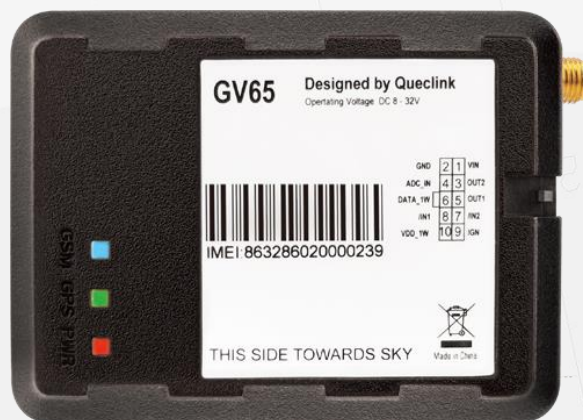


GV65 @Track Air Interface Protocol

GSM/GPRS/GNSS Tracker

TRACGV65AN007

Revision: 9.03



International Telematics Solutions Innovator

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Contents

Contents	2
0. Revision History	5
1. Overview	8
1.1. Scope of This Document	8
1.2. Terms and Abbreviations	8
2. System Architecture	9
3. Message Description	10
3.1. Message Format	10
3.2. Command And Acknowledgement	11
3.2.1. Server Connection	11
3.2.1.1. Bearer Setting Information	11
3.2.1.2. Backend Server Registration Information	12
3.2.1.3. Quick Start Setting	16
3.2.2. Device Configuration	17
3.2.2.1. Global Configuration	17
3.2.2.2. Auto-unlock PIN	21
3.2.2.3. Protocol Watchdog	22
3.2.2.4. Outside Working Hours	24
3.2.2.5. Time Adjustment	26
3.2.2.6. Settings for Preserving Device's Specified Logic States	28
3.2.2.7. Jamming Detection	29
3.2.2.8. Jamming Behavior Setting	31
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. Geo-Fence Information	39
3.2.4.2. Tow Alarm Configuration	41
3.2.4.3. Speed Alarm	43
3.2.4.4. SOS Function	45
3.2.4.5. Excessive Idling Detection	47
3.2.4.6. Harsh Behavior Monitoring	48
3.2.4.7. Start/Stop Report	51
3.2.4.8. Buzzer Alarm	53
3.2.4.9. Overspeed Alarm with Buzzer Notification	55
3.2.4.10. Roaming Detection Configuration	57
3.2.4.11. Crash Detection and Acceleration Report	60
3.2.5. IO Application	62
3.2.5.1. Digital Output	62
3.2.5.2. Digital Input Port Setting	64
3.2.5.3. Input/Output Port Binding	66

3.2.5.4.	External Power Supply Monitoring	68
3.2.5.5.	Analog Input Port Setting	70
3.2.6.	Main Serial Port Application	73
3.2.6.1.	Main Serial Port	73
3.2.6.2.	1-Wire Device Settings.....	75
3.2.6.3.	ID Authentication	77
3.2.6.4.	CANBUS Device Configuration	79
3.2.6.5.	CAN100 FOTA Upgrade.....	84
3.2.6.6.	Output Expansion	85
3.2.6.7.	Input Expansion	87
3.2.7.	Other Settings	88
3.2.7.1.	Real Time Operation	88
3.2.7.2.	Hour Meter Count.....	93
3.2.7.3.	White List	94
3.2.7.4.	GNSS Jamming Status Report.....	96
3.2.7.5.	Fuel Sensor Calibration Table.....	97
3.2.7.6.	Command String Storage	99
3.2.7.7.	User Defined Function	100
3.2.7.8.	SMS Sending	103
3.2.7.9.	Operator White List.....	105
3.2.7.10.	Configuration File Version.....	106
3.2.7.11.	GNSS-Assisted Motion Measurement	112
3.2.7.12.	Over-the-air Configuration Update	113
3.3.	Report.....	115
3.3.1.	Position Related Report	115
3.3.2.	Device Information Report	131
3.3.3.	Report for Real Time Querying	134
3.3.3.1.	+RESP:GTGPS.....	134
3.3.3.2.	+RESP:GTALS	134
3.3.3.3.	+RESP:GTALM.....	136
3.3.3.4.	+RESP:GTALC	137
3.3.3.5.	+RESP:GTCID	169
3.3.3.6.	+RESP:GTCSQ	169
3.3.3.7.	+RESP:GTVAR	170
3.3.3.8.	+RESP:GTBAT	171
3.3.3.9.	+RESP:GTIOS	172
3.3.3.10.	+RESP:GTTMZ.....	173
3.3.3.11.	+RESP:GTGTS.....	173
3.3.3.12.	+RESP:GTCVN	175
3.3.3.13.	+RESP:GTGSV	176
3.3.3.14.	+RESP:GTRSV.....	177
3.3.3.15.	+RESP:GTCML.....	177
3.3.4.	Event Report	178
3.3.5.	Buffer Report	200

3.3.6. Report with Google Maps Hyperlink.....	201
3.3.7. CANBUS Device Information Report	202
3.3.8. Crash Data Packet	208
3.3.9. Acceleration Data Packet	209
3.4. Heartbeat	211
3.5. Server Acknowledgement	212
4. HEX Format Report Message.....	213
4.1. Hex Report Mask	213
4.2. Acknowledgement +ACK	220
4.3. Location Report +RSP	223
4.4. Information Report +INF	236
4.5. Event Report +EVT	241
4.6. CANBUS Information Report +CAN	267
4.7. Heartbeat Data +HBD	273
4.8. Buffer Report in HEX Format	274
4.9. Crash Data Packet	274
4.10. Acceleration Data Packet.....	276
Appendix A: Two's Complement	278
Appendix B: Message Index	279

0. Revision History

Revision	Date	Author	Description of Change
1.08	2015-06-04	Dgreen Lin	1. Initial.
2.00	2015-08-21	Dgreen Lin	1. Added the commands AT+GTSMS and AT+GTJBS .
2.01	2015-09-14	Dgreen Lin	1. Added the command AT+GTOWL .
3.00	2015-10-30	Dgreen Lin	1. Added the parameter <i><CAN Report Expansion Mask></i> to AT+GTCAN .
3.01	2015-11-17	Dgreen Lin	1. Added <i><Rapid Brakings></i> and <i><Rapid Accelerations></i> to +RESP:GTCAN .
3.02	2015-11-25	Dgreen Lin	1. Added <i><CAN Data></i> regarding CANBUS information to +RESP:GTERI .
4.00	2016-02-24	Dgreen Lin	1. Added <i><Voltage Margin Error></i> and <i><Debounce Voltage Threshold></i> to the command AT+GTEPS . 2. Added <i><Voltage Margin Error></i> to the command AT+GTAIS . 3. Added the <i><GNSS Assisted Mode></i> parameter to the command AT+GTCAN .
4.01	2016-03-17	Dgreen Lin	1. Added the AT+GTCFU command to support CAN100 FOTA Upgrade. 2. Added RTO-12 to support inquiry about CAN100 Version and Serial Number. 3. Added the sub command E to AT+GTRTO and the +RESP:GTGSV report message.
5.00	2016-07-04	Dgreen Lin	1. Added Working Mode 17 to AT+GTMUT . 2. Added the commands AT+GTOEX and AT+GTIEX . 3. Added the value range '9 – C' to output / input in all AT commands except AT+GTDOG , AT+GTBZA , AT+GTACD and AT+GTIDA . 4. Used Bit 26 of <i><+RSP Mask></i> and <i><+EVT Mask></i> for <i><EIO100 IO Status></i> in the command AT+GTHRM .
5.01	2016-08-05	Stefan Chang	1. Added a reserved bit and a bit representing the state of speed to <i><Mask></i> in the command AT+GTPDS . 2. Added the <i><GNSS Working Mode></i> parameter to the AT+GTCFG command. 3. Added the <i><MPF Debounce Time></i> parameter to the AT+GTDIS command.

5.02	2016-11-01	Dgreen Lin	1. Modified the range of <Tachograph Driver 1 Card Number> and <Tachograph Driver 2 Card Number> in the +RESP:GTCAN report message.
6.00	2016-11-14	Dgreen Lin	1. Supported GNSS jamming detection function in U8 chip. 2. Supported AGPS-Offline function in U8 chip.
6.01	2016-12-09	Dgreen Lin	1. Added the <ID Validity Time> parameter to the AT+GTIDA command. 2. Expanded the +RESP:GTGTS report message.
6.02	2017-01-25	Arthur Li	1. Expanded the <Mask> in AT+GTPDS .
6.03	2017-02-20	Dgreen Lin	1. Modified the range of <Send Interval> in AT+GTFRI .
7.00	2017-03-29	Abert Xu Dgreen Lin	1. Added the <Update Type> parameter in AT+GTCFU . 2. Used Bit 30 for Driver Authorized event and Bit 31 for Driver Unauthorized event in the AT+GTUFD command.
7.01	2017-05-12	Forrest Cao	1. Added the description of the parameter <Altitude> in HEX format report. 2. Expanded the range of <Motion Threshold> in the AT+GTTOW command. 3. Added the <Last Position> parameter in the AT+GTDIS command. 4. Added the <No CAN Interval> parameter in the AT+GTDOG command. 5. Added <State Mode> in the AT+GTGEO command.
8.00	2018-04-12	Dgreen Lin	1. Added the <Discard Unknown Event> parameter in the AT+GTHBM command.
8.01	2018-04-18	Aleo Liu	1. Added support for controlling the report of +RESP:GTGSV and +RESP:GTRSV via Bit 0 and Bit 1 of Configuration Mask in AT+GTRTO when <Sub Command> is set to E.
	2018-05-03	Dgreen Lin	1. Added the RTO-22 command.
8.02	2018-05-09	Aleo Liu	1. Added the AT+GTFVR command. 2. Added the +RESP:GTRSV message. 3. Added the AT+GTGAM command. 4. Added the AT+GTUPC command. 5. Added HEX report for +RESP:GTGSV .
8.03	2018-06-13	Arthur Li	1. Added HEX format report for +RESP:GTRSV .
9.00	2018-08-03	Arthur Li	1. Added Bit 8 for <ERI Mask> in the AT+GTFRI command, and modified the description of

			<ERI Mask>.
9.01	2018-08-17	Arthur Li	1. Added <EIO100 Connection> to the command AT+GTACD .
9.02	2018-08-24	Arthur Li	1. Expanded the supported ID number from 250 to 1000 in the command AT+GTIDA .
9.03	2018-10-23	Aleo Liu	1. Added the parameter <Fail Interval> in the command AT+GTDOG .

1. Overview

1.1. Scope of This Document

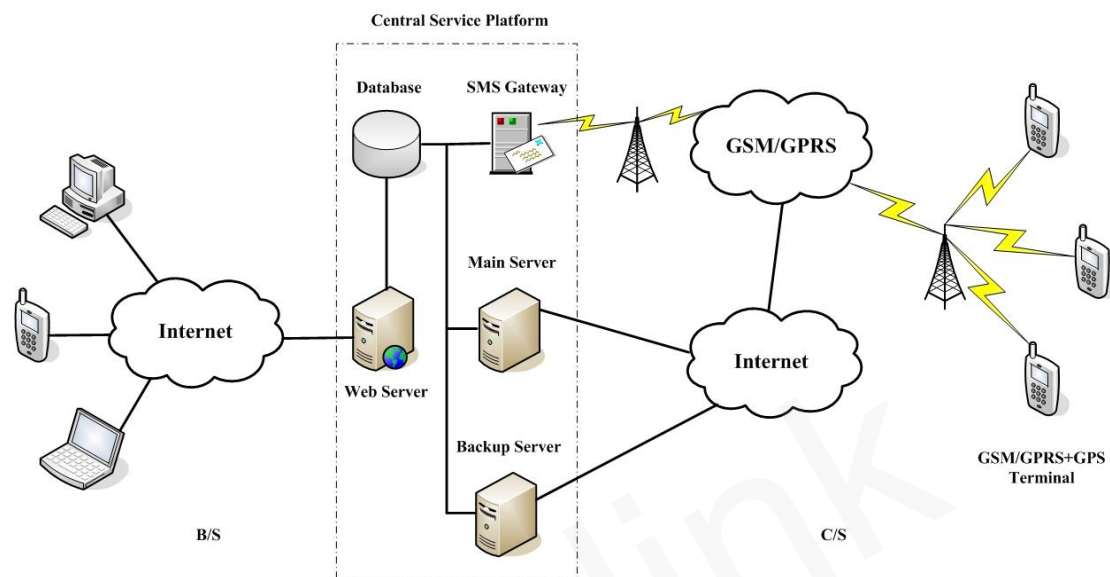
The @Track Air Interface Protocol is a digital communication interface based on printable ASCII characters over SMS or GPRS, which is used for all communications between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms the receipt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

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

1.2. Terms and Abbreviations

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

2. System Architecture



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

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

3. Message Description

3.1. Message Format

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

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

The entire message string ends with the character '\$'.

The characters "XXX" allow the identification of the difference between messages.

The "<parameter1>,<parameter2>,..." carry the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the 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 message sections.

By sending Commands to the terminal, the backend server can either configure and query the parameters of the terminal or control the terminal when it performs specific actions. When the terminal receives Commands over the air, it will reply with a corresponding Acknowledgement message.

According to the configuration of the parameters, the terminal can send Report messages to the backend server. Please see the following figure:

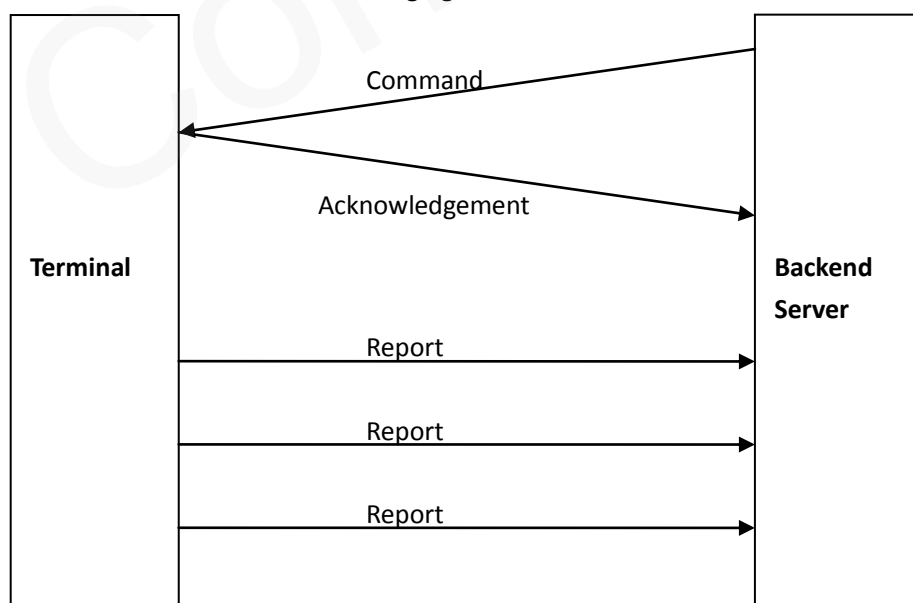


Figure 1: @Track Protocol Message Flow

3.2. Command And Acknowledgement

3.2.1. Server Connection

3.2.1.1. Bearer Setting Information

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

➤ AT+GTBSI=

Example: AT+GTBSI=gv65,cmnet,,,,,,,,0000\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	APN	<=40		
3	APN User Name	<=30		
4	APN Password	<=30		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Serial Number	4	0000 – FFFF	
10	Tail Character	1	\$	\$

- ✧ <Password>: The valid characters for the password include '0'–'9', 'a' –'z', and 'A' –'Z'. The default value is "gv65".
- ✧ <APN>: The access point name (APN).
- ✧ <APN User Name>: The GPRS APN user name. If the parameter field is empty, the current value for this parameter will be cleared.
- ✧ <APN Password>: The GPRS APN password. If the parameter field is empty, the current value for this parameter will be cleared.
- ✧ <Reserved>: Not used at present. Please keep it empty.
- ✧ <Serial Number>: The serial number for the command. It will be included in the ACK message of the command.

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

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

➤ **+ACK:GTBSI,**

Example: +ACK:GTBSI,310201,135790246811220,,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 above, “31” means GV65, and “38” means GV65 with inner battery. The middle two characters represent the major version number of the protocol and the last two characters represent the minor version number of the protocol. And both version numbers are hex digits. For example, “0100” means version 1.00.
- ✧ *<Unique ID>*: The IMEI of the terminal.
- ✧ *<Device Name>*: The specified name of the device.
- ✧ *<Serial Number>*: A serial number which is the same as the *<Serial Number>* in the corresponding command. It distinguishes which command the ACK message is for.
- ✧ *<Send Time>*: The local time to send the ACK message.
- ✧ *<Count Number>*: A self-increasing count number in each acknowledgment message and report message. It begins from 0000 and increases by 1 for each message. And it rolls back after “FFFF”.
- ✧ *<Tail Character>*: A character to indicate the end of the command. It must be '\$'.

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

3.2.1.2. Backend Server Registration Information

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

server.

➤ **AT+GTSRI=**

Example:

AT+GTSRI=gv65,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,0,,,,,0001\$

AT+GTSRI=gv65,3,,1,some.host.name,7011,116.226.45.229,7012,+8613812341234,15,1,0,,0001\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Report Mode	1	0 – 6	0
3	Reserved	0		
4	Buffer Mode	1	0 1 2	1
5	Main Server IP / Domain Name	<=60		
6	Main Server Port	<=5	0 – 65535	
7	Backup Server IP	<=15		
8	Backup Server Port	<=5	0 – 65535	
9	SMS Gateway	<=20		
10	Heartbeat Interval	<=3	0 5 – 360min	0
11	SACK Enable	1	0 1	0
12	Protocol Format	1	0 1	0
13	SMS ACK Enable	1	0 1	0
14	Connection Retry Pattern	1	0 – 4	0
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Serial Number	4	0000 – FFFF	
21	Tail Character	1	\$	\$

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

- 0: Stop mode.

- 1: TCP short-connection preferred mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. And if the terminal fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will try to send data via SMS to the SMS gateway.
 - 2: TCP short-connection forced mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. If the terminal fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the memory buffer if the buffer report function is enabled. Otherwise the data is dropped.
 - 3: TCP long-connection mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heartbeat data. The backend server should respond to the heartbeat data from the terminals.
 - 4: UDP mode. The terminal will send data to the backend server through UDP protocol. Receiving protocol commands via UDP is supported if the GPRS network allows it. It is recommended to enable heartbeat sending and **+RESP:GTPDP** in the case of receiving commands via UDP.
 - 5: Forced SMS mode. Only SMS is used for data transmission.
 - 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.
- ✧ **<Buffer Mode>**: The working mode of the buffer report function. If the buffer report function is enabled and the device goes into areas without GSM/GPRS network coverage, the device will store all reports locally. If the device goes back to areas with GSM/GPRS network coverage, it will then send all the buffered reports through GPRS.
- 0: Disable the buffer report function.
 - 1: Low priority - Enable the buffer report function. Under this working mode, the device will send the buffered messages after the 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>**: The IP address of the backup server.
- ✧ **<Backup Server Port>**: The port of the backup server.
- ✧ **<SMS Gateway>**: A maximum of 20 characters including the optional national code starting with "+" for sending SMS messages. Short code (for example, 10086) is also supported.
- ✧ **<Heartbeat Interval>**: The interval for sending the heartbeat message (**+ACK:GTHBD**) when the report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat message will be sent.

- ✧ **<SACK Enable>**: This defines whether the backend server should respond to the terminal with a SACK message when it receives a message from the terminal.
 - 0: The backend server does not reply with a SACK message after receiving a message from the terminal.
 - 1: The backend server replies with a SACK message when receiving a message from the terminal.
- ✧ **<Protocol Format>**: This field defines the format of the report message sent from the device to the backend server. 0 means "ASCII format", and 1 means "HEX format".
- ✧ **<SMS ACK Enable>**: A numeral to indicate whether to send the acknowledgement message to the original number when the command is sent via SMS.
 - 0: The device will send the acknowledgement message to the backend server according to the mode configured by the **<Report Mode>**.
 - 1: The device will send the acknowledgement message to the original number via SMS if the command is received via SMS.
- ✧ **<Connection Retry Pattern>**: This field defines the method of the terminal retrying to establish TCP connection with the backend server when there is no valid connection. There are 3 retry periods (Period 1, Period 2 and Period 3) for each retry pattern. The "Period" defines how long the terminal waits, in minutes, before initiating the next attempt to reconnect to the backend server. The parameter works starting with Period 1 of a retry pattern. If the failed reconnection attempts amount to 5 at a retry interval specified by Period 1 of a certain retry pattern, the terminal will then reconnect to the backend server at a retry interval specified by Period 2 of the retry pattern. If reconnection still fails after 5 attempts with Period 2, Period 3 of the same retry pattern is used as the retry interval for subsequent reconnection attempts. After that, another round of retry intervals starting from Period 1 and then Period 2 and then Period 3 are applied as needed until the terminal is connected to the backend server.

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

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

➤ **+ACK:GTSRI,**

Example: +ACK:GTSRI,310201,135790246811220,,0001,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

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

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

3.2.1.3. Quick Start Setting

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

➤ **AT+GTQSS=**

Example:

AT+GTQSS=gv65,cmnet,,,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,0002\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	APN	<=40		
3	APN User Name	<=30		
4	APN Password	<=30		
5	Report Mode	1	0 – 6	0
6	Reserved	0		
7	Buffer Mode	1	0 1 2	1
8	Main Server IP / Domain Name	<=60		
9	Main Server Port	<=5	0 – 65535	
10	Backup Server IP	<=15		
11	Backup Server Port	<=5	0 – 65535	
12	SMS Gateway	<=20		
13	Heartbeat Interval	<=3	0 5 – 360min	0
14	SACK Enable	1	0 1	0

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

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

➤ **+ACK:GTQSS,**

Example:			
+ACK:GTQSS,310201,135790246811220,,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=gv65,123456,gv65,,,,,,,,,,,,,,0,,,,,0003\$ AT+GTCFG=gv65,,,1,123.4,,,0,1,,2FF,1,1,300,0,1,1,,,0,000F,0,,,,,0003\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	New Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
3	Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv65
4	ODO Enable	1	0 1	0

5	ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
6	Reserved	0		
7	Reserved	0		
8	Report Composition Mask	<=4	0000 – FFFF	003F
9	Power Saving Mode	1	0 – 2	1
10	Reserved	0		
11	Event Mask	<=4	0000 – FFFF	3FFF
12	Reserved	0		
13	LED On	1	0 1	0
14	Info Report Enable	1	0 1	0
15	Info Report Interval	<=5	30 – 86400sec	300
16	Location by Call	1	0 1 2	0
17	Backup Battery Switch	1	0 1	1
18	Backup Battery Charge Mode	1	0 1	0
19	Reserved	0		
20	Reserved	0		
21	AGPS Mode	1	0 1	0
22	GSM Report	4	0000 – FFFF	000F
23	GNSS Lost Time	2	0 – 30min	0
24	GNSS Working Mode	1	0 - 2	0
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Serial Number	4	0000 – FFFF	
29	Tail Character	1	\$	\$

- ✧ <New Password>: It is set to change the current password.
- ✧ <Device Name>: An ASCII string which represents the name of the device.
- ✧ <ODO Enable>: Enable/disable the odograph function of calculating the total mileage. The current mileage is included in every position report message.
- ✧ <ODO Initial Mileage>: The initial value for calculating the total mileage.
- ✧ <Report Composition Mask>: Bitwise mask to configure the composition of a report message, especially the composition of GNSS information.

- Bit 0 for *<Speed>*
- Bit 1 for *<Azimuth>*
- Bit 2 for *<Altitude>*
- Bit 3 for GSM tower data, including *<MCC>*, *<MNC>*, *<LAC>*, *<Cell ID>* and the *<Reserved>* parameter value "00"
- Bit 4 for *<Mileage>*
- Bit 5 for *<Send Time>*
- Bit 6 for *<Device Name>*

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

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

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

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

- Bit 0 for **+RESP:GTPNA**
- Bit 1 for **+RESP:GTPFA**
- Bit 2 for **+RESP:GTMPN (Only for GV65Plus)**
- Bit 3 for **+RESP:GTMPF (Only for GV65Plus)**
- Bit 4 Reserved
- Bit 5 for **+RESP:GTBPL (Only for GV65Plus)**
- Bit 6 for **+RESP:GTBTC (Only for GV65Plus)**
- Bit 7 for **+RESP:GTSTC (Only for GV65Plus)**
- 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/off location report **+RESP:GTIGL**

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

- ✧ *<LED On>*: It configures the working mode of power LED and GPS LED.
 - 0: Each time the device powers on, both LED's will work for 30 minutes and then turn off.
 - 1: Power LED and GPS LED turn on as configured.
- ✧ *<Info Report Enable>*: Enable/disable the device information report (**+RESP:GTINF**). The device information includes state of the device, ICCID, GSM signal strength, voltage of

external power supply, battery voltage, charge status, Power LED and GPS LED working mode, external GNSS antenna status, the time of last known GNSS fix, status of all digital inputs and outputs, time zone information and daylight saving setting.

- 0: Disable the device information report.
- 1: Enable the device information report.
- ✧ <Info Report Interval>: The interval for reporting the device information.
- ✧ <Location by Call>: It configures how to handle the incoming call.
 - 0: Just hang up the call.
 - 1: Hang up the call and report the current position via **+RESP:GTLBC**.
 - 2: Hang up the call and report the current position with a Google Maps link via SMS to the phone number of the incoming call.
- ✧ <Backup Battery Switch>: It controls whether to switch on/off the backup battery. (This field is valid for GV65Plus, and reserved for GV65).
 - 0: Switch off the backup battery.
 - 1: Switch on the backup battery.
- ✧ <Backup Battery Charge Mode>: It controls the charge mode of the backup battery. (This field is valid for GV65Plus, and reserved for GV65).
 - 0: When the main power supply is connected, charge the backup battery on need.
 - 1: When the main power supply is connected, only charge the backup battery if ignition on is detected. The charge process will begin 3 minutes after the ignition on. The charge process is stopped when the ignition is turned off.
- ✧ <AGPS Mode>: A numeral to indicate whether to enable AGPS. AGPS helps increase the chances of getting GNSS position successfully and reduce the time needed to get GNSS position.
 - 0: Disable the AGPS function.
 - 1: Enable the AGPS function.
- ✧ <GSM Report>: It controls how or when to report cell information.

The two high bits, Bit 14 – 15, indicate GSM report mode.

- 0: Do not allow the cell information report.
- 1: Report the cell information after failing to get GNSS position if cell information is available.
- 2: Report the message **+RESP:GTGSM** after getting GNSS position successfully every time if cell information is available.
- 3: Report the message **+RESP:GTGSM** regardless of GNSS position fix result every time if cell information is available.

Bitwise mask to configure which event report message 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.

- ✧ **<GNSS Lost Time>**: A time parameter to monitor the GNSS signal. If there is no GNSS signal or successful GNSS fix for consecutive **<GNSS Lost Time>**, the device will send the event report message **+RESP:GTGSS** to indicate “GNSS signal lost”. When the GNSS signal is recovered or a successful fix is obtained again, the device will send the event report message **+RESP:GTGSS** to indicate the recovery. 0 means “Disable this function”.
- ✧ **<GNSS Working Mode>**: The working mode of GNSS chip.
 - 0: GPS and GLONASS positioning systems. In this mode, the device gets position(s) with GPS and GLONASS systems. **Note:** If the current GNSS chip does not support GPS and GLONASS combination mode, the device will get position by GPS only.
 - 1: GPS positioning system. In this mode, the device gets position(s) only with GPS system.
 - 2: GLONASS positioning system. In this mode, the device gets position(s) only with GLONASS system.

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

➤ **+ACK:GTCFG,**

Example: +ACK:GTCFG,310201,135790246811220,,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, this command is used to configure the device to auto-unlock the SIM PIN with the pre-set PIN code.

➤ **AT+GTPIN=**

Example:

AT+GTPIN=gv65,1,0000,,,,,,0014\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Enable Auto-unlock PIN	1	0 1	1
3	PIN	4 – 8	'0' – '9'	
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Serial Number	4	0000 – FFFF	
10	Tail Character	1	\$	\$

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

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

➤ **+ACK:GTPIN,**

Example: +ACK:GTPIN,310201,135790246811220,,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. Protocol Watchdog

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

reboot manually.

➤ **AT+GTDG=**

Example:

AT+GTDG=gv65,1,,1,0130,,1,1,,60,60,,,0013\$

AT+GTDG=gv65,2,30,,,,1,1,,60,60,,,0013\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2	0
3	Ignition Frequency	<=3	10 – 120 min	60
4	Interval	<=2	1 – 30 day	30
5	Time	4	HHMM	0200
6	Reserved	0		
7	Report Before Reboot	1	0 1	1
8	Input ID	1	0 – 2	0
9	Reserved	0		
10	GSM Interval	4	0 5-1440 min	60
11	PDP Interval	4	0 5-1440 min	60
12	No CAN Interval	4	0 5-1440 min	60
13	Fail Interval	4	0 5-1440 min	0
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	\$	\$

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

- 0: Disable this function.
- 1: Reboot periodically according to the **<Interval>** and **<Time>** settings.
- 2: Reboot upon ignition on.

✧ **<Ignition Frequency>**: If the **<Mode>** is set to 2 and the time interval between two adjacent ignition-ons is greater than the value specified by this parameter, the device will automatically reboot upon ignition on.

✧ **<Interval>**: The interval for rebooting the device. It is measured in days.

✧ **<Time>**: It specifies the time at which the reboot operation is performed after the **<Interval>** condition is met.

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

- ✧ **<Input ID>**: The ID of the digital input port which is used to trigger the manual reboot. 0 means “Do not use manual reboot”.
- ✧ **<GSM Interval>**: The time interval in minutes for rebooting the device when the device loses GSM signal. 0 means “Do not reboot the device”.
- ✧ **<PDP Interval>**: The time interval in minutes for rebooting the device when the device cannot send message(s) via GPRS connection successfully. 0 means “Do not reboot the device”.
- ✧ **<No CAN Interval>**: The time interval in minutes for rebooting the device when the device can not receive CANBUS messages from CAN100. 0 means “Do not reboot the device”. This function only works in the ignition on state.
- ✧ **<Fail Interval>**: The interval for rebooting the device when the device can not send messages successfully. 0 means “Do not reboot the device”.

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

➤ **+ACK:GTDOG,**

Example:			
+ACK:GTD0G,310201,135790246811220,,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	\$	\$

3.2.2.4. 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. When this function is enabled, the device will report empty latitude, empty longitude, and empty GSM tower information in all the report messages except **+RESP:GTSOS**.

➤ **AT+GTOWH=**

Example:

AT+GTOWH=gv65,1,1F,0900,1200,1300,1730,,,1,1,1,0,0,,,,,0012\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2 3	0
3	Day of Work	<=2	0 – 7F	1F
4	Working Hours Start1	4	HHMM	0900
5	Working Hours End1	4	HHMM	1200
6	Working Hours Start2	4	HHMM	1300
7	Working Hours End2	4	HHMM	1800
8	Reserved	0		
9	Reserved	0		
10	Digital Input ID	1	0 – 2 9-C	0
11	Output ID	1	0 – 2 9-C	0
12	Output Status	1	0 1	0
13	Duration	<=3	0 – 255(×100ms)	0
14	Toggle Times	<=3	0 – 255	0
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Serial Number	4	0000 – FFFF	
20	Tail Character	1	\$	\$

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

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

input. It will automatically check the current time against the range of working hours. If it is outside the working hours, the device will hide the location information. Otherwise, the location information will be reported normally.

