GV350M Series @Track Air Interface Protocol

EGPRS/LTE Cat-M1/LTE Cat-NB1/GNSS Tracker

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Contents

0. Revision History

Version	Date	Author	Description of Change
1.00	2018-01-01	Quentin Xue	Initial
1.01	2018-03-16	Hickey Liao	1. Modify GTCFG, add paramters: <GSM deep saving mode>,<Wakeup hour interval>,<Sensor wakeup device debounce>,<Work Time per Wakeup>
1.02	2018-05-31	Hickey Liao	1. Add LTE Mode 2. Modify Network Mode
1.03	2018-07-26	Hickey Liao	1. Add AGPS Mode 2. Add AT+GTGPJ 3. Add +RESP:GTGPJ 4. Add GPJ in GTRTO
2.01	2018-08-31	Hickey Liao	1. Add Mode 20 to <Working Mode> in the **AT+GTURT** command
3.01	2018-09-28	Hickey Liao	1. Modify description of the CAN function
3.02	2018-10-23	Hickey Liao	1. Add <Manual Netreg> field into AT+GTBSI
3.03	2018-11-29	Kerwin Shen	1. Modify AT+GTDOG command
3.04	2018-12-18	Hickey Liao	1.Modify AT+GTTMA 2.Modify +RESP:GTPHD
3.05	2019-01-08	Hickey Liao	1. Modify AT+GTURT command 2. Modify <Detailed Information/Indicators>/<Doors>/<Lights> in +RESP:GTCAN 3. Add AT+GTACD
3.06	2019-01-24	Hickey Liao	1. Modify <+CAN Mask> in AT+GTHRM 2. Modify Description of <CAN Report Mask> in AT+GTCAN
3.07	2019-04-17	Hickey Liao	1. Modify Alarm Mask 1 in GTCLT 2. Add AT+GTMUT command 3. Modify AT+GTCAN command 4. Modify AT+GTURT
3.08	2019-05-28	Hickey Liao	1. Add RTO CMD 0x12/0x13/0x22 2. Add GTCML Report 3. Add GTCSN and GTCVN Report. 4. Modify Alarm Mask 1 in GTCLT
3.09	2019-07-26	Hickey Liao	1.Add Working Mode 22 in AT+GTURT command 2. Add AT+GTPGN command. 3. Modify <Power Saving Mode> description.
3.10	2019-08-26	Hickey Liao	1. Add Hysteresis Error in AT+GTEPS command 2. Add 1-wire Data field in +RESP:GTINF report. 3. Add BaudRate field in AT+GTCAN command.

3.11	019-10-10	Hickey Liao	1. Add "UDP with fixed local port" report mode in AT+GTSRI.
			2. Add <Position Type> in AT+GTDIS.
			3. Add AT+GTGAM.
			4. Add <Inf Expand Mask> in AT+GTCFG.
			5. Add <Inf Expand Mask> in +RESP:GTINF.
			6. Add RTO-30 subcommand.
			7. Add +RESP:GTRSS report.

1. Overview

1.1. Scope of This Document

The @Track Air Interface Protocol, a digital communication interface based on printable ASCII characters over SMS or network, is used for communication between the server and the device. The server sends a command to the device and then the device confirms with an acknowledgement report. The device also sends reports to the server if necessary.
The purpose of this document is to describe how to build up the server based on the @Track Air Interface Protocol.

1.2. Terms and Abbreviations

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

2. System Architecture
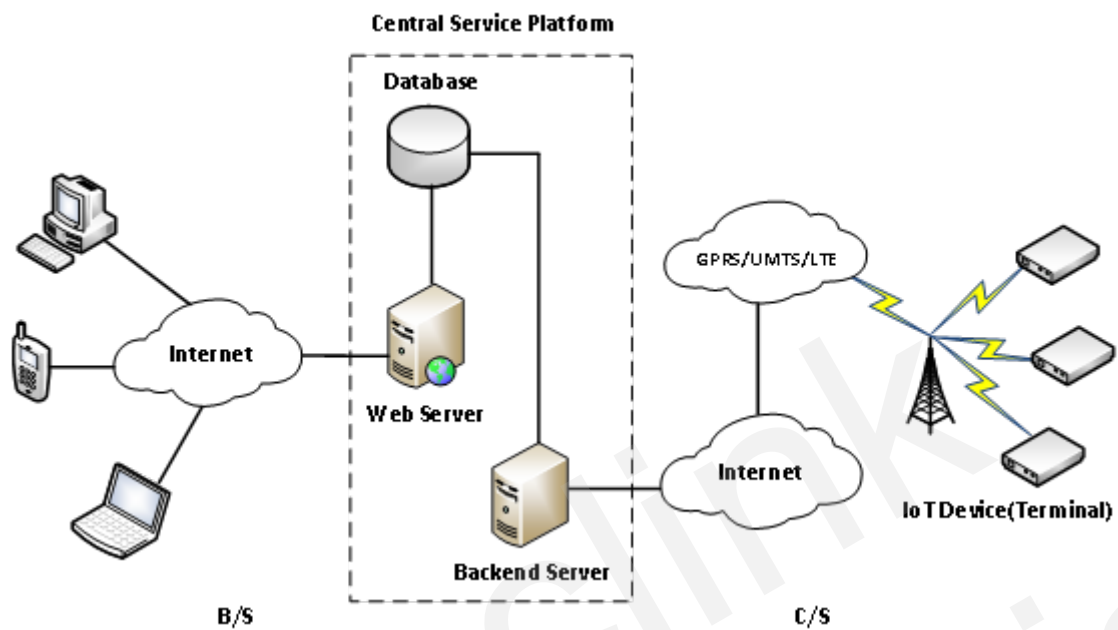
The server can be accessed by multiple devices and should have the following abilities:
✧ The server should be able to access the internet and monitor the connection originating from the device.
✧ The server should be able to support TCP or UDP connection with the device. It should be able to receive data from the device and send data to the device.
✧ The server should be able to receive and send SMS.

3. Report Description

3.1. Report Format

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

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

The entire report string ends with character '$'.

The characters 'XXX' identify the transmitted report.

The "<parameter1>,<parameter2>,…" carries the report's parameters. The number of parameters is different in different reports. The ASCII character ',' is used to separate the neighbouring parameter characters. The parameter string may contain the ASCII characters: '0'–'9','a'–'z', 'A'–'Z'. Detailed descriptions of each report format are located in the specific report sections.

The server can either configure and query the parameters of the device or control the device to perform specific actions by sending Commands to the device. When the device receives Commands over the air, it will reply with a corresponding acknowledgement report.

The device can send other Reports to the server by configuring related parameters. Please see the following figure:
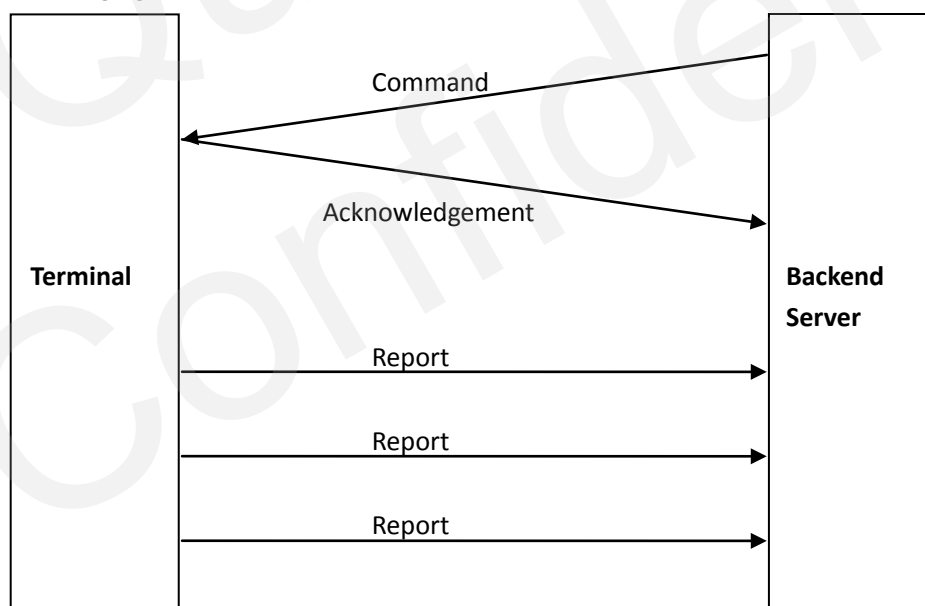
Figure 1: @Tracker Protocol reports flow

3.2. Command And Acknowledgement

3.2.1. Server Configuration

3.2.1.1. Bearer Setting Information

The command **AT+GTBSI** is used to configure the parameters for EGPRS/LTE Cat-M1/LTE Cat-NB1 data connection.

➢ **AT+GTBSI=**

Example: AT+GTBSI=gv350m,myiot,,,CMNET,,,0,2,0,FFFF$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	LTE APN	<=47		
3	LTE APN User Name	<=30		
4	LTE APN Password	<=30		
5	GPRS APN	<=47		
6	GPRS APN User Name	<=30		
7	GPRS APN Password	<=30		
8	Network Mode	1	0 – 3	0
9	LTE Mode	1	0 – 3	
10	Manual Netreg	1	0 – 1	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Password>: The valid characters of password include '0'–9', 'a' –'z', 'A' –'Z'. The default value is "gv350m".

✧ <LTE APN>: LTE access point name.

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

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

✧ <GPRS APN>: GPRS access point name.

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

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

Note:

If there is only one APN, please use it as LTE APN.

✧ <Network Mode>: Select network mode.
  ➤ 0: Auto (LTE first & GSM)
  ➤ 1: GSM Only
  ➤ 2: LTE Only
  ➤ 3: GSM First (LTE & GSM).

✧ <LTE Mode>: Select Cat-M1 and Cat-NB1 work mode.
  ➤ 0: Cat-M1 First (Cat-M1 & Cat-NB1).
  ➤ 1: Cat-NB1 First (Cat-M1 & Cat-NB1).
  ➤ 2: Cat-M1.
  ➤ 3: Cat-NB1.

Note: When "Network Mode" is 1, "LTE Mode" is invalid. "GSM" means EGPRS here.

✧ <Manual Netreg>: Manual network registration selection.
  0: Disable manually register the network.
  1: Enable manually register the network.

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

✧ <Tail Character>: A character which indicates the end of the command. And it must be "$".

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

➤ **+ACK:GTBSI,**

Example:
+ACK:GTBSI,F10101,862170019025640,,0000,20140511093254,11F0$

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 device conforms to. The first two characters represent the device type. As in the example, "**F1**" means GV350M. 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 all the version numbers are hex digits. For example, "**0101**" means version 1.01.

✧ <Unique ID>: The IMEI of the device.

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

✧ <Serial Number>: A serial number which is included in the corresponding command and is

used to distinguish which command the ACK report is for.

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

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

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

Note:

Only after both commands **AT+GTBSI** and **AT+GTSRI** are properly set can the ACK reports and other reports be received by the server.

3.2.1.2. Backend Server Registration Information

The command **AT+GTSRI** is used to configure IP address and port of the server and select report mode between the server and the device.

