF FF FF 00 68 25 02 06 06 02 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 03 00 21 05 10 54 01 02 00 00 03 00 2B FF E9 07 3C 46 BE 01 DB 88 EA 07 DC 06 19 05 12 1B 04 60 00 00 18 77 08 73 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 06 19 05 12 1C 01 66 98 F5 0D 0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Report ID / Report Type	1		
Mic Vol / Speaker Vol	1		
Number	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		

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Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Mic Vol / Speaker Vol*>: The high nibble indicates the current microphone volume and low nibble indicates the current speaker volume.

The location report message **+RESP:GTIDA** uses the format below.

➢ **+RSP,**

Example:
2B 52 53 50 11 01 FE DF FF 00 71 25 08 03 09 09 67 76 33 30 30 2D 41 30 64 2F 7A 00 05 00 18 01 02 22 14 00 08 01 E2 52 0B 16 00 00 63 01 01 00 00 00 06 01 00 00 60 07 3C 4B D0 01 DB 87 53 07 E0 07 1D 09 28 20 04 60 00 01 14 4B 3E 5B 00 01 25 02 00 00 00 04 03 00 15 1E 00 00 00 03 27 2F 00 00 00 00 07 E0 07 1D 11 28 21 07 60 24 3C 0D 0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	

Length	2		
Device Type	1	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Report ID / Report Type	1	00	00
ID Length	1	4|8	
ID	<=20	'0' – '9' 'A' – 'Z'	
ID Report Type	1	0|1|2	
Number	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		

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GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- *<ID>*: The ID that is currently read.
- *<ID Report Type>*: The type of reported ID.
  - 0: The ID is unauthorized.
  - 1: The ID is authorized.
  - 2: The ID has logged out.

The location report message **+RESP:GTERI** uses the format below.

- **+RSP,**

Example:
2B 52 53 50 12 01 FE DF FF 00 00 00 02 00 79 25 02 06 06 02 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 00 00 21 10 10 02 01 28 ED 29 41 03 00 00 FD 01 02 01 9D 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 04 60 00 00 56 78 2D 7E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DE 04 06 04 0E 27 00 36 AA 83 0D 0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	

ERI Mask		4	00000000 – FFFFFFFF	
Length		2		
Device Type		1		25
Protocol Version		2	0000 – FFFF	
Firmware Version		2	0000 – FFFF	
Unique ID		8	IMEI	
Battery Level		1	0~100	
External Power Supply Voltage		2		
Analog Input Mode		2		
Analog Input1 Voltage		2		
Analog Input2 Voltage		2		
EIO100 Input Status		1	00 – 0F	
Digital Input Status		1	00 – 1F	
EIO100 Output Status		1	00 – 0F	
Digital Output Status		1	00 – 1F	
Motion Status		1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View		1		
Report ID / Report Type		1		
UART Device Type		1	0 - 99	
Digital Fuel Sensor Data (Optional)		2	0000 – FFFF	
AC100 Data (Optional)	AC100 Device Number	1	0 - 19	
	1-wire Device ID	8		
	1-wire Device Type	1	00 – FF	
	Device Data Length	1	00 – FF	
	1-wire Device Data	<= 20		
Fuel Sensor Data (Optional)	Sensor Number	1	0 –99	
	Sensor Type	1	0 – 6|20 – 21	
	Reserved	1	0x00	

	Percentage (Optional)	2	0 –100	
	Volume (Optional)	2	0 –10000	
Number		1	1	
GPS Accuracy		1	0|1 – 50	
Speed		3	0.0 – 999.9km/h	
Azimuth		2	0 – 359	
Altitude		2		
Longitude		4		
Latitude		4		
GPS UTC Time		7	YYYYMMDDHHMMSS	
MCC		2	0000 – FFFF	
MNC		2	0000 – FFFF	
LAC		2	0000 – FFFF	
Cell ID		2	0000 – FFFF	
Reserved		1	00	00
Current Mileage		3	0.0 –65535.0 km	
Total Mileage		5	0.0 – 4294967.0 km	
Current Hour Meter Count		3	HHMMSS	
Total Hour Meter Count		6	HHHHHHHHMMSS	
RFID		4	00000000 – FFFFFFFF	
CAN Data		<=99		
Send Time		7	YYYYMMDDHHMMSS	
Count Number		2	0000 – FFFF	
Checksum		2	0000 – FFFF	
Tail Characters		2	0x0D 0x0A	0x0D 0x0A

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

- 0: No device connected.
- 1: Digital fuel sensor. The five reserved fields are used as follows.
- 2: AC100 1-wire bus. The four reserved fields are used as follows.
- 5: CANBUS Device.

✧ *<Digital Fuel Sensor Data>*: The raw data read from the digital fuel sensor. If Bit 0 of *<ERI Mask>* in **AT+GTFRI** is enabled, this field will be displayed. Otherwise, this field will not be

displayed.

- <*Number of AC100 Devices*>: The number of 1-wire devices connected to AC100. If it is 0, the following fields <*1-wire Device ID*>, <*1-wire Device Type*>, <*Device Data Length*>, and <*1-wire Device Data*> will not be displayed. If there are more than one 1-wire devices connected, the fields <*1-wire Device ID*>, <*1-wire Device Type*>, <*Device Data Length*>, and <*1-wire Device Data*> will be repeated for each 1-wire device so that the information of all connected 1-wire devices are displayed. If Bit 1 of <*ERI Mask*> in **AT+GTFRI** is enabled, the <*AC100 Data*> field will be displayed; otherwise, the <*AC100 Data*> will not be displayed.
- <*1-wire Device ID*>: It indicates the device ID read from the 1-wire device.
- <*1-wire Device Type*>: It indicates the type of the 1-wire device.
  - 1: Temperature sensor.
- <*Device Data Length*>: It indicates the length of <*1-wire Device Data*>.
- <*1-wire Device Data*>: It indicates the data read from the 1-wire devices. If the device is a temperature sensor, this parameter indicates the temperature value. To convert the two-byte value in hex to decimal, multiply it by 0.0625 to get the temperature value in degrees Celsius. If the first 5 bits of the high byte are all 1, then the temperature value is below zero degrees Celsius and the value is represented in two's complement format. To obtain the temperature in decimal, plus the hexadecimal data by 1 and then multiply it by 0.0625 to get the value in degrees Celsius.

Note: The word "Optional" means the item is controlled by the parameter <*ERI Mask*>.