- ✧ **<Day of Work>**: It specifies the working days in a week in a bitwise manner.
 - Bit 0 for Monday
 - Bit 1 for Tuesday
 - Bit 2 for Wednesday
 - Bit 3 for Thursday
 - Bit 4 for Friday
 - Bit 5 for Saturday
 - Bit 6 for Sunday

For each bit, 0 means “off day”, and 1 means “working day”.
- ✧ **<Working Hours Start1>, <Working Hours End1>**: The first period of the working hours in a day.
- ✧ **<Working Hours Start2>, <Working Hours End2>**: The second period of the working hours in a day.
- ✧ **<Digital Input ID>**: The ID of the input used to trigger this function when the **<Mode>** is 1. The working parameters of the specified input must be set by **AT+GTDIS** first. If an interruptible digital input is used, please connect a slide button instead of tact button to the input for this function.
- ✧ **<Output ID>, <Output Status>, <Duration> and <Toggle Times>**: If this function is enabled and it is currently off duty time, the specified wave will be output at the specified output.

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

➤ **+ACK:GTOWH,**

Example:			
+ACK:GTOWH,310201,135790246811220,,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. Time Adjustment

The command **AT+GTTMA** is used to adjust the local time of the device remotely. Upon receiving

this command, the device will set the time zone and daylight saving accordingly. Then it will use the given UTC time to adjust the local time based on the time zone and daylight saving settings. This command will also be a trigger for the device to start GNSS. After a successful GNSS fix, the device will update the local time with the GNSS UTC time again.

➤ **AT+GTTMA=**

Example:

AT+GTTMA=gv65,-,3,30,0,20090917203500,,,,,0011\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Sign	1	+ -	+
3	Hour Offset	<=2	0 – 23	0
4	Minute Offset	<=2	0 – 59	0
5	Daylight Saving	1	0 1	0
6	UTC Time	14	YYYYMMDDHHMMSS	
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Serial Number	4	0000 – FFFF	
12	Tail Character			

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

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

➤ **+ACK:GTTMA,**

Example:

+ACK:GTTMA,310201,135790246811220,,0011,20090214093254,11F0\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	

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

3.2.2.6. Settings for Preserving Device's Specified Logic States

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

➤ AT+GTPDS=

Example:

AT+GTPDS=gv65,1,1F,,,,,,FFFF\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2	0
3	Mask	4	0000-FFFF	0
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
10	Serial Number	4	0000 – FFFF	
11	Tail Character	1	\$	\$

✧ <Mode>: The working mode of preserving specified logic state of the device.

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

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

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

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

➤ **+ACK:GTPDS,**

Example: +ACK:GTPDS,310201,135790246811220,,000D,20090214093254,FFFF\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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. Jamming Detection

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

➤ **AT+GTJDC=**

Example: AT+GTJDC=gv65,1,20,,5,10,,,2,1,0,0,,0019\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2	0

3	Signal Threshold	<=2	0 – 31	25
4	Reserved	0		
5	Jamming Cell Number Threshold	<=2	0 – 99	5
6	Enter Jamming Timer Threshold	<=3	0 – 300 sec	10
7	Quit Jamming Timer Threshold	<=4	0-3600sec	10
8	Reserved	0		
9	Output ID	1	0 – 2 9-C	0
10	Output Status	1	0 1	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	\$	\$

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

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

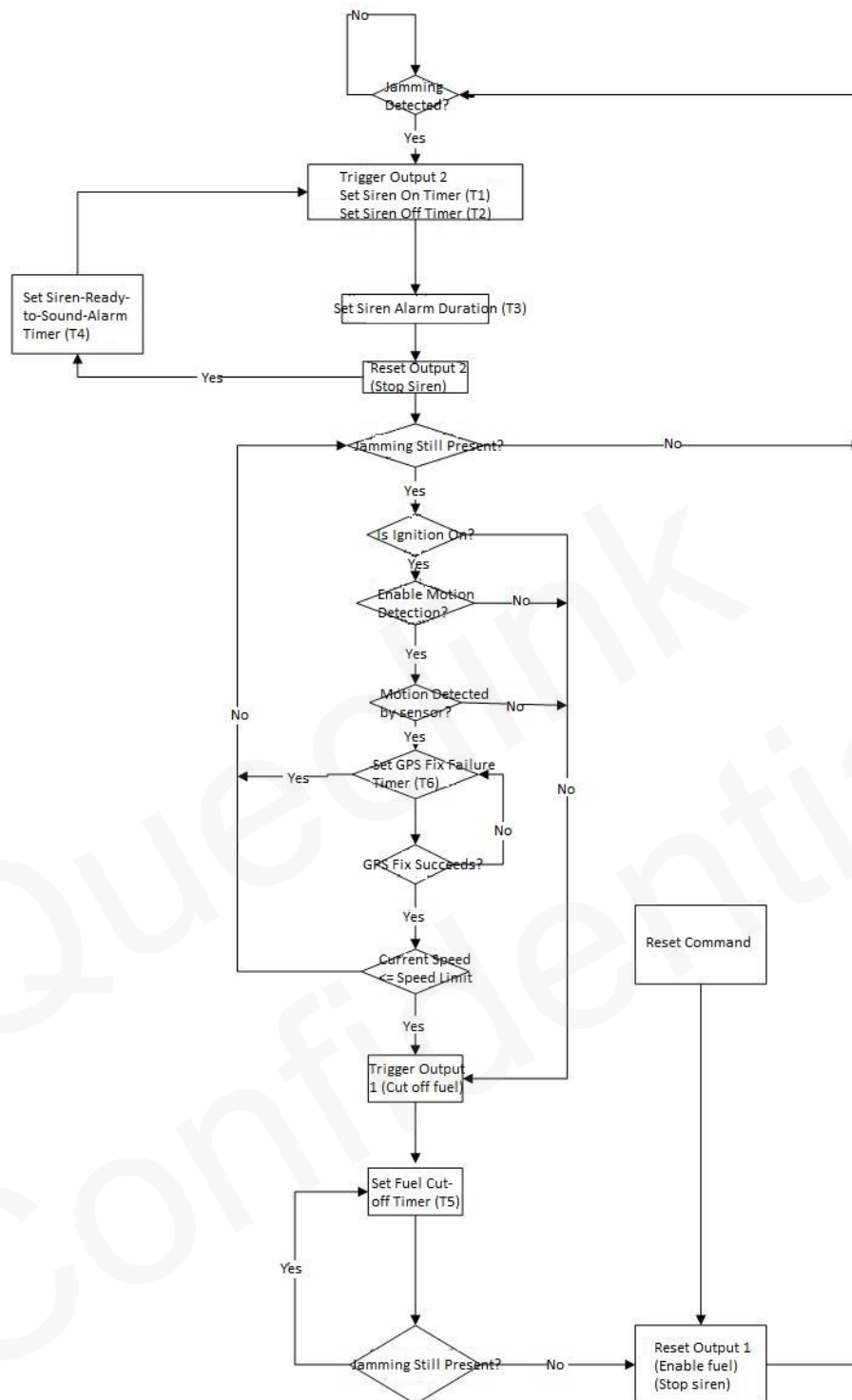
➤ **+ACK:GTJDC,**

Example:			
+ACK:GTJDC,310201,135790246811220,,0019,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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	\$	\$

3.2.2.8. Jamming Behavior Setting

The command **AT+GTJBS** is used for the Jamming Behavior Setting function which is based on the “Jamming Detection” function. The output 1 is used for “fuel cut-off” and the output 2 is used for “siren” alarm.



➤ **AT+GTJBS=**

Example:

AT+GTJBS=gv65,1,,10,10,60,30,3600,1,30,,,,,001A\$

Parameter	Length (byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65

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
Siren Alarm Duration (T3)	5	1 – 65535(sec)	60
Siren-Ready-to-Sound-Alarm Timer (T4)	5	1 – 65535(sec)	30
Fuel Cut-off Timer (T5)	5	1 – 65535(sec)	3600
Motion Sensor	1	0 1	1
Speed Limit	3	0 – 999km/h	30
GNSS Fix Failure Timer (T6)	5	30-65535(sec)	120
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Mode>: The working mode of the jamming behavior setting (JBS) function.
 - 0: Disable the JBS function.
 - 1: Enable the JBS function.
- ✧ <Siren On Timer (T1)>: It specifies the length of time when the siren is on.
- ✧ <Siren Off Timer (T2)>: It specifies the length of time when the siren is off.
- ✧ <Siren Alarm Duration (T3)>: It represents the length of time the siren alarm sounds.
- ✧ <Siren-Ready-to-Sound-Alarm Timer (T4)>: It represents the length of time needed before the siren becomes ready to sound alarm.
- ✧ <Fuel Cut-Off Timer (T5)>: It indicates the length of time when the fuel is cut off.
- ✧ <Speed Limit>: The speed limit to cut off fuel.
- ✧ <Motion Sensor>: Whether to enable/disable the measurement of motion sensor state for fuel cut-off when the GNSS fix fails due to timeout. If the <Motion Sensor> is set to 0, the state machine will cut off fuel.
 - 0: Disable the measurement of motion sensor state.
 - 1: Enable the measurement of the motion sensor state.
- ✧ <GNSS Fix Failure Timer (T6)>: The valid time for GNSS fix. If GNSS fix takes more than the time specified by this parameter, it will be considered as GNSS fix failure.

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

➤ **+ACK:GTJBS,**

Example:

+ACK:GTJBS,310201,135790246811220,,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	\$	\$

3.2.3. Position Related Report

3.2.3.1. Fixed Report Information

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

➤ **AT+GTFRI=**

Example:

AT+GTFRI=gv65,0,,,,,,,,,,,,,0009\$

AT+GTFRI=gv65,1,1,,1,1000,2300,,30,,,,,600,,,,,0009\$

AT+GTFRI=gv65,2,1,,1,1000,2300,,,500,,,,,,,,,0009\$

AT+GTFRI=gv65,3,1,,1,1000,2300,,,1000,,,,,,,,,0009\$

AT+GTFRI=gv65,4,1,,1,1000,2300,,60,,300,,0,60,00FF,,,,,0009\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 – 5	0
3	Discard No Fix	<=2	0 1	1
4	Reserved	0		
5	Period Enable	1	0 1	1
6	Start Time	4	HHMM	0000
7	End Time	4	HHMM	0000
8	Check Interval	<=5	0 – 86400sec	0
9	Send Interval	<=5	1 – 86400sec	30

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

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

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

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

- 0: Enable report.
- 1: Disable report.
- ✧ <Period Enable>: Enable/disable the time range specified by <Start Time> and <End Time>. If the time range is enabled, the position reporting will be limited within the time range.
- ✧ <Start Time>: The start time of the scheduled report. The valid format is "HHMM". The value range of "HH" is "00"–"23". The value range of "MM" is "00"–"59".
- ✧ <End Time>: The end time of the scheduled report. The valid format and range are the same as those of <Start Time>.
- ✧ <Check Interval>: The time interval for updating GNSS position. Its range is 0 – 86400 and the unit is second. If its value is 0, the device will update GNSS position according to the value of <Send Interval>. Please make sure the <Check Interval> is no greater than <Send Interval> so that position data is ready before sending time arrives.
- ✧ <Send Interval>: The time interval for sending the position information. The value range is 1–86400 and the unit is second. If <Report Mode> in **AT+GSRI** is set to forced SMS mode, this parameter SHOULD NOT be less than 15 seconds, otherwise the position information will be sent via TCP short connection.
- ✧ <Distance>: The specified distance for sending the position information when <Mode> is 2. Unit: meter.
- ✧ <Mileage>: The specified length for sending the position information when <Mode> is 3 and 4. Unit: meter.
- ✧ <Corner Report>: The threshold to determine whether the device is turning around a corner. 0 means "Disable the corner report". For other values, the device will compare the current heading with that of the last known corner. If the difference is greater than or equal to the specific value, the device will send the corner report with **+RESP:GTFRI**.
- ✧ <IGF Report Interval>: The time interval for fixing and sending the position information when <Power Saving Mode> in **AT+GTCFG** is set to 0|2 and the engine is off. If <IGF Report Interval> is less than 60 seconds, the GNSS will be always on. Its value range is 0|5 – 86400 and the unit is second.
Note: If the current <Mode> is not 0 and the <Power Saving Mode> in **AT+GTCFG** is set to 0 or 2, the message **+RESP:GTFRI** will be sent to the backend server periodically according to the parameter <IGF Report Interval> when the engine is off.
- ✧ <ERI Mask>: Bitwise mask to determine whether specified parameter fields are included in the **+RESP:GTERI** report message. For each bit, set it to 1 to enable the corresponding parameter field in the report. If this parameter value is not 0, **+RESP:GTERI** will be sent instead of **+RESP:GTFRI**.
 - Bit 0: Reserved
 - Bit 1: for <1-wire Information> field in the report message **+RESP:GTERI**
 - Bit 2: for <CAN Data> field in the report message **+RESP:GTERI**
 - Bit 3 – Bit 7: Reserved
 - Bit 8: for <XYZ Axis Information> field in the report message **+RESP:GTERI**

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

➤ **+ACK:GTFRI,**

Example:

+ACK:GTFRI,310201,135790246811220,,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+GTFRC** is used to change the parameters of fixed report when a certain event occurs, so that different report interval requirements can be met. When the event disappears, the device will resume its previous settings.

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

➤ AT+GTFRC=

Example: AT+GTFRC=gv65,0,1,0,,,,,0,30,500,500,300,,0,,,,0000\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Priority	1	0-4	0
3	Mode	1	0-3	0
4	FRI Mode	1	0-5	0
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
10	FRI Check Interval	<=5	0 – 86400sec	0

11	FRI IGN Report Interval	<=5	5-86400s	30
12	FRI Report Distance	<=5	50-65535m	500
13	FRI Report Mileage	<=5	50-65535m	500
14	FRI IGF Report Interval	<=5	0 5-86400s	300
15	Reserved	0		
16	Corner Report	<=3	0 – 180	0
17	Reserved			
18	Reserved			
19	Reserved			
20	Reserved			
21	Serial Number	4	0000 – FFFF	
22	Tail Character	1	\$	\$

- ✧ <Priority>: The priority of the event which triggers parameter change of fixed report. 0 indicates “the highest priority”.
- ✧ <Mode>: It specifies the trigger event for the change of the fixed report parameters.
 - 0: Disable the parameters of the specified priority.
 - 1: Change the fixed report parameters when the device enters into any of the defined Geo-Fence.
 - 2: Change the fixed report parameters when the device enters into known GSM roaming state. (Please refer to **AT+GTRMD**)
 - 3: Change the fixed report parameters when the device enters into unknown GSM roaming state.
- ✧ <FRI Mode>: If the specified event occurs, the working mode of the fixed report will be changed as described below.
 - 0: Do not change the working mode.
 - 1: Change the working mode to “Fixed Time Report”.
 - 2: Change the working mode to “Fixed Distance Report”.
 - 3: Change the working mode to “Fixed Mileage Report”.
 - 4: Change the working mode to “Optimum Report”.
 - 5: Change the working mode to “Fixed Time or Mileage Report”.
- ✧ <FRI Check Interval>: The time interval for updating GNSS position. Its range is 0 – 86400 and the unit is second. If its value is 0, the device will update GNSS position according to the value of <Report Interval>. Please make sure the <FRI Check Interval> is no greater than <FRI IGN Report Interval> so that the position data is ready before sending time arrives.
- ✧ <FRI IGN Report Interval>: The time interval for sending the position information when the ignition is on. The value range is 5 – 86400 and the unit is second.
- ✧ <FRI Report Distance>: The specified distance for sending the position information when the report mode is fixed distance report. Unit: meter.

- ✧ <FRI Report Mileage>: The specified path length for sending the position information when the report mode is fixed mileage report or optimum report. Unit: meter.
- ✧ <FRI IGF Report Interval>: The time interval for fixing and sending the position information when the ignition is off and <Power Saving Mode> in **AT+GTCFG** is set to 0|2. The value range is 0|5 – 86400 and the unit is second.
- ✧ <Corner Report>: The threshold to determine whether the device is turning around a corner. 0 means “Disable the corner report”. For other values, the device will compare the current heading with that of the last known corner. If the difference is greater than or equal to the value specified by this parameter, the device will send the corner report with **+RESP:GTFRI**.

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

➤ **+ACK:GTFFC,**

Example: +ACK:GTFFC,310201,135790246811220,,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. Geo-Fence Information

The command **AT+GTGEO** is used to configure the parameters of Geo-Fence. (Geo-Fence is a virtual perimeter on a geographic area using a location-based service. When the geofencing 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=gv65,0,3,121.412248,31.187891,1000,600,1,1,0,,,,,000A\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65

2	GEO ID	<=2	0 – 19	
3	Mode	1	0 – 3	0
4	Longitude	<=11	(-)xxx.xxxxxx	
5	Latitude	<=10	(-)xx.xxxxxx	
6	Radius	<=7	50 – 6000000m	50
7	Check Interval	<=5	0 5 – 86400sec	0
8	Output ID	1	0 – 2 9-C	0
9	Output Status	1	0 1	0
10	Duration	<=3	0 – 255(×100ms)	0
11	Toggle Times	<=3	0 – 255	0
12	Trigger Mode	<=2	0 21 22	0
13	Trigger Report	1	0 1	0
14	State Mode	1	0 1	0
15	Reserved	0		
16	Serial Number	4	0000 – FFFF	
17	Tail Character	1	\$	\$

- ✧ <GEO ID>: The ID of the Geo-Fence. A total of 20 zones (0 – 19) are supported.
- ✧ <Mode>: The working mode of the device reporting the Geo-Fence message **+RESP:GTGEO** to the backend server.
 - 0: Disable the zone's Geo-Fence function.
 - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.
 - 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
 - 3: Both entering and exiting the zone.
- ✧ <Longitude>: The longitude of a point which is defined as the center of the circular Geo-Fence region. The format is "(-)xxx.xxxxxx" and the value range is from "-180.000000" to "180.000000". The unit is degree. West longitude is defined as a negative starting with the minus sign "-" and east longitude is defined as a positive without "+".
- ✧ <Latitude>: The latitude of a point which is defined as the centre of the circular Geo-Fence region. The format is "(-)xx.xxxxxx" and the value range is from "-90.000000" to "90.000000". The unit is degree. South latitude is defined as a negative starting with the minus sign "-" and north latitude is defined 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 GNSS checking for the Geo-Fence alarm.

- ✧ **<Trigger Mode>**: A numeral to indicate the mode of triggering Geo-Fence.
 - 0: Disable auto trigger mode.
 - 21: Automatically set up Geo-Fence after ignition off. In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is turned off. The device will only report the alarm when exiting the Geo-Fence. The Geo-Fence will be cancelled after the device exits the zone.
 - 22: Manually enable Geo-Fence after ignition off. In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is turned off. The device will only report the alarm when exiting the Geo-Fence. When the device exits this Geo-Fence, it will cancel this Geo-Fence and disable the trigger mode at the same time. If the driver wants to use the trigger mode again, the trigger mode has to be manually set again.
- ✧ **<Trigger Report>**: Whether to report the **+RESP:GTGES** message when a specified trigger mode is triggered or when the Geo-Fence is cancelled.
 - 0: Disable the **+RESP:GTGES** report.
 - 1: Enable the **+RESP:GTGES** report.
- ✧ **<State Mode>**: The mode of reporting GEO state.
 - 0: Report when getting the GEO state for the first time.
 - 1: Do not report until the GEO state changes.

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

➤ **+ACK:GTGEO,**

Example: +ACK:GTGEO,310201,135790246811220,,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	\$	\$

3.2.4.2. Tow Alarm Configuration

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

➤ **AT+GTTOW=****Example:****AT+GTTOW=gv65,1,5,0,120,1,0,5,10,4,10,4,,,,,,,,,000B\$**

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Tow Enable	1	0 1	0
3	Engine Off to Tow	<=2	5 – 15 min	10
4	Fake Tow Delay	<=2	0 – 10 min	1
5	Tow Interval	<=5	30 – 86400 sec	300
6	Tow Output ID	1	0 – 2 9-C	0
7	Tow Output Status	1	0 1	0
8	Tow Output Duration	<=3	0 – 255 (×100ms)	0
9	Tow Output Toggle Times	<=3	0 – 255	0
10	Rest Duration	<=3	1 – 255 (×15sec)	2
11	Motion Duration	<=2	1 – 10 (×100ms)	3
12	Motion Threshold	1	1– 9	2
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Serial Number	4	0000 – FFFF	
22	Tail Character	1	\$	\$

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

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

✧ *<Engine Off to Tow>*: A time parameter to measure whether the device is considered to be towed after the engine off. If the motion sensor does not detect rest within the specified

- time *<Engine Off to Tow>* after engine off, the device is towed.
- ✧ *<Fake Tow Delay>*: If the motion sensor detects movement after engine off and rest is detected, the device enters into a state called fake tow. If the device stays in fake tow until after a period of time specified by the parameter *<Fake Tow Delay>*, it is considered to be towed.
 - ✧ *<Tow Interval>*: The time interval for sending tow alarm messages.
 - ✧ *<Tow Output ID>*: The ID of the output port to output the specified wave shape when a tow event is detected.
 - ✧ *<Tow Output Status>*: Please refer to the parameter *<Output1–2 Status>* in Chapter 3.2.5.1.
 - ✧ *<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 rest status. The status of the device will be changed to rest if rest is detected by the motion sensor and maintained for the period of time specified by the parameter *<Rest Duration>*.
 - ✧ *<Motion Duration>*: A time parameter to measure whether the device enters motion status. The status of the device will be changed to motion if motion is detected by the motion sensor and maintained for the period of time specified by the parameter *<Motion Duration>*.
 - ✧ *<Motion Threshold>*: The threshold for the motion sensor to measure whether the device is moving.

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

➤ **+ACK:GTTOW,**

Example:			
+ACK:GTTOW,310201,135790246811220,,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	\$	\$

3.2.4.3. Speed Alarm

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

➤ AT+GTSPD=

Example:

AT+GTSPD=gv65,1,80,120,60,300,1,1,0,0,,,,,,,,,000C\$

AT+GTSPD=gv65,2,80,120,60,300,1,1,0,0,,,,,,,,,000C\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2 3	0
3	Min. Speed	<=3	0 – 400km/h	0
4	Max. Speed	<=3	0 – 400km/h	0
5	Validity	<=4	0 – 3600sec	60
6	Send Interval	<=4	30 – 3600sec	300
7	Output ID	1	0 – 2 9-C	0
8	Output Status	1	0 1	0
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Reserved	0		
22	Serial Number	4	0000 – FFFF	
23	Tail Character	1	\$	\$

✧ <Mode>: The working mode of the speed alarm function.

- 0: Disable speed alarm.
- 1: Report speed alarm if the current speed is within the speed range defined by <Min>.

Speed> and <*Max. Speed*>.

- 2: Report speed alarm if the current speed is outside the speed range defined by *<Min. Speed>* and *<Max. Speed>*.
- 3: Report speed alarm only one time if the current speed enters or exits the speed range defined by *<Min. Speed>* and *<Max. Speed>*. In this mode, *<Send Interval>* will be ignored.

- ✧ <Min. Speed>: The lower speed limit.
- ✧ <Max. Speed>: The upper speed limit.
- ✧ <Validity>: If the speed meets the alarm condition and is maintained for a period of time specified by <Validity>, the speed alarm will be triggered.
- ✧ <Send Interval>: The time interval for sending speed alarm messages.

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

➤ **+ACK:GTSPD,**

Example:			
+ACK:GTSPD,310201,135790246811220,,000C,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.4. SOS Function

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

➤ **AT+GTSOS=**

Example: AT+GTSOS=gv65,1,1,+8613812341234,1,1,0,0,,,,,000D\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65

2	Mode	1	0 – 2	0
3	Digital Input ID	1	0 – 2 9-C	0
4	SOS Number	<=20		
5	Output ID	1	0 – 2 9-C	0
6	Output Status	1	0 1	0
7	Duration	<=3	0 – 255(×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Serial Number	4	0000 – FFFF	
14	Tail Character	1	\$	\$

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

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

➤ **+ACK:GTSOS,**

Example: +ACK:GTSOS,310201,135790246811220,,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	\$	\$
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3.2.4.5. Excessive Idling Detection

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

➤ AT+GTIDL=

Example: AT+GTIDL=gv65,1,2,1,0,,,,,1,1,0,0,,,,,000F\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1	0
3	Time to Idling	<=2	1 – 30 min	2
4	Time to Movement	1	1 – 5 min	1
5	Debounce Distance	<=4	0 100-9999m	0
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Output ID	1	0 – 2 9-C	0
10	Output Status	1	0 1	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Serial Number	4	0000 – FFFF	
18	Tail Character	1	\$	\$

✧ <Mode>: The working mode of the excessive idling detection function.

- 0: Disable this function.
- 1: Enable this function.
- ✧ <Time to Idling>: If it is detected that the vehicle is stationary with the ignition on for the period of time specified by this parameter, it is considered to be in idle status.
- ✧ <Time to Movement>: If the vehicle movement or ignition off is detected after the vehicle enters into idling status and the movement or ignition off status lasts for the length of time specified by this parameter, the vehicle is considered to leave idling status.
- ✧ <Debounce Distance>: If the vehicle moves more than <Debounce Distance> after it enters into idling status, the vehicle will be considered to leave idling status.
- ✧ <Output ID>: It specifies the ID of the output port (1 – 2) 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,310201,135790246811220,,000F,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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. Harsh Behavior Monitoring

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

➤ **AT+GTHBM=**

Example: AT+GTHBM=gv65,1,,,100,21,6,,60,21,6,,,21,15,,1,1,8,3,,,,,0010\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2 3 4	0
3	Reserved	0		

4	Discard Unknown Event	1	0 1	0
5	High Speed	≤ 3	100 – 400km/h	100
6	ΔV_{hb}	≤ 3	0 – 100km/h	0
7	ΔV_{ha}	≤ 3	0 – 100km/h	0
8	Reserved	0		
9	Medium Speed	≤ 3	60 – 100km/h	60
10	ΔV_{mb}	≤ 3	0 – 100km/h	0
11	ΔV_{ma}	≤ 3	0 – 100km/h	0
12	Reserved	0		
13	Reserved	0		
14	ΔV_{lb}	≤ 3	0 – 100km/h	0
15	ΔV_{la}	≤ 3	0 – 100km/h	0
16	Reserved	0		
17	Output ID	1	0 – 2 9-C	0
18	Output Status	1	0 1	0
19	Duration	≤ 3	0 – 255($\times 100\text{ms}$)	0
20	Toggle Times	≤ 3	0 – 255	0
21	Cornering and Braking Threshold	≤ 3	30-70	30
22	Cornering and Braking Duration	≤ 3	40-100($\times 8\text{ms}$)	50
23	Acceleration Threshold	≤ 3	15-50	20
24	Acceleration Duration	≤ 3	50-250($\times 8\text{ms}$)	65
25	Serial Number	4	0000 – FFFF	
26	Tail Character	1	\$	\$

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

- 0: Disable this function.
- 1: Enable this function: Detection by GNSS only. In this mode, two harsh behaviors are monitored, i.e. harsh braking and harsh acceleration. According to the speed read from GNSS, 3 levels of speed are defined including high speed, medium speed and low speed. For each speed level, 2 thresholds of speed change are defined to determine harsh braking and harsh accelerating. If the change of speed within 5 seconds is greater than the corresponding threshold, the device will report the

- **+RESP:GTHBM** message to the backend server to indicate the harsh behavior. The same harsh behavior within 30 seconds will only be reported once if only GNSS is used to measure harsh driving behavior.
 - 2: Enable this function: Detection by motion sensor only. In this mode, three types of harsh behavior can be detected, i.e. harsh braking, harsh acceleration and harsh cornering. The device needs GNSS information to get the harsh behavior direction, so it is necessary to keep GNSS always on to collect all the information needed.
 - 3: Enable this function: Detection by motion sensor or GNSS. This mode works as both mode 1 and 2 are enabled.
 - 4: Enable this function: Detection by motion sensor and GNSS. In this mode, a harsh behavior can be triggered only if it is detected by both GNSS and motion sensor.
- ✧ **<Discard Unknown Event>**: It configures whether to discard the **+RESP:GTHBM** message that indicates unknown harsh behavior.
 - 0: Do not discard unknown harsh behavior message.
 - 1: Discard unknown harsh behavior message.
- ✧ **<High Speed>, <Medium Speed>**: If the last known speed of the device read from GNSS is greater than or equal to **<High Speed>**, the vehicle that the device is attached to is considered to be at high speed. If the last known speed is less than **<High Speed>** but greater than or equal to **<Medium Speed>**, the vehicle is considered to be at medium speed. If the last known speed is less than **<Medium Speed>**, the vehicle is considered to be at low speed.
- ✧ **<ΔVhb>**: The threshold for harsh braking at high speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this parameter value within 5 seconds, harsh braking is detected at high speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at high speed level".
- ✧ **<ΔVha>**: The threshold for harsh acceleration at high speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this parameter value within 5 seconds, harsh acceleration is detected at high speed level. If it is set to 0, it means "Do not monitor harsh acceleration behavior at high speed level".
- ✧ **<ΔVmb>**: The threshold for harsh braking at medium speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this parameter value within 5 seconds, harsh braking is detected at medium speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at medium speed level".
- ✧ **<ΔVma>**: The threshold for harsh acceleration at medium speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this parameter value within 5 seconds, harsh acceleration is detected at medium speed level. If it is set to 0, it means "Do not monitor harsh acceleration behavior at medium speed level".
- ✧ **<ΔVlb>**: The threshold for harsh braking at low speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this parameter value within 5 seconds, harsh braking is detected at low speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at low speed level".
- ✧ **<ΔVla>**: The threshold for harsh acceleration at low speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this parameter value within 5 seconds, harsh acceleration is detected at low speed level. If it

is set to 0, it means “Do not monitor harsh acceleration behavior at low speed level”.

- ✧ <Output ID>: It specifies the ID of the output port (1 – 2) to output specified wave shape when harsh driving behavior is detected. If it is set to 0, there will be no output wave.
- ✧ <Cornering and Braking Threshold>: The threshold for the motion sensor to measure whether the device is in harsh cornering or harsh braking status.
- ✧ <Cornering and Braking Duration>: A time parameter to measure whether the device enters harsh cornering or harsh braking status. If the harsh cornering or harsh braking behavior is maintained for a period of time longer than the time specified by <Cornering and Braking Duration>, harsh cornering or harsh braking event will be triggered.
- ✧ <Acceleration Threshold>: The threshold for the motion sensor to measure whether the device is in harsh acceleration status.
- ✧ <Acceleration Duration>: The time parameter to measure whether the device enters harsh acceleration status. If the harsh acceleration driving behavior is maintained for a period of time longer than the time specified by <Acceleration Duration>, harsh acceleration event will be triggered.