➢ **AT+GTSRI=**

Example:
AT+GTSRI=gv350m,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$
AT+GTSRI=gv350m,3,,1,some.host.name,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Report Mode	1	0 – 7	0
3	Reserved	0		
4	Buffer Mode	1	0/1/2	1
5	Main Server IP/ Domain Name	<=60		
6	Main Server Port	<=5	0 – 65535	
7	Backup Server IP/ Domain Name	<=60		
8	Backup Server Port	<=5	0 – 65535	
9	SMS Gateway	<=20		
10	Heartbeat Interval	<=3	0/5 – 360min	0
11	SACK Enable	1	0/1/2	0
12	Protocol Format	1	0/1	0
13	SMS ACK Enable	1	0/1	0
14	Reserved	0		

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

◆ <Report Mode>: This part defines the communication mode between the server and the device. Supported report modes are as follows:
- ● 0: Stop mode.
- ● 1: TCP short-connection preferred mode. The connection is based on TCP protocol. The device will connect to the server every time it needs to send data and will cut off the connection after data sending is finished. If the device failed to establish TCP connection with the server (including Main Server and Backup Server), it will try to send data via SMS.
- ● 2: TCP short-connection forced mode. The connection is based on TCP protocol. The device will connect to the server every time it needs to send data and will cut off the connection after data sending is finished. If the device fails to establish TCP connection with the server (including Main Server and Backup Server), all reports will be stored in the BUFFER (if BUFFER function is enabled, please refer to <Enable Buffer>), otherwise all reports will be discarded (if the BUFFER function is disabled).
- ● 3: TCP long-connection mode. The connection is based on TCP protocol. The heartbeat packet is used to maintain the connection between the server and the device. Please note that backend server should respond to the heartbeat packet data from the devices.
- ● 4: UDP mode. The device will send data to the server through the UDP protocol. It supports receiving protocol command via UDP. Make sure the IP address and UDP port of the device can be accessed over the internet, which is normally realized by heartbeat packet and the report **+RESP:GTPDP**.
- ● 5: Force on SMS. Only SMS is used for data transmission. Please refer to the <Send Interval> in **AT+GTFRI** for details.
- ● 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using UDP protocol. The difference is the terminal will use fixed local port rather than random port to communicate with the server in this mode. Thus the backend server could use identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the primary server.
- ● 7: TCP Long-Connection Mode with the backup server. The connection is based on TCP protocol. The heartbeat packet is used to maintain the connection between the server and the device. Please note that backend server should respond to the heartbeat packet data from the devices. If the connection to main server failed, device will try to connect to the backup server. If the connection to backup server also failed, device will try to connect to the main server again.

◆ <Buffer Mode>: The working mode of the buffer report function. When buffer report function is enabled, if the device goes into the network blind area, it will store all reports locally. When the device goes into the network coverage area again, it will send all the

buffered reports to the server.

- ● 0: Disable the buffer report function.
- ● 1: Low priority. The buffer report function is enabled. The device will send the buffered reports after sending the real-time reports.
- ● 2: High priority. The buffer report function is enabled. The device will send all the buffered reports before sending real-time reports except the SOS report (**+RESP:GTSOS**).

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

This field defines the header part of the URL. The whole URL for the HTTP GET method is header part plus the report content (the header "HTTP://" is excluded). For example:"www.queclink.com:8080/reports/parse.php?str=". If port is not included in the URL, the device will connect to the default port of HTTP protocol, 80.

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

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

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

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

✧ <Heartbeat Interval>: The interval for the device to send the heartbeat report to the server when report mode is TCP Long-Connection Mode or UDP Mode. No heartbeat packet reports will be sent to server if interval is 0.

✧ <SACK Enable>: This defines whether the server should respond to the device with SACK report after receiving reports from the device.

- ● 0: The server does not reply a SACK report after receiving a report from the device.
- ● 1: the server not only replies a SACK report after receiving a report from the device but also checks the serial number of the SACK report.
- ● 2: the server replies a SACK report after receiving a report from the device, but it will not check the serial number of the SACK report.

✧ <Protocol Format>: This defines the format of the report. 0 means ASCII format and 1 means the HEX format.

✧ <SMS ACK Enable>: A numeric to indicate whether to send the acknowledge report to the original number when the command is sent by SMS.

- ● 0: The device will send the ACK confirmation report to the server according to the configuration of <Report Mode>.
- ● 1: The device will send the ACK confirmation report to the phone number which sends the command by SMS.

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

➢ **+ACK:GTSRI,**

Example:
+ACK:GTSRI,F10101,862170019025640,,0001,20140511093254,11F0$

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

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

Note:

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

3.2.1.3. Quick Start Settings

The command **AT+GTQSS** is used to configure the parameters for EGPRS/LTE Cat-M1/LTE Cat-NB1 data connection and backend server information in one command if all these settings are within 160 bytes, otherwise two steps (**AT+GTBSI** and **AT+GTSRI**) are needed to configure the settings.

➤ **AT+GTQSS=**

Example:
AT+GTQSS=gv350m,,,,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,0002$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	LTE APN	<=47		
3	LTE APN User Name	<=30		
4	LTE APN User Password	<=30		
5	Report Mode	1	0 – 7	0
6	Reserved	0		
7	Buffer Mode	1	0/1/2	1
8	Main Server IP/ Domain Name	<=60		
9	Main Server Port	<=5	0 – 65535	
10	Backup Server IP	<=15		
11	Backup Server Port	<=5	0 – 65535	
12	SMS Gateway	<=20		
13	Heartbeat Interval	<=3	0/5 – 360min	0

14	SACK Enable	1	0/1/2	0
15	Protocol Format	1	0/1	0
16	SMS ACK Enable	1	0/1	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

➢ **+ACK:GTQSS,**

Example:				
+ACK:GTQSS,F10101,862170019025640,,0002,20140511093254,11F0$				
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=gv350m,,gv350m,0,0,,,003F,1,,3BFF,0,0,0,300,00,,0,0,001F,0,,,,,,24,10,5,,0,,FFFF$					
SN	**Parameter**	**Length (Byte)**	**Range/Format**		**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'		gv350m
2	New Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'		
3	Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'		gv350m
4	ODO Enable	1	0/1		0
5	ODO Initial Mileage	<=9	0.0 – 4294967.0Km		0.0
6	Reserved	0			

7	Reserved	0	0	0
8	Report Composition Mask	4	0000 – FFFF	003F
9	Power Saving Mode	1	0 – 3	1
10	Reserved	0		
11	Event Mask	4	0000 – FFFF	3BFF
12	Pin Mode	1	0/1	0
13	LED On	1	0/1	0
14	Info Report Enable	1	0/1	0
15	Info Report Interval	<=5	30 – 86400sec	300
16	Location Request Mask	2	00|10|20	00
17	Reserved			
18	Backup Battery Charge Mode	1	0/1	0
19	AGPS Mode	1	0/1	0
20	GSM Report	4	0000 – FFFF	001F
21	GPS Lost Time	2	0 – 30min	0
22	Reserved	0		
23	Reserved	0		
24	Reserved	0		
25	Reserved	0		
26	Reserved	0		
27	Wakeup Hour Interval	<=3	1-720	24
28	Sensor Wakeup Debounce	<=2	0-60(s)	10
29	Work Time per Wakeup	<=2	3-60	5
30	Reserved	0		
31	1-wire Device Sample Period	<=3	0/10– 255(s)	0
32	INF Expand Mask	<=4	0000 – FFFF	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <New Password>: Change the current password with a new one.

✧ <Device Name>: The name of the device. It is contained in each report.

✧ <ODO Enable>: Enable or disable the mileage function. The current mileage is included in the report **+RESP:GTINF**.
  - 0: Disable the ODO mileage function.
  - 1: Enable the ODO mileage function.

✧ <ODO Initial Mileage>: The initial value of mileage.

✧ <Report Composition Mask>: Bitwise report mask to configure the composition of all the reports. Each bit represents a field in the report. If a bit is set to 1, the corresponding field will be filled. Otherwise, the field will be empty.
  - Bit 0 for <Speed>
  - Bit 1 for <Azimuth>
  - Bit 2 for <Altitude>
  - Bit 3 for network data, including <MCC>, <MNC>, <LAC>, <Cell ID> and the <Reserved> parameter "00"
  - Bit 4 for <Mileage>
  - Bit 5 for <Send Time>
  - Bit 6 for <Device Name>

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

✧ <Power Saving Mode>: Set the mode of power saving function. If it is set to 0, FRI report will be uploaded to server at <IGF Report Interval> after ignition off. If it is set to 1, FRI report, geo-fence and speed alarm report will be suspended when the vehicle is static or ignition off. If it is set to 2, geo-fence and speed alarm report will be suspended when the vehicle is static or ignition off while FRI report will be uploaded to server at <IGF Report Interval> after ignition off.
  - 0: Disable power saving function
  - 1: GPS deep saving mode
  - 2: GPS low saving mode
  - 3: GSM deep saving mode. When this mode is select, the parameters <Wakeup Hour Interval>, <Sensor Wakeup Debounce> and <Work Time per Wakeup> will be valid. 5 minutes in stillness status after ignition off, the device will enter power saving mode with both the modem and GPS module turned off. After that, the device will wake up periodically as <Wakeup Hour Interval> and <Work Time per Wakeup> determines how long the device will work upon each wake-up, a **+RESP:GTFRI** (<Report ID/Report Type> is 60) will be sent out. Triggers such as Movement, Inputs and Ignition can be used to wake up the device. The device will enter into sleep again once the triggers disappear.

    Note: If the device is configured to use the functions in Quelink Management System (QMS), the QMS **+RESP:GTDMR** report sending interval should be less than <Wakeup Hour Interval>. Otherwise, due to the device is in deep saving mode, the **+RESP:GTDMR** can not be sent.

✧ <Event Mask>: Bitwise mask to configure which event report should be sent to the server.
  - Bit 0 for **+RESP:GTPNA**
  - Bit 1 for **+RESP:GTPFA**

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

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

✧ <Pin Mode>: Configure the working mode of Pin 7 on the connector.
- 0: Analog input 1.
- 1: Digital output 3.

✧ <LED On>: Configure the working mode of power LED and GPS LED.
- 0: Each time the device powers on, both LEDs will work for 30 minutes and then got turned off and dead.
- 1: Turn on Power LED and GPS LED if necessary.

✧ <Info Report Enable>: Enable/Disable the device information report function (**+RESP:GTINF**). The device information includes state of the device, received signal strength, voltage of external power supply, battery voltage, charging state, Power and GPS LED working mode, the last known time of GPS positioning, analog input voltage, all digit inputs and outputs state.
- 0: Disable the device information report function.
- 1: Enable the device information report function.

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

✧ <Location Request Mask>: Bitwise mask for SMS and TEL Location Request position. 4 high bits for SMS request. Each bit, from bit 4 to bit 7, represents one kinds of report. Set to 1 to enable and 0 to disable corresponding report.
- 4 high bits for SMS request mean as below.

  0: Ignore the SMS position request message via SMS.

  1: Report the current position (**+RESP:GTLBC**) when the device received SMS position request message via SMS.

  2: Report the current position with a Google Map link through SMS to the original number when the device receives SMS position request message via SMS.

✧ <Backup Battery Charge Mode>: Control the charge mode of the backup battery.
- 0: When the main power supply is connected, charge the backup battery on need.
- 1: When the main power supply is connected, the backup battery will be charged only when ignition on is detected. The charge process will start 3 minutes after the ignition on. The charge process is stopped when ignition off.

✧ <AGPS Mode>: A numeric to indicate the AGPS mode. AGPS is helpful to improve the chance

to get GPS position successfully and reduce the time to get GPS position.
- 0: Disable the AGPS function.
- 1: AGPS Offline mode.

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

The 2 high bits, Bit 14 – 15, represent the GSM report mode.
- 0: Do not send **+RESP:GTGSM** report to server.
- 1: Send **+RESP:GTGSM** report to server after positioning failed.
- 2: Send **+RESP:GTGSM** report to server after positioning successfully.
- 3: Send **+RESP:GTGSM** report to server in any case.

Bitwise mask to configure which event report should be sent to the server.
- Bit 0 for **+RESP:GTRTL**
- Bit 1 for **+RESP:GTLBC**
- Bit 2 for **+RESP:GTFRI/+RESP:GTERI**
- Bit 3 for **+RESP:GTSOS**
- Bit 4 for **+RESP:GTTOW**
- Bit 5 – 13 are reserved

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

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

✧ <Wakeup Hour Interval>: A numeral to specify the hour interval for waking up the terminal. The value 24 means the terminal wakes up once per 24 hours.

✧ <Sensor Wakeup Device Debounce>: A numeral to specify the debounce time for sensor for waking up the terminal in the GSM deep saving mode.

✧ <Work Time per Wakeup>: Set work time per wakeup. The value range is 3 – 60 minutes and the default value is 5 minutes.

✧ <1-wire Device Sample Period>: 1-wire device sample interval. All sensors will be read every time.

✧ <INF Expand Mask>: Bitwise mask to configure the composition of expanded information in **+RESP:GTINF**.
- Bit 0 for 1-wire device information.
- Bit 1 – 15 Reserved.

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

➢ **+ACK:GTCFG,**

Example:
+ACK:GTCFG,F10310,868446036599153,gv350m,0934,20190826112049,1522$

Parameter	Length (Byte)	Range/Format	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 **AT+GTPIN** command is used to unlock the SIM automatically.