+RESP:GTGEO in HEX uses the format below**:**

- **+RSP,**

Example:
2B 52 53 50 08 FF FF FF BF 00 67 25 02 06 06 02 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 01 00 41 18 01 01 00 00 00 00 00 00 0F 07 3C 46 8F 01 DB 89 BF 07 DC 01 1E 0A 08 1D 04 60 00 00 18 78 08 73 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 1E 00 22 5D 1A 0D 0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Report ID / Report Type	1		
Number	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	

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Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Report ID / Report Type>*: Bit 0 is used for Report Type. Bit 1 – 3 are used as high 3 bits of Report ID, and Bit 4 – 7 are used as low 4 bits of Report ID.

- Report ID: The ID of Geo-Fence in HEX format. The range is 0 - 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:
2B 52 53 50 14 01 FE DF FF 00 6B 25 02 28 0C 51 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 00 01 11 17 00 00 00 00 04 01 01 00 00 00 00 00 00 59 06 FC 59 97 01 E5 BB 22 07 DD 09 1D 09 0A 36 04 60 00 00 56 63 5A 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 09 1D 09 0A 37 00 16 63 91 0D 0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
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		

Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	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	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

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Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Mask Group*>: The bitwise mask to determine whether to report <*Area Mask Group*>. Bit 0 is for Area Mask Group 1 and Bit 1 is for Area Mask Group 2. 1 means "Report the information", and 0 means "Do not report the information".
- <*Area Mask Group 1*>: The bitwise mask for trigger condition composition of the corresponding PEO ID. Each bit, from Bit 0 to Bit 24, represents the logical status of the corresponding PEO ID to trigger the entering or exiting event. 1 means that the event of the PEO ID set is triggered and 0 means the event of the PEO ID set is not triggered. In a group, if no event of PEO ID is triggered, the bitwise mask will be a null.

4.4. Information Report +INF

Information report messages include **+RESP:GTINF**, **+RESP:GTGPS**, **+RESP:GTCID**, **+RESP:GTCSQ**, **+RESP:GTVER**, **+RESP:GTBAT**, **+RESP:GTIOS**, **+RESP:GTUVN**, **+RESP:GTTMZ**, **+RESP:GTCVN** and **+RESP:GTCSN**. These messages use the same format as shown below. However, only **+RESP:GTINF** includes all the items while other messages only include information of items related to themselves.

- **+INF,**

Example:
2B 49 4E 46 01 FF FF 00 07 00 AD 67 76 33 30 30 6E 00 00 25 04 01 05 01 01 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 11 00 15 00 07 DF 04 08 06 20 32 00 01 00 3F 00 1E 02 58 00 00 00 00 00 D0 00 00 00 00 00 89 86 00 32 09 13 80 01 53 47 1D 63 00 00 00 00 04 04 60 00 00 18 77 08 72 00 18 04 60 00 00 18 06 31 52 00 13 04 60 00 00 18 06 31 51 00 11 04 60 00 00 18 77 08 73 00 1D 0D 03 1F 08 25 0E 15 10 17 17 10 19 08 1A 23 1B 09 1D 0E 1F 1F 20 16 2A 00 32 00 00 07 DF 04 08 06 20 33 00 54 3C 9F 0D 0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+INF	+INF

Message Type	1		
Report Mask	2	0000 – FFFF	
INF Expansion Mask	2	0000 - FFFF	
Length	2		
Unique ID	8	IMEI/Device Name	
Device Type	1	25	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	**+RESP:GTVER**
MCU Version	2	0000 – FFFF	
Reserved	2	0000	
Reserved	1	00	**+RESP:GTIOS**
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
Reserved	1	00	
Reserved	2	0000	
Reserved	2	0000	
EIO100 IO Status	2	0000 – 0F0F	
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Pin15 Mode	1		
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	**+RESP:GTGPS**
Reserved	1	00	
External GPS Antenna Status | Satellites in View	1		
Enable Power Saving / OWH Mode / Outside Working Hours / AGPS	1		
Last Fix UTC Time	7	YYYYMMDDHHMMSS	
Reserved	1	00	

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FRI Discard No Fix	1	0|1	
Response Report Item Mask	2		
IGN Interval	2		
IGF Interval	2		
Reserved	4	00000000	
Reserved	1	00	
Main Supply / Backup Battery On / Charging / LED On / Backup Battery Charge Mode	1		**+RESP:GTBAT**
External Power Supply VCC	2	0	
Backup Battery VCC	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 | 99	
Time Zone Offset Sign / Enable Daylight Saving	1		**+RESP:GTTMZ**
Time Zone Offset	2	HHMM	
GIR Trigger Type	1		**+RESP:GTGIR**
Cell Number	1		
MCC	2		
MNC	2		
LAC	2		
Cell ID	2		
Reserved	1		
RX Level	1		
……	2		
MCC	2		
MNC	2		
LAC	2		
Cell ID	2		

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Reserved	1		
RX Level	1		
SV Count	1		**+RESP: GTGSV**
SV ID	1		
SV Power	1		
……			
SV ID	1		
SV Power	1		
Sensor Protocol Version	1		**+RESP: GTUVN**
Sensor SW Version	2		
Sensor HW Version	1		
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		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

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

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+RESP:GTGIR	10
+RESP:GTGSV	11
+RESP:GTUVN	12
+RESP:GTCVN	13
+RESP:GTCSN	20

- <*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	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 1 of <*+INF Mask*> is 1, the device name is used as the unique ID of the device. Please refer to the <*Device Name*> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <*Device Name*> is more than 8 bytes, the device will only acquire the first 8 bytes. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	**g**	**v**	**3**	**0**	**0**	**n**		
HEX	**67**	**76**	**33**	**30**	**30**	**6E**	**00**	**00**

- <*Device Type*>: If <*Message Type*> is 6(**+RESP:GTVER**) in the message, Bit 2(<*Device Type*>) in <*+INF Mask*> will be forced to 1, and thus the field is always 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 1, and thus the field is always 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 1, and thus the field is always present in the hex report of **+RESP:GTVER**.
- <*EIO100 IO Status*>: The status of EIO100 inputs and outputs. For each bit, 0 means "disabled status", and 1 means "enabled status". If EIO100 device is not connected or the mode of **AT+GTURT** is not for EIO100, it is always "0000".
  - Bit 0: for EIO100 output 9
  - Bit 1: for EIO100 output A
  - Bit 2: for EIO100 output B
  - Bit 3: for EIO100 output C
  - Bit 4 – 7: Reserved
  - Bit 8: for EIO100 input 9
  - Bit 9: for EIO100 input A
  - Bit 10: for EIO100 input B
  - Bit 11: for EIO100 input C
  - Bit 12 – 15: Reserved

- *<Enable Power Saving / OWH Mode / Outside Working Hours / AGPS>*: The highest bit, or Bit 7, is reserved, Bit 5 and Bit 6 are for *<Enable Power Saving>*, 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 outside working hours. 1 means "Outside working hours".
- *<Main Supply / Backup Battery On / Charging / LED On / Backup Battery Charge Mode>*: The highest bit, or Bit 7, is for *<Main Supply>* which indicates whether the external power supply is connected to the device. Bit 6 is for *<Backup Battery On>* which indicates whether the backup battery is working. Bit 5 is for *<Charging>* which indicates whether the backup battery is currently charging. Bit 4 is for *<LED On>* which indicates whether the LED's are turned on. Bit 0 is for *<Backup Battery Charge Mode>*.
- *<ICCID>*: ICCID is a 20-digit string. In the HEX format message, every 4 bits are used to represent one digit of the 20 digits of the ICCID.