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

➤ **+ACK:GTHBM,**

Example:			
+ACK:GTHBM,310201,135790246811220,,0010,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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. Start/Stop Report

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

➤ **AT+GTSSR=**

Example:

AT+GTSSR=gv65,1,2,1,5,,,,,000F\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1	0
3	Time to Stop	2	1 – 30 min	2
4	Time to Start	1	1 – 5 min	1
5	Start Speed	2	1 – 10 Km/h	5
6	Long Stop	3	0 – 43200 min	0
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Serial Number	4	0000 – FFFF	
11	Tail Character	1	\$	\$

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

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

➤ **+ACK:GTSSR,**

Example:

+ACK:GTSSR,310201,135790246811220,,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	\$	\$

3.2.4.8. Buzzer Alarm

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

➤ AT+GTBZA=

Example: AT+GTBZA=gv65,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,,0000\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Output ID	1	0 2	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Alarm 1 Output Status	1	0 1	0
7	Duration	<=3	0 – 255(×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Alarm 2 Output Status	1	0 1	0

12	Duration	<=3	0 – 255(×100ms)	0
13	Toggle Times	<=3	0 – 255	0
14	Reserved	0		
15	Reserved	0		
16	Alarm 3 Output Status	1	0 1	0
17	Duration	<=3	0 – 255(×100ms)	0
18	Toggle Times	<=3	0 – 255	0
19	Reserved	0		
20	Reserved	0		
21	Alarm 4 Output Status	1	0 1	0
22	Duration	<=3	0 – 255(×100ms)	0
23	Toggle Times	<=3	0 – 255	0
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
32	Serial Number	4	0000 – FFFF	
33	Tail Character	1	\$	\$

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

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

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

➤ **+ACK:GTBZA,**

Example:

+ACK:GTBZA,310201,135790246811220,,000D,20090214093254,FFFF\$

Parameter	Length (byte)	Range/Format	Default
-----------	---------------	--------------	---------

Protocol Version	6	XX0000 – XXXFFF, 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. Overspeed Alarm with Buzzer Notification

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

➤ **AT+GTSPA=**

Example:				
AT+GTSPA=gv65,1,20,,2,1,,,40,,2,2,,,60,,2,3,,,80,,2,4,,,,,,000C\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2	0
3	Speed Threshold 1	<=3	0 – 400km/h	50
4	Reserved	0		
5	Validity	<=4	0 – 3600sec	60
6	Alarm Type	1	0 1 – 4	0
7	Reserved	0		
8	Reserved	0		
9	Speed Threshold 2	<=3	0 – 400km/h	70
10	Reserved	0		
11	Validity	<=4	0 – 3600sec	60
12	Alarm Type	1	0 1 – 4	0
13	Reserved	0		
14	Reserved	0		
15	Speed Threshold 3	<=3	0 – 400km/h	90

16	Reserved	0		
17	Validity	<=4	0 – 3600sec	60
18	Alarm Type	1	0 1 – 4	0
19	Reserved	0		
20	Reserved	0		
21	Speed Threshold 4	<=3	0 – 400km/h	110
22	Reserved	0		
23	Validity	<=4	0 – 3600sec	60
24	Alarm Type	1	0 1 – 4	0
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
32	Reserved	0		
33	Serial Number	4	0000 – FFFF	
34	Tail Character	1	\$	\$

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

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

➤ **+ACK:GTSPA,**

Example:

+ACK:GTSPA,310201,135790246811220,,000D,20090214093254,FFFF\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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. Roaming Detection Configuration

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

➤ AT+GTRMD=

Example:

AT+GTRMD=gv65,0,,,,,1,2,46000F,46002F,,,1,1,,,,,2,2,,,,,1f,,,1f,,,,,0,0,0,0,,,0001\$

AT+GTRMD=gv65,1,,,,,1,3,46000,46002,46003,,,2,2,46007,,,1,1,46001,,,3fff,,,2ff,,,,,0,0,0,0,,,0002\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Home Operator Start	<=2	1-10	
8	Home Operator End	<=2	1-10	
9	Home Operator List	<=6*10		
10	Reserved	0		
11	Reserved	0		
12	Roaming Operator Start	<=3	1-150	
13	Roaming Operator End	<=3	1-150	

14	Roaming Operator List	<=6*150		
15	Reserved	0		
16	Reserved	0		
17	Black Operator Start	<=2	1-20	
18	Black Operator End	<=2	1-20	
19	Black List Operator	<=6*20		
20	Reserved	0		
21	Reserved	0		
22	Known Roaming Event Mask	<=6	000000 – FFFFFFFF	3FFF
23	Reserved	0		
24	Reserved	0		
25	Unknown Roaming Event Mask	<=6	000000 – FFFFFFFF	3FFF
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Output ID	1	0 – 2 9-C	0
31	Output Status	1	0 1	0
32	Duration	<=3	0 – 255(×100ms)	0
33	Toggle Times	<=3	0 – 255	0
34	Reserved	0		
35	Reserved	0		
36	Serial Number	4	0000 – FFFF	
37	Tail Character	1	\$	\$

- ✧ <Mode>: The working mode of the roaming detection function.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ <Operator Start>: A numeral to indicate the first index of the white list operator numbers to be input. For example, if it is **1**, the device will update the white list of operators from the **1st** one. If it is empty, there should be no white list operator number.
- ✧ <Operator End>: A numeral to indicate the last index of the white list operator numbers to be input. For example, if it is **2**, the device will update the white list of operators until the

2nd one. If it is empty, there should be no white list operator number.

- ✧ **<Home Operator List>**: A white list of PLMN codes for network operators. The PLMN code comprises of mobile country code (MCC) and mobile network code (MNC), both of which consist of 3 digits. The last digit of MNC can be omitted (e.g. “46001F” or “46001” represents the PLMN of “CHINA UNICOM”). The operators in this list will be considered as in “Home” state. And two adjacent operator numbers are separated with ‘,’. The number of the operators in the list is determined by the parameters **<Operator Start>** and **<Operator End>**. For example, if **<Operator Start>** is **1** and **<Operator End>** is **2**, the operator list should include **2** operator numbers (empty value acceptable) and the two numbers are separated by with ‘,’. MCCFF type code is used to identify operators across a whole country. For example, “460FF” covers the mobile network operators all across China.

- ✧ **<Roaming Operator List>**: It is mostly like the **<Home Operator List>**, and the difference is that the operators in this list will be considered as in “Known Roaming” state.

- ✧ **<Black List Operator>**: It is mostly like the **<Home Operator List>**, and the difference is that the operators in this list will be considered as in “Blocking Report” state. In this state, the device works normally but all reports will be buffered.

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

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

- Bit 0 for **+RESP:GTPNA**
- Bit 1 for **+RESP:GTPFA**
- Bit 2 for **+RESP:GTMPN (Valid only for GV65Plus)**
- Bit 3 for **+RESP:GTMPF (Valid only for GV65Plus)**
- Bit 4 Reserved
- Bit 5 for **+RESP:GTBPL (Valid only for GV65Plus)**
- Bit 6 for **+RESP:GTBTC (Valid only for GV65Plus)**
- Bit 7 for **+RESP:GTSTC (Valid only for GV65Plus)**
- 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/off location report **+RESP:GTIGL**

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

- ✧ **<Unknown Roaming Event Mask>**: It is mostly like the **<Known Roaming Event Mask>**.
- ✧ **<Output ID>**, **<Output Status>**, **<Duration>** and **<Toggle Times>**: If this function is enabled and roaming is detected, the specified wave will be output at the specified output.

Note: If more operators are needed, please adjust **<Operator Start>** and **<Operator End>** for appropriate setup. If some operators in **<Operator List>** are empty, then the corresponding

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

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

➤ **+ACK:GTRMD,**

Example: +ACK:GTRMD,310201,135790246811220,,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 250 bytes could be accepted by the device in the case of sending the command via Manager Tool (there is no such size limit in the case of sending the command via GPRS).

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

3.2.4.11. Crash Detection and Acceleration Report

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

➤ **AT+GTCRA=**

Example: AT+GTCRA=gv65,1,5,,,,,0,1,10,6,,0019\$			
Parameter	Length (byte)	Range/Format	Default

Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
Mode	1	0 1	0
Sensitivity	1	1 – 9	5
Report ACC	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2 9-C	0
Output Status	1	0 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 and acceleration report function.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ <Sensitivity>: The sensitivity of the crash detection. The smaller the value is, the more sensitive this function would be.
- ✧ <Report ACC>: A numeral to indicate whether to report the acceleration data to the backend server.
 - 0: Disable reporting.
 - 1: Enable reporting. The device will report 75 groups of tri-axial acceleration data to the backend server via the message **+RESP:GTACC**.

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

➤ **+ACK:GTCRA,**

Example: +ACK:GTCRA, 220101,135790246811220,,0019,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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 a specified wave shape from the digital output ports. A total of three wave shapes are supported as shown below. If set to wave shape 1, the device will maintain the wave shape at the specified output port after power reset.

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

Wave Shape 1:

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



Figure 2: Wave Shape 1

Wave Shape 2:

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

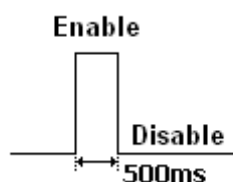


Figure 3: Wave Shape 2

Wave Shape 3:

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

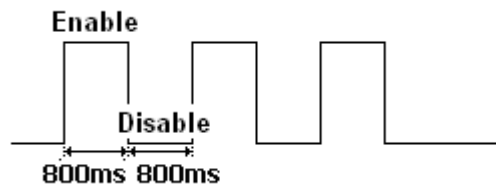


Figure 4: Wave Shape 3

➤ **AT+GTOUT=**

Example:

AT+GTOUT=gv65,1,,,0,0,0,,,,1,,,,,,0004\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Output1 Status	1	0 1	0
3	Duration	<=3	0 – 255(×100ms)	0
4	Toggle Times	<=3	0 – 255	0
5	Output2 Status	1	0 1	0
6	Duration	<=3	0 – 255(×100ms)	0
7	Toggle Times	<=3	0 – 255	0
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	DOS Report	1	0-3	0
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Serial Number	4	0000 – FFFF	
19	Tail Character	1	\$	\$

- ✧ **<Output1–2 Status>**: Valid only for the wave shape 1 as shown in **Figure 2**, it is used to set the final status of the output port.

- 0: Disable status.
- 1: Enable status.
- ✧ <Duration>: Please refer to **Figure 2**, **Figure 3** and **Figure 4**. Unit: 100ms.
- ✧ <Toggle Times>: Please refer to **Figure 2**, **Figure 3** and **Figure 4**.
- ✧ <DOS Report>: A bitwise value to control how to report the message **+RESP:GTDOS**. Each bit represents an output. If the bit value is 1, the device will report the message **+RESP:GTDOS** when the status of the represented output with wave shape 1 changes.
 - Bit 0: Output 1
 - Bit 1: Output 2

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

➤ **+ACK:GTOUT,**

Example: +ACK:GTOUT,310201,135790246811220,,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 for two digital input ports. The input <Ignition Detection> is dedicated to ignition detection. The other one is customizable. If the logic status of the customizable digital input changes, the device will report the message **+RESP:GTDIS** to the backend server.

➤ **AT+GTDIS=**

Example: AT+GTDIS=gv65,0,2,,0,1,1,4,1,2,1,4,1,,,,,,,,,0005\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Ignition Detection	1	0	0

3	Sample Period	≤ 2	0 1 – 12($\times 2s$)	1
4	MPF Debounce Time (only valid for GV65Plus)	≤ 2	0 1 – 12($\times 2s$)	0
5	No Ignition	1	0 1	0
6	Input ID 1	1	1	1
7	Enable	1	0 1	0
8	Debounce Time	≤ 2	0 – 20($\times 10ms$)	0
9	Validity Time	≤ 2	0 1 – 12($\times 2s$)	0
10	Input ID 2	1	2	2
11	Enable	1	0 1	0
12	Debounce Time	≤ 2	0 – 20($\times 10ms$)	0
13	Validity Time	≤ 2	0 1 – 12($\times 2s$)	0
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Last Position	1	0 1	0
20	Reserved	0		
21	Reserved	0		
22	Serial Number	4	0000 – FFFF	
23	Tail Character	1	\$	\$

- ✧ <Ignition Detection>: The ID of the ignition detection port.
- ✧ <Input ID 1>: The digital input 1.
- ✧ <Input ID 2>: The digital input 2.
- ✧ <Sample Period>: The sampling period of the non-interruptible input port.
- ✧ <Enable>: Enable/disable the interrupt input.
 - 0: Disable the interrupt input.
 - 1: Enable the interrupt input.
- ✧ <No Ignition>: A numeral to indicate whether ignition signal is connected.
 - 0: Ignition signal is connected.
 - 1: Ignition signal is not connected.
- ✧ <Debounce Time>: The amount of time for debouncing interruptible input.
- ✧ <Validity Time>: The validity time of the input port. 0 means “Do not check the validity time”.

The input needs to stay in a new state for the time period specified by this parameter before the device accepts the new state as valid.

- ✧ <MPF Debounce Time>: The time for debouncing the **+RESP:GTMPF** report message. This field is only valid for GV65Plus device.
- ✧ <Last Position>: It indicates whether to include real time position or last known position in the report **+RESP:GTDIS**.
 - 0: Include real time position in the report **+RESP:GTDIS**. In this case, the device needs a period of time to get GNSS position before the report.
 - 1: Include the last known position in the report **+RESP:GTDIS**. In this case, the report can be sent to the backend server immediately after digital state update.

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

➤ **+ACK:GTDIS,**

Example:			
+ACK:GTDIS,310201,135790246811220,,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

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

➤ **AT+GTIOB=**

Example:				
AT+GTIOB=gv65,1,7,3,3,1,0,7,3,,,,,0006\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65

2	IOB ID	1	0 – 3	
3	Input Mask	<=4	0000 – 0F0F	0
4	Trigger Mask	<=4	0000 – 0F0F	0
5	Input Sample Period	<=2	0 1 – 12(×2s ×4s)	0
6	Output ID	1	0 – 2 9 – C	0
7	Output Status	1	0 1	0
8	Duration	<=3	0 – 255(×100ms)	0
9	Toggle Times	<=3	0 – 255	0
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Serial Number	4	0000 – FFFF	
15	Tail Character	1	\$	\$

- ✧ <IOB ID>: The ID of the user-defined IO binding.
- ✧ <Input Mask>: Bitwise mask to configure the combination of input ports. Each of the non-reserved bits represents one digital input port. Set a bit to 1 to enable its corresponding input port and 0 to disable its corresponding input port.
 - Bit 0: Ignition detection
 - Bit 1: Digital input 1
 - Bit 2: Digital input 2
 - Bit 3 - Bit 7: Reserved
 - Bit 8: EIO100 input 9
 - Bit 9: EIO100 input A
 - Bit 10: EIO100 input B
 - Bit 11: EIO100 input C
 - Bit 12 - Bit 15: Reserved
- ✧ <Trigger Mask>: Bitwise mask to configure the trigger condition which is composed of a set of specified input ports. The value of each bit indicates the logic status of the corresponding input port to trigger the IOB event. Set a bit to 1 to use “Enable status” as the trigger condition and 0 to use “disabled status” as the trigger condition. Only if the logic status of all the input ports in one IO binding meets the trigger condition will the IOB event be triggered.
 - Bit 0: Ignition detection
 - Bit 1: Digital input 1
 - Bit 2: Digital input 2
 - Bit 3 – Bit 7: Reserved
 - Bit 8: EIO100 input 9

- Bit 9: EIO100 input A
 - Bit 10: EIO100 input B
 - Bit 11: EIO100 input C
 - Bit 12 – Bit 15: Reserved
- ✧ <Input Sample Period>: The time period for checking the status of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use different 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 an EIO100 output, only wave shape 1 is supported.

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

➤ **+ACK:GTIOB,**

Example:			
+ACK:GTIOB,310201,135790246811220,,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 matches the predefined alarm condition, the device will report an alarm message **+RESP:GTEPS** to the backend server to notify the status of the external power supply.

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

➤ **AT+GTEPS=**

Example: AT+GTEPS=gv65,2,250,12000,3,2,1,1,0,0,1,,,,,0007\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2	0
3	Min. Threshold	<=5	250 – 32000 mV	0
4	Max. Threshold	<=5	250 – 32000 mV	0
5	Sample Period	<=2	0 1 – 12(×2s)	0
6	Debounce Time	1	0 – 5 (×1s)	0
7	Output ID	1	0 – 2 9-C	
8	Output Status	1	0 1	
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Sync with FRI	1	0 1	0
12	Voltage Margin Error	3	0 – 100(×10mv)	0
13	Debounce Voltage Threshold	3	0 – 100 (×100mv)	0
14	Reserved	0		
15	Serial Number	4	0000 – FFFF	
16	Tail Character	1	\$	\$

- ✧ <Mode>: The working mode of the external power supply monitoring function.
 - 0: Disable the external power supply monitoring function.
 - 1: Enable the external power supply monitoring function: If the current voltage is within the range of (<Min. Threshold>, <Max. Threshold>), the **+RESP:GTEPS** alarm will be triggered.
 - 2: Enable the external power supply monitoring: If the current voltage is outside the range of (<Min. Threshold>, <Max. Threshold>), the **+RESP:GTEPS** alarm will be triggered.
- ✧ <Min. Threshold>: The lower voltage limit of the external power supply to trigger the alarm.
- ✧ <Max. Threshold>: The upper voltage limit of the external power supply to trigger the alarm.
- ✧ <Sample Period>: The sampling period to measure the external power supply.
- ✧ <Debounce Time>: The 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 (1–2) to output specified wave shape when the **+RESP:GTEPS** alarm is triggered. If it is set to 0, there will be no output wave.

- ✧ <Sync with FRI>: Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the fixed report message.
 - 0: Do not report external power supply voltage with fixed report message.
 - 1: Report external power supply voltage with fixed report message.
- ✧ <Voltage Margin Error>: This parameter will be used together with <Min. Threshold> and <Max. Threshold> parameters. It indicates the voltage margin error of the <Min. Threshold> and <Max. Threshold> parameters. If the current voltage detected falls within the <Voltage Margin Error> of the <Min. Threshold> or the <Voltage Margin Error> of <Max. Threshold>, it will not be processed. For example, if the <Min. Threshold> is set to 6000mv, the <Max. Threshold> is set to 12000mv, and the <Voltage Margin Error> is set to ± 100 mv, the current voltage will not be processed when it meets the condition ($5900\text{mv} < \text{current voltage} < 6100\text{mv}$) or ($11900\text{mv} < \text{current voltage} < 12100\text{mv}$). The <Voltage Margin Error> parameter improves the performance of the **+RESP:GTEPS** report.
- ✧ <Debounce Voltage Threshold>: This parameter will be used together with <Debounce Time>. If the voltage drops or bursts dramatically greater than <Debounce Voltage Threshold>, the device will start to debounce voltage for the period of time specified by <Debounce Time>.

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

➤ **+ACK:GTEPS,**

Example: +ACK:GTEPS,310201,135790246811220,,0007,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	≤ 20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYMMDDHHMMSS	
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 for the analog input port.

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

➤ **AT+GTAIS=**

Example:

AT+GTAIS=gv65,1,1,250,2700,2,,1,1,10,10,1,,,,,,,,,,,,,10,30,10,20,0,0008\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2 3 4 5	0
3	Range Switch	1	0 1	1
4	Min. Threshold	<=5	0 – 30000 mV	0
5	Max. Threshold	<=5	0 – 30000 mV	0
6	Sample Rate	<=2	0 1 – 12(×2s)	0
7	Reserved	0		
8	Output ID	1	0 – 2 9-C	0
9	Output Active	1	0 1	0
10	Duration	<=3	0 – 255(×100ms)	0
11	Toggle Times	<=3	0 – 255	0
12	Sync with FRI	1	0 1	0
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Reserved	0		
22	Reserved	0		
23	Reserved	0		
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Fuel Data Debounce	2	0 – 150	10
28	Fuel Sensor Delay	<=3	0 – 600 sec	30
29	Fuel Loss Alarm	<=2	0 – 50	10

30	Fuel Sensor Sample Count	≤ 3	0 – 150	20
31	Reserved	0		
32	Voltage Margin Error	3	0 – 100($\times 10\text{mv}$)	0
33	Serial Number	4	0000 – FFFF	
34	Tail Character	1	\$	\$

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

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

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

➤ **+ACK:GTAIS,**

Example: +ACK:GTAIS,310201,135790246811220,,0008,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	≤ 20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.6. Main Serial Port Application

3.2.6.1. Main Serial Port

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

➤ **AT+GTMUT=**

Example: AT+GTMUT=gv65,0,12,8,1,0,0,,,,,,0018\$
--

Parameter	Length (byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
Working Mode	<=2	0 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 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: Used as default communication port. In this mode, the main serial port is used for CANBUS. The baud rate must be set to 9600. **Note:** If **AT+GTCAN** command is enabled, the device will never enter low power mode so that CAN100 works normally.
- 17: Used for EIO100 device. In this mode, the baud rate can be set to any value based on the <Baud Rate Index>.

✧ <Baud Rate Index>: The index of the baud rate supported by 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. Its value can be 7 or 8.
- ✧ <Stop Bits>: Stop Bits of the UART. Its value can be 1, 2 or 3.
 - 1: 1 Stop Bit.
 - 2: 2 Stop Bits.
 - 3: 1.5 Stop Bits.
- ✧ <Parity Bits>: Parity Bits of the UART. Its value can be 0, 1, 2, 3, or 4.
 - 0: None Parity.
 - 1: Odd Parity.
 - 2: Even Parity.
 - 3: Space Parity.
 - 4: Mark Parity.
- ✧ <Sleep Control>: The device supports low power mode to reduce the power consumption. When the device enters into low power mode, the response to the serial port will be very slow unless the device is waked up.
 - 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,310201,135790246811220,,0018,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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. 1-Wire Device Settings

The command **AT+GTACD** is used to configure the parameters of 1-Wire devices which include an iButton, temperature sensors and EIO100. When the iButton is connected, a specified wave shape can be configured for a specified output port. Temperature sensor can be configured to read real-time temperature at a specified time interval. Temperature sensor information is

reported in the message **+RESP:GTERI**, and iButton information is reported in the message **+RESP:GTIDA**.

➤ **AT+GTACD=**

Example: AT+GTACD=gv65,1,2,0,10,3,10,,,,,0005\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	iButton Timer	<=2	0 1 – 10(s)	0
3	Output ID	1	0 – 2	0
4	Output Status	1	0 1	0
5	Duration	<=3	0 – 255(×100ms)	0
6	Toggle	<=3	0 – 255	0
7	Temperature Timer	<=3	0 10– 255(s)	0
8	EIO100 Connection	1	0 1	0
9	Reserved			
10	Reserved			
11	Reserved			
12	Serial Number	4	0000 – FFFF	
13	Tail Character	1	\$	\$

✧ *<iButton Timer>*: The time interval for searching the iButton ID.

Note: The sequence of iButton ID is in reverse order of the ID on iButton. The ID structure is composed of <1 byte family ID> + <6 byte serial number> + <1 byte CRC>. Thus, the first byte of the ID number represents iButton's family ID. For example, if the ID on iButton is 12 345678901234 01, then the actual iButton ID is 01 341290785634 12.

✧ *<Temperature Timer>*: The interval for reading the temperature sensor value. If more than one temperature sensor connects to 1-Wire, the device will read the temperature from the temperature sensors one by one at the interval specified by *<Temperature Timer>*. 0 means "Temperature detection is disabled".

✧ *<EIO100 Connection>*: A numeral to indicate whether EIO100 is connected with 1-wire.

- 0: EIO100 is not connected with 1-wire.
- 1: EIO100 is connected with 1-wire.

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

➤ **+ACK:GTACD,**

Example:

+ACK:GTACD,310201,135790246811220,,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	\$	\$

3.2.6.3. ID Authentication

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

➤ AT+GTIDA=

Example: AT+GTIDA=gv65,1,1,2,D2C4FBC5,87654321,45,3,,,,,1,1,0,,,,,FFFF\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1 2	0
3	Start Index	<=4	1 – 1000	
4	End Index	<=4	1 – 1000	
5	ID Number List	<=8*20	'0' – '9', 'a' – 'f', 'A' – 'F'	
6	Timeout After Ignition Off	<=3	15 – 600sec	30
7	Report Mode	1	0 1 2 3	0
8	ID Validity Time	<=3	15 – 600sec	30
9	Reserved	0		

10	Reserved	0		
11	Reserved	0		
12	Output ID	1	0 – 2	0
13	Output Status	1	0 1	0
14	Duration	<=3	0 – 255(×100ms)	0
15	Toggle Times	<=3	0 – 255	0
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Serial Number	4	0000 – FFFF	
21	Tail Character	1	\$	\$

- ✧ **<Mode>**: The working mode of the ID authentication function.
 - 0: Disable this function.
 - 1: Enable this function: Only authorized ID can unlock the vehicle.
 - 2: Enable this function: Any ID can unlock the vehicle.
- ✧ **<Start Index>, <End Index>**: The index range of the white list to which the ID numbers are to be updated. For example, if the **<Start Index>** is set to 1 and the **<End Index>** is set to 2, then the first two ID numbers in the white list will be updated by the numbers provided in the parameter **<ID Number List>**. The **<Start Index>** and **<End Index>** determine the total number of ID numbers that will be updated. If either one is empty, there should be no **<ID Number List>**. At most 8 numbers can be updated each time.
- ✧ **<ID Number List>**: A list of comma-separated ID numbers to be updated to the white list. The number of the ID numbers are determined by **<Start Index>** and **<End Index>**.
- ✧ **<Timeout After Ignition Off>**: If the ignition is turned off, the ID will still be authorized for a short time. In this period, re-authentication is not needed.
- ✧ **<Report Mode>**: The mode of reporting ID.
 - 0: Do not report ID.
 - 1: Report the ID which is authorized.
 - 2: Report the ID which is unauthorized.
 - 3: Report authorized or unauthorized ID.
- ✧ **<Output ID>**: It specifies the ID of the output port to output specified wave shape when the driver ID is authorized. Only the wave shape 1 is supported.
- ✧ **<ID Validity Time>**: The ID will remain authorized for the period of time specified by this parameter when the ID is valid.

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

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

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

➤ **+ACK:GTIDA,**

Example: +ACK:GTIDA,310201,862170013895931,,FFFF,20113102010009,0088\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.6.4. CANBUS Device Configuration

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

➤ **AT+GTCAN=**

Example: AT+GTCAN=gv65,1,5,5,C03FFFFFF,0,FFFF,,FFFF\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
Mode	1	0 1	0
CAN Report Interval	<=5	0 1 – 86400sec	0
CAN Report Interval IGF	<=5	0 1 – 86400sec	0
CAN Report Mask	8	0 - FFFFFFFF	C03FFFFFF
Additional Event	1	0 1	0
CAN Report Expansion Mask	8	0 - FFFFFFFF	007FFFFFF
GNSS Assisted Mode	1	0 1	0

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

- ✧ **<Mode>**: It specifies whether to enable/disable the CAN function.
 - 0: Disable the CAN function.
 - 1: Enable the CAN function.
- ✧ **<CAN Report Interval>**: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is on. Its value range is 0|1 – 86400 and the unit is second. 0 means “Do not report the message **+RESP:GTCAN**”.
- ✧ **<CAN Report Interval IGF>**: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is off. Its value range is 0|1 – 86400 and the unit is second. 0 means “Do not report the message **+RESP:GTCAN** in ignition off state”.
- ✧ **<Additional Event>**: It configures whether to send the **+RESP:GTCAN** report message triggered by additional event.
 - 0: Ignore all additional events.
 - 1: Send the **+RESP:GTCAN** report message triggered by ignition on/off event.
- ✧ **<GNSS Assisted Mode>**: It specifies whether to use GNSS to calculate total distance when the communication between the device and CAN100 is abnormal.
 - 0: Disable this function.
 - 1: Enable this function. In the case of abnormal communication between the device and CAN100, the device will use GNSS to calculate total distance and report the **<Total Distance>** field in **+RESP:GTCAN**.
- ✧ **<CAN Report Mask>**: Bitwise mask to configure the composition of the **+RESP:GTCAN** report message.

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

Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	Reserved	
Bit 21	<Total Vehicle Engine Overspeed Time>	Total time when the vehicle speed is greater than the limit defined in CAN-Logistic's configuration
Bit 20	<Total Vehicle Overspeed Time>	The total time when the vehicle engine speed is greater than the limit defined in CAN-Logistic's 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 one particular light.
Bit 17	<Detailed Information Indicators>	A hexadecimal number. Each bit contains information of one indicator.
Bit 16	<Tachograph Information>	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	<Axle Weight 2nd>	Weight of vehicle's second axle
Bit 14	<Total Idle Fuel Used>	Number of liters of fuel used since vehicle manufacture or device installation
Bit 13	<Total Engine Idle Time>	Time of engine running during idle status (vehicle at a standstill) since vehicle manufacture or device installation
Bit 12	<Total Driving Time>	Time of engine running during driving (non-zero speed) since vehicle manufacture or device installation
Bit 11	<Total Engine Hours>	Time of engine running since vehicle manufacture or device installation
Bit 10	<Accelerator Pedal Pressure>	Accelerator pedal pressure
Bit 9	<Range>	The number of kilometers to drive on remaining fuel
Bit 8	<Fuel Level>	The level of fuel in vehicle's tank (in Liters or Percents)

Bit 7	<Fuel Consumption>	The fuel consumption of the engine
Bit 6	<Engine Coolant Temperature>	Engine coolant temperature
Bit 5	<Engine RPM>	Revolutions per minute of the engine
Bit 4	<Vehicle Speed>	Vehicle road speed
Bit 3	<Total Fuel Used>	Number of liters of fuel used since vehicle manufacture or device installation
Bit 2	<Total Distance>	Vehicle total distance
Bit 1	<Ignition Key>	Ignition status
Bit 0	<VIN>	Vehicle identification number

Note: Bit 30 and Bit 31 are only valid in ASCII format report of **+RESP:GTCAN**. Please ignore them in HEX format report of **+RESP:GTCAN**.

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

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<Rapid Accelerations>	Number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value).
Bit 21	<Rapid Brakings>	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 hexadecimal number. Each bit contains information of one indicator.
Bit 19	<Registration Number>	The vehicle registration number

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

Bit 0	<Ad-Blue Level>	The level of Ad-Blue
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The acknowledgment message of the **AT+GTCAN** command:

➤ **+ACK:GTCAN,**

Example: +ACK:GTCAN,310201,135790246811220,,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	\$	\$

3.2.6.5. CAN100 FOTA Upgrade

The command **AT+GTCFU** is used to upgrade the firmware in CAN100 over the air. Please disable the **AT+GTCAN** function during upgrading the firmware or configuration in CAN100.

➤ **AT+GTCFU=**

Example: AT+GTCFU=gv65,3,30,0,,,http://220.178.67.210:8331/GV65N/deltabin/cfg_ascii_queclink_00_01_02_ASCII.frm,1,,,,0001\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
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	
Update Type	1	0 1	0
Reserved	0		

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

- ✧ <Retry Times>: It specifies the maximum number of retries to download the update package upon download failure.
- ✧ <Timeout>: It specifies the expiration time of one download. If the download expires, it is considered to be failure.
- ✧ <Protocol Type>: The protocol used to download the package.
 - 0: HTTP. Only HTTP is supported now.
- ✧ <Server User Name>: If the file server uses authentication, the user name is specified here.
- ✧ <Server Password>: If the file server uses authentication, the password is specified here.
- ✧ <Server URL>: It specifies the URL to download the package.
- ✧ <Update Type>: It specifies the update type in CAN100 over the air.
 - 0: Firmware update.
 - 1: Configuration update.