➢ **AT+GTPIN=**

	Example: AT+ GTPIN=gv350m,1,1234, ,,,,,0011$			
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Enable Auto Unlock PIN	1	0/1	0
3	PIN	4-8	'0'-'9'	
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Auto Unlock PIN>: A numeric to indicate whether to unlock the PIN for the device.
- 0: Do not unlock PIN automatically.
- 1: Each time the device power on, it will detect whether the SIM card is locked with PIN or not. If it is locked, the device will unlock the PIN automatically for one time.

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

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

➢ **+ACK: GTPIN,**

Example:
+ACK:GTPIN,F10310,868446036599153,gv350m,0943,20190826112744,155A$

Parameter	Length (Byte)	Range/Format	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. Software Protocol Watchdog

The **AT+GTDOG** command is used to reboot the device or the module. There are two ways of reboot, one is to reboot at regular intervals, and the other is to reboot with specific trigger conditions, for example, ignition on or digital input. This is to prevent the device from working long hours in abnormal state.

➢ **AT+GTDOG=**

Example:
AT+GTDOG=gv350m,1,,1,0130,,1,1,,60, ,,0011$
AT+GTDOG=gv350m,2,30,,,,1,2,,60, ,,0011$
AT+GTDOG=gv350m,0,60,25,,,1,0,1,60,60,60,0011$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0/1/2	1
3	Ignition Frequency	<=3	10 – 120 min	60
4	Reboot Interval	<=2	1 – 30	7
5	Reboot Time	4	HHMM	0200
6	Reserved	0		
7	Report Before Reboot	1	0/1	1
8	Input ID	1	0/1/2/3	0
9	Unit	1	0/1	0
10	No Network Interval	4	0/5-1440 min	480
11	No Activation Interval	4	0/5-1440 min	480
12	Send Failure Timeout	4	0/5-1440 min	480

	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: Working Mode.
- ● 0: Disable
- ● 1: Auto reboot
- ● 2: Ignition reboot

✧ <Ignition Frequency>: When the working mode is 2, if the time interval between two ignitions is greater than the value set in Ignition Frequency, the device will automatically reboot upon ignition on. But please note that if the function is enabled for the first time, the device will reboot at next ignition even if the interval is less than the value set in Ignition Frequency.

✧ <Reboot Interval>: The interval to reboot the device per days.

✧ <Reboot Time>: At what time to perform the reboot operation when <Interval> is met.

✧ <Report Before Reboot>: Whether to report the **+RESP:GTDOG** report or not before reboot. 0 is not to report and 1 to report.

✧ <Input ID>: ID of the digital input port which is used to trigger the manual reboot. 0 means no manual reboot. Digital input ports 1 to 3 are supported.

✧ <Unit>: Unit
- ● 0: Unit is day.
- ● 1: Unit is hour.

✧ <No Network Interval>: The interval to reboot the device when there is no network signal. 0 means no rebooting the device.

✧ <No Activation Interval>: The reboot interval of the device when PDP is unable to register or report interaction failed (such as no TCP Ack, Sever Ack). 0 means no rebooting the device.

✧ <Send Failure Timeout>: The device will reboot automatically if report sending time is greater than <Send Failure Timeout>. 0 means "Do not reboot the device".

The acknowledgment report of **AT+GTDOG** command:

➢ **+ACK:GTDOG,**

Example:
+ACK:GTDOG,F10310,868446036599153,gv350m,0944,20190826112803,155B$

Parameter	Length (Byte)	Range/Format	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. Time Adjustment

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

➢ **AT+ GTTMA =**

	Example:			
	AT+ GTTMA=gv350m,-,3,30,0,20090917203500,,,,,0006$			
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Sign	1	+/-	+
3	Hour Offset	<=2	0-12	00
4	Minute Offset	<=2	0-59	00
5	Daylight Saving	1	0/1	0
6	UTC Time	14	YYYYMMDDHHMMSS	
7	Reserved			
8	Reserved			
9	Reserved			
10	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

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

➢ **+ACK: GTTMA,**

	Example:		
	+ACK:GTTMA,F10310,868446036599153,gv350m,0949,20190826113719,158D$		
Parameter	Length (Byte)	Range/Format	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. Outside Working Hours

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

➢ **AT+GTOWH=**

Example:
AT+GTOWH=gv350m,1,1F,0900,1200,1300,1730,,,3,1,1,0,0,,,,,0010$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
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 –3	0
11	Output ID	1	0 – 3	0
12	Output Status	1	0/1	
13	Duration	<=3	0 – 255(×100ms)	0
14	Toggle Times	<=3	0 – 255	0

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

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

✧ <Day of Work>: Specify the working days in a week in 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, 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 digital input used to reboot device manually. When it is set to 0, the digital input is deactivated. If SOS and reboot use the same digital input, only the command **AT+GTSOS** is valid (**AT+GTDOG** invalid) when the digital input is triggered, and the device will not reboot.

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

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

➢ **+ACK:GTOWH,**

Example:
+ACK:GTOWH,F10310,868446036599153,gv350m,0946,20190826112922,1570$

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

3.2.2.6. Preserve Device Special Logical State

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

➢ **AT+GTPDS=**

Example:
AT+GTPDS=gv350m,1,0,,,,,,,001A$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0/1/2	1
3	Mask	<=4	0-7FF	7FF
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>:
- ● 0: Disable
- ● 1: Preserve device output logical state in the <Mask>

- 2: Reset device output logical state in the <Mask>
- ✧ <Mask>: Bitwise mask to configure which device states will be preserved. Each bit represents a state.
  - Bit 0: States of GEO
  - Bit 1: Reserved bit
  - Bit 2: State of GPS antenna
  - Bit 3: Information of last known position
  - Bit 4: State of ignition
  - Bit 5: State of waveform 1
  - Bit 6: State of digital input
  - Bit 7: State of SPD
  - Bit 8: State of SSR
  - Bit 9: State of main power
  - Bit 10: States of PEO

The acknowledgment report of AT+GTPDS command:

- ➢ **+ACK:GTPD**S,

Example:
+ACK:GTPDS,F10310,868446036599153,gv350m,0951,20190826113823,1593$

Parameter	Length (Byte)	Range/Format	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. Position Report

3.2.3.1. Fixed Report Information

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

- ➢ **AT+GTFRI=**

Example:
AT+GTFRI=gv350m,0,,,,,,,,,,,,,,,,,,0009$

	AT+GTFRI=gv350m,1,1,,1,1000,2300,,30,,,,,600,,,,,0009$
	AT+GTFRI=gv350m,2,1,,1,1000,2300,,,500,,,,,,,,,,0009$
	AT+GTFRI=gv350m,3,1,,1,1000,2300,,,,1000,,,,,,,,0009$
	AT+GTFRI=gv350m,4,1,,1,1000,2300,,60,,300,,,,,,,,0009$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
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	Reserved	0		
9	IGN Report Interval	<=5	5 – 86400sec	30
10	Distance	<=5	50 – 65535m	1000
11	Mileage	<=5	50 – 65535m	1000
12	Reserved	0		
13	Corner Report	<=3	0 – 180	0
14	IGF Report Interval	<=5	0/5-86400sec	600
15	ERI Mask	8	00000000-FFFFFFFF	00000000
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

- 0: Disable.
- 1: Fixed Timing Report. When device is in ignition on and ignition off state, the FRI reports will be reported periodically to the server according to the time parameters defined by <IGN Report Interval> and <IGF Report Interval>.
- 2: Fixed Distance Report. The position report is sent to the server when the straight-line distance between the current GPS position and the last sent GPS position is greater than or equal to the distance specified by parameter <Distance>.

- 3: Fixed Mileage Report. The position report is sent to the server when the path length between the current GPS position and the last position is greater than or equal to the value of <Mileage>. It requires connecting the vehicle ignition signal to the specified digital input port of the device to use this function.

- 4: Optimum Report. Optimum Report mode combines the Fixed Timing Report and Fixed Mileage Report. Only when the report time interval is greater than or equal to the <IGN Report Interval> and the cumulative mileage is greater than or equal to the <Mileage> will the Optimum Report be sent to the server. It requires connecting the vehicle ignition signal to the specified digital input port of the device to use this function.

- 5: Fixed Time or Mileage Report. Fixed Time or Mileage Report mode combines the Fixed Timing Report and Fixed Mileage Report, the device will detect <IGN Report Interval> and the <Mileage> at the same time. As long as one of them meets the conditions, the report will be sent to the server. It requires connecting the vehicle ignition signal to the specified digital input port of the device to use this function.

Note: If ignition is off, the position report is sent to the server periodically according to the parameter <IGF Report Interval>.

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

✧ <Period Enable>: If this function is enabled, FRI report is sent to the server only during the time period defined by <Start time> and <End time>. If this function is disabled, the FRI report is sent to backend server in 24 hours.

✧ <Start Time>: The start time of the FRI 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 FRI report. The valid format and range are the same as <Start Time>.

✧ <IGN Report Interval>: Period to send the position information. The value range is 5 – 86400 and the unit is second. When <Report Mode> in **AT+GTSRI** is set to Force on SMS and IGN Report interval of FRI report is less than or equal to 15s, the port in the SRI configuration must be TCP port, otherwise all data will be cached in buffer if buffer function is enabled and discarded if buffer function is disabled. If IGN Report Interval of FRI report is longer than 15s, all data will be sent via TCP short connection.

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

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

✧ <Corner Report>: If the absolute value of the difference of the azimuth between two positions is greater than or equal to the set value of <Corner Report>, the device will send the corner report with +RESP:GTFRI.

✧ <IGF Report Interval>: If vehicle ignition is off, no matter which report mode it is, even if Power Saving Mode is set to "GPS low saving mode" in Global Configuration, the FRI report is sent to the server as the time interval of <IGF Report Interval>. The range is 0/5 – 86400 and the unit is second.

✧ <ERI Mask>: If the serial port is connected to peripherals and the mask is not 0x00000000, the device will report **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure whether to report the data from peripherals by **+RESP:GTERI**.
- ● Bit 0 for reserved.
- ● Bit 1 for 1-wire device data.
- ● Bit 2 for reserved.
- ● Bit 3 for <Percentage> field in the report of **+RESP:GTERI**. If it is set to 1, the data block <Fuel Sensor Data> will be displayed.
- ● Bit 4 for<Volume> field in the report of **+RESP:GTERI**. If it is set to 1, the data block <Fuel Sensor Data> will be displayed.
- ● Bit 5 for reserved
- ● Bit 6 for reserved

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

➢ **+ACK:GTFRI,**

Example:			
+ACK:GTFRI,F10310,868446036599153,gv350m,0922,20190826111925,1517$			
Parameter	**Length (Byte)**	**Range/Format**	**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 Configuration

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

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

➢ **AT+GTFFC=**

Example:
AT+GTFFC=gv350m,0,1,0,30,500,500,300,,,,,0016$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Priority	1	0-4	0
3	Mode	1	0-3	0
4	FRI Mode	1	0-5	0
5	FRI IGN Report Interval	<=5	5-86400s	30
6	FRI Report Distance	<=5	50-65535m	500
7	FRI Report Mileage	<=5	50-65535m	500
8	FRI IGF Report Interval	<=5	0/5-86400s	300
9	Reserved			
10	Corner Report	<=3	0 – 180	0
11	Reserved			
12	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

✧ <Mode>: Specify the trigger event to change the FRI report parameters.
   ● 0: Disable the parameters in the specified priority.
   ● 1: Change the reporting frequency of FRI report when the device enters into any of the defined Geo-Fence.
   ● 2: Change the reporting frequency of FRI report when the device enters into known roaming state.
   ● 3: Change the FRI report parameter when the device enters into unknown roaming state.

✧ <FRI Mode>: When the specified event occurs, the working mode of the FRI report will be changed according to this parameter.
   ● 0: Do not change the working mode
   ● 1: Change the working mode to 'Timing Report'.
   ● 2: Change the working mode to 'Distance Report'.
   ● 3: Change the working mode to 'Mileage Report'.
   ● 4: Change the working mode to 'Optimum Report'.
   ● 5: Change the working mode to 'Fixed Time or Mileage Report'.