ICCID	**89**	**86**	**00**	**00**	**09**	**09**	**17**	**21**	**49**	**53**
HEX	**89**	**86**	**00**	**00**	**09**	**09**	**17**	**21**	**49**	**53**

- *<Time Zone Offset Sign / Enable Daylight Saving>*: Bit 1 is for *<Enable Daylight Saving>* which indicates whether the daylight saving function is currently enabled. Bit 0 is for *<Time Zone Offset Sign>* which indicates the positive or negative offset of the local time from UTC time. 1 means "negative offset".
- *<GIR Trigger Type>*: A string to indicate what kind of GPS fix this cell information is for.
  "INF": This cell information is for INF request.
  "SOS": This cell information is for SOS request.
  "RTL": This cell information is for RTL request.
  "LBC": This cell information is for LBC request.
  "TOW": This cell information is for TOW request.
  "FRI": This cell information is for FRI request.
  "GIR": This cell information is for sub command "**C**" in the **AT+GTRTO** command.
  "ERI": This cell information is for ERI request.

Fix Type	**ID**
INF	0
SOS	1
RTL	2
LBC	3
TOW	4
FRI	5
GIR	6
ERI	7

- *<Cell Number>*: It indicates the number of the IMSI**.** The IMSI consists of MCC, MNC, LAC, and Cell ID.

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4.5. Event Report +EVT

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

➢ **+EVT,**

Example: **2B4556540901FEFFFF0068250A040B0E67763330302D676C63000000000000000000100211A0100000000000001306FC5A7901E5BBEF07E0081107293904600000566 3B65500000000000000000000000000000000000000000000000000000000007E0081107293B035539AD0D0A**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22	

		0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN DATA	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

Message	ID
+RESP:GTPNA	1
+RESP:GTPFA	2

+RESP:GTMPN	3
+RESP:GTMPF	4
Reserved	5
+RESP:GTBPL	6
+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
+RESP:GTANT	10
+RESP:GTMON	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
+RESP:GTDTT	31
+RESP:GTJDS	32

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+RESP:GTRMD	33
+RESP:GTPHL	34
+RESP:GTEXP	35
Reserved	36
+RESP:GTUFS	37
+RESP:GTFTP	38
Reserved	39
+RESP:GTUPC	40
+RESP:GTCLT	41
+RESP:GTCFU	42

- *<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	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 6 of *<+EVT Mask>* is 1, the device name is used as the unique ID of the device. Please refer to the *<Device Name>* in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the *<Device Name>* is more than 8 bytes, the device will only acquire the first 8 bytes. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	**g**	**v**	**3**	**0**	**0**	**n**		
HEX	**67**	**76**	**33**	**30**	**30**	**6E**	**00**	**00**

The event report message **+RESP:GTBPL** uses the format below.

- **+EVT,**

Example: **2B 45 56 54 06 01 FE DF FF 00 68 25 08 03 09 09 67 76 33 30 30 00 00 00 09 00 00 00 06 00 9A 00 00 11 1B 0D D9 01 00 00 00 00 00 00 00 00 07 3C 46 E3 01 DB 88 FF 07 DD 02 02 0B 31 15 04 60 00 00 18 06 21 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 02 02 0B 31 19 05 20 E7 6E 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Backup Battery VCC	2	0 – 4500 mV	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	

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LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN DATA	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTJDR** uses the format below.

- **+EVT,**

Example: **2B 45 56 54 14 01 FE DF FF 00 66 25 0B 00 0C 03 67 76 33 30 30 6E 00 00 63 00 00 00 00 00 00 01 02 22 16 01 00 00 00 00 00 00 00 36 06 FC 5A 54 01 E5 BC 11 07 E0 08 1F 03 32 33 04 60 00 01 55 04 67 F4 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E0 08 1E 14 15 09 00 7D 50 76 0D 0A**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply	2		

Voltage			
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	

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RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTJDS** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 20 01 FE FF FF 00 69 25 02 1F 0B 13 67 76 33 30 30 41 31 31 46 00 00 00 00 00 00 00 00 00 01 11 10 01 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 56 78 20 79 00 00 00 00 00 00 00 0B 05 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 0A 0A 11 16 21 00 3F 30 DE 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	

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Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Jamming Status	1	1|2	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Jamming Status>*: The current jamming status of the device.

- 1: Quit the jamming state.
- 2: Enter the jamming state.

The event report message **+RESP:GTMON** uses the format below.

➢ **+EVT,**

Example: **2B 45 56 54 0B FF FF FF FF 00 6E 25 02 06 06 02 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 01 00 22 08 70 15 00 03 87 88 7F 50 01 00 00 00 07 00 2B 00 16 07 3C 47 F8 01 DB 87 EA 07 DC 06 19 05 24 22 04 60 00 00 18 77 08 73 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 06 19 05 24 23 01 86 EB EB 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		

Number Length / Number Type	1		
Phone Number	<=10		
Microphone / Speaker			
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Microphone / Speaker>*: Bit 4 is for *<Microphone>* which indicates the volume level of the microphone, and the low nibble is for *<Speaker>* which indicates the volume level of the speaker.

The event report messages **+RESP:GTIGN** and **+RESP:GTIGF** use the format below. For these two

types of messages, the <*Duration of Ignition On or Ignition Off*> field will always be present regardless of the <*Report Item Mask*> setting.

- **+EVT,**

Example: **2B 45 56 54 0E FF FF FF FF 00 6A 25 02 06 06 02 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 00 00 00 12 08 00 00 05 88 01 00 00 00 03 00 2B 00 1F 07 3C 47 AD 01 DB 87 F5 07 DC 06 19 05 28 20 04 60 00 00 18 77 08 73 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 06 19 05 28 23 01 8D 43 90 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	

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Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTUPD** uses the format below. For this message, the <*Protocol Version*> and <*Firmware Version*> will always be present regardless of the <*Report Item Mask*> setting.