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

➤ **+ACK:GTCFU,**

Example:			
+ACK:GTCFU,310504,135790246811220,,0018,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.6.6. Output Expansion

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

➤ **AT+GTOEX=**

Example: AT+GTOEX=gv65,,,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'	gv65
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 an 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,060308,862170013988157,,FFFF,20110101000045,0008\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.6.7. Input Expansion

The command **AT+GTIEX** is used to configure the parameters of 4 EIO100 inputs. All these 4 inputs are customizable. If the logic status on one of the EIO100 input ports changes, the device will report the message **+RESP:GTDIS** to the backend server. Please set *<Working Mode>* in **AT+GTMUT** to 17 for EIO100 device.

➤ **AT+GTIEX=**

Example: AT+GTIEX=gv65,,,2,9,5,B,5,,,,,,FFFF\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
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 an input 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,060308,862170013988157,,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	\$	\$

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=gv65,A,,,,,,0015\$ AT+GTRTO=gv65,E,01,,,,,,0015\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Sub Command	1	0 – 0x16 0x22	
3	AT Command	3 16 1	"SRI" 0000000000000000 –	

	Configuration Mask CAN100 Operation Mode		FFFFFFFFFFFFFFFF 0-1	
4	Output Direction CAN100 Car Model ID	1 1-5	0-3 1-65535	
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Serial Number	4	0000 – FFFF	
9	Tail Character	1	\$	\$

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

- 0: **GPS**. Get the GNSS related information via the message **+RESP:GTGPS**.
- 1: **RTL**. Request the device to report its current position immediately via the message **+RESP:GTRTL**.
- 2: **READ**. Get the current configuration of the device via the message **+RESP:GTALM**.
- 3: **REBOOT**. Reboot the device.
- 4: **RESET**. Reset all parameters to factory settings and clear all buffered messages. Parameters configured by **AT+GTBSI**, **AT+GTSRI**, **AT+GTCFG**, **AT+GTTMA** and **AT+GTPIN** will not be reset.
- 5: **PWROFF**. Power off the device.
- 6: **CID**. Get the ICCID of the SIM card being used by the device via the message **+RESP:GTCID**.
- 7: **CSQ**. Get the current GSM signal level of the device via the message **+RESP:GTCSQ**.
- 8: **VER**. Get the version information of the device via the message **+RESP:GTVER**.
- 9: **BAT**. Get the battery level and adapter status of the device via the message **+RESP:GTBAT**.
- A: **IOS**. Get the status of all the IO ports via the message **+RESP:GTIOS**.
- B: **TMZ**. Get the time zone settings via the message **+RESP:GTTMZ**.
- C: **GIR**. Get cell information via the message **+RESP:GTGSM**.
- D: **DELBUF**. Delete all the buffered reports.
- E: **GSV/RSV**. Request the device to report the GPS/GLONASS fix level.
- F: **Reserved**.
- 10: **CAN**. Get CAN information via the message **+RESP:GTCAN**.
- 11: **BAK**. Write all the settings to backup block.
- 12: **CVN**. Get the version number information and serial number of CAN100 via the message **+RESP:GTCVN**.
- 13-15: Reserved.
- 16: **GTS**. Get the network status via the message **+RESP:GTGTS**.
- 22: **CAN100 Operation**. Set car model for CAN100 or read car model from CAN100.

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

- **AT Command:** To get a single AT command's configuration when *<Sub Command>* is set to 2, please follow the format in the following example. Example: To get the configuration of **AT+GTFRI**, set **AT+GTRTO=gv65,2,FRI,,,,,0015\$**, and get it via **+RESP:GTALS**.
- **Configuration Mask:** If *<Sub Command>* is set to 2, configuration information for a specific configuration mask can be obtained via the message **+RESP:GTALC**. The configuration mask must be 16 bytes. If it is less than 16 bytes, '0' should be added to the high bytes of the configuration mask. If *<Sub Command>* is set to E, this parameter will be used as a bitwise mask to control the **+RESP:GTGSV** / **+RESP:GTRSV** message via which the satellite information is to be reported. If this field is empty, the device will report **+RESP:GTGSV**.

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

Note: For other sub commands, the configuration mask will be ignored. The full Configuration Mask is '5F3A3BFBFFB'.

Configuration Mask Table:

Mask Bit	Item
Bit 63	Reserved
Bit 62	Reserved
Bit 61	Reserved
Bit 60	Reserved
⋮	Reserved
Bit 55	FVR
Bit 54	GAM
Bit 53	UDF
Bit 52	CMD
Bit 51	IEX
Bit 50	OEX
Bit 49	UPC
Bit 48	OWL
Bit 47	CRA
Bit 46	JBS
Bit 45	MUT

Bit 44	CAN
Bit 43	Reserved
Bit 42	FSC
Bit 41	Reserved
Bit 40	FFC
Bit 39	RMD
Bit 38	GPJ
Bit 37	SPA
Bit 36	BZA
Bit 35	Reserved
Bit 34	Reserved
Bit 33	PDS
Bit 32	ACD
Bit 31	IDA
Bit 30	Reserved
Bit 29	SSR
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	HRM
Bit 24	WLT
Bit 23	JDC
Bit 22	Reserved
Bit 21	HBM
Bit 20	HMC
Bit 19	IDL
Bit 18	AIS
Bit 17	DOG
Bit 16	OWH
Bit 15	PIN

Bit 14	Reserved
Bit 13	SOS
Bit 12	SPD
Bit 11	GEO
Bit 10	FRI
Bit 9	TMZ
Bit 8	IOB
Bit 7	OUT
Bit 6	DIS
Bit 5	EPS
Bit 4	TOW
Bit 3	CFG
Bit 2	Reserved
Bit 1	SRI / +RESP:GTRSV
Bit 0	BSI / +RESP:GTBSV

- CAN100 Operation Mode: If the sub command is 0x22, this parameter will work as follows.

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

1: Set car model. Please use <CAN100 Car Model ID> to set car model.

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

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

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

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

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

➤ **+ACK:GTRTO,**

Example:

+ACK:GTRTO,310201,135790246811220,,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 to indicate the sub command of **AT+GTRTO**.

3.2.7.2. Hour Meter Count

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

➤ **AT+GTHMC=**

Example:

AT+GTHMC=gv65,1,12345:12:34,,,,,,,,,0018\$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Hour Meter Enable	1	0 1	0
3	Initial Hour Meter Count	11	00000:00:00 – 99999:00:00	00000:00:00
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		

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

- ✧ **<Hour Meter Enable>**: Enable/disable the hour meter count function. If the hour meter count function is enabled, the hour meter count will be increased when the device detects the vehicle ignition is turned on.
 - 0: Disable the hour meter count function.
 - 1: Enable the hour meter count function.
- ✧ **<Initial Hour Meter Count>**: It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00. If the ignition is turned on for the first time, the **<Hour Meter Count>** which is reported in **+RESP:GTFRI**, **+RESP:GTIGN** or **+RESP:GTIGF** will be increased based on this value.

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

➤ **+ACK:GTHMC,**

Example: +ACK:GTHMC,310201,135790246811220,,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 function or send AT command via SMS.

➤ **AT+GTWLT=**

Example: AT+GTWLT=gv65,1,1,2,13813888888,13913999999,,,,,0018\$				
SN	Parameter	Length (byte)	Range/Format	Default

1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Call Filter	1	0 1 4 5	0
3	Start Index	<=2	1 – 10	
4	End Index	<=2	1 – 10	
5	Phone Number List	<=20*10		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Serial Number	4	0000 – FFFF	
11	Tail Character	1	\$	\$

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

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

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

✧ <Start Index>, <End Index>: The index range of the white list to which the phone numbers are to be updated. For example, if the <Start Index> is set to 1 and the <End Index> is set to 2, then the first two phone numbers in the white list will be updated by the numbers provided in the parameter <Phone Number List>. The <Start Index> and <End Index> determine the total number of phone numbers that will be updated. If either one is empty, there should be no <Phone Number List>.

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

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

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

➤ **+ACK:GTWLT,**

Example:

+ACK:GTWLT,310201,135790246811220,,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 size of the command is not greater than 160 bytes if the command is sent via SMS.

3.2.7.4. GNSS Jamming Status Report

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

➤ AT+GTGPJ=

Example:				
AT+GTGPJ=gv65,1,15,3,,,,,1,1,15,5,,0019\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4–20	'0'–'9' 'a'–'z' 'A'–'Z'	gv65
2	Mode	1	0 1	0
3	CW Threshold	<=2	0 - 31	15
4	BB Threshold	<=2	0 - 15	3
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Output ID	1	0 – 2 9-C	0
10	Output Status	1	0 1	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0

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

- ✧ **<Mode>**: The working mode of the GNSS jamming status detection function.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ **<BB Threshold>**: Broadband jamming detection threshold (unit = dB)
- ✧ **<CW Threshold>**: Narrowband continuous wave (CW) jamming detection threshold (unit = dB)

Note: This function is only supported by UBLOX-7 and future versions.

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

➤ **+ACK:GTGPJ,**

Example: +ACK:GTGPJ,310201,135790246811220,,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	\$	\$

3.2.7.5. Fuel Sensor Calibration Table

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

➤ **AT+GTFSC=**

Example: AT+GTFSC=gv65,,,,,1,,,3,16000,0,10000,50,250,100,,,,,,,FFFF\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Reserved			

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

- ✧ <Enable>: Enable/disable the current calibration table. If the table is disabled, the calculation of the fuel level will be linearized.
- ✧ <Num of Node>: The number of nodes in the blue-colored part of the table above.
- ✧ <Node N Value>: The value of the current node.
- ✧ <Node N Percentage>: The percentage value of this node. The percentage value must be in ascending order beginning with 0% and ending with 100%.

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

➤ **+ACK:GTFSC,**

Example: +ACK:GTFSC,310201,135790246811220,,0004,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default

Protocol Version	6	XX0000 – XXXFFF, 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	\$	\$

3.2.7.6. 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=gv65,1,1,AT+GTRTO=gv65,0,,,,,000B\$,,,,,0005\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv65
2	Mode	1	0-1	0
3	Stored Cmd ID	3	0 – 31	
4	Command String	200	AT command	
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Serial Number	4	0000 – FFFF	
10	Tail Character	1	\$	\$

- ✧ <Mode>: The working mode of storing the command string.
 - 0: Delete the stored command.
 - 1: Add the stored command.
- ✧ <Stored Cmd ID>: A numeral to identify the stored command.
- ✧ <Command String>: The whole content of the stored command.

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

➤ **+ACK:GTCMD**

Example: +ACK:GTCMD,310201,135790246811220,,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	\$	\$

3.2.7.7. 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=gv65,1,1,FFFFFFFF,30,,,1F,1,,,,,0005\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv65
2	Mode	1	0-2	0
3	Group ID	<=2	0 – 31	
4	Input ID Mask	<=8	0-FFFFFFFF	
5	Debounce Time	<=5	0-86400(s)	0
6	Inzizo Mask	<=4	0-FFFFF	0
7	Outzizo Mask	<=4	0-FFFFF	0
8	Stocmd ID Mask	<=8	0-FFFFFFFF	
9	Stocmd ACK	1	0 1	0
10	Reserved			
11	Reserved			
12	Reserved			
13	Reserved			
14	Serial Number	4	0000 – FFFF	

15	Tail Character	1	\$	\$
----	----------------	---	----	----

- ✧ **<Mode>**: The working mode of the user defined function.
 - 0: Disable the group of input events and stored commands to be executed.
 - 1: Enable the group of input events and stored commands to be executed.
 - 2: Delete the group of input events and stored commands to be executed.
- ✧ **<Group ID>**: A numeral to identify the group of input events and stored commands to be executed.
- ✧ **<Input ID Mask>**: Bitwise mask to indicate the input events included in the group.
 - Bit 0 (00000001): Select ID1
 - Bit 1 (00000002): Select ID2
 - Bit 2 (00000004): Select ID3
 - Bit 3 (00000008): Select ID4
 - For example:
 - Bit (00000003): Select ID1, and ID2
 - Bit (00000017): Select ID1, ID2, ID3, and ID5

ID	Mask Bit	Item
1	Bit 0	Power on finished
2	Bit 1	Ignition on
3	Bit 2	Ignition off
4	Bit 3	Attached to the GPRS network
5	Bit 4	Not attached to the GPRS network
6	Bit 5	Registered on the GSM network
7	Bit 6	Not registered on the GSM network
8	Bit 7	Network roaming
9	Bit 8	Network non-roaming
10	Bit 9	SIM card is locked.
11	Bit 10	GNSS is on.
12	Bit 11	GNSS is off.
13	Bit 12	The device is stationary.
14	Bit 13	The device is moving.
15	Bit 14	Reserved
16	Bit 15	Reserved
17	Bit 16	Reserved
18	Bit 17	Reserved
19	Bit 18	Digital input 2 is low.
20	Bit 19	Digital input 2 is high.
21	Bit 20	Digital input 1 is low.
22	Bit 21	Digital input 1 is high.
23	Bit 22	SIM card is inserted.
24	Bit 23	SIM card is not inserted.
25	Bit 24	GNSS external antenna is inserted.

26	Bit 25	GNSS external antenna is not inserted.
27	Bit 26	Inside the speed range
28	Bit 27	Outside the speed range
29	Bit 28	Messages need to be sent.
30	Bit 29	No message needs to be sent.
31	Bit 30	Driver authorized
32	Bit 31	Driver unauthorized

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

✧ <Inzizo Mask>: Bitwise mask to indicate the input event within the GEO-fence.

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

✧ <Outzizo Mask>: Btwise mask to indicate the input event outside the GEO-fence.

ID	Mask Bit	Item
1	Bit 0	Outside the Geo 0
2	Bit 1	Outside the Geo 1
3	Bit 2	Outside the Geo 2
4	Bit 3	Outside the Geo 3
5	Bit 4	Outside the Geo 4
6	Bit 5	Outside the Geo 5
7	Bit 6	Outside the Geo 6

8	Bit 7	Outside the Geo 7
9	Bit 8	Outside the Geo 8
10	Bit 9	Outside the Geo 9
11	Bit 10	Outside the Geo 10
12	Bit 11	Outside the Geo 11
13	Bit 12	Outside the Geo 12
14	Bit 13	Outside the Geo 13
15	Bit 14	Outside the Geo 14
16	Bit 15	Outside the Geo 15
17	Bit 16	Outside the Geo 16
18	Bit 17	Outside the Geo 17
19	Bit 18	Outside the Geo 18
20	Bit 19	Outside the Geo 19

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

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

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

➤ **+ACK:GTUFD**

Example:			
+ACK:GTUFD,310201,135790246811220,,0005,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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	\$	\$

3.2.7.8. SMS Sending

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

➤ **AT+GTSMS=**

Example:

AT+GTSMS=gv65,,,0,"http://www.queclink.com",1388888888,,,FFFF\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
Reserved	0		
Reserved	0		
SMS Message Format	1	0	0
SMS Text	<=160		
Target Number	<=20		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <SMS Message Format>: It defines the format of the SMS content.
 - 0: ASCII Format.
- ✧ <SMS Text>: A string that contains quotes. This string will be sent to <Target Number> via SMS. This field can not be empty and the parameter value can not be a string which represents a command of this protocol.
- ✧ <Target Number>: The phone number that the SMS text will be sent to. This field can not be empty.

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

➤ **+ACK:GTSMS,**

Example: +ACK:GTSMS,318101,862193022001192,,,FFFF,20140605140622,001F\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.9. Operator White List

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

➤ AT+GTOWL=

Example: AT+GTOWL=gv65,1,1,1,46000,30,,,,,FFFF\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
2	Mode	1	0 1	0
3	Start Index	<=3	1 – 100	
4	End Index	<=3	1 – 100	
5	Operator White List	<=6*100		
6	TCP Connection Timeout	2	30 – 90min	60
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Serial Number	4	0000 – FFFF	
12	Tail Character	1	\$	\$

- ✧ <Mode>: The working mode of this function.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ <Start Index>: A numeral to indicate the first index of the white list operator numbers to be input. For example, if it is **1**, the device will update the white list operators from the **1st** one. If it is empty, there should be no white list number.
- ✧ <End Index>: A numeral to indicate the last index of the white list operator numbers to be input. For example, if it is **2**, the device will update the white list operators until the **2nd** one. If it is empty, there should be no white list number.
- ✧ <Operator White List>: A white list of PLMN codes for network operators. The PLMN code comprises of mobile country code (MCC) and mobile network code (MNC), each of which consists of 3 digits. The last digit of MNC can be omitted (e.g. "46001F" or "46001" represents the PLMN of "CHINA UNICOM"). The operators in this list will be considered as in "Home" state. And two adjacent operator codes are separated with ','. The number of the operators in the list is determined by the parameters <Operator Start> and <Operator End>. For example, if <Operator Start> is **1** and <Operator End> is **2**, the operator list should include **2** operator codes (empty value acceptable) and the two numbers are separated by

with ‘,’. MCCFF type code is used to identify operators across a whole country. For example, “460FF” covers the mobile network operators all across China.

- ✧ **<TCP Connection Timeout>**: The timeout period for the terminal to establish connection to the TCP server.

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

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

➤ **+ACK:GTOWL,**

Example:			
+ACK:GTOWL,318101,862193022001192,,FFFF,20140605140622,001F\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	‘0’ – ‘9’ ‘a’ – ‘z’ ‘A’ – ‘Z’ ‘-’ ‘_’	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7.10. Configuration File Version

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

➤ **AT+GTFVR=**

Example:				
AT+GTFVR=gv65,1,0000,,,,,,,,,0010\$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	‘0’ – ‘9’ ‘a’ – ‘z’ ‘A’ – ‘Z’	gv65
2	Configuration Name	<=40	‘0’ – ‘9’, ‘a’ – ‘z’, ‘A’ – ‘Z’, ‘-’, ‘_’	
3	Configuration Version	4	0000 – 9999	
4	Command Mask	<=32	000000000000000000000000 –	

			FFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFF	
5	GEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
6	Stocmd ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
7	Group ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
8	Message Digest	32	'0'-'9' 'a'-'z' 'A'-'Z'	
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Generation Time	14	YYMMDDHHMMSS	
	Serial Number	4	0000 – FFFF	
	Tail Character	1	\$	\$

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

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

Bit 13	PDS
Bit 14	CMD
Bit 15	UDF
Bit 16	Reserved
Bit 17	Reserved
Bit 18	Reserved
Bit 19	Reserved
Bit 20	FVR
Bit 21	TOW
Bit 22	EPS
Bit 23	IDL
Bit 24	HMC
Bit 25	HBM
Bit 26	HRM
Bit 27	CRA
Bit 28	SSR
Bit 29	Reserved
Bit 30	Reserved
Bit 31	Reserved
Bit 32	OUT
Bit 33	SOS
Bit 34	IOB
Bit 35	GPJ
Bit 36	Reserved
Bit 37	FFC
Bit 38	RMD
Bit 39	Reserved
Bit 40	JDC
Bit 41	BZA
Bit 42	SPA

Bit 43	JBS
⋮	Reserved
Bit 50	Reserved
Bit 51	Reserved
⋮	Reserved
Bit 54	PIN
Bit 55	GAM
Bit 56	AIS
Bit 57	Reserved
Bit 58	Reserved
Bit 59	Reserved
Bit 60	IDA
Bit 61	ACD
⋮	Reserved
Bit 65	FSC
Bit 66	Reserved
Bit 67	Reserved
Bit 68	MUT
Bit 69	CAN
Bit 70	Reserved
Bit 71	Reserved
Bit 72	OEX
Bit 73	IEX
⋮	Reserved
Bit 101	Reserved
Bit 102	CFU
Bit 103	OWL
⋮	Reserved

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

ID	Mask Bit	Item
1	Bit 0	Indicate the Geo 0

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

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

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

Bit 18	19
Bit 19	20
⋮	⋮
Bit 31	31

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

Bit	Group ID
Bit 0	1
Bit 1	2
Bit 2	3
Bit 3	4
Bit 4	5
Bit 5	6
Bit 6	7
Bit 7	8
Bit 8	9
Bit 9	10
Bit 10	11
Bit 11	12
Bit 12	13
Bit 13	14
Bit 14	15
Bit 15	16
Bit 16	17
Bit 17	18
Bit 18	19
Bit 19	20
⋮	⋮
Bit 31	31

✧ <Message Digest>: A fixed-length hash value which is obtained by using hash algorithm.

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

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

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

➤ **+ACK:GTFVR,**

Example:			
+ACK:GTFVR,310201,135790246811220,,0012,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	14	MEID	

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

3.2.7.11. GNSS-Assisted Motion Measurement

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

➤ AT+GTGAM=

Example: AT+GTGAM=gv65,1,1,25,10,60,60,,,,,0006\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
Mode	1	0 1	1
Speed Mode	1	0 1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GNSS Fix Failure Timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

- ✧ <Motion Speed Threshold>: The speed threshold which is combined with GNSS speed to measure the status of movement.
- ✧ <Motion Cumulative Time>: If the average speed in <Motion Cumulative Time> is higher than <Motion Speed Threshold>, the device is considered to be in moving state.
- ✧ <Motionless Cumulative Time>: If the average speed in <Motionless Cumulative Time> is lower than <Motion Speed Threshold>, the device is considered to be in stationary state.
- ✧ <GNSS Fix Failure Timeout>: If the time of GNSS fix is more than <GNSS Fix Failure Timeout>, the device will update motion status by motion sensor again.

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

➤ **+ACK:GTGAM,**

Example: +ACK:GTGAM,318013,135790246811220,,1,0006,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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	\$	\$

3.2.7.12. Over-the-air Configuration Update

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

➤ **AT+GTUPC=**

Example: AT+GTUPC=gv65,0,10,0,0,168,http://www.queclink.com/configure.ini,0,,1,00000001,0001\$			
Parameter	Length (byte)	Range/Format	Default value
Password	4~20	'0'-'9', 'a'-'z', 'A'-'Z'	gv65
Max. Download Retry	1	0 – 3	0
Download Timeout	<=2	5 – 30 min	10
Download Protocol	1	0	0
Enable Report	1	0 1	0
Update Interval	<=4	0 – 8760 hour	0

Download URL	<=100	URL	
Mode	1	0 1	0
Reserved	0		
Extended Status Report	1	0 1	0
Identifier Number	8	00000000-FFFFFFFF	0
Reserved	0		
Update Status Mask	1	0 - F	3
Serial Number	4	0000-FFFF	
Tail Character	1	\$	\$

- ✧ <Password>: The valid characters for the password include '0'-'9', 'a'-'z', and 'A'-'Z'. The default value is "gv55".
- ✧ <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 <Download URL> ends with "/" which means the URL is just a path without file name, the unit will add <imei>.ini as the file name to complete the URL. If it is greater than 100 bytes in length, error will be returned.
- ✧ <Mode>: A numeral which indicates the working mode of downloading configuration over the air.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ <Identifier Number>: A numeral to identify the configuration update request. It will be included in the message **+RESP:GTEUC** to indicate the request it is related to.
- ✧ <Extended Status Report>: A numeral to indicate the message to be reported for the configuration update status when <Enable Report> is 1.
 - 0: Report the message **+RESP:GTUPC**.
 - 1: Report the message **+RESP:GTEUC** to include more information.
- ✧ <Update Status Mask>: Bitwise mask to configure the status in which the device can update the configuration.
 - Bit 0 for Ignition Off
 - Bit 1 for Ignition On
 - Bit 2 Reserved
 - Bit 3 Reserved

Note:

1. The maximum number of commands in configuration file is 255. The max length of a command string is 320 bytes. If there are more than 255 commands in the configuration file or the length of a command string is over 320 bytes, the device will fail to download the configuration file.
2. Make sure there is only one command per line in the configuration file and there is a “\r\n” between two commands.
3. There should be no space before each command.
4. The configuration file should be a plain text file.
5. **+RESP:GTEUC** in hex format has the same message format as **+RESP:GTUPC**.

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

➤ **+ACK:GTUPC,**

Example: +ACK:GTUPC,2F0605,135790246811220,,0005,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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	\$	\$

3.3. Report

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

3.3.1. Position Related Report

➤ **+RESP:GTTOW,**

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

➤ **+RESP:GTDIS,**

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

➤ **+RESP:GTIOB,**

If the IO combination is set and the corresponding condition appears, the device will report the message **+RESP:GTIOB** to the backend server.

➤ **+RESP:GTSPD,**

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

➤ **+RESP:GTSOS,**

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

➤ **+RESP:GTRTL,**

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

➤ **+RESP:GTDOG,**

The protocol watchdog reboot message.

➤ **+RESP:GTIGL,**

The location message for ignition on or ignition off.

➤ **+RESP:GTHBM,**

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

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

Example:

```
+RESP:GTTOW,310201,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
```

```
+RESP:GTDIS,310201,135790246811220,,,20,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
```

```
+RESP:GTIOB,310201,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
```

```
+RESP:GTSPD,310201,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
```

```
+RESP:GTSOS,310201,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
```

+RESP:GTRTL,310201,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214
013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTDOG,310201,135790246811220,,,01,1,1,4.3,92,70.0,121.354335,31.222073,2009021
4013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTIGL,310201,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,200902140
13254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTHBM,310201,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,2009021
4013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

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

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

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

<Report ID> has different meanings in different messages:

- The ID of digital input port which triggers the report messages **+RESP:GTDIS** and **+RESP:GTSOS**. The range is 1-2 | 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:GTDG**.
- The speed level at which the harsh behavior is detected in the message **+RESP:GTHBM**. The value 3 indicates “high speed”, 2 indicates “medium speed” and 1 indicates “low speed”. If the *<Mode>* is set to 2, the value is always 0 which indicates unknown speed.

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

<Report Type> has different meanings in different messages:

- In the **+RESP:GTDIS** report message generated by the digital input
 - 0: The current logic status of the input port is “Disable status”.
 - 1: The current logic status of the input is “Enable status”.
- In the **+RESP:GTIOB** report message generated by bound IO
 - 0: The current logic status of the bound IO does not meet the alarm condition.
 - 1: The current logic status of the bound IO meets the alarm condition.
- In the speed alarm message **+RESP:GTSPD**
 - 0: Outside the predefined speed range.
 - 1: Inside the predefined speed range.
- In the protocol watchdog reboot message **+RESP:GTDG**
 - 1: Reboot message for time based working mode
 - 2: Reboot message for ignition on working mode
 - 3: Reboot message for input triggered reboot
 - 4: Reboot message for GSM watchdog
 - 5: Reboot message for GPRS watchdog
 - 6: Reboot message for CAN watchdog
 - 7: Reboot message for send failure watchdog
- In the harsh behavior monitoring message **+RESP:GTHBM**
 - 0: Harsh braking behavior
 - 1: Harsh acceleration behavior
 - 2: Harsh cornering behavior
 - 3: Harsh braking and cornering behavior
 - 4: Harsh acceleration and cornering behavior
 - 5: Unknown harsh behavior
- In the ignition message **+RESP:GTIGL**

0: Ignition off

1: Ignition on

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

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

➤ **+RESP:GTFRI,**

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

Example:

```
+RESP:GTFRI,310201,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,200902140
13254,0460,0000,18d8,6141,00,2000.0,12345:12:34,,,80,310201,,,,20090214093254,11F0$
```

```
+RESP:GTFRI,310201,135790246811220,,,00,2,1,4.3,92,70.0,121.354335,31.222073,200902140
13254,0460,0000,18d8,6141,00,0,4.3,92,70.0,121.354335,31.222073,20093102010000,0460,0
000,18d8,6141,00,2000.0,12345:12:34,,,80,310201,,,,20090214093254,11F0$
```

```
+RESP:GTFRI,310201,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,200902140
13254,0460,0000,18d8,6141,00,2000.0,12345:12:34,,,92,80,310201,,,,20090214093254,11F0$
```

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Voltage	<=5	0 – 99999 mV	
Report ID / Report Type	2	X(1-5)X(0-6)	

Number	<=2	1 – 15	
GNSS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input VCC	<=5	0 – 30000 mV	
Reserved	0		
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 Voltage>*: The voltage of the external power supply. If the device is configured to report the external power supply voltage periodically with fixed report using the command **AT+GTEPS**, the device will send the current voltage along with the **+RESP:GTFRI** message to the backend server. If the device is not configured as such, this field will be empty.

✧ *<Report ID / Report Type>*: It indicates the working mode of the fixed report and the type of

the message.

Report ID has five 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: FRI report frequency change which indicates that the terminal enters into Geo-Fence or roaming status
- 3: Corner report when FRI report frequency changes
- 4: Mileage report when fixed report is mode 5
- 5: Reserved
- 6: Mileage report when fixed report is mode 5 and **AT+GTFRC** works

Note: In the case of multi-position report, the report type is determined by the report type of last position.

- ✧ **<Number>**: The number of the GNSS position(s) included in the report message. In the message **+RESP:GTFRI**, it may include one or several GNSS positions depending on the settings of **<Send Interval>** and **<Check Interval>**. If there are multiple positions in one **+RESP:GTFRI** report message, the items in the green part of the table above will repeat for each position that is reported.
- ✧ **<Hour Meter Count>**: If the hour meter count function is enabled by the command **AT+GTHMC**, total hours the meter has counted when the engine is on will be reported in this field. It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00. If the hour meter count function is disabled, this field will be empty.
- ✧ **<Backup Battery Percentage>**: The current volume of the backup battery in percentage.
- ✧ **<Device Status>**: The status of the device. From left to right, the first two characters indicate the status of EIO100 inputs, the second two characters indicate the status of EIO100 outputs, 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 motion status of the device:

- 16 (**Tow**): The device attached vehicle is ignition off and it is towed.
- 1A (**Fake Tow**): The device attached vehicle is ignition off and it might be towed.
- 11 (**Ignition Off Rest**): The device attached vehicle is ignition off and it is motionless.
- 12 (**Ignition Off Motion**): The device attached vehicle is ignition off and it is moving before it is considered to be towed.
- 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motionless.
- 22 (**Ignition On Motion**): The device attached vehicle is ignition on and it is

moving.

- 41 (**Sensor Rest**): The device attached vehicle is motionless without ignition signal detected.
- 42 (**Sensor Motion**): The device attached vehicle is moving without ignition signal detected.