✧ <FRI IGN Report Interval>: Period to send the position information when ignition on. The value range is 5 – 86400 and the unit is second.

✧ <FRI Report Distance>: The specified distance to send the position information when it is changed to fixed distance report. Unit: meter.

✧ <FRI Report Mileage>: The specified path length to send the position information when it is changed to fixed mileage report or optimum report. Unit: meter.

✧ <FRI IGF Report Interval>: Period to fix and send the position information when ignition off if <Power Saving Mode> in **AT+GTCFG** is set to 2 and <FRI Mode> in this command is set to 1 (Fixed Timing Report). The value range is 0/5 – 86400 and the unit is second.

✧ <Corner Report>: If the absolute value of the difference of the azimuth between two positions is greater than or equal to the set value of <Corner Report>, the device will send the corner report with **+RESP:GTFRI**.

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

➢ **+ACK:GTFFC,**

Example:
+ACK:GTFFC,F10310,868446036599153,gv350m,0928,20190826111947,151B$

Parameter	Length (Byte)	Range/Format	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 Configuration

The command AT+GTGEO is used to configure the parameters of the virtual Circular Geo-Fence. If this function is enabled, the device will send a report **+RESP:GTGIN** or **+RESP:GTGOT** to the server when the device detects it enters or exits the area. The device can support up to 20 Circular Geo-Fences.

➢ **AT+GTGEO=**

Example:
AT+GTGEO=gv350m,0,3,121.412248,31.187891,1000,600,1,1,0,0,0,0,,,000A$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
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 – 3	0
9	Output Status	1	0/1	
10	Duration	<=3	0 – 255(×100ms)	0
11	Toggle Times	<=3	0 – 255	0
12	Trigger Mode	<=2	0/21/22	0
13	Trigger Report	1	0/1	0
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

✧ <Mode>: The working mode of the circular Geo-Fence to report **+RESP:GTGIN** or **+RESP:GTGOT** to the server.
   ● 0: Disable.
   ● 1: Entering the zone. Device will send report **+RESP:GTGIN** to the server when it detects that vehicle enters the Geo-Fence area.
   ● 2: Exiting the zone. Device will send report **+RESP:GTGOT** to the server when it detects that vehicle exits the Geo-Fence area.
   ● 3: Both entering and exiting.

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

✧ <Latitude>: The coordinate which defines the center of a circle of Circular Geo-Fence. The format is "(−) xx.xxxxxx" and the value range is from "−90.000000" to "90.000000". The unit is degree. South Latitude is defined as negative value starting with "−" and north Latitude is defined as positive value without "+".

✧ <Radius>: The radius of the circular Geo-Fence. The value range is 50 – 6000000 and the unit is meter.

✧ <Check Interval>: The checking interval of the circular Geo-Fence alarm.0 means to disable Geo-Fence function.

✧ <Trigger Mode>:

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

✧ **<Trigger Report>**: Whether to report **+RESP:GTGES** when specified trigger mode is triggered and when the Geo-Fence is cancelled.
- 0: Disable report **+RESP:GTGES**.
- 1: Enable report **+RESP:GTGES**.

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

➢ **+ACK:GTGEO,**

Example:
+ACK:GTGEO,F10310,868446036599153,gv350m,0,0768,20190823152046,139D$

Parameter	Length (Byte)	Range/Format	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. Polygon Geo-Fence

The command **AT+GTPEO** is used to configure the parameters of the virtual Polygon Geo-Fence.
If this function is enabled, the device will send a report **+RESP:GTGIN** or **+RESP:GTGOT** to the server when the device detects that it enters or exits the area. The device can support up to 20 Polygon Geo-Fences.

➢ **AT+GTPEO=**

	Example:			
	AT+GTPEO=gv350m,0,0,1,3,121.412240,31.187801,121.412248,31.187891,121.412258,31.187991,600,1,1,0,0,,,,,0039$			
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	GEO ID	<=2	0 – 19	0
3	Mode	1	0 – 3	0
4	Start Point	1/2	0/1-10	1
5	End Point	1/2	0/1-10	3
5+2N-1	Longitude	<=11	(–)xxx.xxxxxx	
5+2N	Latitude	<=10	(–)xx.xxxxxx	
6+2N	Check Interval	<=5	0/5 – 86400sec	0
7+2N	Output ID	1	0 – 3	0
8+2N	Output Status	1	0/1	
9+2N	Duration	<=3	0 – 255(×100ms)	0
10+2N	Toggle Times	<=3	0 – 255	0
11+2N	Reserved	0		
12+2N	Reserved	0		
13+2N	Reserved	0		
14+2N	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

✧ <Mode>: The working mode of the polygon Geo-Fence to report **+RESP:GTGIN** or **+RESP:GTGOT** to the server.

- ● 0: Disable.
- ● 1: Entering the zone. Device will send report **+RESP:GTGIN** to the server when it detects that vehicle enters the Geo-Fence area.
- ● 2: Exiting the zone. Device will send report **+RESP:GTGOT** to the server when it detects that vehicle exits the Geo-Fence area.
- ● 3: Both entering and exiting.

✧ <Start Point>: The starting coordinate of the polygon Geo-Fence.

✧ <End Point>: The ending coordinate of the polygon Geo-Fence

✧ <Longitude>: The node coordinate of the polygon Geo-Fence. The format is "(–)xxx.xxxxxx"

and the value range is from "–180.000000" to "180.000000". The unit is degree. West longitude is defined as negative value starting with "–" and east longitude is defined as positive without "+".

✧ <Latitude>: The node coordinate of the polygon Geo-Fence. The format is "(–)xx.xxxxxx" and the value range is from "–90.000000" to "90.000000". The unit is degree. South Latitude is defined as negative value starting with "–" and north Latitude is defined as positive without "+".

Note: If more groups of <longitude>and <latitude> are needed, please use<start point> and <end point> to adjust. Marked <longitude> and <latitude> mean to repeat.

✧ <Check Interval>: The checking interval for the Geo-Fence alarm. 0 means to disable Geo-Fence function.

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

➢ **+ACK:GTPEO,**

Example:
+ACK:GTPEO,F10310,868446036599153,gv350m,0,FFFF,20190823162454,13E9$

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

3.2.4.3. Speed Alarm

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

➢ **AT+GTSPD=**

Example:
AT+GTSPD=gv350m,1,80,120,60,300,1,1,0,0,,,,,,,,,,,,,000C$
AT+GTSPD=gv350m,2,80,120,60,300,1,1,0,0,,,,,,,,,,,,,000C$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m

2	Mode	1	0/1/2/3/4	0
3	Min Speed	<=3	0 – 400km/h	0
4	Max Speed	<=3	0 – 400km/h	0
5	Valid Time	<=4	0 – 3600sec	60
6	Send Interval	<=4	30 – 3600sec	300
7	Output ID	1	0 – 3	0
8	Output Status	1	0/1	
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: The working mode of the speed alarm.
- ● 0: Disable.
- ● 1: Send **+RESP:GTSPD** report to server when current speed is within the speed range.
- ● 2: Send **+RESP:GTSPD** report to server when current speed is outside the speed range.
- ● 3: Send **+RESP:GTSPD** report to server when current speed switches between upper limit and lower limit.
- ● 4: Same as mode 3, but speed detected for the first time must be outside the range.

✧ <Min Speed>: The lower limit speed.

✧ <Max Speed>: The upper limit speed.

✧ <Valid Time>: If the speed meets the alarm condition and maintains the period of time

defined by <Valid Time>, the speed alarm will be triggered.

✧ <Send Interval>: The time interval of sending speed alarm report.

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

➢ **+ACK:GTSPD,**

Example:
+ACK:GTSPD,F10310,868446036599153,gv350m,0846,20190823174249,141A$

Parameter	Length (Byte)	Range/Format	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	$	$

3.2.4.4. Overspeed Alarm

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

➢ **AT+GTSPA**

Example:
AT+GTSPA=gv350m,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,,0000$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0/1/2	0
3	Speed Threshold 1	<=3	0 – 400km/h	50
4	Reserved	0		
5	Valid Time	<=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	Valid Time	<=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	Valid Time	<=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	Valid Time	<=4	0 – 3600sec	60
24	Alarm Type	1	0/1 – 4	0
25	Reserved	0		
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
32	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: Working mode of overspeed alarm.
- 0: Disable.
- 1: Strict Standard Mode. This mode will check the speed and trigger the buzzer alarm during speedup or slowdown.
- 2: Warning Mode. This mode will only check the speed and trigger the buzzer alarm during speedup.

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

✧ <Valid Time>: If the speed meets the alarm condition and duration is longer than the time specified by <Valid Time>, the buzzer alarm will be triggered.

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

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

➢ **+ACK:GTSPA,**

Example:
+ACK:GTSPA,F10310,868446036599153,gv350m,0847,20190823174322,141D$

Parameter	Length (Byte)	Range/Format	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	$	$

3.2.4.5. Buzzer Alarm

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

➢ **AT+GTBZA=**

Example:
AT+GTBZA=gv350m,2,,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,,,,0000$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Output ID	1	0 - 3	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Alarm 1 Output Status	1	0/1	
7	Duration	<=3	0 – 255 (×100ms)	0
8	Toggle Times	<=3	0 – 255	0

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

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

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

➤ **+ACK:GTBZA,**

Example:
+ACK:GTBZA,F10310,868446036599153,gv350m,0848,20190823174524,1422$

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

3.2.4.6. Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh behavior of the driver with motion sensor. Two kinds of harsh behavior will be monitored, the harsh braking and the harsh acceleration. The function works when the ignition is on and the vehicle is moving.

➢ **AT+GTHBM=**

Example:
AT+GTHBM=gv350m,1,,,100,21,6,,60,21,6,,,21,15,,1,1,8,3,,,,,000F$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0/1/2/3	0
3	Reserved	0		
4	Reserved	0		
5	High Speed	<=3	100 – 400km/h	100
6	ΔVhb	<=3	0 – 100km/h	0
7	ΔVha	<=3	0 – 100km/h	0
8	Reserved	0		
9	Medium Speed	<=3	60 – 100km/h	60
10	ΔVmb	<=3	0 – 100km/h	0
11	ΔVma	<=3	0 – 100/km/h	0
12	Reserved	0		
13	Reserved	0		
14	ΔVlb	<=3	0 – 100/km/h	0
15	ΔVla	<=3	0 – 100/km/h	0

16	Reserved	0		
17	Output ID	1	0 – 3	0
18	Output Status	1	0/1	0
19	Duration	<=3	0 – 255(×100ms)	0
20	Toggle Times	<=3	0 – 255	0
21	Brake Threshold	<=3	30-70	30
22	Brake Duration	<=3	40-100(*8ms)	50
23	Acceleration Threshold	<=3	15-50	20
24	Acceleration Duration	<=3	50-250(*8ms)	65
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

According the speed read from GPS, 3 levels of speed, high speed, medium speed and low speed are defined. For each speed level, 2 thresholds of speed change are defined to determine the harsh braking and harsh acceleration. If the change of speed within 5 seconds is greater than the corresponding threshold, the device will report **+RESP:GTHBM** to the server to indicate the harsh behavior. Repetitive harsh behaviors within 30 seconds will only be reported once.

✧ <Mode>: Working Mode.
  ● 0: Disable
  ● 1: Detected by GPS only.
  ● 2: Detected by motion sensor only.
  ● 3: Detected by motion sensor and GPS.
✧ <High Speed>, <Medium Speed>: If the last known speed of the device read from GPS is greater or equal to <High Speed>, the vehicle that the device attached to is considered to be at high speed. If the last known speed is less than <High Speed> while greater 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 within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to this value, a harsh braking is detected at high speed level. If it is set to 0, there is no monitoring harsh braking behavior at high speed level.
✧ <ΔVha>: The threshold for harsh acceleration at high speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected at high speed level. If it is set to 0, there is no monitoring harsh acceleration behavior at high speed level.
✧ <ΔVmb>: The threshold for harsh braking in medium speed level. If within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to this value, a harsh braking is detected in medium speed level. If set to 0, do not monitor harsh braking behavior in medium speed level.

✧ <ΔVma>: The threshold for harsh acceleration at medium speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected at medium speed level. If it is set to 0, there is no monitoring harsh acceleration behavior at medium speed level.