- **+EVT,**

Example:
2B 45 56 54 0F FF FF FF FF 00 69 25 02 06 06 02 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 00 00 00 11 00 00 CA 01 01 00 00 00 08 00 2B 00 3F 07 3C 47 34 01 DB 87 CF 07 DC 06 19 05 28 30 04 60 00 00 18 77 08 73 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0 000 00 00 07 DC 06 19 05 2B 22 01 9A 1C CE 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Code	2		
Retry	1		
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		

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Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTIDF** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 11 FF FF FF BF 00 6A 25 02 06 06 02 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 00 0C 00 41 10 00 00 00 00 01 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	25	25

Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Duration of Idling	4		
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	

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Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN DATA	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTDAT** uses the format below.

- **+EVT,**

Example: **2B 45 56 54 12 FF FF FF BF 00 67 25 02 06 06 02 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 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		

Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Data Length	2		
Data			
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		

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

✧ <*Data Length*>: It expresses the length of the <*Data*> parameter.

The event report message **+RESP:GTGSS** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 15 FF FF FF BF 00 67 25 02 06 06 02 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 01 00 00 00 00 00 00 0C 00 41 10 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 18 78 08 72 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 01 1E 0A 08 06 00 20 7F F3 0D 0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	

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Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
GPS Signal Status	1	0 | 1	
Reserved	4	00000000	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

Event report message **+RESP:GTFLA** uses the format below.

- **+EVT,**

Example: **2B 45 56 54 16 FF FF FF BF 00 67 25 02 06 06 02 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 01 00 00 00 00 00 00 0C 00 41 10 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 18 78 08 72 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		

Input ID	1	0|1|2	
Last Fuel Level	1	0 – 100	
Current Fuel Level	1	0 – 100	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN DATA	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- *<Input ID>*: The ID of the input to which the fuel sensor is connected. 0 means “Connected with serial port”.
- *<Last Fuel Level>*: The fuel level saved before last ignition off or when FLA event occurs.
- *<Current Fuel Level>*: The current fuel level when FLA event occurs.

The event report message **+RESP:GTDOS** uses the format below.

- **+EVT,**

Example: **2B 45 56 54 1B 01 FE DF FF 00 68 25 02 06 06 02 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 00 01 41 10 01 01 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 18 77 08 73 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DB 01 01 00 02 1C 00 0D 80 F6 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status / Satellites in View	1		
Wave1 Output ID	1	1-3	
Wave1 Ouptut Active	1	0|1	

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Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTGES** uses the format below.

- **+EVT,**

Example: **2B 45 56 54 1C 01 FE DF FF 00 70 25 02 0F 08 23 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 00 00 00 11 17 00 00 00 00 00 00 01 F4 00 00 01 68 01 00 00 00 00 00 00 00 32 06 FC 59 DC 01 E5 BB CD 07 DC 0C 1A 09 20 18 04 60 00 00 56 63 5A 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DC 0C 1A 09 20 21 00 1B 42 F0 0D 0A**			
Parameter	**Length**	**Range / Format**	**Default**

	(Byte)		
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Trigger GEO ID	2	0-19	
Enable Trigger GEO	1	0|1	
Trigger Mode	1	0|21|22	
Radius	4	50 – 6000000m	
Check Interval	4	0|5 – 86400sec	
Number	1	1	
GPS Accuracy	1	0	

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Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

The event message **+RESP:GTTMP** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 1E FF FF FF BF 00 67 25 04 02 0C 01 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 0C 00 41 10 00 64 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 18 78 08 72 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 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	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status / Satellites in View	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	

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GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN DATA	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Temperature Alarm ID*>: The ID of temperature alarm.
- <*Temperature Status*>: The status of current temperature. 0 means "Outside of the predefined temperature range". 1 means "Inside of the predefined temperature range".
- <*Temperature Sensor Device ID*>: The ID of the temperature sensor.
- <*Temperature Sensor Device Data*>: The current temperature the sensor detects.

The event report message **+RESP:GTDTT** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 1F FF FF FF BF 00 67 25 02 06 06 02 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 00 0C 00 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 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Reserved	1	00	00
Data Length	2		
Data			
Number	1	1	
GPS Accuracy	1	0	0

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Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <*Data Length*>: It expresses the length of the <*Data*> parameter.

The event report message **+RESP:GTRMD** uses the format below.

➢ **+EVT,**

Example: **2B 45 56 54 21 01 FE DF FF 00 67 25 90 06 01 0B 67 76 33 30 30 2D 41 30 64 2F 81 00 05 00 18 01 00 22 15 02 01 00 00 00 01 00 00 00 30 07 3C 4C 17 01 DB 87 85 07 E0 07 1D 09 2A 21 04 60 00 01 14 4B 3E 5B 00 00 00 00 00 00 00 04 03 00 00 05 00 00 00 03 29 16 00 00 00 00 07 E0 07 1D 11 2A 24 07 7F 94 39 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Roaming State	1	0-3	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	

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MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTPHL** uses the format below, and it is only sent via GPRS even if the report mode is forced SMS mode.

- **+EVT,**

Example: **2B 42 56 54 22 01 FE DF FF 00 72 25 03 01 03 01 61 78 31 30 30 30 00 00 00 00 00 00 00 00 00 00 00 00 00 00 11 14 00 03 00 08 00 07 DD 0A 19 0C 1A 0D 01 00 00 00 00 00 00 00 22 06 FC 5A 15 01 E5 BB C7 07 DD 0A 19 0C 0A 1B 04 60 00 00 56 78 2D 7E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 0A 19 0C 1A 0D 00 47 B9 DA 0D 0A**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Attribute Mask	2	0000 – FFFF	
Attribute Length	2		
Camera ID	1	0-3	
Photo Time	7	YYYYMMDDHHMMSS	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	

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Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Attribute Length>*: The total length of attribute parameters which include *<Camera ID>* and *<Photo Time>*.

The event report message **+RESP:GTEXP** uses the format below.

➢ **+EVT,**

Example: **2B 45 56 54 23 01 FE DF FF 00 6A 25 03 07 0D 05 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 01 00 21 1B 00 00 33 31 01 00 00 00 00 00 42 00 3D 06 FC 5A 08 01 E5 BB FC 07 DE 06 13 07 02 1E 04 60 00 01 55 04 67 F3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DE 06 13 07 02 20 05 21 CE 98 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	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Digital Fuel Sensor Type	1	2|4	
Reserved	1		
Reserved Parameters	1		
HW Fault Code	1		
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00

Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTUFS** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 25 01 FE FF FF 00 68 25 04 04 05 0D 67 76 33 30 30 6E 31 30 63 00 00 00 00 00 00 00 00 00 00 11 17 01 00 00 00 00 00 00 00 31 06 FC 5A 1B 01 E5 BC 3D 07 DF 06 03 03 1D 16 04 60 00 01 55 04 58 2B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DF 06 03 03 1D 18 01 D5 7F C0 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	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		

EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Code	2		
Reserved	1	00	00
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTFTP** uses the format below.