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

Mask Bit	Item
Bit 39 (Optional)	Reserved
...(Optional)	Reserved
Bit 35 (Optional)	EIO100 input C
Bit 34 (Optional)	EIO100 input B
Bit 33 (Optional)	EIO100 input A
Bit 32 (Optional)	EIO100 input 9
...(Optional)	Reserved
Bit 27 (Optional)	EIO100 output C
Bit 26 (Optional)	EIO100 output B
Bit 25 (Optional)	EIO100 output A
Bit 24 (Optional)	EIO100 output 9
Bit 16-23	Motion status of device
...	Reserved
Bit 11	Reserved
Bit 10	Digital input 2
Bit 9	Digital input 1
Bit 8	Ignition detection
...	Reserved
Bit 3	Reserved
Bit 2	Reserved
Bit 1	Digital output 2
Bit 0	Digital output 1

➤ **+RESP:GTERI,**

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

Example:

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

```
+RESP:GTERI,22020B,862170010196747,,00000000,,10,1,2,1.8,0,-2.5,117.198440,31.845219,20
120802061037,0460,0000,5663,0358,00,0.0,,,,0,410000,20120802061040,0012$
```

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

```
+RESP:GTERI,220209,862170011501234,,00000002,,10,1,1,0.0,0,43.6,117.198435,31.845227,2
0120728025538,0460,0000,5663,0358,00,0.0,,,,0,310201,2,1,FD0000034129ED28,2,01A2,2012
0728025540,0010$
```

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

```
+RESP:GTERI,220209,862170011501234,,00000002,,10,1,0,3.2,0,64.7,117.198613,31.845190,2
```

0120728025304,0460,0000,5663,0358,00,0.0,,,,0,310201,2,2,3C000000340FD1128,2,019E,FD0000034129ED28,2,01AC,20120728025310,000A\$				
Parameter		Length (byte)	Range/Format	Default
Protocol Version		6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID		15	IMEI	
Device Name		<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ERI Mask		8	00000000 – FFFFFFFF	
External Power Supply		<=5	0 – 32000 mV	
Report ID / Report Type		2	X(1-5)X(0-6)	
Number		<=2	1– 15	
GNSS Accuracy		<=2	0 1 – 50	
Speed		<=5	0.0 – 999.9 km/h	
Azimuth		<=3	0 – 359	
Altitude		<=8	(-)xxxxx.x m	
Longitude		<=11	(-)xxx.xxxxxx	
Latitude		<=10	(-)xx.xxxxxx	
GNSS UTC Time		14	YYYYMMDDHHMMSS	
MCC		4	0XXX	
MNC		4	0XXX	
LAC		4	XXXX	
Cell ID		4	XXXX	
Reserved		2	00	
Mileage		<=9	0.0 – 4294967.0 km	
Hour Meter Count		11	HHHHH:MM:SS	
Analog Input		<=5	0 – 30000 mV	
Backup Battery Percentage		<=3	0 – 100	
Device Status		<=10	0000000000 – 0F0FFFFFFF	
UART Device Type		<= 2	0 - 99	
1-wire Information	1-wire Device Number	<= 2	0 - 19	

(Optional)	1-wire Device ID	16		
	1-wire Device Type	2		
	1-wire Device Data	<= 40		
CAN Data (Optional)		<=1000		
XYZ Axis Information (Optional)	Data Group Number	<= 3	0 - 3	
	Data Attribute	1		
	XYZ Axis Data	12	'0'-'9' 'a'-'f'	
Send Time		14	YYYYMMDDHHMMSS	
Count Number		4	0000 – FFFF	
Tail Character		1	\$	\$

- ✧ <UART Device Type>: The type of the device which is connected to the second serial port.
 - 0: No device connected.
 - 2: 1-wire bus.
- ✧ <1-wire Device Number>: The number of 1-wire devices connected to 1-wire. If it is 0, the fields <1-wire Device ID>, <1-wire Device Type>, and <1-wire Device Data> will not be displayed. If there is more than one 1-wire devices connected, the fields <1-wire Device ID>, <1-wire Device Type>, and <1-wire Device Data> will repeat to show the information of all connected 1-wire devices. If Bit 1 of <ERI Mask> in **AT+GTFRI** is enabled, the information items contained in the <1-wire Information (Optional)> field will be displayed; otherwise, the <1-wire Information (Optional)> field will not be displayed.
- ✧ <1-wire Device ID>: It indicates the device ID read from the 1-wire device.
- ✧ <1-wire Device Type>: It indicates the type of the 1-wire device.
 - 1: Temperature sensor.
- ✧ <1-wire Device Data>: It indicates the data read from the 1-wire devices. If the device is a temperature sensor, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix A). To get the real temperature in degrees Celsius, please convert the data to a decimal value according to the calculation in Appendix A first and then multiply the decimal value by 0.0625.
- ✧ <CAN Data>: If Bit 2 of <ERI Mask> in **AT+GTFRI** is set to 1, information of the corresponding part will be displayed, including the data got from CAN device.
- ✧ <Data Group Number>: The number of the XYZ axis data groups.
- ✧ <Data Attribute>: It indicates the attribute of the XYZ axis data.
 - 0: Maximum value.
 - 1: Average value.
- ✧ <XYZ Axis Data>: There are 12 characters in a group of acceleration data. 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 Z axis acceleration data. The ASCII "0001" means HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" means HEX value 0xFFFF which is the complement of -3, so it means the acceleration is -3. If

Bit 8 of <ERI Mask> in **AT+GTFRI** is set to 1, information of <XYZ Axis Information (Optional)> will be displayed; otherwise, the <XYZ Axis Information (Optional)> field will not be displayed. If <Data Group Number> is greater than one, the <XYZ Axis Data> field will repeat for each data group.

➤ **+RESP:GTEPS,**

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

➤ **+RESP:GTAIS,**

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

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

Example: +RESP:GTEPS,310201,135790246811220,,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,310201,135790246811220,,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 Voltage	<=5	0 – 99999mV	
Report ID / Report Type	2	X(0-2)X(0-1)	
Number	<=2	1	
GNSS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

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

- ✧ **<External Power Voltage>**: The value of the external power voltage. If the voltage of the external input meets the alarm condition as set by the command **AT+GTEPS** or **AT+GTAIS**, the device will send the current external input voltage via **+RESP:GTEPS** or **+RESP:GTAIS** to the backend server.
- ✧ **<Report ID / Report Type>**: The report ID and the report type in hex format. 4 high bits means “report ID” and 4 low bits means “report type”.
 - <Report ID>** has two meanings:
 - 0: The ID of analog input port which triggers the report message **+RESP:GTEPS**.
 - 1: The ID of analog input port which triggers the report message **+RESP:GTAIS**.
 - <Report Type>** has two meanings:
 - 0: Outside the predefined range.
 - 1: Inside the predefined range.
- ✧ **<Number>**: The number of the GNSS position(s) included in the report message. Generally, it is 1.

➤ **+RESP:GTLBC,**

If 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,310201,135790246811220,,+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	
GNSS Accuracy	<=2	0 1 – 50	

Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

➤ **+RESP:GTGEO,**

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

Example: +RESP:GTGEO,310201,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214 013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$			
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(0-3)	
Number	1	1	

GNSS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Report ID / Report Type>: The meaning of this parameter as below,

- Report ID: The ID of Geo Fence in HEX format. The range is 0x0 to 0x13.
- Report Type: 0 means “Exit from the Geo-Fence”; 1 means “Enter the Geo-Fence”.

➤ **+RESP:GTGES,**

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

Example: +RESP:GTGES,310201,135790246811220,gv65,,00,0,100,30,11,1,1,24.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141, ,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID / Report Type	<=3	X(0-13)X(0-3)	

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

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

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

➤ **+RESP:GTIDA,**

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

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

Example: +RESP:GTIDA,220103,862170013895931,,,D2C4FBC5,1,1,1,0.8,0,22.2,117.198630,31.845229,2 0120802121626,0460,0000,5663,2BB9,00,0.0,,,,,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	
Number	1	1	
GNSS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

✧ <ID Report Type>: The type of reported ID.

- 0: The ID is unauthorized or the ID Authorization function is disabled.
- 1: The ID is authorized.

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,310201,135790246811220,,16,898600810906F8048812,16,0,1,12000,,4.16,0,0,,,20090214013254,,,,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' '-' ' ' '_'	
Motion Status	2	11 12 21 22 41 42 1A 16	
ICCID	20		
CSQ RSSI	<=2	0 – 31 99	
CSQ BER	<=2	0 – 7	
External Power Supply	1	0 1	
External Power Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery Voltage	<=4	0.00 – 4.16 V	
Charging	1	0 1	
LED On	1	0 1	
Reserved	0		
External GNSS Antenna	1	0 1 3	
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Analog Input VCC	<=5	0~30000mV	
Reserved	0		
Digital Input	<=4	0000 – 0F0F	
Digital Output	<=4	0000 – 0F07	
Time Zone Offset	5	±HHMM	

Daylight Saving	1	0 1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Motion Status>: The current motion status of the device.
 - 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 deemed to be towed.
 - 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motionless.
 - 22 (**Ignition On Motion**): The device attached vehicle is ignition on and it is moving.
 - 41 (**Sensor Rest**): The device attached vehicle is motionless without ignition signal detected.
 - 42 (**Sensor Motion**): The device attached vehicle is moving without ignition signal detected.

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

- ✧ <CSQ RSSI>: The 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 0 is for unknown strength of signal.
- ✧ <External Power Voltage>: The voltage of the external power supply.
- ✧ <Backup Battery Voltage>: The voltage of the backup battery. The value of this field is only valid when the external power is not connected. (This parameter is valid for GV65Plus and reserved for GV65).
- ✧ <Charging>: Whether the backup battery is charging when the main power supply is connected.
 - 0: Not charging
 - 1: Charging
- ✧ <Backup Battery Switch>: Battery supply switch status.
 - 0: Switch off the backup battery
 - 1: Switch on the backup battery
- ✧ <External GNSS Antenna>: The status of the external GNSS antenna.

- 0: The external GNSS antenna of the device is working.
 - 1: The external GNSS antenna of the device is detected in open circuit state.
 - 3: The external GNSS antenna of the device is in unknown state.
- ✧ <Last Fix UTC Time>: The UTC time of the latest successful GNSS fix.
- ✧ <Analog Input VCC>: The voltage of the analog input.
- ✧ <Digital Input>: A bitwise hex integer to indicate the logic status of the digital input. For each bit, 0 means “Disable status”, and 1 means “Enable status”. If EIO100 device is not connected or the mode of **AT+GTMUT** is not for EIO100, the optional bits will not be included.

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

- ✧ <Digital Output>: A bitwise hex integer to indicate the logic status of the digital output. For each bit, 0 means “Disable status”, and 1 means “Enable status”. If EIO100 device is not connected or the mode of **AT+GTMUT** is not for EIO100, the optional bits will not be included.

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

- ✧ <Time Zone Offset>: The time offset of the local time zone from the UTC time.
- ✧ <Daylight Saving>: The current setting of the daylight saving time.
- 0: Daylight saving time is disabled.
 - 1: Daylight saving time is enabled.

3.3.3. Report for Real Time Querying

3.3.3.1. +RESP:GTGPS

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

➤ **+RESP:GTGPS,**

Example: +RESP:GTGPS,310201,135790246811220,,,,,0000,,1,20090214013254,20090214093254,11F0\$			
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 GNSS Antenna	1	0 1 3	
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

3.3.3.2. +RESP:GTALS

After the device receives the command **AT+GTRTO** to get sub AT command configuration information, it will send the configuration information to the backend server via the message **+RESP:GTALS**. Configuration information varies with different AT commands. For example, to get FRI configuration, set **AT+GTRTO=gv65,2,FRI,,,,,0015\$**.

➤ **+RESP:GTALS,**

Example: +RESP:GTALS,310201,862170010822169,gv65,FRI,1,0,,0,0000,0000,,30,1000,1000,,40,60,00000000,,,,,20121205072258,00C3\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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		
Period Enable	1	0 1	
Start Time	4	HHMM	
End Time	4	HHMM	
Reserved	0		
Send Interval	<=5	1 – 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		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.3. +RESP:GTALM

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

➤ +RESP:GTALM,

Example:

```
+RESP:GTALM,380108,863286020428604,,10,1,BSI,cmnet,,,,,,,,SRI,3,,2,220.178.67.210,8228,0,0
.0,0,0,+86000000,5,1,0,0,0,,,,CFG,gv65,gv65,0,0,0,,,003F,1,,3FFF,,0,0,300,0,1,0,,,0,000F,0,00,,,T
OW,0,10,1,300,0,0,0,0,2,3,2,,,,,,,,EPS,0,0,0,0,0,0,0,0,0,0,DIS,0,1,,0,1,0,0,0,2,0,0,0,,,,OUT,0,
,,,,IOB,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,2,0,0,0,0,0,0,3,0,0,0,0,0,0,0,TMA,+0000,0,,,,
FRI,0,1,,1,0000,0000,0,30,1000,1000,,0,600,00000000,,,,20150626103740,000D$
+RESP:GTALM,380108,863286020428604,,10,2,GEO,0,0,,,50,0,0,0,0,0,0,0,1,0,,,50,0,0,0,0,0,0,0
,,2,0,,,50,0,0,0,0,0,0,0,3,0,,,50,0,0,0,0,0,0,0,4,0,,,50,0,0,0,0,0,0,0,5,0,,,50,0,0,0,0,0,0,0,6,0,
,,50,0,0,0,0,0,0,0,7,0,,,50,0,0,0,0,0,0,0,8,0,,,50,0,0,0,0,0,0,0,9,0,,,50,0,0,0,0,0,0,0,10,0,,,50,
0,0,0,0,0,0,0,11,0,,,50,0,0,0,0,0,0,0,12,0,,,50,0,0,0,0,0,0,0,13,0,,,50,0,0,0,0,0,0,0,14,0,,,50,
0,0,0,0,0,0,0,15,0,,,50,0,0,0,0,0,0,0,16,0,,,50,0,0,0,0,0,0,0,17,0,,,50,0,0,0,0,0,0,0,18,0,,,50,
0,0,0,0,0,0,0,19,0,,,50,0,0,0,0,0,0,0,SPD,0,0,0,60,300,0,0,0,0,,,,SOS,0,0,,0,0,0,0,,,,PIN,1,
1234567,,,,OWH,0,1F,0900,1200,1300,1800,,,0,0,0,0,0,0,DOG,0,60,30,0200,,1,0,,60,60,60,201
50626103740,000E$
+RESP:GTALM,380108,863286020428604,,10,3,AIS,0,1,0,0,0,,0,0,0,0,0,,,,,10,30,10,20,,ID
L,0,2,1,0,,,0,0,0,0,,,,HMC,0,000000:00:00,,,,,HBM,0,,,100,0,0,,60,0,0,,,0,0,,0,0,0,0,30,50,20,6
5,JDC,0,25,,5,10,10,,0,0,0,0,,WLT,0,,,,,HRM,,,EF,FE5FBF,FE5FBF,FFFD,EF,7D,7FF,,,SSR,0,2,1,
5,0,,,20150626103740,000F$
+RESP:GTALM,380108,863286020428604,,10,4,IDA,0,1,50,,,,,,,,,,,,,,,,,,,,,,,,,30,0,
,,,0,0,0,0,,,20150626103740,0010$
+RESP:GTALM,380108,863286020428604,,10,5,IDA,0,51,100,,,,,,,,,,,,,,,,,,,,,,,,,30
,0,,,0,0,0,0,,,20150626103740,0011$
+RESP:GTALM,380108,863286020428604,,10,6,IDA,0,101,150,,,,,,,,,,,,,,,,,,,,,,,,,3
0,0,,,0,0,0,0,,,20150626103740,0012$
+RESP:GTALM,380108,863286020428604,,10,7,IDA,0,151,200,,,,,,,,,,,,,,,,,,,,,,,,,3
0,0,,,0,0,0,0,,,20150626103740,0013$
+RESP:GTALM,380108,863286020428604,,10,8,IDA,0,201,250,,,,,,,,,,,,,,,,,,,,,,,,,3
0,0,,,0,0,0,0,,,20150626103740,0014$
+RESP:GTALM,380108,863286020428604,,10,9,ACD,0,0,0,0,0,0,0,PDS,0,0,,,,,BZA,0,,,0,0,0,0,0,
0,0,,,0,0,0,0,0,0,0,SPA,0,50,,60,0,,70,,60,0,,90,,60,0,,110,,60,0,,,,,GPI,0,15,3,,,,0,0,0,0,,
20150626103740,0015$
+RESP:GTALM,380108,863286020428604,,10,10,RMD,0,,,,,,,,,,,,,,,,,,,,,,,,,3FFF,,3FFF,,,
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0,0,0,0,FFC,0,0,0,0,0,30,500,500,300,0,0,1,0,0,0,0,30,500,500,300,0,0,2,0,0,0,0,30,500,
500,300,0,0,3,0,0,0,0,30,500,500,300,0,0,4,0,0,0,0,30,500,500,300,0,0,FSC,,,,0,,,0,,,,,C
AN,0,0,0,C03FFFFF,0,,,MUT,0,12,8,1,0,1,,,,,CRA,0,5,0,,,0,0,0,0,0,OWL,0,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,,,,,,,,,,,,,60,,,,,20150626103740,0016$
```

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	≤20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Total Packets	1	10	
Current Packet	1	1 – 10	
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 **SSR**, the 4th-8th messages are for the command **IDA**, the 9th is for the commands from **ACD** to **GPJ** and the last message is for the commands from **UDF** to the end of the protocol commands.

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

3.3.3.4. +RESP:GTALC

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

➤ **+RESP:GTALC,**

Example:

```
+RESP:GTALC,310201,135790246811220,gv65,FFFFFFFFFB,,,BSI,cmnet,,,,,,SRI,3,,1,220.178.67.2
10,10029,0,0,0,0,0,,15,0,0,0,,,,,CFG,gv65,gv65,1,0,0,,,007F,0,,3FFF,1,1,30,1,,,,,1,0000,0,,,,TOW
,1,5,1,60,1,0,5,10,3,4,3,,,,,EPS,1,250,25000,1,1,0,0,255,255,1,,,,DIS,0,1,,0,1,1,1,2,1,1,1,,,,,
OUT,0,,,,,IOB,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,,,,,TMZ,+0800
,0,,,,,FRI,1,0,,1,0000,2359,,30,999,999,,8,600,00000003,,,,,GEO,0,3,117.201331,31.833094,50,60
,1,0,255,255,0,0,,1,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,2,3,117.201331,31.833094
,50,60,1,0,255,255,0,0,,3,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,4,3,117.201331,31.8
```

33094,50,60,1,0,255,255,0,0,,,5,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,,6,3,117.20133
1,31.833094,50,60,1,0,255,255,0,0,,,7,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,,8,3,117.
201331,31.833094,50,60,1,0,255,255,0,0,,,9,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,,1
0,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,,11,3,117.201331,31.833094,50,60,1,0,255,2
55,0,0,,,12,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,,13,3,117.201331,31.833094,50,60,
1,0,255,255,0,0,,,14,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,,15,3,117.201331,31.8330
94,50,60,1,0,255,255,0,0,,,16,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,,17,3,117.201331
,31.833094,50,60,1,0,255,255,0,0,,,18,3,117.201331,31.833094,50,60,1,0,255,255,0,0,,,19,3,11
7.201331,31.833094,50,60,1,0,255,255,0,0,,,SPD,3,1,99,61,60,0,1,255,255,,,,,,,,,,,,SOS,2,2,15705
602728,0,0,0,0,,,,PIN,0,,,,OWH,0,1f,0900,1200,1300,1800,,,0,0,0,0,0,,,,DOG,1,60,2,1500,,,1,0,
,0,0,,AIS,1,1,30000,30000,12,,,2,0,255,255,1,,,,,,,,,,,,149,600,50,150,,IDL,1,2,1,100,,,2,0,255,25
5,,,,HMC,1,12345:00:00,,,,,,,,HBM,1,,,100,1,1,,60,1,1,,,1,1,,0,0,255,255,,,,JDC,0,25,,5,10,,,0,0,0
,0,,WLT,0,,,,,,,,,,,,HRM,,,EF,FE57BF,FE57BF,FFFD,EF,,,,SSR,1,2,1,5,1,,,IDA,0,1,50,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,,,,,30,0,,,,0,0,0,0,,,IDA,0,51,100,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,30,0,,,,0,0,0,0,,,
,IDA,0,101,150,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,30,0,,,,0,0,0,0,,,IDA,0,151,200,,,,,,,,,,,,,,,,,,,,,,,,,
,,,,,,,,,,,,,,,,,30,0,,,,0,0,0,0,,,IDA,0,201,250,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,30,0,,,,0,0,0,0,,,
,ACD,0,0,0,0,0,0,,,,PDS,0,0,,,,BZA,0,,,,0,0,0,,,0,0,0,,,0,0,0,,,0,0,0,,,,SPA,0,50,,60,0,,,70,,60,0,
,,90,,60,0,,,110,,60,0,,,,GPJ,1,31,15,,,,2,1,255,255,,FSC,,,,0,,,0,,,,CAN,1,0,0,65535,,,,MUT,
0,12,8,1,0,1,,,,CRA,0,5,0,,,,0,0,0,0,,OWL,0,,,
,,,,,,,,,,,,,,,,,60,,,,,20113102010725.1B73\$

Parameter	Length (byte)	Range/Format	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	0		
Current Packet	0		
BSI	3	BSI	BSI
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

SRI	3	SRI	SRI
Report Mode	1	0 – 6	
Reserved	0		
Buffer Mode	1	0 1 2	
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0 5 – 360min	
SACK Enable	1	0 1	
Protocol Format	1	0 1	0
SMS ACK Enable	1	0 1	0
Connection Retry Pattern	1	0 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ODO Enable	1	0 1	
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Power Saving Mode	1	0 – 2	
Reserved			
Event Mask	4	0000 – FFFF	

Reserved	0		
LED On	1	0 1	
Info Report Enable	1	0 1	
Info Report Interval	<=5	30 – 86400sec	
Location by Call	1	0 1 2	
Backup Battery Switch	1	0 1	
Backup Battery Charge Mode	1	0 1	
Reserved	0		
Reserved	0		
AGPS Mode	1	0 1	
GSM Report	4	0000 – FFFF	
GNSS Lost Time	2	0 – 30min	
Feature Switch Mask	2	00~FF	
Reserved	0		
Reserved	0		
Reserved	0		
TOW	3	TOW	TOW
Tow Enable	1	0 1	
Engine Off to Tow	<=2	5 – 15min	
Fake Tow Delay	<=2	0 – 10min	
Tow Interval	<=5	30 – 86400sec	
Tow Output ID	1	0 – 2 9-C	
Tow Output Status	1	0 1	
Tow Output Duration	<=3	0 – 255(×100ms)	
Tow Output Toggle Times	<=3	0 – 255	
Rest Duration	<=3	1 – 255(×15sec)	
Motion Duration	<=2	1 – 10(×100ms)	
Motion Threshold	1	2 – 4	
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0 1 2	
Min. Threshold	<=5	250 – 28000 mV	
Max. Threshold	<=5	250 – 28000 mV	
Sample Period	<=2	0 1 – 12(×2s)	
Debounce Time	1	0 – 5(×1s)	
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Sync with FRI	1	0 1	
Voltage Margin Error	3	0 – 100(×10mv)	0
Debounce Voltage Threshold	3	0 – 100 (×100mv)	0
Reserved	0		
DIS	3	DIS	DIS
Ignition Detection	1	0	0
Sample Period	<=2	0 1 – 12(×2s)	
MPF Debounce Time (only valid for GV65Plus)	<=2	0 1 – 12(×2s)	0
No Ignition	1	0 1	0
Input ID 1	1	1	1
Enable	1	0 1	
Debounce Time	<=2	0 – 20(×10ms)	
Validity Time	<=2	0 1 – 12(×2s)	0
Input ID 2	1	2	2

Enable	1	0 1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=2	0 1 – 12(×2s)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Last Position	1	0 1	0
Reserved	0		
Reserved	0		
OUT	3	OUT	OUT
DOS Report	1	0-3	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	0 – 7	
Trigger Mask	1	0 – 7	
Input Sample Period	<=2	0 1 – 12(×2s)	
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		

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

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

Reserved	0		
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 5 – 86400sec	
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
State Mode	1	0 1	0
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 – 3	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 5 – 86400sec	
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0

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

GEO ID4	1	4	4
Mode	1	0 – 3	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 5 – 86400sec	
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
State Mode	1	0 1	0
Reserved	0		
⋮	⋮	⋮	
GEO ID19	2	19	19
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 5 – 86400sec	
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
State Mode	1	0 1	0
Reserved	0		
SPD	3	SPD	SPD

Mode	1	0 1 2	
Min. Speed	<=3	0 – 400km/h	
Max. Speed	<=3	0 – 400km/h	
Validity	<=4	0 – 3600sec	
Send Interval	<=4	30 – 3600sec	
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 4	
Digital Input ID	1	0 – 2 9-C	
SOS Number	<=20		
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		

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

Ignition Frequency	<=3	10 – 120min	
Interval	<=2	1 – 30	
Time	4	HHMM	
Reserved	0		
Report Before Reboot	1	0 1	
Input ID	1	0 – 2 9-C	
Reserved	0		
GSM Interval	4	0 5-1440 min	60
PDP Interval	4	0 5-1440 min	60
No CAN Interval	4	0 5-1440 min	60
AIS	3	AIS	AIS
Mode	1	0 1 2 3 4 5	0
Range Switch	1	0 1	1
Min. Threshold	<=5	0 – 30000 mV	
Max. Threshold	<=5	0 – 30000 mV	
Sample Rate	<=2	0 1 – 12(×2s)	0
Reserved	0		
Output ID	1	0 – 2 9-C	
Output Active	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Fuel Data Debounce	2	0 – 150	10
Fuel Sensor Delay	<=3	0 – 600 sec	30
Fuel Loss Alarm	<=2	0 – 50	10
Fuel Sensor Sample Count	<=3	0 – 150	20
Reserved	0		
Voltage Margin Error	3	0 – 100(×10mv)	0
IDL	3	IDL	IDL
Mode	1	0 1	
Time to Idling	2	1 – 30 min	
Time to Movement	1	1 – 5 min	
Debounce Distance	<=4	0 100-9999m	
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Hour Meter Enable	1	0 1	

Initial Hour Meter Count	11	00000:00:00-99999:00:00	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
HBM Enable	1	0 1 2 3 4	
Reserved	0		
Reserved	0		
High Speed	≤ 3	100 – 400km/h	
ΔV_{hb}	≤ 3	0 – 100km/h	
ΔV_{ha}	≤ 3	0 – 100km/h	
Reserved	0		
Medium Speed	≤ 3	100 – 400km/h	
ΔV_{mb}	≤ 3	0 – 100km/h	
ΔV_{ma}	≤ 3	0 – 100km/h	
Reserved	0		
Reserved	0		
ΔV_{lb}	≤ 3	0 – 100km/h	
ΔV_{la}	≤ 3	0 – 100km/h	
Reserved	0		
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	≤ 3	0 – 255(×100ms)	
Toggle Times	≤ 3	0 – 255	
Cornering and Braking Threshold	≤ 3	30-70	

Cornering and Braking Duration	<=3	40-100(*8ms)	
Acceleration Threshold	<=3	15-50	
Acceleration Duration	<=3	50-250(*8ms)	
JDC	3	JDC	JDC
Mode	1	0 1	0
Signal Threshold	<=2	0 – 31	25
Reserved	0		
Jamming Cell Number Threshold	<=2	0 – 99	5
Enter Jamming Timer Threshold	<=3	0 – 300 sec	10
Quit Jamming Timer Threshold	<=4	0-3600sec	10
Reserved	0		
Output ID	1	0 – 2 9-C	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
WLT	3	WLT	WLT
Call Filter	1	0 1 4 5	0
Start Index	<=2	1 – 10	
End Index	<=2	1 – 10	
Phone Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HRM	3	HRM	HRM
Reserved	0		
Reserved	0		

ACK Mask	1	'0' – '9', 'a' – 'f', 'A' – 'F'	EF
Response Mask	4	'0' – '9', 'a' – 'f', 'A' – 'F'	FE57BF
Event Mask	4	'0' – '9', 'a' – 'f', 'A' – 'F'	FE57BF
Information Mask	2	'0' – '9', 'a' – 'f', 'A' – 'F'	FFFD
HBD Mask	1	'0' – '9', 'a' – 'f', 'A' – 'F'	EF
CRD Mask	2	0000-FFFF	7D
CAN Mask	8	00000000 – FFFFFFFF	7FF
Reserved	0		
Reserved	0		
SSR	3	SSR	SSR
Mode	1	0 1	0
Time to Stop	2	1 – 30 min	2
Time to Start	1	1 – 5 min	1
Start Speed	2	1 – 10 Km/h	5
Long Stop	3	0 – 255 min	0
Reserved	0		
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Mode	1	0 1 2	0
Start Index	1	1	1
End Index	1	50	50
ID Number List	<=8*20	'0' – '9', 'a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	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 – 2 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		
IDA	3	IDA	IDA
Mode	1	0 1 2	0
Start Index	1	51	51
End Index	1	100	100
ID Number List	<=8*20	'0' – '9', 'a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	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 – 2 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		
IDA	3	IDA	IDA
Mode	1	0 1 2	0
Start Index	1	101	101
End Index	1	150	150

ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	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 – 2 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		
IDA	3	IDA	IDA
Mode	1	0 1 2	0
Start Index	1	151	151
End Index	1	200	200
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	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 – 2 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		
IDA	3	IDA	IDA
Mode	1	0 1 2	0
Start Index	1	201	201
End Index	1	250	250
ID Number List	$\leq 8 \times 20$	'0' – '9', 'a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	≤ 3	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 – 2 9-C	0
Output Status	1	0 1	0
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	0
Toggle Times	≤ 3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
⋮	⋮	⋮	
IDA	3	IDA	IDA
Mode	1	0 1 2	0
Start Index	1	951	951
End Index	1	1000	1000
ID Number List	$\leq 8 \times 20$	'0' – '9', 'a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	≤ 3	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 – 2 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		
ACD	3	ACD	ACD
iButton Timer	<=2	0 1 – 10(s)	0
Output ID	1	0 – 2 9-C	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
EIO100 Connection	1	0 1	
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 9-C	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 2 Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 3 Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 4 Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GPJ	3	GPJ	GPJ
Mode	1	0 1	0
CW Threshold	<=2	0 - 31	15
BB Threshold	<=2	0 - 15	3
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 - 2 9-C	0
Output Status	1	0 1	
Duration	<=3	0 - 255(×100ms)	0
Toggle Times	<=3	0 - 255	0
Reserved	0		
RMD	3	RMD	RMD
Mode	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Home Operator List	<=6*10		
Reserved	0		
Reserved	0		
Roaming Operator List	<=6*100		
Reserved	0		

Reserved	0		
Black List Operator	$\leq 6 \times 20$		
Reserved	0		
Reserved	0		
Known Roaming Event Mask	≤ 6	000000 – FFFFFFFF	3FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	≤ 6	000000 – FFFFFFFF	3FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2 9-C	0
Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	0
Toggle Times	≤ 3	0 – 255	0
Reserved	0		
Reserved	0		
FFC	3	FFC	FFC
Priority	1	0	0
Mode	1	0-3	0
FRI Mode	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI Check Interval	≤ 5	0 – 86400sec	0
FRI IGN Report Interval	≤ 5	5-86400s	30
FRI Report Distance	≤ 5	50-65535m	500

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

Reserved			
Reserved			
Enable	1	0 1	0
Reserved			
Reserved			
Num of Node	<= 2	0 2 – 11	0
Node 1 Value	< = 5	0 – 99999	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	< = 4	0 – 99999	
Node N Percentage	<= 2	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
CAN	3	CAN	CAN
Mode	1	0 1	1
CAN Report Interval	<=5	0 5 – 86400sec	0
CAN Report Interval IGF	<=5	0 5 – 86400sec	0
CAN Report Mask	<=8	0 - FFFFFFFF	C03FFFFFF
Additional Event	1	0 1	0
Reserved			
Reserved			
Reserved			
Reserved			
MUT	3	MUT	MUT

Working Mode	<=2	0 17	0
Band 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			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
CRA	3	CRA	CRA
Mode	1	0 1	0
Sensitivity	1	1 – 9	5
Report ACC	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2 9-C	0
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
OWL	3	OWL	OWL
Mode	1	0 1	
Operator List 1	6		
.....			
Operator List 100	6		

TCP Connection Timeout	2	30-90min	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GAM	3	GAM	GAM
Mode	1	0 1	1
Speed Mode	1	0 1	1
Motion Speed Threshold	<=2	5-50km/h	10
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GNSS Fix Failure Timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OEX	3	OEX	OEX
DOS Report	1	0-F	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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		
IEX	3	IEX	IEX
Reserved	0		
Reserved	0		
Input Number	1	1 – 4	
Input ID	1	9 – C	
Sample Period	<=2	0 1 – 12(×4s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CMD	3	CMD	CMD
Mode	1	0 1	
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
Reserved			
Reserved			
Reserved			
Reserved			
GAM	3	GAM	GAM
Mode	1	0 1	1
Speed Mode	1	0 1	1
Motion Speed Threshold	<=2	5-50km/h	10
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GNSS Fix Failure Timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FVR	3	FVR	FVR
Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', ' ', _	
Configuration Version	4	0000 – 9999	
Command Mask	<=32	000000000000000000000000 00000000 – FFFFFFFFFFFFFFFFFFFFFFFF FFFFFFF	
GEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Stocmd ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Group ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Message Digest	32	'0'-'9'-'a'-'z' 'A'-'Z'	
Reserved	0		

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

- ✧ <Next Packet>: Whether the following information packet is the last one or not.
 - 0: The following packet is the last information packet.
 - 1: The following packet is not the last information packet.
- ✧ <Current Packet>: It indicates the first of several data packets if <Next Packet> is set to 1. The default is 1 if <Next Packet> is set to 0.