✧ <ΔVlb>: The threshold for harsh braking at low speed level. If within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to this value, a harsh braking is detected at low speed level. If it is set to 0, there is no monitor harsh braking behavior in low speed level.

✧ <ΔVla>: The threshold for harsh acceleration at low speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected at low speed level. If it is set to 0, there is no monitor harsh acceleration behavior in low speed level.

✧ <Output ID>: Specify the ID of the output port (1 to 3) to output specified waveform when the harsh behavior is detected. If it is set to 0, there is no output waveform.

✧ <Brake Threshold>: The threshold for the motion sensor to measure whether the device is in harsh braking status.

✧ <Brake Duration>: The time parameter to confirm that the device enters harsh braking status. The driving behavior must maintain for a period of time greater than the value defined by <Brake Duration> so that harsh braking behavior event can be triggered.

✧ <Acceleration Threshold>: The threshold for the motion sensor to measure whether the device is in harsh acceleration behavior status.

✧ <Acceleration Duration>: The time parameter to confirm that the device enters harsh acceleration status. The driving behavior must maintain for a period of time greater than the value defined by <Acceleration Duration> so that harsh acceleration behavior event can be triggered.

The acknowledgment report of **AT+GTHBM** command:

➢ **+ACK:GTHBM,**

Example:
+ACK:GTHBM,F10310,868446036599153,gv350m,1243,20190827090902,23CB$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	154	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. Crash Alarm

The command **AT+GTCRA** is used to configure the parameter for Crash Alarm. When the detection condition is met, the device will report **+RESP:GTCRA** event report and data packets **+RESP:GTCRD** to the server. If it is configured to report GPS information to the server, the device will report **+RESP:GTCRG** with GPS information up to 10s before crash and up to 10s after crash.

➢ **AT+GTCRA=**

Example:
AT+GTCRA=gv350m,1,5,,,,,,0,1,10,6,,001D$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0/1	0
3	G-Sensor Sensitivity	<=2	1 – 99(*0.1g)	7
4	Reserved	0		
5	GPS Data Pre-Crash	<=2	0-10	10
6	GPS Data Post-Crash	<=2	0-10	10
7	Sample Period Pre-Crash	<=2	1-10	10
8	Sample Period Post-Crash	<=2	1-10	10
9	Output ID	1	0 – 3	0
10	Output Status	1	0/1	
11	Duration	<=3	0～255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: Working Mode.
   ● 0: Disable.
   ● 1: Enable.
✧ <G-Sensor Sensitivity>: G-Sensor Sensitivity of the Crash Alarm. The smaller the number is, the more sensitive this function would be.

The acknowledgment report of **AT+GTCRA** command:

➢ **+ACK:GTCRA,**

Example:
+ACK:GTCRA,F10310,868446036599153,gv350m,0858,20190826104350,14AF$

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

3.2.4.8. SOS Alarm

This command is used to configure the specified digital input port for emergency event. When emergency event occurs, device will report **+RESP:GTSOS** to the server or to the SOS number by SMS. A specified output waveform can be configured on specified output port.

➢ **AT+GTSOS=**

Example:
AT+GTSOS=gv350m,1,1,+8613812341234,1,1,0,0,,,,,000D$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0 – 4	0
3	Digital Input ID	1	0/1 – 3	0
4	Reserved	0		
5	Output ID	1	0 –3	
6	Output Status	1	0/1	
7	Duration	<=3	0 – 255(×100ms)	0
8	Toggle Times	<=3	0 – 255	0
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	

	Tail Character	1	$	$

✧ <Mode>: The working mode of SOS Alarm.
- 0: Disable SOS Alarm.
- 1: reserved.
- 2: Send current location to the server only.
- 3: reserved.
- 4: Send the current location to gateway number and the number in the Google Link SMS Configuration.

✧ <Digital Input ID>: ID of the digital input port which triggers the SOS Alarm. 0 means the SOS Alarm is disabled. The corresponding digital input port should be configured by the command **AT+GTDIS** firstly. If SOS Alarm is configured, the **+RESP:GTDIS** report will be not generated when specified digital input was triggered.

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

➢ **+ACK:GTSOS,**

Example:				
+ACK:GTSOS,F10310,868446036599153,gv350m,0861,20190826104755,14C8$				
Parameter	**Length (Byte)**	**Range/Format**		**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}		
Unique ID	15	IMEI		
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'		
Serial Number	4	0000 – FFFF		
Send Time	14	YYYYMMDDHHMMSS		
Count Number	4	0000 – FFFF		
Tail Character	1	$		$

3.2.4.9. Google Link SMS Configuration

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

➢ **AT+GTGLM=**

Example:				
AT+GTGLM=gv350m,1,1,2,13813888888,13913999999,,,,,000D$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m

2	Google Mode	1	0/1/2/3	0
3	Phone Number Start	1	1-3	1
4	Phone Number End	1	1-3	1
5	Direct Number List	<=20*3		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Google Mode>: A numeric to indicate whether to send a SMS with Google link to the number in <Direct Number List> for SOS and GEO event.
- 0: Do not send SMS with Google hyperlink to the number in the <Direct Number List> when SOS or GEO event occurs.
- 1: Send SMS with Google hyperlink to the number in the <Direct Number List> only when SOS event occurs.
- 2: Send SMS with Google hyperlink to the number in the <Direct Number List> only when GEO event occurs.
- 3: Send SMS with Google hyperlink to the number in the <Direct Number List> when SOS or GEO event occurs.

✧ <Phone Number Start>: A numeric to indicate the first index of the white number list to be input. For example, if it is 1, it will update the white number list from the 1st one. If it is empty, it should not include the number of <Direct Number List>.

✧ <Phone Number End>: A numeric to indicate the last index of the white number list to be input. For example, if it is 2, it will update the white number list until the 2nd one. If it is empty, it should not include the number of <Direct Number List>.

✧ <Direct Number List>: A phone number list. It could include several phone numbers. And two neighboring phone numbers are separated with ",". The number of the phone number in the list is defined by the parameter <Phone Number Start> and <Phone Number End>. For example, if <Phone Number Start> is 1 and <Phone Number End> is 2, the <White Number List> should include 2 phone numbers and the two numbers are separated with ",".

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

➤ **+ACK: GTGLM,**

Example:
+ACK:GTGLM,F10310,868446036599153,gv350m,0906,20190826110805,14FB$

Parameter	Length (Byte)	Range/Format	Default

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

3.2.4.10. External Power Supply Monitoring

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

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

➢ **AT+GTEPS=**

| Example: |
| **AT+GTEPS=gv350m,2,250,12000,,2,1,1,0,0,1,1000,,5,0007$** |

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0-3	0
3	Min Threshold	<=5	250 – 32000 mV	
4	Max Threshold	<=5	250 – 32000 mV	
5	Reserved			0
6	Debounce Time	1	0 – 255 (×10s)	0
7	Output ID	1	0 – 3	
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	00
12	Hysteresis Error	<=4	0 – 2000	0
13	Reserved			

14	MPN/MPF Valid Time	1	0 – 255 (×1s)	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: Working mode of the external power supply monitoring.
   ● 0: Disable.
   ● 1: Report when the input voltage is within the range.
   ● 2: Report when the input voltage is outside the range.
   ● 3: Report when the input voltage is within or outside the range.

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

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

✧ <Debounce Time>: Checking twice in a short period of time to make sure the external power supply is definitely changed.

✧ <Output ID>: Specify the ID of the output port (1 to 3) to output specified waveform when the **+RESP:GTEPS** alarm is triggered. If it is set to 0, there is no output waveform.

✧ <Sync with FRI>: Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the FRI report.
   ● 0: Do not report external power supply voltage with FRI report.
   ● 1: Report external power supply voltage with FRI report.

✧ <Hysteresis Error>*:* It is an offset to the *<Min Threshold>* and *<Max Threshold>*. It can be used to suppress the bouncing of external power supply voltage detection. If this parameter is set, the limit to trigger the alarm is calculated as following:
   ● Outside the range: detected voltage is greater than *<Max Threshold> + <Hysteresis Error>* or less than *<Min Threshold>.*
   ● Inside the range: detected voltage is higher than *<Min Threshold> + <Hysteresis Error>* or less than *<Max Threshold>.*

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

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

➢ **+ACK:GTEPS,**

Example:
+ACK:GTEPS,F10310,868446036599153,gv350m,0908,20190826110956,14FC$

Parameter	Length (Byte)	Range/Format	Default

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

3.2.4.11. Movement Alarm

The command **AT+GTSSR** is used to detect the motion state of vehicle (movement or static). When the device detects that the vehicle is in movement state, it will send event report **+RESP:GTSTR** to the server. When the vehicle exits the movement state and goes into static state, it will send event report **+RESP:GTSTP** to the server.

➢ **AT+GTSSR=**

Example:				
AT+GTSSR=gv350m,1,2,1,5,2,,,,0017$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0/1	0
3	Stop Detection Time	2	1 – 30 min	2
4	Motion Detection Time	1	1 – 5 min	1
5	Start Speed	2	1 – 10 Km/h	5
6	Long Stop Detection Time	<=5	0 – 43200 min	0
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: Working Mode.

- 0: Disable
- 1: Enable

✧ <Stop Detection Time>: Duration of static state is more than <Stop Detection Time>, the vehicle is considered to go into static state.

✧ <Motion Detection Time>: Duration of movement state is more than <Motion Detection Time>, the vehicle is considered to go into movement state.

✧ <Start Speed>: The threshold of start speed

- After successful GPS positioning, if the vehicle speed is more than <Start Speed> and the duration is longer than <Motion Detection Time>, **+RESP:GTSTR** report will be sent to backend server; if the vehicle speed is less than <Start Speed> and the duration is longer than <Stop Detection Time>, **+RESP:GTSTP** report will be sent to backend server; if the duration is more than <Long Stop Detection Time>, report **+RESP:GTLSP** will be sent to backend server.
- When GPS fails to locate, device will not detect the vehicle speed. At this time, only built-in motion sensor detects the movement state. When the motion sensor detects that the vehicle is moving with ignition on and the duration is more than <Motion Detection Time>, **+RESP:GTSTR** report will be sent to backend server. If device detects that vehicle is in static state and the duration is more than <Stop Detection Time>, **+RESP:GTSTP** report will be sent to backend server; if the duration is more than <Long Stop Detection Time>, **+RESP:GTLSP** report will be to backend server.

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

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

➢ **+ACK:GTSSR,**

Example:
+ACK:GTSSR,F10310,868446036599153,gv350m,0850,20190823175259,1433$

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

3.2.4.12. Excessive Idling Detection

The command **AT+GTIDL** is used to detect excessive engine idling (static while ignition on). The

ignition wire must be connected to the device or the OBD Virtual Ignition mode must be used before enabling this function. When the device detects the vehicle goes into idle state, it will send event report **+RESP:GTIDN** to the server. After the vehicle exits the idle state, the device will send event report **+RESP:GTIDF** to the server.

➢ **AT+GTIDL=**

SN	Parameter	Length (Byte)	Range/Format	Default
Example: AT+GTIDL=gv350m,1,2,1,,,,,1,1,0,0,,,,,000E$				
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0/1	0
3	Idling Detection Time	2	1 – 30 min	2
4	Idling End Time	1	1 – 5 min	1
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Output ID	1	0 – 3	0
10	Output Status	1	0/1	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Debounce Option	1	0-1	0
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

✧ <Idling Detection Time>: If the vehicle is detected to be static with ignition on for this time long, it is considered to be in idling state.

✧ <Idling End Time>: After the vehicle goes into idling state, if it moves again or ignition is off and hold that state for the time specified by <Idling End Time>, the vehicle is considered to

exit idling state.

✧ <Output ID>: Specify the ID of the output port (1-3) to output specified waveform when the vehicle goes into idling state. If it is set to 0, there is no output waveform.

✧ <Debounce Option>: Specify required debouncing time to exit idle state after ignition off. 0 means needing no debounce. 1 means needing to debounce <Idling End Time>.

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

➢ **+ACK:GTIDL,**

Example:
+ACK:GTIDL,F10310,868446036599153,gv350m,0854,20190823175847,143F$

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

3.2.4.13. Tow Alarm

The **AT+GTTOW** command is used to configure the motion sensor and the parameters for tow alarm. If the ignition state can't be known by hard-wired line or OBD, this function is invalid.