- **+EVT,**

Example:
2B 45 56 54 26 01 FE DF FF 00 7F 25 04 01 0E 04 67 76 33 30 30 41 31 34 00 00 00 00 00 00 00 01 00 21 10 01 6A 6F 6E 65 79 5F 32 30 31 31 30 31 30 31 30 30 32 32 31 39 2E 6A 70 67 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 56 63 5A 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DB 01 01 00 16 20 00 16 2A 33 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	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	

External GPS Antenna Status | Satellites in View	1		
File Name	<=40		
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<File Name>*: The file name of picture. The value is the file name string which ends by '\0'. The value is in ASCII format.

The event report message **+RESP:GTUPC** uses the format below.

➢ **+EVT,**

Example: 2B 45 56 54 28 01 FE DF FF 00 9F 25 07 04 08 09 67 76 33 30 30 00 00 00 00 00 00 00 00 00 00 01 01 21 13 00 64 00 68 74 74 70 3A 2F 2F 71 75 65 63 6C 69 6E 6B 2E 33 33 32 32 2E 6F 72 67 3A 38 34 37 38 2F 47 56 33 30 30 4E 2F 64 65 6C 74 61 62 69 6E 2F 63 66 67 2E 69 6E 69 00 01 00 00 00 00 00 00 00 3D 07 3C 48 78 01 DB 87 2F 07 DF 0C 07 07 06 06 04 60 00 00 18 77 08 73 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DF 0C 07 07 0A 12 00 21 43 16 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	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Command ID	1		
Result	2	100|101|102|103|200|2	

		01|202|300|301|302	
Download URL	<=100	Complete URL	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- *<Command ID>*: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of commands when the response code is 301. It indicates wrong format of command ID when the response code is 302.
- *<Result>*: A numeral to indicate whether the configuration is updated successfully.
  - 100: The update command is starting.
  - 101: The update command is confirmed by the device.

- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name and ends by 0x00.

The event report message **+RESP:GTCLT** uses the format below.

➢ **+EVT,**

Example: **2B 45 56 54 26 01 FE DF FF 00 7F 25 04 01 0E 04 67 76 33 30 30 41 31 34 00 00 00 00 00 00 00 01 00 21 10 01 6A 6F 6E 65 79 5F 32 30 31 31 30 31 30 31 30 30 32 32 31 39 2E 6A 70 67 01 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 56 63 5A 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DB 01 01 00 16 20 00 16 2A 33 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	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	
EIO100 Output Status	1	00 – 0F	

Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Group ID	1	00– 19	
Alarm Mask 1	4	00000000 – FFFFFFFF	
Alarm Mask 2	4	00000000 – FFFFFFFF	
Alarm Mask 3	4	00000000 – FFFFFFFF	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN DATA	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	

Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Group ID*>: The ID of CANBUS alarm group. The CANBUS alarm function supports settings of a total of 20 groups.
- <*Alarm Mask 1*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Detailed Information / Indicators*> of the **+RESP:GTCAN** message.
- <*Alarm Mask 2*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Lights*> and <*Doors*> of the **+RESP:GTCAN** message.
- <*Alarm Mask 3*>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <*Engine RPM*> of the **+RESP:GTCAN** message.

The event report message **+RESP:GTCFU** uses the format below.

- **+EVT,**

Example: **2B 45 56 54 09 00 FE 1F BF 00 5E 21 01 03 03 02 56 50 22 00 0A 00 27 07 5F 00 00 01 00 22 0C 01 00 00 00 02 00 28 00 35 06 FC 5E 38 01 E5 E0 E4 07 DD 01 1D 0C 34 30 04 60 00 00 55 0A 03 58 00 00 01 07 00 00 00 01 07 00 2D 0A 00 00 00 00 2D 0A 07 DD 01 1D 14 34 31 00 53 78 1D 0D 0A**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
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		
Analog Input2 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 1F	

EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 | 0x12 0x21 | 0x22 0x41 | 0x42 0x16 | 0x1A	
External GPS Antenna Status | Satellites in View	1		
Code	2		
Reserved	1	00	00
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
RFID	4	00000000 – FFFFFFFF	
CAN Data	<=99		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	

Tail Characters	2	0x0D 0x0A	0x0D 0x0A

4.6. Data Report +DAT

Data report messages **+RESP:GTPHD**, **+RESP:GTEHD** and **+RESP:GTCRG** use the format below, and they are only sent via GPRS even if the report mode is forced SMS mode.

- **+DAT,**

Example:
2B444154010000007F023525060307074359303 95F4E6577000300080007DF0A09053312490102 00FFD8FFDB00840006040505050406050505070706070910 0A09090909130E0E0B101714181716 141615191C241E191B221B15161F2B20222526282928181E2C2F2C272F2427282701070707090908 09120A0A12271A161A2727272727272727272727272727272727272727272727272727272727272727272 7272727272727272727272727272727272727272727FFC000110801E0028003012100021101031101FF DD0004000AFFC401A2000001050101010101010000000000000000010203040506070809 0A0B1 0000201030302040305050404000017D01020300041105122131410613516107227114328191A 1082342B1C11552D1F02433627282090A161718191A25262728292A3435363738393A43444546 4748494A535455565758595A636465666768696A737475767778797A838485868788898A929394 95969798999AA2A3A4A5A6A7A8A9AAB2B3B4B5B6B7B8B9BAC2C3C4C5C6C7C8C9CAD2D3D4D 5D6D7D8D9DAE1E2E3E4E5E6E7E8E9EAF1F2F3F4F5F6F7F8F9FA0100030101010101010101010100 0000000000102030405060708090A0B1100020102040403040705040400010277000102031104 0 5213106124151076171132232810814429 1A1B1C109233352F0156272D10A162434E125F117181 91A262728292A35363738393A434445464748494A535455565758595A636465666768696A7374 75767778797A82838407DF0A09053318294A77380D0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+DAT	+DAT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Attribute Mask	2	0000 – FFFF	**+RESP:GTPHD/+RESP:GTEHD**
Attribute Length	2		
Camera ID	1	0-3	

Photo Time	7	YYYYMMDDHHMMSS	
Total Frames	1/2		
Current Frame Index	1/2		
Photo Data Length	2		
Photo Data	<=512		
Data Length	2		**+RESP:GTFSD**
Sensor Data	<=128		
Data Type	1	0 | 1	**+RESP:GTCRG**
GPS Validity Number	1	0 – 10	
GPS Point Index	1	1	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9 km /h	
Azimuth	2	0 – 359	
Altitude	2	(–)xxxxx.x m	
Longitude	4	(–)xxx.xxxxxx	
Latitude	4	(–)xx.xxxxxx	
GPS UTC Time	7	YYYYMMDDHHMMSS	
.....			
GPS Point Index	1	10	
GPS Accuracy	1	0|1 – 50	
Speed	3	0.0 – 999.9 km /h	
Azimuth	2	0 – 359	
Altitude	2	(–)xxxxx.x m	
Longitude	4	(–)xxx.xxxxxx	
Latitude	4	(–)xx.xxxxxx	
GPS UTC Time	7	YYYYMMDDHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Message Type*>: The ID of data report message.