3.3.3.5. +RESP:GTCID

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

➤ **+RESP:GTCID,**

Example: +RESP:GTCID,310201,135790246811220,,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	\$	\$

3.3.3.6. +RESP:GTCSQ

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

➤ +RESP:GTCSQ,

Example: +RESP:GTCSQ,310201,135790246811220,,16,0,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CSQ RSSI	<=2	0 – 31 99	
CSQ BER	<=2	0 – 7	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

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

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

3.3.3.7. +RESP:GTVR

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:GTVR**.

➤ +RESP:GTVR,

Example: +RESP:GTVR,310201,135790246811220,,GV65,0100,0101,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	

Software Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

3.3.3.8. +RESP:GTBAT

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

➤ **+RESP:GTBAT,**

Example: +RESP:GTBAT,310201,135790246811220,,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 Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery Voltage	<=4	0.00 – 4.16V	
Charging	1	0 1	
LED On	1	0 1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.9. +RESP:GTIOS

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

➤ **+RESP:GTIOS,**

Example: +RESP:GTIOS,310201,153759012345670,gv65,,0,,01,01,20150324140404,0364\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Analog Input VCC	<=5	0 – 30000 mV	
Reserved	0		
Digital Input Status	4	0000 – 0F07	
Digital Output Status	4	0000 – 0F03	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ *<Digital Input Status>*: The first two characters indicate the status of EIO100 inputs. For each bit, 0 means “Disable status”, and 1 means “Enable status”. If EIO100 device is not connected or the mode of **AT+GTMUT** 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

The last two characters represent the status of ignition detection, digital input1 and digital input2.

Input Status Mask	ID
Ignition Detection	0x01
Digital Input1	0x02
Digital Input2	0x04

- ✧ **<Digital Output Status>**: The first two characters indicate the status of EIO100 outputs. For each bit, 0 means “Disable status”, and 1 means “Enable status”. If EIO100 device is not connected or the mode of **AT+GTMUT** is not for EIO100, it is empty.

- 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

The last two characters represent the status of digital output1 and digital output2.

Output Status Mask	ID
Digital Output1	0x01
Digital Output2	0x02

3.3.3.10. +RESP:GTTMZ

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

➤ **+RESP:GTTMZ,**

Example:			
+RESP:GTTMZ,310201,135790246811220,,+0800,0,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0 1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.11. +RESP:GTGTS

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

➤ **+RESP:GTGTS,**

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GSM State	1	0-5	
GPRS State	1	0-5	
Send State / PDP State	2	0 – 5 0 – 3	
CSQ RSSI / BER	<=4	0 – 31 or 99 0 – 7	
Message Queued Number / Message Buffered Number	<=6	0 – 10 0 – 10000	
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <GSM State>: The current state of GSM network.

- 0: Not registered, not searching for a new operator
- 1: Registered
- 2: Not registered, searching for a new operator
- 3: Registering
- 4: Unknown
- 5: Registered, roaming

✧ <GPRS State>: The current state of GPRS network.

- 0: No registered, not searching for a new operator
- 1: Registered
- 2: Not registered, searching for a new operator
- 3: Registering
- 4: Unknown
- 5: Registered, roaming

✧ <Send State / PDP State>: The item before the symbol '/' is <Send State>, and the item after the symbol '/' is <PDP State>.

<Send State>: The state of sending data.

- 0: Initial state
- 1: No service
- 2: Idle state

- 3: Activating GPRS
- 4: Establishing TCP or UDP connection
- 5: Sending data to the backend server
- 6: Reset

<PDP State>: The state of PDP context activation.

- 0: The PDP context is deactivated.
- 1: The PDP context is being activated.
- 2: The PDP context is activated.
- 3: The PDP context is being deactivated.

✧ <CSQ RSSI / CSQ BER>: The item before the symbol '/' is <CSQ RSSI>, and the item after the symbol '/' is <CSQ BER>.

<CSQ RSSI>: The signal strength level.

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

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

✧ <Message Queued Number / Message Buffered Number>: The item before the symbol '/' is <Message Queued Number>, and the item after the symbol '/' is <Message Buffered Number>. <Message Queued Number> represents the number of messages in the queue to be sent. <Message Buffered Number> represents the number of messages to be buffered.

3.3.3.12. +RESP: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,310504,869158008709145,gv65,2.2.1d,,,,,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'	
CAN100 Serial Number	<=10	'0' – '9' 'a' – 'z'	
Reserved			

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

- ✧ <CAN100 SW Version>: The software version of the CAN100 device.
- ✧ <CAN100 Serial Number>: The Serial Number of the CAN100 device.

3.3.3.13. +RESP:GTGSV

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

➤ **+RESP:GTGSV,**

Example:

+RESP:GTGSV,360304,862193022019434,,15,3,42,4,48,14,39,16,43,22,44,23,36,25,0,26,47,27,29,29,26,31,45,32,41,40,0,42,36,50,37,20160405133851,000B\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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 GNSS finds.
- ✧ <SV ID>: The satellite ID.
- ✧ <SV Power>: Satellite power. In case of no satellite, the field is filled with zero.

3.3.3.14. +RESP:GTRSV

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

➤ **+RESP:GTRSV,**

Example: +RESP:GTRSV,360304,862193022019434,,,15,3,42,4,48,14,39,16,43,22,44,23,36,25,0,26,47,27,29,29,26,31,45,32,41,40,0,42,36,50,37,20160405133851,000B\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	20		
SV Count	2	0-32	
SV ID	2	> =0	
SV Power	2	> =0	
⋮			
SV ID	2	> =0	
SV Power	2	> =0	
Ver	10	HHHHSSPPPP	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <SV Count>: The number of satellites the GLONASS finds.
- ✧ <SV ID>: Satellite ID. In case of no satellite, this field is filled with zero.
- ✧ <SV Power>: Satellite power. In case of no satellite, this field is filled with zero.

3.3.3.15. +RESP:GTCML

After the device receives the command **AT+GTRTO** to get the car model with which CAN100 works, it will send the information to the backend server via the message **+RESP:GTCML**.

➤ **+RESP:GTCML,**

Example:

+RESP:GTCML,310504,869158008709145,gv65,2.2.1d,,,,,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 Car Model ID	<=5	0-65535	
CAN100 Car Name	<=50	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <CAN100 Car Model ID>: The model ID of the car with which CAN100 device works. If the value is 0, it means that no model has been obtained.
- ✧ <CAN100 Car Name>: It indicates human readable make and model of the car.

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 (Valid only for GV65Plus)
- +RESP:GTMPF: The report for disconnecting main power supply (Valid only for GV65Plus)
- +RESP:GTBTC: Backup-battery-starts-charging report (Valid only for GV65Plus)
- +RESP:GTSTC: Backup-battery-stops-charging report (Valid only for GV65Plus)
- +RESP:GTBPL: Backup battery low (reported 4 times before power off) (Valid only for GV65Plus)
- +RESP:GTSTT: Device motion state reported when the motion state changes
- +RESP:GTANT: External GNSS antenna status reported when the state changes
- +RESP:GTPDP: GPRS connection establishment report
- +RESP:GTIGN: Ignition on report
- +RESP:GTIGF: Ignition off report
- +RESP:GTIDN: Enter into idling status
- +RESP:GTIDF: Leave idling status
- +RESP:GTJDR: Jamming indication when the <Mode> in the **AT+GTJDC** command is set to 1
- +RESP:GTJDS: Jamming indication when the <Mode> in the **AT+GTJDC** command is set to 2
- +RESP:GTGSM: The report for the information of the serving cell and the neighbor cells

- +RESP:GTGSS:** GNSS signal status
- +RESP:GTSTR:** Vehicle enters into Start status
- +RESP:GTSTP:** Vehicle enters into Stop status
- +RESP:GTLSP:** Vehicle enters into Long Stop status
- +RESP:GTDOS:** Status of wave shape 1 output changes
- +RESP:GTGPJ:** GNSS jamming status report
- +RESP:GTFLA:** Unusual fuel consumption alarm
- +RESP:GTCAN:** CANBUS device information report
- +RESP:GTRMD:** The report for entering or leaving GSM roaming state
- +RESP:GTCFU:** The device will send the message **+RESP:GTCFU** to the backend server during the CAN100 FOTA upgrade process.
- +RESP:GTMOA:** Mobileye System Alert report (only ASCII format supported)

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

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

Example:

```
+RESP:GTPNA,310201,135790246811220,,20090214093254,11F0$
+RESP:GTPFA,310201,135790246811220,,20090214093254,11F0$
+RESP:GTPDP,310201,135790246811220,,20090214093254,11F0$
```

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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,310201,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,200902140132
54,0460,0000,18d8,6141,00,20090214093254,11F0$
```

+RESP:GTMPF,310201,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0\$ +RESP:GTBTC,310201,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0\$ +RESP:GTCRA,220200,863286020138401,,0,,,,,117.201481,31.832936,20141226015711,,,,,,000E\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

➤ **+RESP:GTJDR,**

Example: +RESP:GTJDR,310201,135790246811220,,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 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

➤ **+RESP:GTJDS,**

Example: +RESP:GTJDS,310201,135790246811220,,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 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'	
Jamming Status	1	1 2	
GNSS Accuracy	<=2	0	0, Last known

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

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

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

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

➤ **+RESP:GTRMD,**

Example:

+RESP:GTRMD,310201,135790246811220,,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	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Roaming State	1	0-3	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	

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

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

- 0: Home
- 1: Known Roaming
- 2: Unknown Roaming
- 3: Blocking Report

➤ **+RESP:GTSTC,**

Example: +RESP:GTSTC,310201,135790246811220,,,0,4.3,92,70.0,121.354335,31.222073,200902140132 54,0460,0000,18d8,6141,00,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	

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

➤ **+RESP:GTBPL,**

Example: +RESP:GTBPL,310201,135790246811220,,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 Voltage	<=4	0.00 – 4.16 V	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	

Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTSTT,****Example:**

+RESP:GTSTT,310201,135790246811220,,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 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion Status	2	11 12 21 22 41 42 16	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ **<Motion Status>**: The current motion status of the device.

- **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 deemed to be towed.
- 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motionless.
- 22 (**Ignition On Motion**): The device attached vehicle is ignition on and it is moving.
- 41 (**Sensor Rest**): The device attached vehicle is motionless without ignition signal detected.
- 42 (**Sensor Motion**): The device attached vehicle is moving without ignition signal detected.

➤ +RESP:GTANT,

Example:			
+RESP:GTANT,310201,135790246811220,,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 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External GNSS Antenna	1	0 1 3	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

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

➤ +RESP:GTIGN,

Example: +RESP:GTIGN,310201,153759012345670,gv65,1111,0,0.4,0,112.1,121.389694,31.166979,20150320093414,0000,0000,0000,0000,00,,0.6,20150320175239,0208\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition Off	<=6	0 – 999999 sec	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

➤ **+RESP:GTIGF,**

Example:			
+RESP:GTIGF,310201,153759012345670,gv65,0,0,,,,0,0,,0000,0000,0000,0000,00,,0.5,20150322083448,2599\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition On	<=6	0 – 999999 sec	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	

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

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

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

Example:

```
+RESP:GTIDN,310201,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,200902140132
54,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
+RESP:GTSTR,310201,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,200902140132
54,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
+RESP:GTSTP,310201,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,200902140132
54,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
+RESP:GTLSP,310201,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,200902140132
54,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$
```

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

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

➤ **+RESP:GTIDF,****Example:**

+RESP:GTIDF,310201,135790246811220,,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 Status	2	11 12 16 22	
Duration of Idling Status	<=6	0 – 999999 sec	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	

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

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

➤ **+RESP:GTGSM,**

Example: +RESP:GTGSM,310201,135790246811220,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 FRI GIR	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4		
Cell ID1	4		
RX Level1	2	0-63	
Reserved	2	00	
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
Cell ID2	4		
RX Level2	2	0-63	
Reserved	2	00	
MCC3	4	0XXX	
MNC3	4	0XXX	

LAC3	4		
Cell ID3	4		
RX Level3	2	0-63	
Reserved	2	00	
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
Cell ID4	4		
RX Level4	2	0-63	
Reserved	2	00	
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	4		
RX Level5	2	0-63	
Reserved	2	00	
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4		
Cell ID6	4		
RX Level6	2	0-63	
Reserved	2	00	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	4		
RX Level	2	0-63	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

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

Note:

- 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.
- "ffff" in the fields of **<LAC(i)>** and **<Cell ID(i)>** means the terminal doesn't know the value.
- This message cannot be sent via SMS.

➤ **+RESP:GTGSS,**

Example:			
+RESP:GTGSS,310201,135790246811220,,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 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	≤20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Signal Status	1	0 1	
Satellite Number	2	0 - 24	

Motion Status	2	11 12 21 22 41 42 16	
Reserved	0		
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <GNSS Signal Status>: 0 means “GNSS signal lost or no successful GNSS fix”, and 1 means “GNSS signal recovered and successful GNSS fix”.
- ✧ <Satellite Number>: The number of visible satellites when a fix is successful. If a fix fails, the parameter is empty.
- ✧ <Motion Status>: The current motion status of the device.
 - 16 (**Tow**): The device attached vehicle is ignition off and it is towed.
 - 11 (**Ignition Off Rest**): The device attached vehicle is ignition off and it is motionless.
 - 12 (**Ignition Off Motion**): The device attached vehicle is ignition off and it is moving before it is deemed to be towed.
 - 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motionless.
 - 22 (**Ignition On Motion**): The device attached vehicle is ignition on and it is moving.
 - 41 (**Sensor Rest**): The device attached vehicle is motionless without ignition signal detected.
 - 42 (**Sensor Motion**): The device attached vehicle is moving without ignition signal detected.

➤ +RESP:GTDOS,

Example:

+RESP:GTDOS,310201,153759012345670,gv65,1,1,0,0.1,330,22.7,121.390934,31.164596,20150324023057,0000,0000,0000,0000,00,20150324103058,0FA0\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Wave1 Output ID	1	1-2 9-C	
Wave1 Output Active	1	0 1	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	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:GTGPJ,

Example:

+RESP:GTGPJ,310201,135790246811220,,16,1,0,4.3,92,70.0,121.354335,31.222073,200902140

13254,0460,0000,18d8,6141,00,20090214093254,11F0\$			
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' '-' '_'	
CW Jamming Value	<=3	0-255	
GNSS Jamming State	2	0 1 3	
GNSS 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	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <CW Jamming Value>: The current continuous wave jamming value.

✧ <GNSS Jamming State>: The current jamming state.

- 0: Unknown or feature disabled
- 1: (OK) No significant jamming
- 2: Reserved.
- 3: (Critical) Interference visible and no fix

➤ +RESP:GTFLA,

Example:

+RESP:GTFLA,310201,135790246811220,gv65,,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' '-' '_'	
Reserved	0		
Ignition Off Fuel Level	<=4	0 - 100	
Ignition On Fuel Level	<=4	0 - 100	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Ignition Off Fuel Level>: The fuel level saved before last ignition off.
- ✧ <Ignition On Fuel Level>: The fuel level after the current ignition on.

CAN100 FOTA Upgrade Report

The device will send the message **+RESP:GTCFU** to the backend server during the CAN100 FOTA upgrade process.

➤ **+RESP:GTCFU,**

Example:

+RESP:GTCFU,250513,862170011507322,,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	100 101 102 110 111 112 200 201 202 210 211 212 300 301 302 310 311 312	
New Version (Optional)	<=10	'0'-'9', 'a'-'z'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Code>: Information code.

- 100/110: Upgrade confirmed to be OK. Start upgrade.
- 101/111: Baud rate error. UART does not work for CAN100. Stop upgrade.
- 102/112: Low power. Stop upgrade.
- 200/210: Start to download package.
- 201/211: Package download succeeds.
- 202/212: Package download fails.
- 300/310: Start upgrade.
- 301/311: Upgrade succeeds. The optional parameter is used as follows.

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

- 302/312: Upgrade fails.

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

Note: The codes listed before "/" as described above in <Code> including 100, 101, 102, 200, 201, 202, 300, 301 and 302 indicate the firmware update information, while the codes listed after "/" such as 110, 111, 112, 210, 211, 212, 310, 311 and 312 indicate the configuration update information.

+RESP:GTUPC: The report for information about configuration update.

➤ **+RESP:GTUPC,**

Example: +RESP:GTUPC,310601,135790246811220,,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	100 101 102 103 200 201 202 300 301 302 304 305 306	
Download URL	<=100	Complete URL	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	\$	\$

- ✧ **<Command ID>**: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the response code is 301. It indicates wrong format of command ID when the response code is 302.
- ✧ **<Result>**: A code to indicate whether the configuration is updated successfully.
 - 100: The update command is starting.
 - 101: The update command is confirmed by the device.
 - 102: The update command is refused by the device.
 - 103: The update process is refused because the battery is low.
 - 200: The device starts to download the package.
 - 201: The device finishes downloading the package successfully.
 - 202: The device fails to download the package.
 - 300: The device starts to update the device configuration.
 - 301: The device finishes updating the device configuration successfully.
 - 302: The device fails to update the device configuration.
 - 303: Reserved
 - 304: **<Command Mask>**, **<GEO ID Mask>**, **<Stocmd ID Mask>** or **<Group ID Mask>** check fails.
 - 305: The update process is interrupted by abnormal reboot.
 - 306: The update process is interrupted by md5 verification error.
- ✧ **<Download URL>**: The complete URL to download the configuration. It includes the file name.

➤ **+RESP:GTEUC,**

Example: +RESP:GTEUC,310601,135790246811220,,1,http://www.queclink.com/configure.ini,2,,,,,20150201000000,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9', 'a'-'z', 'A'-'Z'	
Command ID	<=3		
Result	3	100 101 102 103 200 201 202 300 301 302 304 305	
Download URL	<=100	Complete URL	

Identifier Number	8	000000000-FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	\$	\$

- ✧ **<Command ID>**: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the result code is 301. It indicates wrong format of command ID when the result code is 302.
- ✧ **<Result>**: A numeral to indicate whether the configuration is updated successfully.
 - 100: The update command is starting.
 - 101: The update command is confirmed by the device.
 - 102: The update command is refused by the device.
 - 103: The update process is refused because the battery is low.
 - 200: The device starts to download the package.
 - 201: The device finishes downloading the package successfully.
 - 202: The device fails to download the package.
 - 300: The device starts to update the device configuration.
 - 301: The device finishes updating the device configuration successfully.
 - 302: The device fails to update the device configuration.
 - 303: Reserved.
 - 304: **<Command Mask>**, **<GEO ID Mask>**, **<Stocmd ID Mask>** or **<Group ID Mask>** check fails.
 - 305: The update process is interrupted by abnormal reboot.
- ✧ **<Download URL>**: The complete URL to download the configuration. It includes the file name.
- ✧ **<Identifier Number>**: Please refer to the parameter **<Identifier Number>** in the command **AT+GTUPC**.

3.3.5. Buffer Report

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

- ✧ GSM network is not available.
- ✧ GPRS context activation for the TCP or UDP connection fails.
- ✧ Establishment of the TCP connection with the backend server fails.

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

Detailed information about buffer report is given below.

- ✧ Only **+RESP** messages except **+RESP:GTALM**, **+RESP:GTPDP**, **+RESP:GTHBD** and **+RESP:GTALC** are buffered.
- ✧ In the buffer report, the original header string “**+RESP**” is replaced by “**+BUFF**” while the other content including the original sending time and count number is kept unchanged.
- ✧ Buffered messages will be sent only via GPRS by TCP or UDP protocol. They cannot be sent via SMS. Even if the current report mode is forced SMS mode, the buffered messages will be sent via TCP short connection.
- ✧ The buffered messages will be sent after the real-time messages if *<Buffer Mode>* in **AT+GTSRI** is set to 1.
- ✧ The buffered messages will be sent before the real-time messages if *<Buffer Mode>* in **AT+GTSRI** is set to 2. The SOS message has the highest priority and is sent before the buffered messages.

Example:

The following is an example of the buffered message:

+BUFF:GTFRI,310201,868034001000579,gv65,0,10,1,1,0.4,60,56.6,117.201309,31.833082,20130107182151,0460,0000,5678,2079,00,21188.6,,,,100,310201,,,,20130107182154,01B8\$

3.3.6. Report with Google Maps Hyperlink

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

➤ Google Maps Hyperlink

Example: gv65: <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	
GNSS Fix	<=3	F0 F1 – F50	
GNSS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	

- ✧ *<GNSS Fix>*: The accuracy of the location information. F0 means “No GNSS fix”.

3.3.7. 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,310201,153759012347650,gv65,0,1,C03FFFFF,,2,H89394,63.14,200,0,87,,P43.60,0,0,17.53,11.61,5.92,0.00,0,0,4002,0,1,0.76,35.00,0,,,,0,0,,0000,0000,0000,0000,00,20040101000052,05A6\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Distance Type / Report Type	2	X(0-1)X(0-2)	
CANBUS Device State	1	0 1	
CANBUS Report Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' – '9' 'A' – 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0 1 2	
Total Distance	<=12	H(0 – 99999999)/I(0 – 2147483647)	
Total Fuel Used	<=9	0 .00 – 999999.99L	
Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 - 455Km/h	
Engine Coolant Temperature	<=4	-40 – +215 °C	
Fuel Consumption	<=5	0.0– 99999.9L/100km L/H	
Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100)	
Range	<=8	0 – 99999999hm	
Accelerator Pedal Pressure	<=3	0 – 100%	
Total Engine Hours	<=8	0.00 – 99999.99h	

Total Driving Time	<=8	0.00 – 99999.99h	
Total Engine Idle Time	<=8	0.00 – 99999.99h	
Total Idle Fuel Used	<=9	0.00 – 999999.99L	
Axle Weight 2nd	<=5	0 – 65535kg	
Tachograph Information	4	00-FFFF	
Detailed Information / Indicators	4	00-FFFF	
Lights	2	0-FF	
Doors	2	0-FF	
Total Vehicle Overspeed Time	<=8	0.00 – 99999.99h	
Total Engine Overspeed Time	<=8	0.00 – 99999.99h	
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	
Ad-Blue Level	<=3	0-100%	
Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0 1	
Tachograph Vehicle Motion Signal	1	0 1	
Tachograph Driving Direction	1	0 1	
Analog Input Value	<=5	0-99999mv	
Engine Braking Factor	<=6	0-999999	
Pedal Braking Factor	<=6	0-999999	
Total Accelerator Kick-Downs	<=6	0-999999	
Total Effective Engine Speed Time	<=8	0.00 – 99999.99h	

Total Cruise Control Time	<=8	0.00 – 99999.99h	
Total Accelerator Kick-Down Time	<=8	0.00 – 99999.99h	
Total Brake Applications	<=6	0-999999	
Tachograph Driver 1 Card Number	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', ' ', '_'	
Tachograph Driver 2 Card Number	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', ' ', '_'	
Tachograph Driver 1 Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', ' ', '_'	
Tachograph Driver 2 Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', ' ', '_'	
Registration Number	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', ' ', '_'	
Expansion Information	4	00-FFFF	
Rapid Brakings	<=6	0-999999	
Rapid Accelerations	<=6	0-999999	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	\$	\$
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- ✧ **<Distance Type / Report Type>**: It indicates the type of total distance (unit: hm) and the report type.
<Distance Type> has two meanings:
 - 0: Total distance acquired from CAN100.
 - 1: Total distance obtained by calculation with GNSS.**<Report Type>** has three meanings:
 - 0: Periodic report.
 - 1: RTO CAN report.
 - 2: Ignition event report.
- ✧ **<CANBUS Device State>**: A numeral to indicate the state of communication with the CANBUS device.
 - 0: Abnormal. Failed to receive data from the CANBUS device.
 - 1: Normal. Able to receive data from the CANBUS device.
- ✧ **<VIN>**: Vehicle identification number.
- ✧ **<Ignition Key>**: A numeral to indicate the ignition status.
 - 0: Ignition off.
 - 1: Ignition on.
 - 2: Engine on.
- ✧ **<Total Distance>**: Vehicle total distance. The number is always increasing. The unit is hectometer (H) or impulse (I) (if distance from dashboard is not available).
- ✧ **<Total Fuel Used>**: 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 hectometer to drive on remaining fuel. The unit is hectometer.
- ✧ **<Vehicle Speed>**: The vehicle speed based on wheel. The unit is km/h.
- ✧ **<Engine RPM>**: The revolutions per minute. The unit is rpm.
- ✧ **<Accelerator Pedal Pressure>**: The unit is percent.
- ✧ **<Engine Coolant Temperature>**: The unit is Celsius. Negative value is preceded by a negative sign (-), e.g. "-2". There is no extra character before a positive value (e.g. "20").
- ✧ **<Fuel Consumption>**: The fuel consumption of the vehicle. It is a value with one decimal place. The unit is L/100Km(M) or L/H(H).
- ✧ **<Tachograph Information>**: Two bytes. The high byte describes driver 2, and the low byte describes driver 1.

Format of each byte:

V	R	W1	W0	C	T2	T1	T0
---	---	----	----	---	----	----	----

V: Validity mark (0 – valid driver data, 1 – no valid data)

R: Reserved

C: Driver card (1 – card inserted, 0 – no card inserted)

T2-T0: Driving time related states:

- 0: Normal / no limits reached
- 1: 15 min before 41 h
- 2: 41 h reached

- 3: 15 min before 9 h
- 4: 9 h reached
- 5: 15 min before 16 h (without 8h rest during the last 24h)
- 6: 16 h reached
- 7: Other limit

W1-W0: Driver working states:

- 0: Rest - sleeping
- 1: Driver available – short break
- 2: Work – loading, unloading, working in an office
- 3: Drive – behind the wheel

✧ <Detailed Information / Indicators>: A hexadecimal number. Each bit contains information of one indicator.

- Bit 0: FL – fuel low indicator (1 – indicator on, 0 – off)
- Bit 1: DS – driver seatbelt indicator (1 – indicator on, 0 – off)
- Bit 2: AC – air conditioning (1 – on, 0 – off)
- Bit 3: CC – cruise control (1 – active, 0 – disabled)
- Bit 4: B – brake pedal (1 – pressed, 0 – released)
- Bit 5: C – clutch pedal (1 – pressed, 0 – released)
- Bit 6: H – handbrake (1 – pulled up, 0 – released)
- Bit 7: CL – central lock (1 – locked, 0 – unlocked)
- Bit 8: R – reverse gear (1 – engaged, 0 – disengaged)
- Bit 9: RL – running lights (1 – on, 0 – off)
- Bit 10: LB – low beams (1 – on, 0 – off)
- Bit 11: HB – high beams (1 – on, 0 – off)
- Bit 12: RFL – rear fog lights (1 – on, 0 – off)
- Bit 13: FFL – front fog lights (1 – on, 0 – off)
- Bit 14: D – doors (1 – any door opened, 0 – all doors closed)
- Bit 15: T – trunk (1 – opened, 0 – closed)

✧ <Lights>: A hexadecimal number. Each bit contains information of one particular light.

- Bit 0: Running Lights (1 – on, 0 – off)
- Bit 1: Low beam (1 – on, 0 – off)
- Bit 2: High beam (1 – on, 0 – off)
- Bit 3: Front fog light (1 – on, 0 – off)
- Bit 4: Rear fog light (1 – on, 0 – off)
- Bit 5: Hazard lights (1 – on, 0 – off)
- Bit 6: Reserved
- Bit 7: Reserved

✧ <Doors>: A hexadecimal number. Each bit contains information of one door.

- Bit 0: Driver door (1 – opened, 0 – closed)
- Bit 1: Passenger door (1 – opened, 0 – closed)
- Bit 2: Rear left door (1 – opened, 0 – closed)
- Bit 3: Rear right door (1 – opened, 0 – closed)
- Bit 4: Trunk (1 – opened, 0 – closed)
- Bit 5: Hood (1 – opened, 0 – closed)

- Bit 6: Reserved
- Bit 7: Reserved
- ✧ <Total Vehicle Overspeed Time>: The total time when the vehicle speed is greater than the speed limit defined in CAN-Logistic's configuration.
- ✧ <Total Engine Overspeed Time>: The total time when the vehicle engine speed is greater than the speed limit defined in CANLogistic's configuration.
- ✧ <Ad-Blue Level>: The level of Ad-Blue.
- ✧ <Axle Weight 1st>: Vehicle's first axle weight. Unit: Kg.
- ✧ <Axle Weight 3rd>: Vehicle's third axle weight. Unit: Kg.
- ✧ <Axle Weight 4th>: Vehicle's fourth axle weight. Unit: Kg.
- ✧ <Tachograph Overspeed Signal>: Vehicle overspeed signal from the tachograph. The value 1 indicates "Overspeed detected". The value 0 indicates "No overspeed detected".
- ✧ <Tachograph Vehicle Motion Signal>: The vehicle motion signal from the tachograph. The value 1 indicates "Motion detected". The value 0 indicates "No motion detected".
- ✧ <Tachograph Driving Direction>: Vehicle driving direction from the tachograph.
- ✧ <Analog Input Value>: The value of analog input.
- ✧ <Rapid Brakings>: The count of rapid brakings of the vehicle.
- ✧ <Engine Braking Factor>: It measures how often the driver brakes with brake pedal or with engine and CAN100 stores both counts (always increasing). Decreasing speed with no pedal pressed causes an increase in engine braking factor.
- ✧ <Pedal Braking Factor>: It measures how often the driver brakes with brake pedal or with engine and CAN100 stores both counts (always increasing). Decreasing speed with brake pedal pressed causes an increase in pedal braking factor.
- ✧ <Total Accelerator Kick-Downs>: The count of accelerator pedal kick-downs (with the pedal pressed over 90%).
- ✧ <Total Effective Engine Speed Time>: Total time when the vehicle engine speed is effective. The unit is hour.
- ✧ <Total Cruise Control Time>: Total time when the vehicle speed is controlled by cruise control module. The unit is h.
- ✧ <Total Accelerator Kick-Down Time>: Total time when accelerator pedal is pressed over 90%. The unit is hour.
- ✧ <Total Brake Applications>: The count of brake pedal applications defined as braking process initiated by brake pedal.
- ✧ <Tachograph Driver 1 Card Number>: The card number of driver 1 from the tachograph.
- ✧ <Tachograph Driver 2 Card Number>: The card number of driver 2 from the tachograph.
- ✧ <Tachograph Driver 1 Name>: The name of driver 1 from the tachograph.
- ✧ <Tachograph Driver 2 Name>: The name of driver 2 from the tachograph.
- ✧ <Registration Number>: The vehicle registration number.
- ✧ <Expansion Information>: A hexadecimal number. Each bit contains information of one indicator.
 - Bit 0: W – webasto (1 – on, 0 – off or not available).
 - Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
 - Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
 - Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)

- Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
 - Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
 - Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
 - Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
 - Bit 8: Reserved
 - Bit 9: CHK – “check engine” indicator (1 – on, 0 – off or not available)
 - Bit 10: AIR – airbags indicator (1 – on, 0 – off or not available)
 - Bit 11: SC – service call indicator (1 – on, 0 – off or not available)
 - Bit 12: OLL – oil level low indicator (1 – on, 0 – off or not available)
- ✧ <Rapid Brakings>: The total number of rapid brakings since installation (calculation based on CAN-Logistic’s settings of speed decrease time and value).
- ✧ <Rapid Accelerations>: The total number of rapid accelerations since installation (calculation based on CAN-Logistic’s settings of speed increase time and value).

3.3.8. Crash Data Packet

The **+RESP:GTCRD** message contains 10s tri-axial acceleration data before crash and after crash. When a crash accident is detected, the 10s tri-axial acceleration data before the crash occurs 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 the backend server packed with another three frames.

➤ **+RESP:GTCRD,**

Example:

```
+RESP:GTCRD,310201,863286020138401,,0,3,1,FFFB00030058FFFB0004005AFFFC0002005BFFF
900010059FFFC0003005AFFFC0004005AFFFD00040059FFFB0005005CFFFC0004005DFFFB0004
0058FFFC0002005AFF90001005AFFFE0002005BFFFB0001005BFFFB0001005BFFFC0003005AFF
FE0003005BFFFB0003005AFFFC0003005DFFFE00040057FFFC0001005AFFFC0003005AFFFC0001
0058FFFB0003005AFFFB0002005BFFFA0004005AFFFE0005005BFFFC0002005CFFFE0002005EFF
FD0003005BFFFE0004005CFFFD00010058FFFD00020058FFFC00050059FFFC0001005CFFFC0000
005AFFFD0002005BFFFC0004005BFFFC0005005CFFFC0001005DFFFC0002005CFFFE00030059FF
FC00050059FFFE0003005AFFFA00030059FFFB0001005BFFFC00020056FFFB0002005CFFFB0004
005AFFFC00040058FFFB0000005DFFFD0004005DFFFC00030059FFFC0004005CFFFC0003005CF
FFC0002005AFFFB0003005CFFFD00010059FFFD00040058FFFC0001005BFFFD00020059FFFA00
01005BFFFB0002005AFFFC00030059FFFB0003005DFFFC00030059FFFE0002005BFFFA0001005C
FFFD0005005CFFFD00020059FFFA0003005BFFFB0004005AFFFB0002005DFFFF0002005BFFFB0
0060059FFFB00030058FFFC0003005AFFFC00020059FFFF0003005CFFFE0002005CFFFD0002005
7FFFC0001005AFFFC0004005AFFFC,,000F$
```

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

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Data Type	1	0 1	
Total Frame	1	3	
Frame Number	1	1 – 3	
Data	1000	'0'-'9' 'a'-'f'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Data Type>: The data reported to the backend server is recorded before or after crash.
 - 0: Before crash.
 - 1: After crash.
- ✧ <Total Frame>: The total number of messages that are sent to the backend server for the crash event.
- ✧ <Frame Number>: A numeral to indicate the sequence of the current message.
- ✧ <Data>: There are at most 1000 ASCII characters in the message with 12 characters as a group. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data. The ASCII "0001" means HEX value "0x0001", so the acceleration is 1. The ASCII "ffff" means HEX value "0xFFFF" which is the compliment of -3, so the acceleration is -3.

Example:

+RESP:GTCRD,310201,359231038715676,,0,3,1,000100010055... ,20120330120443,005C\$

This is the oldest XYZ-axis acceleration data:

Conversion to hex format: X (axis acceleration data) = 0x0001; Y = 0x0001; Z = 0x0055;

Decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;

+RESP:GTCRD,310201,359231038715676,,1,3,3,...ffffff10052,20120330115736,005A\$

This is the last XYZ-axis acceleration data:

Conversion to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFFF1; Z = 0x0052;

Decimal format: X (axis acceleration data) = -1; Y = -15; Z = 82;

Note: Acceleration of gravity (+g) is 82 in decimal format and -g is -82. The linear acceleration data 1312 represents +16g and -1312 represents -16g.

3.3.9. 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,310201,863286020138401,,fffc00090059fffc000a005afffc000a0057fffb0008005afffd0009005afffb00070058fffc00090058fffb00090057fffd00090054fffc00080059fffc0008005cfff
b00090059fffc00090058fffb0009005afffd00080058fffe00080056fffb00090058fffb00090059fffb
00090055fffc00090057fffd0008005bfff00080059fffd00080056fffb00080057fffd000a0059fffb0
009005afffc00080058fffd0009005affff00060058fff900080057fffd00090057fffe000a0057fffc000
a0059fffb00090058fffd00090059fffd00090058fffa0007005bfff00090059fffd00080058fffe0009
0059fffa00090059fffc00090057fffc00090059fffa00090059fffe00090056fffc000a0057fffa000900
5afffb00090058fffa0009005cfff00090059fffc0009005afffc0009005afffa00090057fffd0009005
9fffb00090057fffc000b005afffb0008005bfff00080059fffc0008005bffa00090056fffc00080058f
ffd00090058fffc000a0056fffb00080059fffb0008005bffd0009005afffd00090059fffc00090058fff
d0009005afffb0009005afffb00090057fffd0009005cfff00090057fffc00090059fffe0009005b,,,,,2
0141226015738,0019$
```

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Data	12*75	'0'-'9' 'a'-'f'	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Data>: There are 12*75 ASCII characters in the message with 12 characters as a group. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data. The ASCII "0001" means HEX value "0x0001", so the acceleration is 1. The ASCII "ffff" means HEX value "0xFFFF" which is the compliment of -3, so the acceleration is -3.

Example:

```
+RESP:GTACC,310201, 868034001591569 ,000100010055...,,,20120330120443,005C$
```

This is the oldest XYZ-axis acceleration data:

Conversion to hex format: X (axis acceleration data) = 0x0001; Y = 0x0001; Z = 0x0055;

Equal to decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;

```
+RESP:GTACC,310201, 868034001591569 , fffffff10052...,,,20120330120443,005C$
```

This is the last XYZ-axis acceleration data:

Conversion to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; Z = 0x0052;

Equal to decimal format: X (axis acceleration data) = -1; Y = -15; Z = 82;

Note: Acceleration of gravity (+g) is 82 in decimal format and -g is -82. The acceleration data 1312 represents +16g and -1312 represents -16g.

3.4. Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server in the case of GPRS communication. The heartbeat package is sent to the backend server at the interval specified by *<Heartbeat Interval>* in the **AT+GTSRI** command.

➤ **+ACK:GTHBD,**

Example: +ACK:GTHBD,310201,135790246811220,,20100214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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,310201,11F0\$ +SACK:GTHBD,,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ *<Protocol Version>*: The device type and the protocol version that the backend server

supports. This field is optional. The backend server could just send an empty field to decrease the length of the heartbeat data acknowledgement.

- ✧ *<Count Number>*: The backend server uses the *<Count Number>* extracted from the heartbeat package from the device as the *<Count Number>* in the server acknowledgement of the heartbeat.

3.5. Server Acknowledgement

If server acknowledgement is enabled by the **AT+GTSRI** command, the backend server should reply to the device whenever it receives a message from the device.

➤ **+SACK:**

Example: +SACK:11F0\$			
Parameter	Length (byte)	Range/Format	Default
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ *<Count Number>*: The backend server uses the *<Count Number>* extracted from the received message as the *<Count Number>* in the server acknowledgement.

4. HEX Format Report Message

From this version, the @Track protocol starts to support report messages in HEX format. For all the commands, they are still using the ASCII format as described above. By default, the device uses ASCII format report messages. The backend server could use the **AT+GTQSS** or **AT+GTSRI** command to enable the HEX format report messages by setting the *<Protocol Format>* to 1.

All the report messages are sorted into 7 categories and messages in the same category use the same header string, including acknowledgement to command (**+ACK**), location report (**+RSP**), event report (**+EVT**), information report (**+INF**), the heartbeat data (**+HBD**), the crash data packet (**+CRD**) and the CANBUS data (**+CAN**).

The composition of the HEX report message could be customized by the **AT+GTHRM** command. The actual length of each HEX report message varies depending on mask settings in **AT+GTHRM**.

The device uses CRC16 method to calculate the checksum of the report data and appends the checksum to the end of the data. The backend server could use this checksum to verify the integrity of the received data.

At the end of each HEX report message, the device uses 0x0D and 0x0A to mark the end.

The HEX report messages are transmitted in network byte order (big-endian).

4.1. Hex Report Mask

The **AT+GTHRM** command consists of *<+ACK Mask>*, *<+RSP Mask>*, *<+EVT Mask>*, *<+INF Mask>*, *<+HBD Mask>*, *<+CRD Mask>* and *<+CAN Mask>* which control the composition of the corresponding HEX report message. In each HEX report message, the corresponding mask for the report indicates which information items are reported.

➤ **AT+GTHRM=**

Example:			
AT+GTHRM=gv65,,,EF,FFFFFFFF,FFFFFFFF,FFFF,FF,FE0F,,,,0018\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv65
Reserved	0		
Reserved	0		
+ACK Mask	1	00– FF	EF
+RSP Mask	4	00000000 – FFFFFFFF	FE5FBF

+EVT Mask	4	00000000 – FFFFFFFF	FE5FBF
+INF Mask	4	00000000 – FFFFFFFF	FFFD
+HBD Mask	1	00 – FF	EF
+CRD Mask	2	0000-FFFF	7D
+CAN Mask	8	00000000 – FFFFFFFF	7BF
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <+ACK Mask>: Component mask of the acknowledgement received.

Mask Bit	Item
Bit 7	Reserved
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Unique ID>
Bit 3	<Firmware Version>
Bit 2	<Protocol Version>
Bit 1	<Device Type>
Bit 0	<Length>

✧ <+RSP Mask>: Component mask of the location report message.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	<EIO100 IO Status>
Bit 25	Reserved
Bit 24	Reserved

Bit 23	<Total Hour Meter Count>
Bit 22	<Current Hour Meter Count>
Bit 21	<Total Mileage>
Bit 20	<Current Mileage>
Bit 19	<Satellite Information>
Bit 18	<Motion Status>
Bit 17	<Digital IO Status>
Bit 16	Reserved
Bit 15	Reserved
Bit 14	<Analog Input Voltage>
Bit 13	Reserved
Bit 12	<External Power Voltage>
Bit 11	<Battery Level> (Valid only for GV65Plus)
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Unique ID>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<MCC / MNC / LAC / Cell ID / Reserved>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

✧ <+EVT Mask>: Component mask of the event report message.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved

Bit 27	Reserved
Bit 26	<EIO100 IO Status>
Bit 25	Reserved
Bit 24	Reserved
Bit 23	<Total Hour Meter Count>
Bit 22	<Current Hour Meter Count>
Bit 21	<Total Mileage>
Bit 20	<Current Mileage>
Bit 19	<Satellite Information>
Bit 18	<Motion Status>
Bit 17	<Digital IO Status>
Bit 16	Reserved
Bit 15	Reserved
Bit 14	<Analog Input Voltage>
Bit 13	Reserved
Bit 12	<External Power Voltage>
Bit 11	<Battery Level> (Valid only for GV65Plus)
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Unique ID>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<MCC / MNC / LAC / Cell ID / Reserved>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

- ✧ <+INF Mask>: Component mask of the information report message. Bit 8 - Bit 15 indicate which groups of information items are included when the device reports the +RESP:GTINF message.

Mask Bit	Item
Bit 15	+RESP:GTGIR
Bit 14	+RESP:GTTMZ
Bit 13	+RESP:GTCSQ
Bit 12	+RESP:GTCID
Bit 11	+RESP:GTBAT
Bit 10	+RESP:GTGPS
Bit 9	+RESP:GTIOS
Bit 8	+RESP:GTVR
Bit 7	<INF Expansion Mask>
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Firmware Version>
Bit 3	<Protocol Version>
Bit 2	<Device Type>
Bit 1	<Unique ID>
Bit 0	<Length>

- ✧ <INF Expansion Mask>: Component mask of the information report message. Bit 0 - Bit 15 indicate which groups of information items are included when the device reports the message +RESP:GTINF.

Mask Bit	Item
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	Reserved

Bit 5	Reserved
Bit 4	+RESP:GTCML
Bit 3	Reserved
Bit 2	+RESP:GTCVN
Bit 1	Reserved
Bit 0	+RESP:GTGSV / +RESP:GTRSV

✧ <+HBD Mask>: Component mask of the heartbeat data.

Mask Bit	Item
Bit 7	<UID>
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Unique ID>
Bit 3	<Firmware Version>
Bit 2	<Protocol Version>
Bit 1	<Device Type>
Bit 0	<Length>

✧ <+CRD Mask>: Component mask of the crash data packet.

Mask Bit	Item
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	<Count Number>
Bit 5	<Send Time>

Bit 4	<Firmware Version>
Bit 3	<Protocol Version>
Bit 2	<Device Type>
Bit 1	<Unique ID>
Bit 0	<Length>

✧ <+CAN Mask>: Component mask of the CANBUS information packet.

Mask Bit	Item
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Reserved
Bit 20	Reserved
Bit 19	Reserved
Bit 18	Reserved
Bit 17	Reserved
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>

Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Unique ID>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<MCC / MNC / LAC / Cell ID / Reserved>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

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

➤ **+ACK:GTHRM,**

Example: +ACK:GTHRM,310201,135790246811220,,0019,20090214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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 EF 24 21 01 03 03 02 56 50 22 00 0A 00 27 07 00 07 F9 07 DD 01 1E 0A 15 0A 01 01 F9 19 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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
ID	1		
Serial Number	2	0000 – FFFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Message Type>*: It indicates the ID of the command that the device receives.

Command	ID
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
Reserved	3
AT+GTCFG	4
AT+GTTOW	5
AT+GTEPS	6
AT+GTDIS	7
AT+GTOUT	8
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14
AT+GTCAN	15
AT+GTRTO	16

AT+GTMUT	17
Reserved	18
Reserved	19
Reserved	20
AT+GTUPD	21
AT+GTPIN	22
Reserved	23
AT+GTOWH	24
AT+GTDG	25
AT+GTAIS	26
AT+GTJDC	27
AT+GTIDL	28
AT+GTHBM	29
AT+GTHMC	30
Reserved	31
Reserved	32
Reserved	33
AT+GTWLT	34
AT+GTHRM	35
AT+GTCRA	36
AT+GTPDS	38
AT+GTBZA	39
AT+GTSPA	40
AT+GTSSR	41
Reserved	42
AT+GTGPJ	43
AT+GTACD	44
AT+GTIDA	45
AT+GTFSC	46
AT+GTRMD	47

AT+GTFFC	48
AT+GTCMD	49
AT+GTUDF	50
AT+GTJBS	51
AT+GTSMS	52
AT+GTOWL	53
AT+GTCFU	54
Reserved	55
AT+GTUPC	56
Reserved	57
AT+GTOEX	58
AT+GTIEX	59
AT+GTGAM	60
AT+GTFVR	61

- ✧ <Report Mask>: Please refer to the <+ACK Mask> in **AT+GTHRM**.
- ✧ <Length>: The length of the whole acknowledgement message from header to the tail characters.
- ✧ <Unique ID>: Bit 4 of <+ACK Mask> is always 0, and 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 A hexadecimal number as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

- ✧ <ID>: The ID of the sub-command of **AT+GTRTO** or the ID of **AT+GTIOB** or **AT+GTGEO**. For others, set it to 0.
- ✧ <Send Time>: The local time to send the acknowledgement message. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

Send Time	2011		01	31	06	29	11
HEX	07	DB	01	1F	06	1D	0B

- ✧ <Checksum>: The CRC16 checksum for data from <Message Type> to <Count Number>.

4.3. Location Report +RSP

Location report messages including **+RESP:GTTOW**, **+RESP:GTEPS**, **+RESP:GTDIS**, **+RESP:GTIOB**, **+RESP:GTFRI**, **+RESP:GTGEO**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTDOG**, **+RESP:GTIGL** and

+RESP:GTHBM use the format below.

➤ **+RSP,**

Example:

**2B 52 53 50 07 00 FE 0F BF 00 5D 0F 01 03 03 02 56 50 22 00 0A 00 27 07 5F 01 00 22 08 30 01 01
00 24 00 00 AE 00 28 06 FC 0F 06 01 E5 F6 04 07 DD 01 1E 00 14 04 04 60 00 00 55 0A 1A 11 00
00 07 00 00 00 00 07 00 0C 0C 23 00 00 00 0C 0C 23 07 DD 01 1E 08 14 05 00 C7 DE 11 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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Report ID / Report Type	1		
Number	1	1 – 15	
GNSS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	

Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ **<Message Type>**: The ID of a specific location report message.

Message	ID
+RESP:GTRTL (PNL)	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

- ✧ *<Report Mask>*: Please refer to the *<+RSP Mask>* in **AT+GTHRM**.
- ✧ *<Unique ID>*: Bit 6 of *<+RSP Mask>* is always 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 a hexadecimal number as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

- ✧ *<EIO100 Input Status>*: The status of EIO100 inputs. For each bit, 0 means “Disable status”, and 1 means “Enable status”. If EIO100 device is not connected or the mode of **AT+GTMUT** 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, and digital input2 compose the byte.

Input Status Mask	ID
Ignition Detection	0x01
Digital Input1	0x02
Digital Input2	0x04

- ✧ *<EIO100 Output Status>*: The status of EIO100 outputs. For each bit, 0 means “Disable status”, and 1 means “Enable status”. If EIO100 device is not connected or the mode of **AT+GTMUT** is not for EIO100, it is empty.
 - 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 status compose the byte.

Output Status Mask	ID
Digital Output1	0x01
Digital Output2	0x02

- ✧ <Motion Status>: The motion status of the device.
- ✧ <Satellites>: 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>.

In **+RESP:GTGEO**, Bit 0 is used for Report Type, Bit 1 – Bit 3 are used as high 3 bits of Report ID, and Bits 4 – 7 are used as low 4 bits of Report ID.

- ✧ <Speed>: 3 bytes in total. The first two bytes are for the integer part of the speed and the last byte is for the fractional part. The fractional part has 1 digit.
- ✧ <Longitude>: The longitude of the current position. 4 bytes in total. The device converts the longitude to an integer with 6 implicit decimals and reports this integer in HEX format. If the value of the longitude is negative, it is represented in 2's complement format.

Longitude 121.390847	121390847			
HEX	07	3C	46	FF

- ✧ <Latitude>: The latitude of the current position. 4 bytes in total. The device converts the latitude to an integer with 6 implicit decimals and reports this integer in HEX format. If the value of the latitude is negative, it is represented in 2's complement format.

Latitude 31.164503	31164503			
HEX	01	DB	88	57

- ✧ <Altitude>: The altitude from GNSS. If the altitude is negative, it is represented in 2's complement format. Unit: meter.
- ✧ <GNSS UTC Time>: The UTC time from the GNSS chip. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

GNSS UTC Time	2011		07	14	08	24	13
HEX	07	DB	07	0E	08	18	0D

- ✧ <Current Mileage>: 3 bytes in total. The first 2 bytes are for the integer part of the current mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Current Mileage	0		0
HEX	00	00	00

- ✧ <Total Mileage>: 5 bytes in total. The first 4 bytes are for the integer part of the total

mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Total Mileage	0				0
HEX	00	00	00	00	00

- ✧ <Total Hour Meter Count>: 6 bytes in total. The first 4 bytes represent the hour's portion, the fifth byte represents the minute's portion, and the sixth byte indicates the second's portion.

Total Hour Meter Count	0				0	0
HEX	00	00	00	00	00	00

The location report message **+RESP:GTLBC** uses the format below.

Example:
2B 52 53 50 03 00 FE 1F BF 00 66 0F 01 03 03 02 56 50 22 00 0A 00 27 07 62 2E 46 01 00 21 08 00
70 02 15 44 50 29 3F 01 01 00 00 03 00 81 00 40 06 FC 59 86 01 E5 BC 2D 07 DD 01 1E 03 28 08 04
60 00 00 56 78 5D 7B 00 00 00 01 00 00 00 0B 05 00 04 32 00 00 00 0E 2A 29 07 DD 01 1E 0B 28
09 01 82 6A 27 0D 0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	

External GNSS Antenna Status Satellites in View	1		
Report ID / Report Type	1		
Number Length / Number Type	1		
Phone Number	<=10		
Number	1	1 – 15	
GNSS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Number Length / Number Type>: The high nibble is for <Number Length> and the low nibble is for <Number Type>. <Number Length> is the total number of bytes which is equal to the length of the <Phone Number> in bytes plus the length of the parameter <Number Length / Number Type>. <Number Type> indicates if there is a '+' sign before the phone number. 1 means "with the sign", and 0 means "without the sign".

	Number Length	Number Type
--	---------------	-------------

HEX	7	0
-----	---	---

- ✧ <Phone Number>: Not more than 10 bytes. In each byte, the high nibble and low nibble are used to represent one digit of the phone number respectively. If there is no digit for the last to represent, fill it with 0xF.

Phone Number	02	15	44	50	29	3
02154450293						
HEX	02	15	44	50	29	3F

The location report message **+RESP:GTSOS** uses the format below.

Example: 2B 52 53 50 0A 00 FE 1F BF 00 60 0F 01 03 03 02 56 50 22 00 0A 00 27 07 62 2E 64 01 00 21 09 10 00 01 01 00 00 06 00 81 00 32 06 FC 59 89 01 E5 BC 06 07 DD 01 1E 03 28 26 04 60 00 00 56 78 5D 7B 00 00 00 01 00 00 00 0B 05 00 05 14 00 00 00 0E 2B 0B 07 DD 01 1E 0B 28 27 01 84 D1 47 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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna	1		

	4		
Time	7	YYYYMMDDHHMMSS	
	2	0000 – FFFF	
	2	0000 – FFFF	
	2	0000 – FFFF	
	2	0000 – FFFF	
	1	00	00
leage	3	0.0 – 65535.0 km	
ge	5	0.0 – 4294967.0 km	
ur Meter Count	3	HHMMSS	
Meter Count	6	HHHHHHHHHHMMSS	
	7	YYYYMMDDHHMMSS	
ber	2	0000 – FFFF	

➤ **+RSP,**

```
2B 52 53 50 11 01 FF D7 FF 00 71 04 04 09 13 02 67 76 32 30 30 00 00 00 00 00 00 00 00  
09 00 22 15 08 01 FF 26 55 15 00 00 29 00 01 00 00 00 06 00 67 00 44 06 FC 5A 2A 01 E5 BC 59 07  
DC 09 1C 08 35 1B 04 60 00 00 56 78 5D 7B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  
00 00 00 00 07 DC 09 1C 08 35 1D 00 16 83 3F 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	31	31
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 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Report ID / Report Type	1	00	00
ID Length	1	4 8	
ID	<=20	'0' – '9' 'A' – 'F'	
ID Report Type	1	0 1	
Number	1	1 – 15	
GNSS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		

Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <ID>: The ID which is currently read.
- ✧ <ID Report Type>: The type of reported ID.
 - 0: The ID is unauthorized.
 - 1: The ID is authorized.

The location report message **+RESP:GTERI** uses the format below.

➤ **+RSP,**

Example: 2B 52 53 50 12 01 FF D7 FF 00 00 00 02 00 7A 04 04 09 13 02 67 76 32 30 30 00 00 00 00 00 00 00 00 09 00 22 15 10 02 01 28 ED 29 41 03 00 00 FD 01 02 01 9D 01 01 00 00 00 01 0C 00 60 06 FC 59 5A 01 E5 BB B7 07 DC 09 1C 08 2E 02 04 60 00 00 56 78 2D 80 07 DC 09 1C 08 2E 07 00 21 2B 4D 0D 0A			
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
ERI Mask	4	00000000 – FFFFFFFF	
Length	2		

Device Type	1	31	31
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 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status/ Satellites in View	1		
Report ID / Report Type	1		
UART Device Type	1	0 - 99	
1-wire Information (Optional)	1-wire Device Number	1	0 - 19
	1-wire Device ID	8	
	1-wire Device Type	1	00 – FF
	Device Data Length	1	00 – FF
	1-wire Device Data	<= 20	
CAN Data (Optional)		<=99	
XYZ Axis Information (Optional)	Data Group Number	1	0 - 3
	Data Attribute	1	
	XYZ Axis Data	6	'0'-'9' 'a'-'f'
Number	1	1 – 15	
GNSS Accuracy	1	0 1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	

Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
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 which is connected to the second serial port.
 - 0: No device connected.
 - 2: 1-wire bus.
- ✧ *<1-wire Device Number>*: The number of 1-wire devices connected to 1-wire. If it is 0, the fields *<1-wire Device ID>*, *<1-wire Device Type>*, *<Device Data Length>*, and *<1-wire Device Data>* will not be displayed. If there is more than one 1-wire device connected, the fields *<1-wire Device ID>*, *<1-wire Device Type>*, *<Device Data Length>* and *<1-wire Device Data>* will repeat to show the information of each connected 1-wire device. If Bit 1 of *<ERI Mask>* in **AT+GTFRI** is enabled, the information of the *<1-wire Information (Optional)>* field will be displayed; otherwise, the *<1-wire Information (Optional)>* 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.
- ✧ *<Device Data Length>*: It indicates the length of *<1-wire Device Data>*.
- ✧ *<1-wire Device Data>*: It indicates the data read from the 1-wire devices. If the device is a temperature sensor, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix A). To get the real temperature in degrees Celsius, please convert the data to a decimal value according to the calculation in Appendix A first

and then multiply the decimal value by 0.0625.

- ✧ **<CAN Data>**: If Bit 2 in **<ERI Mask>** is set to 1, CANBUS information (fields from **<CANBUS Device State>** to **<Total Engine Overspeed Time>**) will be included in **+RESP:GTERI**.

Note: The word “Optional” indicates the item is controlled by the parameter **<ERI Mask>**.

4.4. Information Report +INF

Information report messages include **+RESP:GTINF**, **+RESP:GTGPS**, **+RESP:GTCID**, **+RESP:GTCSQ**, **+RESP:GTVER**, **+RESP:GTBAT**, **+RESP:GTIOS**, **+RESP:GTTMZ** and **+RESP:GTGIR**. These messages use the same format as shown below. However, only **+RESP:GTINF** includes all the items while others only include the information of items related to themselves.

➤ **+INF,**

Example:

```
2B 49 4E 46 01 FF FD 00 AD 56 50 22 00 0A 00 27 07 0F 01 03 03 02 01 01 01 0B 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 01 00 00 21 00 0C 01 07 DD 01 1D 0C 34 15 00 00 00 7F 00 3C 01 2C
00 00 00 00 00 D1 00 00 00 04 5F 89 86 00 95 12 42 16 06 30 63 1F 00 00 08 00 06 07 04 60 00
00 56 65 01 EC 00 2F 04 60 00 00 55 0A 2B B8 00 2F 04 60 00 00 55 0A 11 D3 00 2C 04 60 00 00
56 65 20 6D 00 2A 04 60 00 00 56 63 3A 40 00 29 04 60 00 00 55 0A 2B B9 00 28 04 60 00 00 55
0A 03 58 00 3E 07 DD 01 1D 14 34 16 00 52 A1 2C 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 Type	1	31	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	+RESP:GTVER
MCU Version	2	0000 – FFFF	
Reserved	2	0000	
Reserved	1	00	+RESP:GTIOS
Analog Input Voltage	2		

Reserved	2	0000	
Reserved	1	00	
Reserved	2	0000	
Reserved	2	0000	
EIO100 IO Status	2	0000 – 0F0F	
Digital Input Status	1	00 – 07	
Digital Output Status	1	00 – 03	
Reserved	1	00	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	+RESP:GTGPS
Reserved	1	00	
External GNSS Antenna Status Satellites in View	1		
Power Saving Enable / OWH Mode / Outside Working Hours / AGPS	1		
Last Fix UTC Time	7	YYYYMMDDHHMMSS	
Reserved	1	00	
FRI Discard No Fix	1	0 1	
Report Composition Mask	2		
IGN Interval	2		
IGF Interval	2		
Reserved	4	00000000	
Reserved	1	00	
External Power Supply / Backup Battery On / Charging / LED On / Backup Battery Charge Mode	1		+RESP:GTBAT
External Power Voltage	2	0	
Backup Battery Voltage	2	0 – 4200mV	
Backup Battery Level	1	00	
ICCID	10	ICCID	+RESP:GTCID

CSQ RSSI	1	0 – 31 99	+RESP:GTC SQ
CSQ BER	1	0 – 7 99	
Time Zone Offset Sign / Daylight Saving Enable	1		+RESP:GTTMZ
Time Zone Offset	2	HHMM	
GIR Trigger Type	1		+RESP:GTGIR
Cell Number	1		
MCC	2		
MNC	2		
LAC	2		
Cell ID	2		
TA	1		
RX Level	1		
SV Count	1		+RESP:GTGSV +RESP:GTRSV
SV ID	1		
SV Power	1		
⋮			
SV ID	1		
SV Power	1		
CAN100 SW Version Length	1	0-10	+RESP:GTCVN
CAN100 SW Version	<=10		
CAN100 Serial Number length	1	0-10	
CAN100 Serial Number	<=10		
CAN100 Car Model ID	2	0x0000-0xFFFF	+RESP:GTCML
CAN100 Car Name Length	1	0-50	
CAN100 Car Name	<=50		
Send Time	7	YYYYMMDDHHMM MSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Message Type>: The ID of a specific information report message.

Message	ID
+RESP:GTINF	1
+RESP:GTGPS	2
+RESP:GTCID	4
+RESP:GTCSQ	5
+RESP:GTVER	6
+RESP:GTBAT	7
+RESP:GTIOS	8
+RESP:GTTMZ	9
+RESP:GTGIR	10
+RESP:GTGSV	11
Reserved	12
+RESP:GTCVN	13
+RESP:GTCML	26
+RESP:GTRSV	27

- ✧ <Report Mask>: Please refer to the <+INF Mask> in **AT+GTHRM**.
- ✧ <Unique ID>: Bit 1 of <+INF Mask> is always 0, and 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 A hexadecimal number as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

- ✧ <Power Saving Enable / OWH Mode / Outside Working Hours / AGPS>: The highest bit, or Bit 7 is reserved, Bit 5 and Bit 6 are for <Power Saving Enable>, Bit 4 and Bit 3 are for <OWH Mode>, Bit 2 is for <Outside Working Hours>, and Bit 0 is for <AGPS>. <Outside Working Hours> is used to indicate whether the device is currently outside the working hours. 1 means "Outside working hours".
- ✧ <LED On>: Bit 4 is for <LED On> which indicates whether the LED's are turned on.