➢ **AT+GTTOW=**

Example:
AT+GTTOW=gv350m,0,120,120,,0,0,0,0,,,,,,,,,,,,,000D$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Tow Enable	1	0/1	0
3	Tow Detection Time	<=2	5 – 15 min	10
4	Fake Tow Delay	<=2	0 – 10 min	1
5	Report Interval	<=5	30 – 86400 sec	300
6	Tow Output ID	1	0 – 3	
7	Tow Output Status	1	0/1	
8	Tow Output Duration	<=3	0 – 255 (×100ms)	0

9	Tow Output Toggle Times	<=3	0 – 255	0
10	Rest Duration	<=3	1 – 255 (×15sec)	2
11	Motion Duration	<=2	1 – 10 (×100ms)	3
12	Motion Threshold	1	2 – 4	3
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Tow Enable>: Enable or disable tow alarm (**+RESP:GTTOW**).
   ● 0: Disable the tow alarm
   ● 1: Enable the tow alarm
✧ <Tow Detection Time>: After ignition off, if device detects that vehicle has never entered into static state and this situation lasts longer than the threshold of <Tow Detection Time>. Then this action will be regarded as car-towing, and the **+RESP:GTTOW** report will be sent to the backend server.
✧ <Fake Tow Delay>: After ignition off and vehicle has entered into static state, if device detects that vehicle was moved but the duration is no more than the threshold of <Fake Tow Delay>, this action will be regarded as fake car-towing. If the moving lasts longer than the threshold of <Tow Detection Time>, this action will be regarded as car-towing, and +RESP:GTTOW report will be sent to the backend server.
✧ <Report Interval>: The period to send tow alarm report.
✧ <Tow Output ID>: The ID of the output port to send the specified waveform when tow event is detected.
✧ <Tow Output Status>: Please refer to the parameter <Output1–3 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.

The acknowledgment report of **AT+GTTOW** command:
➢ **+ACK:GTTOW,**

Example:			
+ACK:GTTOW,F10310,868446036599153,gv350m,0855,20190826093423,1452$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.14. Temperature Alarm

This command is used to configure parameters of temperature detection. According to the working mode, the device will send event report **+RESP:GTTMP** to the server when the device detects the temperature is outside or inside the range.

➢ **AT+GTTMP=**

Example:				
AT+GTTMP=gv350m,0,1, 862170019025640,,,-20,50,,,2,10,,,1,1,0,0,,,,,000C$				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Alarm ID	1	0-7	
3	Mode	1	0-3	0
4	Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
5	Reserved	0		
6	Reserved	0		
7	Low Temperature	<=3	-55 – 125℃	0
8	High Temperature	<=3	-55 – 125℃	0
9	Reserved	0		
10	Reserved	0		
11	Valid Time	<=2	1 – 10	2
12	Send Interval	<=2	0 – 60	10
13	Reserved	0		

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

✧ <Alarm ID>: ID of the temperature alarm. Total eight samples (0-7) are supported
✧ <Mode>: The working mode of the temperature alarm.
  ● 0: Disable.
  ● 1: When the current temperature is within the range.
  ● 2: When the current temperature is outside the range.
  ● 3: Report only once if the current temperature is within or outside the range.
✧ <Sensor ID>: ID of the temperature sensor. Total 8 sensors are supported.
✧ <Low Temperature>: The lower limit temperature.
✧ <High Temperature>: The upper limit temperature.
✧ <Valid Time>: When the temperature sensor detects the environment temperature meets the alarm condition and the duration is more than the value of <Valid Time>, the temperature alarm will be triggered.
✧ <Send Interval>: The sending interval of temperature report **+RESP:GTTMP**. If <Send Interval> is set to 0, it will report only once.

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

➢ **+ACK:GTTMP,**

Example:				
+ACK:GTTMP,F10310,868446036599153,gv350m,0,0962,20190826115502,15D0$				
Parameter	**Length (Byte)**	**Range/Format**		**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}		
Unique ID	15	IMEI		
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'		

Alarm ID	1	0-7	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.4.15. Roaming Detection Configuration

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

➢ **AT+GTRMD=**

Example:
AT+GTRMD=gv350m,0,,,,,1,2,4600F,4602F,,,1,1,,,,2,2,,,,1f,,,1f,,,,,0,0,0,0,,,0001$
AT+GTRMD=gv350m,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 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
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	1
8	Home Operator End	<=2	1-10	1
9	Home Operator List	<=6*10		
10	Reserved	0		
11	Reserved	0		
12	Roaming Operator Start	<=3	1-100	1
13	Roaming Operator End	<=3	1-100	1
14	Roaming Operator List	<=6*100		
15	Reserved	0		
16	Reserved	0		
17	Black Operator Start	<=2	1-20	1
18	Black Operator End	<=2	1-20	1

19	Black Operator List	<=6*20		
20	Reserved	0		
21	Reserved	0		
22	Known Roaming Event Mask	<=6	000000 – FFFFFF	7FFF
23	Reserved	0		
24	Reserved	0		
25	Unknown Roaming Event Mask	<=6	000000 – FFFFFF	7FFF
26	Reserved	0		
27	Reserved	0		
28	Reserved	0		
29	Reserved	0		
30	Output ID	1	0 – 3	0
31	Output Status	1	0/1	
32	Duration	<=3	0～255(×100ms)	0
33	Toggle Times	<=3	0 – 255	0
34	Reserved	0		
35	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: Working mode of the roaming detection function.
  ● 0: Disable.
  ● 1: Enable.
✧ <Operator Start>: A numeric which indicates the first index of the white operator number to be input. For example, if the value is 1, it will update the white operator list from the 1st one. If the parameter is empty, there should be no white number list following the empty value.
✧ <Operator End>: A numeric which indicates the last index of the white operator number to be input. For example, if the value is 2, it will update the white operator list until the 2nd one. If the parameter is empty, there should be no white number list following the empty value.
✧ <Home Operator List>: A white number list of PLMN operators. The numbers are comprised of MCC and MNC, both of which consist of 3 digits. The operators in this list will be considered as in "Home" state. And two adjacent operator numbers are separated with ','. The number of the operators in the list depends on the parameters <Operator Start> and <Operator End>. For example, if <Operator Start> is 1 and <Operator End> is 2, the operator

list should include **2** operator numbers (empty value acceptable) and the two numbers are separated with '**,**'. 'MCCFF' type code is used to identify operators across a whole country. For example, '460FF' covers the mobile network operators all across China.

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

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

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

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

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

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

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

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

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

➢ **+ACK:GTRMD,**

Example:
+ACK:GTRMD,F10310,868446036599153,gv350m,0909,20190826111109,1500$

Parameter	Length (Byte)	Range/Format	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:

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

3.2.4.16. GPS Jamming Alarm

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

➢ **AT+ GTGPJ=**

Example:				
AT+GTGPJ=gv350m,1,15,3,,,,,1,1,15,5,,0019$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0'–'9' 'a'–'z' 'A'–'Z'	Gv350m
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 – 3	0
10	Output Status	1	0/1	0
11	Duration	<=3	0 – 255(×100ms)	0
12	Toggle Times	<=3	0 – 255	0
13	Reserved	0		
	Serial Number	4	0000–FFFF	

	Tail Character	1	$	$

✧ <Mode>: Working Mode.
   ● 0: Disable.
   ● 1: Enable.
✧ <BB Threshold>: Broadband jamming detection threshold (unit: dB)
✧ <CW Threshold>: Continuous wave (narrowband) jamming detection threshold (unit: dB)

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

➢ **+ACK:GTGPJ**

Example:
+ACK:GTGPJ,F10310,868446036599153,gv350m,0913,20190826111226,1505$

Parameter	Length (Byte)	Range/Format	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	$	$

3.2.4.17. Binding SIM Card

The **AT+GTSIM** command is used to bind SIM card. The device will generate a digital output signal when changing SIM card.

➢ **AT+ GTSIM =**

Example:
AT+GTSIM=gv350m,1,898600910909f0385552,,,2,1,0,0,,,,,,0013$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0/1/2	0
3	ICCID	20		
4	Reserved	0		
5	Reserved	0		
6	Output ID	1	0 – 3	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		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: A numeric which indicates whether to bind SIM card.
- ● 0: Do not bind SIM card.
- ● 1: Bind the current SIM card.
- ● 2: Bind the specified SIM card by ICCID.

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

✧ <Output Status>: If the device detects that the SIM card is changed, the digital output port <Output ID> will send the status to indicate that the SIM card is changed.

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

➢ **+ACK: GTSIM,**

Example:
+ACK:GTSIM,F10310,868446036599153,gv350m,0911,20190826111157,1504$

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

3.2.5. IO Application

3.2.5.1. Digital Output Port Settings

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

this waveform at the specified output port after power on reset.

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

Waveform 1:

✓ <Duration> = 0ms, <Toggle Times> = 0
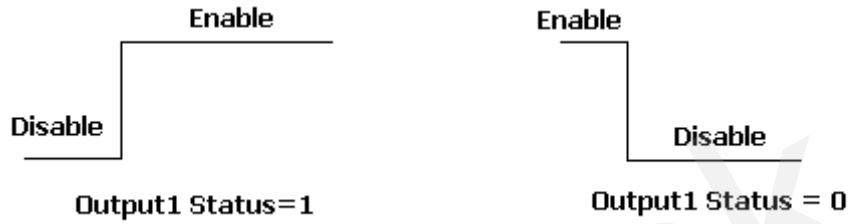
Figure 2: Waveform 1

Waveform 2:

✓ <Duration> = 500ms, <Toggle Times> = 1
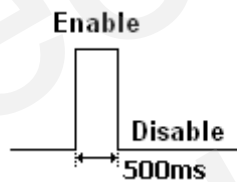
Figure 3: Waveform 2

Waveform 3:

✓ <Duration> = 800ms, <Toggle Times> = 3
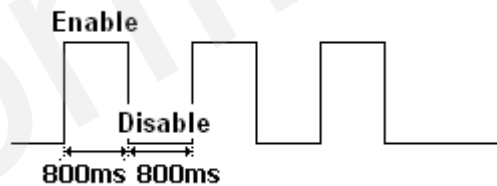
Figure 4: Waveform 3

Waveform 4:

✓ <Duration> = 800ms, <Toggle Times> = 0
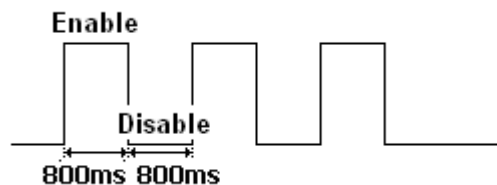
Figure 5: Waveform 4

➢ **AT+GTOUT=**

SN	Parameter	Length (Byte)	Range/Format	Default
Example: **AT+GTOUT=gv350m,1,,,0,0,0,0,0,0,,,,,,,0,2,0,0,,,FFFF$**				
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Output1 Status	1	0/1	0
3	Reserved	0		0
4	Reserved	0		0
5	Output2 Status	1	0/1	0
6	Duration	<=3	0 – 255(×100ms)	0
7	Toggle Times	<=3	0 – 255	0
8	Output3 Status	1	0/1	0
9	Duration	<=3	0 – 255(×100ms)	0
10	Toggle Times	<=3	0 – 255	0
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	DOS Report	1	0-7	0
18	Long Operation1	<=3	0 – 120min	0
19	Long Operation2	<=3	0 – 120min	0
20	Long Operation3	<=3	0 – 120min	0
21	Reserved	0		
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Output1–3 Status>: Used only for the waveform 1 as shown in **Figure** 2 to set the final

state of the output port.
- 0: Disable state.
- 1: Enable state.

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

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

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

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

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

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

✧ <Long Operation1> to <Long Operation3>: The long operation time for output 1-3. After the long operation time, the output waveform will reset to the initial status at the specified output port. These three parameters would be effective only when the output waveform is 1 or 4.