Message	ID
+RESP:GTPHD	1
+RESP:GTFSD	2
+RESP:GTEHD	3
+RESP:GTCRG	4

- <*Report Mask*>: Please refer to the <*+DAT Mask*> in **AT+GTHRM**.
- <*Attribute Length*>: The total length of attribute parameters which include <*Camera ID*> and <*Photo Time*>.
- <*Total Frames*>: If the message is **+RESP:GTPHD** and the actual size of the picture is larger than 0xFF frames (255*512Bytes), its value will be 0 which indicates more frames wait to be received until the remaining frames is less or equal to 0xFF when its value equals to the remaining frames.
- <*Data Type*>: The data reported to the backend server is recorded before crash or after crash.
  - 0: Before crash.
  - 1: After crash.
- <*GPS Validity Number*>: The number of the successfully fixed GPS positions included in the report message.
- <*GPS Point Index*>: The index of GPS point.

4.7. Heartbeat Data +HBD

- **+HBD,**

Example: **2B484244FF20250A040B0E67763330302D676C07E00811061E18032C3C560D0A**			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	

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

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

IMEI	**13**	**57**	**90**	**24**	**68**	**11**	**22**	**0**
HEX	**0D**	**39**	**5A**	**18**	**44**	**0B**	**16**	**00**

If Bit 4 of <+*HBD Mask*> is 1, the device name is used as the unique ID of the device. Please refer to the <*Device Name*> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <*Device Name*> is more than 8 bytes, the device will only acquire the first 8 bytes. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	**g**	**v**	**3**	**0**	**0**	**n**		
HEX	**67**	**76**	**33**	**30**	**30**	**6E**	**00**	**00**

If the mask of <*UID*> in the <+*HBD Mask*> of **AT+GTHRM** is set to 0, the heartbeat message reported will not include device name or IMEI information. If the mask of <*UID*> is set to 1, then the heartbeat message reported will report device name or IMEI information according to the mask of <*Device Name*>.

4.8. Buffer Report in HEX Format

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

4.9. Crash Data Packet

➢ **+CRD,**

Example:
2B 43 52 44 00 7D 02 19 25 01 04 04 08 56 50 22 00 0F 5B 31 04 00 03 01 00 01 00 01 00 52 00 02 00 01 00 51 00 01 00 01 00 53 00 01 FF FF 00 52 00 01 FF FF 00 50 FF FF 00 00 00 54 00 01 00 00

00 52 00 01 00 00 00 52 00 02 00 00 00 54 00 01 00 00 00 53 00 02 00 00 00 53 00 01 00 00 00 52 00 02 00 01 00 52 00 01 00 00 00 52 00 00 00 01 00 50 00 00 00 01 00 55 00 01 00 01 00 51 00 01 00 01 00 51 00 02 00 00 00 53 00 01 FF FF 00 51 00 01 00 01 00 52 00 02 00 02 00 52 00 01 00 01 00 52 00 02 FF FF 00 52 00 03 FF FF 00 51 00 04 00 00 00 51 00 01 00 00 00 52 00 02 00 00 00 51 00 01 00 00 00 50 00 02 00 02 00 53 00 00 00 01 00 51 00 02 00 02 00 53 00 01 00 01 00 52 00 03 00 01 00 55 00 03 00 00 00 52 00 01 00 01 00 51 FF FF 00 00 00 52 00 02 00 02 00 53 00 02 FF FF 00 52 00 01 FF FF 00 52 00 00 00 01 00 54 00 01 00 00 00 52 00 01 00 01 00 51 00 02 00 00 00 54 00 03 00 00 00 53 00 01 00 01 00 52 00 02 00 02 00 53 00 01 00 00 00 53 00 01 00 00 00 52 00 02 00 01 00 52 00 02 00 01 00 54 00 00 00 00 00 54 00 02 00 00 00 52 00 01 00 00 00 52 00 01 00 01 00 51 00 02 FF FF 00 52 00 01 00 01 00 53 00 01 FF FF 00 51 00 01 00 01 00 52 00 01 00 01 00 53 00 01 00 00 00 52 00 04 00 02 00 53 00 02 00 01 00 51 00 01 00 01 00 54 00 03 00 02 00 52 00 03 FF FF 00 53 00 00 00 00 00 52 00 01 FF FF 00 53 00 01 00 01 00 52 00 03 00 01 00 51 00 02 00 02 00 53 00 00 00 01 00 52 00 01 FF FF 00 50 00 01 00 02 00 50 00 02 00 00 00 53 00 00 00 00 00 51 00 01 00 01 00 51 00 01 00 01 00 51 00 00 FF FF 00 52 00 01 00 02 00 51 00 02 00 00 00 52 00 02 00 00 00 53 00 03 00 00 00 52 00 00 07 DD 05 08 10 29 3A 00 18 10 CD 0D 0A			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+CRD	+ CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	25	25
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Data Type	1	0|1	
Total Frame	1	3	
Frame Number	1	1|2|3	
Data	500		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- <*Report Mask*>: Please refer to the <+*CRD Mask*> in **AT+GTHRM**.
- <*Unique ID*>: If Bit 1 of <+*CRD Mask*> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

- <*Data Type*>: The data reported to the backend server is recorded before crash or after crash.
  - 0: Before crash.
  - 1: After crash.
- <*Total Frame*>: Total number of the messages that are sent to the backend server for the crash event.
- <*Frame Number*>: A numeral to indicate the sequence of the current message.
- <*Data*>: There are 500 bytes in one frame with 6 bytes in a group. The first 2 bytes of these 6 numbers represent X axis acceleration data, the middle 2 bytes represent Y axis acceleration data, and the last 2 bytes are for Z axis acceleration data.