Mask Bit	Item
Bit 7	<Reserved>
Bit 6	<Reserved>
Bit 5	<Reserved>

Bit 4	<LED On>
Bit 3	<Reserved>
Bit 2	<Reserved>
Bit 1	<Reserved>
Bit 0	<Reserved>

- ✧ <External Power Supply / Backup Battery On / Charging / LED On / Backup Battery Charge Mode>: The highest bit, or Bit 7, is for <Main Supply> which indicates whether the external power supply is connected to the device. Bit 6 is for <Backup Battery On> which indicates whether the backup battery is working. Bit 5 is for <Charging> which indicates whether the backup battery is currently charging. Bit 4 is for <LED On> which indicates whether the LED's are turned on. Bit 0 is for <Backup Battery Charge Mode>.

- ✧ <ICCID>: ICCID is a 20-digit string. In the HEX format message, every 4 bits are used to represent one digit of the 20 digits of the ICCID.

ICCID	89	86	00	00	09	09	17	21	49	53
HEX	89	86	00	00	09	09	17	21	49	53

- ✧ <Time Zone Offset Sign / Daylight Saving Enable>: Bit 1 is for <Daylight Saving Enable> which indicates whether the daylight saving function is currently enabled. Bit 0 is for <Time Zone Offset Sign> which indicates positive or negative offset of the local time from UTC time. 1 means "negative offset".

- ✧ <GIR Trigger Type>: A string to indicate what kind of GNSS fix this cell information is for.

"SOS": This cell information is for SOS request.

"RTL": This cell information is for RTL request.

"LBC": This cell information is for LBC request.

"TOW": This cell information is for TOW request.

"FRI": This cell information is for FRI request.

"GIR": This cell information is for the sub command "C" in the **AT+GTRTO** command.

"ERI": This cell information is for ERI request.

Fix Type	ID
INF	0
SOS	1
RTL	2
LBC	3
TOW	4
FRI	5
GIR	6
ERI	7

- ✧ **<Cell Number>**: The number of cells. It also indicates the number of cell information groups. One cell information group consists of MCC, MNC, LAC, and Cell ID.
- ✧ **<EIO100 IO Status>**: The status of EIO100 inputs and outputs. For each bit, 0 means “Disable status”, and 1 means “Enable status”. If EIO100 device is not connected or the mode of **AT+GTMUT** 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
- ✧ **<CAN100 Car Model ID>**: The car model ID of the CAN100 device. If the value is 0, this means that no models have been obtained.
- ✧ **<CAN100 Car Name>**: It is human readable make and model of the car.

4.5. Event Report +EVT

Event report messages including **+RESP:GTPNA**, **+RESP:GTPFA**, **+RESP:GTMPN**, **+RESP:GTMPE**, **+RESP:GTBTC**, **+RESP:GTSTC**, **+RESP:GTSTT**, **+RESP:GTPDP**, **+RESP:GTIDN**, **+RESP:GTJDR**, **+RESP:GTSTR**, **+RESP:GTSTP**, **+RESP:GTLSP**, **+RESP:GTCRA**, and **+RESP:GTANT** use the format below.

➤ **+EVT,**

Example: 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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	

Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of a specific event report message.

Message	ID
+RESP:GTPNA	1
+RESP:GTPFA	2
+RESP:GTMPN	3
+RESP:GTMPF	4
Reserved	5
+RESP:GTBPL	6
+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
+RESP:GTANT	10
Reserved	11
+RESP:GTPDP	12
+RESP:GTIGN	13
+RESP:GTIGF	14
+RESP:GTUPD	15
+RESP:GTIDN	16
+RESP:GTIDF	17
Reserved	18
Reserved	19
+RESP:GTJDR	20
+RESP:GTGSS	21
+RESP:GTFLA	22
+RESP:GTCRA	23
+RESP:GTDOS	25
+RESP:GTGES	26

+RESP:GTSTR	28
+RESP:GTSTP	29
+RESP:GTLSP	30
+RESP:GTGPJ	31
+RESP:GTRMD	32
Reserved	33
+RESP:GTJDS	34
+RESP:GTUPC	35
+RESP:GTCFU	36

- ✧ *<Report Mask>*: Please refer to the *<+EVT Mask>* in **AT+GTHRM**.
- ✧ *<Unique ID>*: Bit 6 of *<+EVT Mask>* is always 0, and 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 A hexadecimal number as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

The event report message **+RESP:GTBPL** uses the format below.

➤ **+EVT,**

Example: 2B 45 56 54 06 00 7E 1F 3F 0F 01 03 03 02 56 50 22 00 0B 31 5C 01 04 00 00 00 00 11 07 0D C1 01 00 00 01 02 01 0A 00 33 06 FC 59 81 01 E5 BC 2A 07 DD 01 1F 08 0B 15 04 60 00 01 55 04 69 D3 00 00 00 00 00 00 00 17 04 00 00 00 07 DD 01 1F 10 0B 18 00 B6 69 C2 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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		

Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Backup Battery Voltage	2	0 – 4200 mV	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	

Tail Characters	2	0x0D 0x0A	0x0D 0x0A
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The event report message **+RESP:GTFLA** uses the format below.

➤ **+EVT,**

Example:

[illegible]

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	31	31
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 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Input ID	1	0 – 2 9-C	
Ignition Off Fuel Level	1	0 – 100	
Ignition On Fuel Level	1	0 – 100	

Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
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.
- ✧ **<Ignition Off Fuel Level>**: The fuel level saved before last ignition off.
- ✧ **<Ignition On Fuel Level>**: The fuel level after the current ignition on.

The event report message **+RESP:GTRMD** uses the format below.

➤ +EVT,

Example:

```
2B 45 56 54 20 FF FF FF BF 00 69 21 02 06 06 02 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 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 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
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Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	31	31
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 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Roaming State	1	0-3	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	

MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

- 0: Home
- 1: Known Roaming
- 2: Unknown Roaming
- 3: Blocking Report

The event report messages **+RESP:GTIGN** and **+RESP:GTIGF** use the format below. For these two messages, the **<Current Mileage>** and **<Total Mileage>** fields will always be present regardless of the **<+EVT Mask>** setting.

➤ **+EVT,**

Example:
2B 45 56 54 0D 00 FE 1F BF 00 62 2101 03 03 02 56 50 22 00 0A 00 27 07 57 00 00 01 00 22 08
00 00 00 00 01 00 00 00 04 00 6B 00 38 06 FC 59 7D 01 E5 BC 00 07 DD 01 1D 0C 07 24 04 60 00
00 56 78 5D 7B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 01 1D 14 07 27 00
3E 0F 13 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	31	31
Protocol Version	2	0000 – FFFF	

Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Duration of Ignition On / Ignition Off	4	0 – 999999 sec	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTUPD** uses the format below. For this message, the parameters *<Protocol Version>* and *<Firmware Version>* will always be present regardless of the *<+EVT Mask>* setting.

➤ **+EVT,**

Example:

2B 45 56 54 0F 00 FE 1F BF 00 61 21 01 03 03 02 56 50 22 00 0B 31 5C 01 62 2C C9 00 00 41 05 01 2C 00 01 00 00 00 01 00 00 00 43 06 FC 59 ED 01 E5 BC 09 07 DD 01 1F 0A 05 0E 04 60 00 01 55 04 58 2B 00 00 00 00 00 00 00 03 04 00 00 00 00 30 34 00 02 07 DD 01 1F 03 00 30 00 27 F7 0C 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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12	

		0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Code	2		
Retry	1		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTIDF** uses the format below.

➤ **+EVT,**

Example:

2B 45 56 54 11 00 FE 1F BF 00 62 21 01 03 03 02 56 50 22 00 0A 00 27 07 5D 00 00 00 03 12 07 00
00 03 FF 01 00 00 01 01 00 99 00 21 06 FC 59 75 01 E5 BB BD 07 DD 01 1E 09 1C 07 04 60 00 00
56 78 5D 7B 00 00 00 02 00 00 00 0B 07 00 0B 28 00 00 00 00 00 07 DD 01 1E 11 1C 0A 03 C9
2A A1 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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Duration of Idling Status	4		
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		

Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTGSS** uses the format below.

➤ **+EVT,**

Example:

**2B 45 56 54 15 00 FE 1F BF 00 63 21 01 03 03 02 56 50 22 00 0A 00 27 07 50 00 00 00 03 1A 05 00
00 00 00 00 01 00 00 02 04 00 2A 00 35 06 FC 59 9A 01 E5 BC 2C 07 DD 01 1E 09 25 24 04 60 00 00
56 78 5D 7B 00 00 00 02 00 00 00 0B 07 00 0B 28 00 00 00 00 00 00 07 DD 01 1E 12 04 19 03 D7
64 41 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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	

Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
GNSS Signal Status	1	0 1	
Reserved	4	00000000	00000000
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	

Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ *<GNSS Signal Status>*: 0 means “GNSS signal lost or no successful GNSS fix”, and 1 means “GNSS signal recovered and successful GNSS fix”.

The event report message **+RESP:GTDOS** uses the format below.

➤ **+EVT,**

Example: 2B 45 56 54 19 00 FE 1F BF 00 60 21 01 05 05 05 56 50 22 00 0F 5B 2E 00 5F 00 00 01 01 21 0A 01 01 01 00 00 00 00 00 85 00 38 06 FC 59 AA 01 E5 BB CE 07 DD 07 0B 08 07 29 04 60 00 00 56 78 20 79 00 00 00 02 00 00 00 00 02 00 00 00 00 00 00 00 00 07 DD 07 0B 10 07 2B 02 0D 42 59 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	31	31
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 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22	

		0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Wave1 Output ID	1	1-2 9-C	
Wave1 Ouput Active	1	0 1	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
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 1A 00 FE 1F BF 00 68 21 01 05 05 05 56 50 22 00 0F 5B 2E 00 5F 00 00 00 01 11 0B 01

15 00 00 00 32 00 00 00 1E 01 01 00 00 00 00 85 00 37 06 FC 59 9A 01 E5 BB D7 07 DD 07 0B 08
1C 11 04 60 00 00 56 78 20 79 00 00 00 02 00 00 00 00 02 00 00 00 00 00 00 00 07 DD 07 0B
10 1C 11 02 17 D2 D2 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	31	31
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 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Trigger GEO ID	2	0-19	
Trigger GEO Enable	1	0 1	
Trigger Mode	1	0 21 22	
Radius	4	50 – 6000000m	
Check Interval	4	0 5 – 86400sec	
Number	1	1	
GNSS Accuracy	1	0 1	

Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Trigger GEO ID>: The ID of Geo-Parking-Fence. The range is 0 – 19.
- ✧ <Trigger GEO Enable>: The zone's Geo-parking-fence function is enabled or disabled.
 - 0: The zone's Geo-parking-fence function is disabled.
 - 1: The zone's Geo-parking-fence function is enabled.

The event report message **+RESP:GTGPJ** uses the format below.

➤ **+EVT,**

Example: 2B 45 56 54 1F 00 FE 1F BF 00 60 21 01 05 05 02 56 50 22 00 0F 5B 2A 09 5E 00 00 00 00 16 09 03 01 01 00 00 00 00 00 00 00 5B 06 FC 59 D5 01 E5 BB 91 07 DD 07 04 05 09 2A 04 60 00 00 56 78 20 79 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 07 04 05 09 2C 00 2C 46 69 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	31	31
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
CW Jamming Value	1	0-255	
GNSS Jamming State	1	0 1 3	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 –999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	

LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 –4294967.0 km	
CurrentHour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <CW Jamming Value>: The current continuous wave (CW) jamming value.
- ✧ <GNSS Jamming State>: The current jamming state.
 - 0: Unknown or feature disabled
 - 1: (OK) No significant jamming
 - 3: (Critical) Interference visible and no fix

The event report message **+RESP:GTJDS** uses the format below.

➤ +EVT,

Example:

```
2B 45 56 54 22 FF FF FF BF 00 69 21 02 06 06 02 23 5C 1F 03 43 23 1B 00 00 00 00 00 00 00 00 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  
    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	31	31
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 Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Jamming Status	1	1-2	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	

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: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	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0 – 100	
External Power Voltage	2		
Analog Input Voltage	2		
EIO100 Input Status	1	00 – 0F	
Digital Input Status	1	00 – 07	
EIO100 Output Status	1	00 – 0F	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22	

		0x41 0x42 0x16 0x1A	
External GNSS Antenna Status Satellites in View	1		
Code	2	100 101 102 110 111 112 200 201 202 210 211 212 300 301 302 310 311 312	
Reserved	1	00	00
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

The event report message **+RESP:GTUPC** uses the format below.

➤ **+EVT,**

Example:

2B 45 56 54 24 00 FE 1F BF 00 A0 2F 06 01 09 04 0D 39 5A 18 44 0B 16 00 59 00 00 01 00 21 05 00
 00 64 68 74 74 70 3A 2F 2F 32 32 30 2E 31 37 38 2E 36 37 2E 32 31 30 3A 31 30 30 32 38 2F 47 56
 35 35 4E 2F 64 65 6C 74 61 62 69 6E 2F 47 56 35 35 4E 5F 30 32 30 33 5F 30 34 30 35 2E 62 69 6E
 00 01 00 00 00 00 00 00 00 00 31 06 FC 5A 99 01 E5 BB C9 07 E1 01 12 02 0F 10 04 60 00 00 56 78 20
 79 00 00 00 00 00 00 00 1D 04 00 00 00 00 00 00 00 00 07 E1 01 12 0A 0F 12 00 4A 10 15 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	2F	2F
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		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Command ID	1		
Result	2	100 101 102 103 200 201 202 300 301 302	
Download URL	<=100	Complete URL	
Number	1	1	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	

Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
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 code 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.

Fuel Level (Percentage)	5	P(0.00-99.99)	
Range	4	0 – 99999999hm	
Accelerator Pedal Pressure	2	0 – 100	
Total Engine Hours	5	0 – 99999.99h	
Total Driving Time	5	0 – 99999.99h	
Total Engine Idle Time	5	0 – 99999.99h	
Total Idle Fuel Used	5	0 – 999999.99L	
Axle Weight 2nd	2	0 – 65535kg	
Tachograph Information	2	0x0000-FFFF	
Detailed Information / Indicators	2	0x0000-FFFF	
Lights	1	0x00-0xFF	
Doors	1	0x00-0xFF	0
Total Vehicle Overspeed Time	5	0 – 99999.99h	
Total Engine Overspeed Time	5	0 – 99999.99h	
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	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
Tachograph Driver 2 Card Number	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
Registration Number	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
Expansion Information	2	0x0000-0xFFFF	
Rapid Brakings	4	0-999999	
Rapid Accelerations	4	0-999999	
GNSS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GNSS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Check Sum	2	0000 - FFFF	
Tail Character	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of the event report message.

Message	ID
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+RESP:GTCAN	33
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- ✧ <Report Mask>: Please refer to the <+CAN Mask> in **AT+GTHRM**.
- ✧ <Distance Type / Report Type>: The high nibble is for <Distance type> and the low nibble is for <Report Type>.

Distance type has two meanings below.

- 0: Total distance acquired from CAN100
- 1: Total distance obtained by calculation with GNSS

Report type has three meanings as follows.

- 0: Periodic report
- 1: RTO CAN report
- 2: Ignition event report

- ✧ <CANBUS Device State>: It indicates whether the device can receive data from CANBUS device.
 - 0: Abnormal. The device cannot receive data from CANBUS device.
 - 1: Normal. The device can receive data from CANBUS device.

- ✧ <CANBUS Report Mask>: Please refer to the <CANBUS Report Mask> in **AT+GTCAN**.
- ✧ <Length>: The length of the whole message from header to the tail characters.
- ✧ <Unique ID>: Bit 6 of <+CAN Mask> is always 0, and 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 a hexadecimal number as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

- ✧ <VIN>: Vehicle identification number.
- ✧ <Total Fuel Used>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.

Example of float number conversion:

Total Fuel Used	5	0 – 999999.99	0000000248
------------------------	----------	----------------------	-------------------

Integer: 00000002

Fraction: 48

Convert hex to decimal: 2.72

- ✧ <Fuel Level (Liter)>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- ✧ <Fuel Level (Percentage)>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- ✧ <Fuel Consumption>: 3 bytes in total. The first byte indicates the unit. The unit L/100km is represented as FE, and the unit L/H is represented as FF. The other two bytes indicate the value. The device converts the fuel consumption value to an integer with 1 implicit decimal by multiplying by ten and reports this integer in HEX format.

Fuel Consumption Value	121	
12.1		
HEX	00	79

- ✧ <Total Engine Hours>: The parameter value is a 5-byte long float number. The first 4 bytes

are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.

- ✧ <Total Driving Time>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- ✧ <Total Engine Idle Time>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- ✧ <Total Idle Fuel Used>: The parameter value is a 5-byte long float number. The first 4 bytes are for the integer part and the last byte is for the fractional part. The fractional part has 2 digits.
- ✧ <Tachograph Information>: Please refer to the parameter <Tachograph Information> in Chapter 3.3.7.
- ✧ <Detailed Information / Indicators>: Please refer to the parameter <Detailed Information / Indicators> in Chapter 3.3.7.
- ✧ <Lights>: Please refer to the parameter <Lights> in Chapter 3.3.7.
- ✧ <Doors>: Please refer to the parameter <Doors> in Chapter 3.3.7.
- ✧ <Total Vehicle Overspeed Time>: Please refer to the parameter <Total Vehicle Overspeed Time> in Chapter 3.3.7.
- ✧ <Total Engine Overspeed Time>: Please refer to the parameter <Total Engine Overspeed Time> in Chapter 3.3.7.
- ✧ <Ad-Blue Level>: The level of Ad-Blue. 2 bytes in total.
- ✧ <Axle Weight 1st>: Vehicle's first axle weight. Unit: Kg.
- ✧ <Axle Weight 3rd>: Vehicle's third axle weight. Unit: Kg.
- ✧ <Axle Weight 4th>: Vehicle's fourth axle weight. Unit: Kg.
- ✧ <Tachograph Overspeed Signal>: Vehicle's overspeed signal from the tachograph. The value 1 indicates "Overspeed detected". The value 0 indicates "No overspeed detected".
- ✧ <Tachograph Vehicle Motion Signal>: Vehicle's motion signal from the tachograph. The value 1 indicates "Motion detected". The value 0 indicates "No motion detected".
- ✧ <Tachograph Driving Direction>: Vehicle driving direction from the tachograph.
- ✧ <Analog Input Value>: The value of analog input. Unit: mv.
- ✧ <Engine Braking Factor>: It measures how often the driver brakes with brake pedal or with engine and CAN100 stores both counts (always increasing). Decreasing speed with no pedal pressed causes an increase in the engine braking factor.
- ✧ <Pedal Braking Factor>: It measures how often the driver brakes with brake pedal or with engine and CAN100 stores both counts (always increasing). Decreasing speed with brake pedal pressed causes an increase in the pedal braking factor.
- ✧ <Total Accelerator Kick-downs>: The count of accelerator pedal kick-downs (with the pedal pressed over 90%).
- ✧ <Total Effective Engine Speed Time>: The total time when the vehicle engine speed is effective. The unit is h. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- ✧ <Total Cruise Control Time>: The total time when the vehicle speed is controlled by cruise-control module. The unit is h. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.

- ✧ <Total Accelerator Kick-Down Time>: The total time when the accelerator pedal is pressed over 90%. The unit is h. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- ✧ <Total Brake Applications>: The count of brake pedal applications defined as braking processes initiated by brake pedal.
- ✧ <Tachograph Driver 1 Card Number>: The driver 1 card number from the tachograph. The value is a string representing the number, which ends by 0x00.
- ✧ <Tachograph Driver 2 Card Number>: The driver 2 card number from the tachograph. The value is a string representing the number, which ends by 0x00.
- ✧ <Tachograph Driver 1 Name>: The name of driver 1 from the tachograph. The value is a string representing the name, which ends by 0x00.
- ✧ <Tachograph Driver 2 Name>: The name of driver 2 from the tachograph. The value is a string representing the name, which ends by 0x00.
- ✧ <Registration Number>: The registration number of the vehicle. The value is a string representing the number, which ends by 0x00.
- ✧ <Expansion Information>: A hexadecimal number. Each bit contains information of one indicator.
 - Bit 0: W – webasto (1 – on, 0 – off or not available).
 - Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
 - Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
 - Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
 - Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
 - Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
 - Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
 - Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
 - Bit 8: Reserved
 - Bit 9: CHK – “check engine” indicator (1 – on, 0 – off or not available)
 - Bit 10: AIR – airbags indicator (1 – on, 0 – off or not available)
 - Bit 11: SC – service call indicator (1 – on, 0 – off or not available)
 - Bit 12: OLL – oil level low indicator (1 – on, 0 – off or not available)
- ✧ <Rapid Brakings>: The total number of rapid brakings since installation (calculation based on CAN-Logistic's settings of speed decrease time and value).
- ✧ <Rapid Accelerations>: The total number of rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value).
- ✧ <Speed>: 3 bytes in total. The first two bytes are for the integer part of the speed and the last byte is for the fractional part. The fractional part has 1 digit.
- ✧ <Longitude>: The longitude of the current position. 4 bytes in total. The device converts the longitude to an integer with 6 implicit decimals and reports this integer in HEX format. If the value of the longitude is negative, it is represented in 2's complement format.

Longitude	121390847			
121.390847				
HEX	07	3C	46	FF

- ✧ <Latitude>: The latitude of the current position. 4 bytes in total. The device converts the

latitude to an integer with 6 implicit decimals and reports this integer in HEX format. If the value of the latitude is negative, it is represented in 2's complement format.

Latitude 31.164503	31164503			
HEX	01	DB	88	57

- ✧ <GNSS UTC Time>: The UTC time from the GNSS chip. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

GNSS UTC Time	2011	07	14	08	24	13
HEX	07	DB	07	0E	08	0D

- ✧ <Send Time>: The local time to send the acknowledgement message. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

Send Time	2011	01	31	06	29	11
HEX	07	DB	01	1F	06	0B

4.7. Heartbeat Data +HBD

- +HBD,

Example: 2B 48 42 44 EF 20 21 01 03 03 02 56 50 22 00 0A 00 27 07 07 DD 01 1D 14 02 13 00 39 D2 5B 0D 0A			
Parameter	Length (byte)	Range/Format	Default
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	31	31
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
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 A hexadecimal number 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 A hexadecimal number as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

IMEI	g	v	6	5	n			
HEX	67	76	36	35	6E	00	00	00

If Bit 7 for <UID> of the <+HBD Mask> in **AT+GTHRM** is set to 0, the heartbeat message will not report device name or IMEI information. If Bit 7 for <UID> is set to 1, then the heartbeat message will report device name or IMEI information according to the mask of <Device Name>.

4.8. Buffer Report in HEX Format

When HEX format messages go into the local buffer, the device will replace the 2nd byte of the report messages with 'B'. Thus, **+BSP** indicates buffered report for **+RSP**, **+BNF** indicates buffered report for **+INF** and **+BVT** indicates buffered report for **+EVT**. The remaining part of the report messages is kept unchanged.

4.9. Crash Data Packet

➤ **+CRD,**

Example:

```
2B435244007D021922020002015620560201281203000302FFFCFFD60050FFFAFFD40050FFFBFF
D4004EFFFBFDD6004EFFFCCFFD60050FFFBFFD50050FFFEFFD6004FFFBFFD6004FFFF9FFD60050F
FFBFFD6004FFFBFFD7004FFFBFFD7004EFFFACFFD4004DFFBFFD70050FFFAFFD60050FFFAFFD
70050FFFCFFD40050FF9FFD60050FFBFFD4004FFFAFFD7004FFFBFFD50050FFBFFD7004FFF
BFFD5004FFF9FFD6004EFFFCCFFD50050FFFAFFD4004FFFBFFD70050FFFAFFD7004FFFAFFD40
04FFFBFFD8004FFFF9FFD50050FF9FFD50051FFFCFFD7004EFFFACFFD50050FFBFFD7004EFFF
FFD50050FFFAFFD5004DFFCCFFD60050FFBFFD6004EFFFCCFFD70050FFFCFFD8004FFFBFFD5004
FFFAFFD6004FFFAFFD50050FF9FFD60050FFBFFD50050FFFCFFD50050FF9FFD40050FFFAFF
D4004FFFAFFD50050FFBFFD5004EFFFCCFFD70050FFFCFFD50050FFFCFFD60050FFCCFFD5004FF
FFCCFFD5004FFFEFFD50050FFDFFD50050FFBFFD50050FFFAFFD6004EFFFCCFFD6004FFFAFFD7
```

004EFFFFAFD6004FFFFAFD60050FFFBFFD50050FFFBFFD70050FFFBFFD60050FFFBFFD80050FFFBFFD7004EFFFFCFD8004EFFFFCFD5004EFFFFAFD60050FFFBFFD6004EFFFFBFFD50050FFFAFFD5004EFFFFAFD5004EFFFFAFD30050FFFBFFD6004EFFFFAFD60050FFFBFFD5004EFFFF9FFD70051FFFCFFD50050FFFAFFD5004EFFFFA07DE0C190B2A0002020DDE0D0A

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+CRD	+CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	31	31
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>: Bit 1 of <+CRD Mask> is 0, and 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 A hexadecimal number 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 or after crash.
 - 0: Before crash.
 - 1: After crash.
- ✧ <Total Frame>: The total number of the messages that are sent to the backend server for the crash event.
- ✧ <Frame Number>: A numeral to indicate the sequence of the current message.
- ✧ <Data>: There are 500 bytes in one frame with 6 bytes as a group. The first 2 bytes of these 6 bytes represent X-axis acceleration data, the middle 2 bytes represent Y-axis acceleration data and the last 2 bytes are for Z-axis acceleration data.

4.10. Acceleration Data Packet

➤ +ACC,

Example:

```
2B414343220200562056020128150700000000056FFFFFFD00550000FFFF00540001FFFF00550
000FFFF00540000FFFD0053FFFFFFF00540001FFFE00540000FFFF0057000100000054000100010
056FFFF00000053FFFFFFF00530000FFFE0056FFFE00000056FFFFFFF00540002FFFE00560000FF
FF00550001FFFF00540000FFFF00530000FFFF00570000FFFF00550000FFFE0055000100000056FF
FFFFFFD00510001FFFF00570000FFB00550002FFFF00520001FFFE00530000FFFF00550000FFFF00
54000200000054FFFFFFFE00560000000000540002000100550000000000540000FFFF005200000
00000530001FFFE0055FFFF000000520000FFFF00550000FFFF00540000FFFF00540000000000530
000FFFE00550001FFFE00540000FFFE00550000FFFE00560000FFFD00530000FFFE0054000100000
055FFFF000000530000FFFE0053FFFFFFF00560001FFFF0053000000000055000000000055FFFC0
00000550001FFFD00550000000000540000FFFF00530000000000560000FFFF00520000FFFF0055
0000000000560000000000560001FFFF00530000FFFC0054000100000054000200000056000000
0000540000FFFD00560001FFFD005400000000005500010000005507DE0C190F302C01B374920
D0A
```

Parameter	Length (byte)	Range/Format	Default
Message Header	4	+ACC	+ACC
Device Type	1	31	31
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 A hexadecimal number as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

- ✧ <Data>: There are 6*75 bytes in one message with 6 bytes as a group. The first 2 bytes of these 6 bytes represent X-axis acceleration data, the middle 2 bytes represent Y-axis acceleration data and the last 2 bytes are for Z axis acceleration data.

Appendix A: Two's Complement

For a positive value, the two's complement is itself. Take 17 as an example. Its hex format is 0x11 and the two's complement for it is 0x11. For a negative value, the following gives detailed calculations.

-X is a negative value.

Firstly, get to know the number of bits for the negative value N, then the two's complement for it is:

$$2^N - X$$

For example, to use 16 bits to represent -100, the two's complements for it should be:

$$2^{16} - 100 = 65436 = 0xFF9C$$

Above is two's complement for -100 in hex format.

On the contrary, the two's complement can also be converted to the hex value that it represents in a similar way.

1. Get to know the number of bits for the two's complement.
2. Get the sign of the value, positive or negative. If the highest bit is 1, it is a negative value. If the highest bit is 0, it is a positive value.
3. If it is a positive value, there is no need for conversion. It is the value.
4. If it is a negative value, get the real value through the following calculation:

$$-(2^N - X)$$

Where:

N is the number of bits for the two's complement.

X is the value that is converted from the two's complement directly.

For example, if the number of bits for the two's complement is 16 and the two's complement is 0xFF9C, then it is a negative value as the highest bit is 1, and the detailed calculation for it is:

$$-(2^{16} - 0xFF9C) = -100$$

Appendix B: Message Index

✧ Command and ACK

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+GTCAN

+ACK:GTCAN

AT+GTMUT

+ACK:GTMUT

AT+GTIDL

+ACK:GTIDL

AT+GTHBM

+ACK:GTHBM

AT+GTTMA

+ACK:GTTMA

AT+GTOWH

+ACK:GTOWH

AT+GTDOG

+ACK:GTDG
AT+GTPIN
+ACK:GTPIN
AT+GTRTO
+ACK:GTRTO
AT+GTHMC
+ACK:GTHMC
AT+GTJDC
+ACK:GTJDC
AT+GTWLT
+ACK:GTWLT
AT+GTPDS
+ACK:GTPDS
AT+GTSSR
+ACK:GTSSR
AT+GTBZA
+ACK:GTBZA
AT+GTSPA
+ACK:GTSPA
AT+GTGPJ
+ACK:GTGPJ
AT+GTACD
+ACK:GTACD
AT+GTIDA
+ACK:GTIDA
AT+GTFSC
+ACK:GTFSC
AT+GTRMD
+ACK:GTRMD
AT+GTFFC
+ACK:GTFFC
AT+GTCMD
+ACK:GTCMD
AT+GTUDF
+ACK:GTUDF
AT+GTJBS
+ACK:GTJBS
AT+GTCRA
+ACK:GTCRA
AT+GTOWL
+ACK:GTOWL
AT+GTCFU
+ACK:GTCFU
AT+GTOEX

+ACK:GTOEX

AT+GTIEX

+ACK:GTIEX

AT+GTFVR

+ACK:GTFVR

✧ **Position Related Report**

+RESP:GTTOW

+RESP:GTEPS

+RESP:GTDIS

+RESP:GTIOB

+RESP:GTFRI

+RESP:GTGEO

+RESP:GTSPD

+RESP:GTSOS

+RESP:GTRTL

+RESP:GTLBC

+RESP:GTDOG

+RESP:GTIGL

+RESP:GTHBM

+RESP:GTDOS

+RESP:GTGES

+RESP:GTIDA

+RESP:GTERI

+RESP:GTAIS

✧ **Device Information Report**

+RESP:GTINF

✧ **Report for Querying**

+RESP:GTGPS

+RESP:GTCID

+RESP:GTCSQ

+RESP:GTVR

+RESP:GTBAT

+RESP:GTIOS

+RESP:GTTMZ

+RESP:GTALS

+RESP:GTALM

+RESP:GTALC

+RESP:GTGSV

+RESP:GTRSV

✧ **Event Report**

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN
+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTPDP
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF
+RESP:GTJDR
+RESP:GTGSM
+RESP:GTGSS
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTGPJ
+RESP:GTFLA
+RESP:GTCAN
+RESP:GTJDS
+RESP:GTRMD
+RESP:GTCFU

✧ **Crash Data Packet**

+RESP:GTCRD

✧ **Acceleration Data Packet**

+RESP:GTACC

✧ **Heartbeat**

+ACK:GTHBD

+SACK:GTHBD

✧ **Server Acknowledgement**

+SACK

✧ **Hex Format Report Message**

+ACK

+RSP

+EVT

+INF

+HBD

+CAN