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

➢ **+ACK:GTOUT,**

Example:
+ACK:GTOUT,F10310,868446036599153,gv350m,0430,20190823135004,1218$

Parameter	Length (Byte)	Range/Format	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 Settings

The command **AT+GTDIS** is used to configure the parameters of 3 digital input ports. <Ignition Detection> is dedicated for ignition detection. The rest three inputs are customizable. If the logical state of any one of the three digital input ports is changed, the device will report **+RESP:GTDIS** to the server.

➢ **AT+GTDIS=**

Example:

AT+GTDIS=gv350m,0,0,5,0,1,0,0,0,2,0,0,0,3,0,0,0,,,,,,,,,FFFF$
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Ignition Detection Port ID	1	0	0
3	Position Type	1	0 – 1	0
4	Debounce Time	<=2	0 – 20(×10ms)	5
5	Ignition Detection	1	0/1	0
6	Input ID 1	1	1	1
7	Enable	1	0/1	0
8	Debounce Time	<=2	0 – 20(×10ms)	0
9	Valid Time	<=2	0/1 – 12(×2s)	0
10	Input ID 2	1	2	2
11	Enable	1	0/1	0
12	Debounce Time	<=2	0 – 20(×10ms)	0
13	Valid Time	<=2	0/1 – 12(×2s)	0
14	Input ID 3	1	3	3
15	Enable	<=2	0/1	0
16	Debounce Time	0	0 – 20(×10ms)	0
17	Valid Time	<=2	0/1 – 12(×2s)	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		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

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

   0: Including real time position in the report.

   1: Including the last known position in the report.

✧ <Input ID 1-3>: The digital input port IDs.

✧ <Enable>: Enable or disable the input.

   ● 0: Disable

   ● 1: Enable

✧ <Debounce Time>: Checking twice in a short period of time to make sure the input is definitely triggered.

✧ <Ignition Detection>:

   ● 0: Detect ignition

   ● 1: Don't detect ignition

✧ <Valid Time>: The valid time of the input port. 0 means not to check the valid time.

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

➢ **+ACK:GTDIS,**

Example:
+ACK:GTDIS,F10310,868446036599153,gv350m,0431,20190823135050,121E$

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

3.2.5.3. Input/Output Port Binding

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

➢ **AT+GTIOB=**

Example:
AT+GTIOB=gv350m,1,F,A,3,1,0,8,3,,,,,0006$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	IOB ID	1	0 – 3	
3	Input Mask	2	0 – 0F	0
4	Trigger Mask	2	0 – 0F	0
5	Input Sample Period	<=2	0/1 – 12(×2s)	0
6	Output ID	1	0 –3	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		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

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

✧ <Input Mask>: Bitwise mask for input port composition. Each bit, from bit 0 to bit 3, represents one digital input port. Set it to 1 to enable and 0 to disable corresponding input port.

- ● bit0: ignition detection
- ● bit1: digital input 1
- ● bit2: digital input 2
- ● bit3: digital input 3

✧ <Trigger Mask>: Bitwise mask for trigger condition composition of the corresponding input ports. Each bit, from bit 0 to bit 3, represents the logical state of the corresponding input port to trigger the IOB event. Set it to 1 to use enabled state as the trigger condition and 0 to use disabled state. Only when the logical state of all the input ports in the IO binding meets the trigger condition will the IOB event be triggered.

- ● bit0: ignition detection
- ● bit1: digital input 1
- ● bit2: digital input 2
- ● bit3: digital input 3

✧ <Input Sample Period>: The period to check the state of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use independent sample period to check the input port state even for the same input port.

✧ <Output ID>: ID of the output port to output specified waveform when the trigger condition meets. 0 means no waveform will be output.

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

➢ **+ACK:GTIOB,**

Example:
+ACK:GTIOB,F10310,868446036599153,gv350m,0,0439,20190823140657,1248$

Parameter	Length (Byte)	Range/Format	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. Analog Input Port Settings

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

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

➢ **AT+GTAIS=**

Example:
AT+GTAIS=gv350m,1,1,10000,12000,1,,0,0,0,0,1,10,30,10,20,0,FFFF$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Analog Input ID	1	1	1
3	Mode	1	0/1/2/3/4/5	0
4	Min Threshold	<=5	0～32000 mV	
5	Max Threshold	<=5	0～32000 mV	
6	Sample Rate	<=2	0/1～12(×2s)	0
7	Reserved	0		

8	Output ID	1	0 - 3	
9	Output Status	1	0/1	
10	Duration	<=3	0～255(×100ms)	0
11	Toggle Times	<=3	0～255	0
12	Sync with FRI	1	0/1	0
13	Fuel Level Debounce	<=3	0-150	10
14	Fuel Sensor Delay Time	<=3	0-600 sec	30
15	Fuel Loss Alarm	<=2	0-50	10
16	Sampling Number	<=3	0-150	20
17	Fuel Level Change Threshold	<=2	0-50%	0
	Serial Number	4	0000～FFFF	
	Tail Character	1	$	$

✧ <Analog Input ID>: The analog input port ID.

✧ <Mode>: Working mode of the analog input alarm (**+RESP:GTAIS**).

- 0: Disable.
- 1: Enable analog input alarm (the current input voltage is within the range).
- 2: Enable analog input alarm (If the current input voltage is outside the range).
- 3: Connect with special fuel level sensor to support fuel level reporting and monitoring.

   Note: when the selected mode is 3, please do not choose the waveform 1 as the specified output waveform.

- 4: No alarm mode. The range of the voltage will be ignored, and no alarm will be triggered.
- 5: Voltage process mode. The range of the voltage will be ignored, and no alarm will be triggered. But the voltage will be processed before being reported.

✧ <Min Threshold>: If <Mode> is set to 1 or 2, the lower limit of voltage of the analog input port to trigger the alarm.

✧ <Max Threshold>: If <Mode> is set to 1 or 2, the upper limit of the voltage of the analog input port to trigger the alarm.

✧ <Sample Rate>: The sampling period of the analog input port.

✧ <Output ID>: Specify the ID of the output port (1 to 3) to output specified waveform when the analog input alarm is triggered. If it is set to 0, there is no output waveform.

✧ <Output Status>: Set the final state of the output port.

- 0: Disable state.
- 1: Enable state.

✧ <Toggle Times>: The times of the square-waveform.

✧ <Sync with FRI>: The device can send the analog input voltage periodically along with FRI report. Set this field to 1 to enable it and 0 to disable. If the analog input port is used to work with a fuel sensor and the <Sync with FRI> is enabled, the device will report the fuel level together with the FRI report.

✧ <Fuel Level Debounce>: The data discarded when calculating the fuel level.

✧ <Fuel Sensor Delay Time>: After power on or enabling the fuel level reporting and monitoring function, the fuel sensor reports correct fuel level after <Fuel Sensor Delay Time>.

✧ <Fuel Loss Alarm>: If the difference between the current fuel level after ignition on and the last measured fuel level before previous ignition off is greater than this value, an unusual fuel consumption alarm is sent with the event report **+RESP:GTFLA**.

✧ <Sampling Number>: This parameter defines the total number of samples from the fuel sensor for calculating the current fuel level. And it must be greater than <Fuel Level Debounce>.

✧ <Fuel Level Change Threshold>: This parameter defines the threshold of the value change. The value change must be greater than this defined threshold to trigger it. This value should be less than <Fuel Loss Alarm>, otherwise the **+RESP:GTFLA** may be reported incorrectly.

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

➢ **+ACK:GTAIS,**

Example:			
+ACK:GTAIS,F10310,868446036599153,gv350m,0444,20190823141005,1252$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6. Serial Port

3.2.6.1. Sub Serial Port Settings

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

➢ **AT+GTURT=**

	Example: AT+GTURT=gv350m,1,1,12,8,1,0,0,0,,,FFFF$			
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	UART Port	1	0-1	
3	Working Mode	<=2	0 – 9|20|22	0
4	Baud Rate	<=2	1 – 12	5
5	Data Bits	1	7 – 8	8
6	Stop Bits	1	1 – 3	1
7	Parity Bits	1	0 – 2	0
8	Sleep Enable	1	0/1	0
9	Reserved (optional)			
10	Reserved (optional)			
11	Reserved (Optional)			
	Serial Number	4	0000～FFFF	
	Tail Character	1	$	$

✧ <UART Port>: The number of the UART.
  ● 0: UART 1
  ● 1: UART 2
✧ <Working Mode>: Configure the working mode of UART.
  ● 0: Disable UART.
  ● 1: Use UART to transparent transfer data. The data received from the external device will be packed into **+RESP:GTDAT** report, then sent to backend server. And the data in **AT+GTDAT** command from the backend server will be sent to external device.

9	Format	1	0|1	0
10	Hex Convert Mode	1	0/1	0
11	Reserved	0	0	

  <Hex Convert Mode>: If this mode is enabled, it means the UART uses hex data.
  ● 2: Used for Garmin function.
  ● 3: Used for specific RFID card reader to communicate with UART of device. If <RFID Type> is old RFID card reader, configure digital input port settings by **AT+GTDIS** command before using this function. The device will report the card ID received from the card reader to the server with the report **+RESP:GTIDA**.

10	RFID type	<=3	0 – 255	4
11	Reserved	0	0	

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

10	Digital Fuel Sensor Type	1	0 – 6	4
11	Reserved	0	0	

Note: Different fuel sensors have different baud rates. Make sure the baud rate is available for the sensor.

● 5: CAN100

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

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

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

9	Format	1	0|1	0
10	Interval	<=4	1-3600sec	1
11	Length	<=4	1-640	640

● 8: Used for transparent transfer based on the length of received data and data-receiving interval. The data in **+RESP:GTDTT** is packed in pure HEX code. The three reserved parameters are used as follows.

9	Format	1	0|1	0
10	Interval	<=4	1-3600sec	1
11	Length	<=4	1-1280	1280

● 9: Used for camera.

● 20: Used for sending out NMEA sentences. The following types of NMEA sentences are selectable.

10	NMEA Send Mask	<=4	0000 - FFFF	7F
11	Reserved	0		

The bitwise mask to configure whether to output the specific NMEA sentence:

■ Bit 0 for $GPRMC
■ Bit 1 for $GPGSV
■ Bit 2 for $GPGSA
■ Bit 3 for $GPGGA
■ Bit 4 for $GPGLL
■ Bit 5 for $GPVTG
■ Bit 6 for $GPTXT

Note:

In this mode, the baud rate should be equal or greater than 9600.

Set NMEA Send Mask to 0 to output all NMEA sentences.

- ● 22: Used for sending J1939 PGN messages. The PGN list set by AT+GTPGN command specifies which PGN messages will be sent.

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

Note: When the <Working Mode> is set to 20, the baud rate should be equal or greater than 9600.

✧ <Data Bits>: Data bits of the UART. Their values can be 7 or 8.
✧ <Stop Bits>: Stop bits of the UART. Their values can be 1, 2 or 3.
- ● 1: 1 Stop Bits.
- ● 2: 2 Stop Bits.
- ● 3: 1.5 Stop Bits.
✧ <Parity Bits>: Parity Bits of the UART. Their values can be 0, 1 or 2.
- ● 0: None Parity.
- ● 1: Odd Parity.
- ● 2: Even Parity.
✧ <Enable Sleep>: The device supports sleep mode, which helps reduce power consumption. When the device enters into the sleep mode, the response to the serial port will be very slow unless the device is woken up. This parameter is used to enable or disable the sleep mode of the device.
- ● 0: Disable the device sleep mode.
- ● 1: Enable the device sleep mode.
✧ <Digital Fuel Sensor Type>: The type of digital fuel sensor connected to serial port.
- ● 0: Reserved.
- ● 1: Reserved.
- ● 2: Reserved.
- ● 3: Reserved.
- ● 4: UFSxxx.

- 5: Reserved.
- 6: Reserved.

✧ <RFID Type>: The type of RFID connected to serial port.
- 0-3: Reserved.
- 4: DR100. 19200 baud rate, 8 data bits, 1 stop bit, and no parity.

✧ <Format>: It controls the format of data transferred from auxiliary serial port to the backend server when <Working Mode> is 1/6/7/8.
- 0: Short format.
- 1: Long format.

✧ <Interval>: When <Working Mode> is 7 or 8 and no data is received after the defined period of <Interval>, the data in UART buffer will be sent.