4.10. Acceleration Data Packet

➢ **+ACC,**

Example:
2B4143432501055650220 00F5B3809FFFDFFFA005DFFFEFFFC005B0000FFFD005B0000FFFB0059FFFFFFFA005BFFFDFFFB005CFFFFFFFD0059FFFEFFFC0059FFFFFFFC005AFFFFFFFD00590000FFFB005BFFFFFFFC005BFFFCFFFE005B0000FFFE005BFFFAFFFB005AFFFEFFFB005AFFFFFFFD005CFFFEFFFA0058FFFEFFFD005AFFFEFFFB005DFFFEFFFE005DFFFDFFFB005AFFFEFFFB005DFFFEFFFB005CFFFFFFFB005CFFFEFFFC005BFFFFFFFC005BFFFEFFFD005D0001FFFE005BFFFFFFFE005B0000FFFE005B0000FFFB005D0000FFFC005AFFFFFFFC00590000FFFC0057FFFEFFFE0059FFFFFFFB005AFFFFFFFC005BFFFEFFFB0059FFFFFFFD0058FFFBFFFE005BFFFFFFFC00580000FFFE0060FFFEFFFD005CFFFFFFFE005AFFFFFFFD005D0001FFFE0059FFFEFFFC005BFFFCFFFD005AFFFEFFF9005DFFFDFFFC005AFFFEFFFC005A0000FFFA005E0000FFFB005B0000FFFA005CFFFFFFFE005A0000FFFD005BFFFEFFFD005B0000FFFC005CFFFDFFFB005BFFFDFFFB005AFFFEFFFC005BFFFEFFFB005AFFFDFFFD005CFFFBFFFB0059FFFCFFFB005AFFFEFFFC005C0000FFFA005B0001FFFD005BFFFEFFFB005AFFFDFFFD0059FFFCFFFC00590000FFFA005BFFFCFFFE005CFFFFFFFD005A07DB010100000D059891F80D0A

Parameter	Length (Byte)	Range / Format	Default
Message Header	4	+ACC	+ACC
Device Type	1	25	25
Protocol Version	2	0000–FFFF	
Unique ID	8	IMEI	
Data	6*75		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	

Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

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

- <*Data*>: There are 6*75 bytes in one message with 6 bytes in a group. The first 2 bytes of these 6 numbers represent X axis acceleration data, the middle 2 bytes represent Y axis acceleration data and the last 2 bytes are for Z axis acceleration data.

4.11. CANBUS Device Information Report

The CANBUS device information report message **+RESP:GTCAN** uses the format below.

- **+CAN,**

Example:
2B43414E01000007FF009B250A040B0E67763330302D676C0100C00FFFFF000000000000000000
0000000000000000002000BE37D000000323806A90028005A000000000000572800000043140000
00F78002000000020E000000011100000000006100001D0C2D110D00BF7FFF3F1F0000000000000
03906FC5A4601E5BBF507E0081108063704600000 5663B6550007E0081108063A03B2C3D60D0A

Parameter	**Length (Byte)**	**Range / Format**	**Default**
Message Header	4	+CAN	+CAN
Message Type	1		
Report Mask	4	0x00000000 – 0xFFFFFFFF	
Length	2		
Device Type	1	25	25
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Report Type	1	0|1|2	
CANBUS Device State	1	0|1	
CANBUS Report Mask	4	0x00000000 - 0xFFFFFFFF	
VIN	17		
Ignition Key	1	0|1|2	
Total Distance	4	H(0 – 99999999)/I(0 –	

		2147483647)	
Total Fuel Used	5	0.00 – 999999.99	
Engine RPM	2	0 – 16383 rpm	
Vehicle Speed	2	0 - 400Km/h	
Engine Coolant Temperature	2	-40 – +215 ℃	
Fuel Consumption	3	L/100km(0.0–999.9)|L/H(0.0–999.9)	
Fuel Level (Liter)	5	L(0.00 – 999999.99)	
Fuel Level (Percentage)	5	P(0.00 – 99.99)	
Range	4	0 – 99999999hm	
Accelerator Pedal Pressure	2	0 – 100%	
Total Engine Hours	5	0.00 – 99999.99h	
Total Driving Time	5	0.00 – 99999.99h	
Total Engine Idle Time	5	0.00 – 99999.99h	
Total Idle Fuel Used	5	0.00 –999999.99l	
Axle Weight	2	0 – 65535kg	
Tachograph Information	2	00-FFFF	
Detailed Information / Indicators	2	00-FFFF	
Lights	1	0x00-0xFF	
Doors	1	0x00-0xFF	0
Total Vehicle Overspeed Time	5	0 – 99999.99h	
Total Vehicle Engine Overspeed Time	5	0 – 99999.99h	
Total Distance Impulses	4	0– 2147483648	
CANBUS Report Expansion Mask	4	0x00000000 - 0xFFFFFFFF	
Ad-Blue Level	2	0-100%	
Axle Weight 1st	2	0 – 65535kg	
Axle Weight 3rd	2	0 – 65535kg	

Axle Weight 4th	2	0 – 65535kg	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle Motion Signal	1	0|1	
Tachograph Driving Direction	1	0|1	
Analog Input Value	4	0-99999mv	
Engine Braking Factor	4	0-999999	
Pedal Braking Factor	4	0-999999	
Total Accelerator Kick-downs	4	0-999999	
Total Effective Engine Speed Time	5	0.00 – 99999.99h	
Total Cruise Control Time	5	0.00 – 99999.99h	
Total Accelerator Kick-down Time	5	0.00 – 99999.99h	
Total Brake Applications	4	0-999999	
Tachograph Driver 1 Card Number	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Card Number	<=10	'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	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Expansion Information	2	0x0000-0xFFFF	
Rapid Brakings	4	0-999999	
Rapid Accelerations	4	0-999999	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	

Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Character	2	0x0D 0x0A	0x0D 0x0A

- <*Message Type*>: The ID of CAN report message.

Message	ID
+RESP:GTCAN	1

- <*Report Mask*>: Please refer to the <*+CAN Mask*> in **AT+GTHRM**.
- <*Length*>: The whole length of the 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 the <*Device Name*> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <*Device Name*> is more than 8 bytes, the device will only acquire the first 8 bytes. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	**g**	**v**	**3**	**0**	**0**	**n**		
HEX	**67**	**76**	**33**	**30**	**30**	**6E**	**00**	**00**

- <*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 communication state with the external

CANBUS device.

- 0: Abnormal. It fails to receive data from the external CANBUS device.
- 1: Normal. It is able to receive data from the external CANBUS device.

✧ <*CANBUS Report Mask*>: Please refer to the <*CAN Report Mask*> in **AT+GTCAN**.

✧ <*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 41h.
- 2: 41h reached.

- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15 minute before 16h (without 8h rest during the last 24h).
- 6: 16h reached.
- 7: Other limit.

W1-W0: Driver working states:

- 0: Rest - sleeping.
- 1: Driver available – short break.
- 2: Work – loading, unloading, working in an office.
- 3: Driver – behind the wheel.

✧ <*Detailed Information / Indicators*>: 2 bytes in total. Each bit contains information of one indicator.

- Bit 0: FL – fuel low indicator (1 – indicator on, 0 – off).
- Bit 1: DS – driver seatbelt indicator (1 – indicator on, 0 – indicator off).
- Bit 2: AC – air conditioning (1 – on, 0 - off).
- Bit 3: CC – cruise control (1 – active, 0 - disabled).
- Bit 4: B – brake pedal (1 – pressed, 0 – released).
- Bit 5: C – clutch pedal (1 – pressed, 0 – released).
- Bit 6: H – handbrake (1 – pulled-up, 0 – released).
- Bit 7: CL – central lock (1 – locked, 0 – unlocked).
- Bit 8: R – reverse gear (1 – on, 0 – off).
- Bit 9: RL – running lights (1 – on, 0 – off).
- Bit 10: LB – low beams (1 – on, 0 – off).
- Bit 11: HB – high beams (1 – on, 0 – off).
- Bit 12: RFL – rear fog lights (1 – on, 0 – off).
- Bit 13: FFL – front fog lights (1 – on, 0 – off).
- Bit 14: D – doors (1 – any door opened, 0 – all doors closed).
- Bit 15: T – trunk (1 – opened, 0 – closed).

✧ <*Lights*>: One byte. Each bit contains information of one light.

- Bit 0: Running Lights (1 – on, 0 – off).
- Bit 1: Low Beam (1 – on, 0 – off).
- Bit 2: High Beam (1 – on, 0 – off).
- Bit 3: Front Fog Light (1 – on, 0 – off).
- Bit 4: Rear Fog Light (1 – on, 0 – off).
- Bit 5: Hazard Lights (1 – on, 0 – off).
- Bit 6: Reserved.
- Bit 7: Reserved.

✧ <*Doors*>: One byte. 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*>: The value 1 indicates “Overspeed”. The value 0 indicates “No overspeed”.

✧ <*Tachograph Vehicle Motion Signal*>: The vehicle motion signal from tachograph. The value 1 indicates “Motion”. The value 0 indicates “No motion”.

✧ <*Tachograph Driving Direction*>: Vehicle driving direction from tachograph.

✧ <*Analog Input Value*>: The value of analog input. The unit is mv.

✧ <*Engine Braking Factor*>: 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 decimal number. Each bit contains information of one indicator.
  - Bit 0: W – webasto (1 – on, 0 – off or not available).
  - Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
  - Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
  - Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
  - Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
  - Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
  - Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
  - Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
  - Bit 8: 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-Logistic's settings of speed decrease time and value).
- <*Rapid Accelerations*>: The number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value).
- <*Send Time*>: The local time to send the acknowledgement 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: 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+GTAIS
+ACK:GTAIS
AT+GTFRI
+ACK:GTFRI
AT+GTGEO
+ACK:GTGEO
AT+GTTOW
+ACK:GTTOW
AT+GTSPD
+ACK:GTSPD
AT+GTSOS
+ACK:GTSOS
AT+GTMON
+ACK:GTMON
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+GTURT
+ACK:GTURT
AT+GTDAT
+ACK:GTDAT
AT+GTHMC
+ACK:GTHMC
AT+GTJDC
+ACK:GTJDC
AT+GTWLT
+ACK:GTWLT
AT+GTFFC
+ACK:GTFFC
AT+GTJBS
+ACK:GTJBS
AT+GTSSR
+ACK:GTSSR
AT+GTIDA
+ACK:GTIDA
AT+GTPDS
+ACK:GTPDS
AT+GTACD
+ACK:GTACD
AT+GTEFS
+ACK:GTEFS
AT+GTIDA
+ACK:GTIDA
AT+GTBZA
+ACK:GTBZA
AT+GTSPA
+ACK:GTSPA
AT+GTTMP
+ACK:GTTMP
AT+GTUDT
+ACK:GTUDT
AT+GTFSC
+ACK:GTFSC
AT+GTPEO
+ACK:GTPEO
AT+GTRMD

+ACK:GTRMD
AT+GTCMS
+ACK:GTCMS
AT+GTTAP
+ACK:GTTAP
AT+GTMUT
+ACK:GTMUT
AT+GTCAN
+ACK:GTCAN
AT+GTFTP
AT+GTUFS
+ACK:GTUFS
AT+GTOEX
+ACK:GTOEX
AT+GTIEX
+ACK:GTIEX
AT+GTBSE
+ACK:GTBSE
AT+GTSIM
+ACK:GTSIM
AT+GTUPC
+ACK:GTUPC
AT+GTCLT
+ACK:GTCLT
AT+GTGAM
+ACK:GTGAM
AT+GTCFU
+ACK:GTCFU

✧ 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:GTAIS
+RESP:GTIGL
+RESP:GTHBM

+RESP:GTIDA
+RESP:GTGES
+RESP:GTGIN
+RESP:GTGOT
+RESP:GTCAN

✧ Device Information Report

+RESP:GTINF

✧ Report for Querying

+RESP:GTGPS
+RESP:GTALL
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTIOS
+RESP:GTTMZ
+RESP:GTAIF
+RESP:GTALS
+RESP:GTALC
+RESP:GTGSV
+RESP:GTUVN
+RESP:GTCVN
+RESP:GTCSN

✧ Event Report

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN
+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTANT
+RESP:GTMON
+RESP:GTPDP
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF
+RESP:GTJDR
+RESP:GTJDS

+RESP:GTGSM
+RESP:GTGSS
+RESP:GTCRA
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTDOS
+RESP:GTTMP
+RESP:GTRMD
+RESP:GTPHL
+RESP:GTFTP
+RESP:GTEXP
+RESP:GTUPC
+RESP:GTCLT
+RESP:GTCFU

- Transparent Data Transmission
  +RESP:GTDAT (Short Format)
- +RESP:GTDAT (Long Format)
- +RESP:GTDTT(Short Format)
- +RESP:GTDTT(Long Format)
- +RESP:GTUDT
- +RESP:GTPHD
- +RESP:GTFSD

- Heartbeat
  +ACK:GTHBD
  +SACK:GTHBD

- Server Acknowledgement
  +SACK

- Hex Format Report Message
  +ACK
  +RSP
  +EVT
  +DAT
  +INF
  +HBD
  +CAN