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

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

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

➢ **+ACK:GTURT,**

Example:
+ACK:GTURT,F10310,868446036599153,gv350m,0976,20190826115726,15E6$

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

3.2.6.2. Main Serial Port Setting

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

➢ **AT+GTMUT=**

Example:
AT+GTMUT=gv350m,0,12,8,1,0,0,,,,,,,0018$

Parameter	Length (Byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m

Working Mode	<=2	0|1|11|12|22	0
Baud rate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 4	0
Enable Sleep	1	0|1	1
Reserved (optional)			
Reserved (optional)			
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Working Mode*>: Configure the working mode of UART.
- 0: As Default communication port.
- 1: Use UART to transfer data via **AT+GTDAT** and other protocol commands.
- 2-10: Reserved.
- 11: Used UART to transfer data via AT+GTDAT and for the basic command.
- 12: Used for CANBUS devices.
- 22: Used for sending J1939 PGN messages.

NOTE: only under mode 0, the device can receive all the AT commands.

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

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

12	115200

✧ *<Data Bits>*: Data Bits of the UART and its' value may be 7 and 8.

✧ *<Stop Bits>*: Stop Bits of the UART and its' value may be 1, 2 and 3.
  - 1: 1 Stop Bits.
  - 2: 2 Stop Bits.
  - 3: 1.5 Stop Bits.

✧ *<Parity Bits>*: Parity Bits of the UART.
  - 0: None Parity.
  - 1: Odd Parity.
  - 2: Even Parity.

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

✧ <Reserved(optional)>: when Working Mode is 1 or 11, it means as below

Format	1	0|1	0
Hex Convert Mode	1	0/1	0

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

➢ **+ACK:GTMUT,**

Example:
+ACK:GTMUT,F10310,868446036599153,gv350m,0996,20190826135922,1798$

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

3.2.6.3. PGN List

The command **AT+GTPGN** is used to set or delete the J1939 PGN list. The PGNs in the list can be output from the serial port which is configured by **AT+GTURT** command.

➢ **AT+GTPGN=**

	Example: AT+GTPGN=gv350m,0,1,4,1,00001,1,00002,2,00001,2,00002,,,,,0012$			
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	Gv350m
2	Sub Command	1	0-2	
3	PGN Num	<=2	0~99	
4	PGN	4	0000~FFFF	
4+N	Reserved	0		
5+N	Reserved	0		
6+N	Reserved	0		
7+N	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Sub Command>:
  ● 0: Add PGN. Add PGNs into PGN list, the max number of the list is 99.
  ● 1: Delete PGN. Delete the specified PGNs in the list.
  ● 2: Clear PGN list.
✧ <PGN Num>: The number of the <PGN>.
✧ <PGN>: List the PGNs which will be added or deleted.

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

➢ **+ACK:GTPGN,**

	Example: +ACK:GTPGN,F10310,868446036599153,gv350m,0997,20190826135949,1799$			
Parameter	**Length (Byte)**	**Range/Format**	**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	$	$

3.2.6.4. Data Transfer

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

➢ **AT+GTDAT=**

Example: **AT+GTDAT=gv350m,0,1,data to the server,,,,,0014$** **AT+GTDAT=gv350m,1,1,data to the serial port,,,,,0014$** **AT+GTDAT=gv350m,2,1,data to the server,,,,,0014$** **AT+GTDAT=gv350m,3,1,data to the serial port,,,,,0014$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Transfer Mode	1	0/1/2/3	
3	UART Port	1	0-2	
4	Data Type	<=1280	ASCII Code	
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Transfer Mode>: To indicate which way to send the data.
  ● 0: Send data to server in the form of report **+RESP:GTDAT (Short Format)**.
  ● 1: Send pure data directly to the peripheral.
  ● 2: Send data to server in the form of report **+RESP:GTDAT (Long Format)**.
  ● 3: Send pure data directly to the peripheral without CRLF.
✧ <UART Port>: Means to select which serial port.
  ● 0: UART1
  ● 1: UART2
  ● 2: main serial port (MUT)
✧ <Data Type>: Data to be transferred between the server and the peripheral connected to the serial port of the device. The max length is 1280.

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

➢ **+ACK:GTDAT,**

Example:
+ACK:GTDAT,F10310,868446036599153,gv350m,1187,20190827074248,218B$

Parameter	Length (Byte)	Range/Format	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. iButton Settings

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

➢ **AT+GTACD**

Example:
AT+GTACD=gv350m,2,0,0,0,0,,,,,,0005$

Parameter	Length (byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
iButton Timer	<=2	0|1 – 10(s)	0
Output ID	1	0-3	0
Output status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle	<=3	0 – 255	0
Reserved			
Reserved			
Reserved			
Reserved			

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

✧ <*iButton Timer*>: Interval of searching the iButton ID.

Note: The number of iButton ID is in opposite order to the number that printed on iButton. The ID structure is <1 byte family ID> + <6 byte serial number> + <1 byte CRC>. So the first byte of ID number is iButton's family ID.

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

➢ **+ACK:GTACD,**

Example: +ACK:GTACD,F10310,868446036599153,gv350m,1189,20190827074412,2190$			
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	$	$

3.2.6.6. ID Authentication

The command **AT+GTIDA** is used to protect against unauthorized use. This function needs an ID card reader and an external relay. To use this command, make sure both the ID card reader and the external relay are connected to the device. When the device reads an ID, it will send event report **+RESP:GTIDA** to the server. If the ID is in the White Number List Configuration, it will be authorized until next ignition off. After the ignition off, the authentication valid time will last for a short period of time (settable). Within this period, the driver can turn on the engine again without reidentification

➢ **AT+GTIDA=**

Example: AT+GTIDA=gv350m,1,1,2,D2C4FBC5,87654321,30,3,30,,,,1,0,0,0,,,,,FFFF$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m

Mode	1	0/1/2	0
Start Index	<=2	1 – 250	
End Index	<=2	1 – 250	
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0/15 – 600sec	30
Report Mode	1	0 – 7	0
ID Valid Time	<=3	15 – 600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Mode>: Working mode of the ID authentication function.
- ● 0: Disable.
- ● 1: Only authorized ID cards can unlock the vehicle.
- ● 2: Any ID card can unlock the vehicle.

✧ <Start Index>, <End Index>: The index range of the White Number List Configuration in which the ID numbers are to be uploaded. For example, if the <Start Index> is set to 1 and the <End Index> is set to 2, then the first two ID numbers (ID1 and ID2) in the White Number List Configuration will be uploaded. The <Start Index> and <End Index> define the total amount of ID numbers that will be uploaded. If either one is empty, there should be no <ID Number List>parameter following the Index. A maximum of 8 numbers can be uploaded each time.

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

✧ <Timeout After Ignition Off>: When the ignition is off, it will still be authorized for use for a

short time. In this period, re-authentication is not needed. 0 means "Lock the vehicle when ignition off".

✧ <Report Mode>:
 ● Bit 0: Report the ID which is authorized.
 ● Bit 1: Report the ID which is unauthorized.
 ● Bit 2: Report the ID which has logged out. (If authorized ID meets the trigger conditions <ID Valid Time> and <Timeout After Ignition Off>, then IDA report will be sent to indicate the log-out event).

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

✧ <ID Valid Time>: It will remain authorized for this period of time.
✧ <Output ID>: It specifies the ID of the output port to output specified waveform when it is authorized. Only waveform 1 is supported.

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

➢ **+ACK:GTIDA,**

Example:
+ACK:GTIDA,F10310,868446036599153,gv350m,1190,20190827074435,2192$

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

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

3.2.6.7. External Digital Fuel Sensor

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

➢ **AT+GTEFS=**

Example:
AT+GTEFS=gv350m,,,,,15,10,,0,5,,,,,,,,FFFF$

Parameter	Length (Byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Reserved	0		
Reserved	0		
Ex Full Value	<= 5	0 – 65535	9999
Ex Fuel Sensor Delay	<=3	0 – 600 sec	30
Ex Fuel Loss Alarm	<=2	0 – 50 %	10
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Report Sensor Data	1	0/1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Ex Full Value>: The value read from the sensor when the fuel tank is full.
  Note: This value needs to be set only for UFSxxx, and it is not required by the other sensors.
  The unit for UFSxxx is 0.1mm.

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

✧ <Ex Fuel Loss Alarm>: If the difference between the current fuel level after ignition off and
  the last measured fuel level is greater than this value, an abnormal fuel consumption alarm
  will be sent to the backend server with event report **+RESP:GTFLA**. 0 means "Disable".

✧ <Report Sensor Data>: A numeric to indicate whether to report raw data from fuel sensor to
  the server with **+RESP:GTFSD**. Currently, only the UFSxxx supports the raw data report.
    ● 0: Do not report raw data from fuel sensor.
    ● 1: Report raw data from fuel sensor.

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

➢ **+ACK:GTEFS,**

Example:
+ACK:GTEFS,F10310,868446036599153,gv350m,1191,20190827074500,2196$

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

3.2.6.8. Fuel Sensor Calibration Table

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

➢ **AT+GTFSC=**

Example:
AT+GTFSC=gv350m,,0,20,1,100,,3,10000,10,12000,40,15000,100,,,,,,,,,,FFFF$

Parameter	Length (Byte)	Range/Format	Default
Password	4～20	'0'～'9' 'a'～'z' 'A'～'Z'	gv350m
Reserved			
Table ID	1	0 – 4	0
Sensor Type	<= 2	0 – 6/20 – 23	20
Enable	1	0/1	0
Max. Tank Volume	<= 5	0 –10000	100
Reserved			
Num of Node	<= 2	0/2 – 11	0
Node 1 Value	<= 5	0～99999	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	<= 5	0～99999	
Node N Percentage	<= 2	0 – 100	
Reserved			
Reserved			
Reserved			

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

✧ <Table ID>: The ID of the calibration table that is currently being set.

✧ <Sensor Type>: The sensor type for this table.
- 0: Reserved
- 1: Reserved
- 2: Reserved
- 3: Reserved
- 4: UFSxxx
- 5: Reserved
- 6: Reserved
- 20: ADC1
- 21: Reserved
- 22: Reserved
- 23: Reserved

✧ <Enable>: Enable or disable this table. If this table is enabled, the calculation of fuel level will be linearized.

✧ <Max. Tank Volume>: The maximum volume of tank. The unit is L.

✧ <Num of Node>: Number of the nodes in the table below.

✧ <Node N Value>: Value of this node.

✧ <Node N Percentage>: The corresponding percentage value of this node. This parameter must be in ascending order beginning with 0% and ending with 100%.

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

➢ **+ACK:GTFSC,**

Example:
+ACK:GTFSC,F10310,868446036599153,gv350m,1237,20190827085914,238B$

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

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.9. Camera Settings

AT+GTCMS is used for setting camera parameters.

➢ **AT+GTCMS=**

Example:
AT+GTCMS=gv350m,0,3,5,150,2,1,0003,,,2,1,1,20,,,,,FFFF$

Parameter	Length (Byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Camera ID	1	0-3	
Number	<=2	1-10	1
Interval	<=2	1-60s	5
Photo Compression Ratio	<=3	20-250	150
Photo Resolution	1	1-3	2
Digital Input ID	1	0/1-3	0
Attribute Mask	<=4	0000 - FFFF	0x0003
Server Type	1	0/1	0
EHD Support	1	0/1	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Number>: The number of pictures taken in one continuous shooting.

✧ <Interval>: The interval between two pictures in one continuous shooting.

✧ <Photo Compression Ratio>: The compression ratio of picture. The smaller the compression ratio is, the better the picture quality will be.

✧ <Photo Resolution>: The resolution of picture.
- 1: 160*120
- 2: 320*240
- 3: 640*480

✧ <Digital Input ID>: The input ID used to trigger photographing.

✧ <Attribute Mask>: The <Attribute Mask> in report **+RESP:GTPHL** and **+RESP:GTPHD** in HEX format.

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

✧ <Server Type>: The server that the picture is transferred to.
- 0: Backend server
- 1: FTP server

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

Note: The output settings are used to output special waveform when the camera is photographing or trying to photograph and data is being transmitted between camera and GV350M device.

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

➢ **+ACK:GTCMS,**

Example:			
+ACK:GTCMS,F10310,868446036599153,gv350m,0989,20190826135246,1783$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.6.10. Taking Picture in Real Time

AT+GTTAP is used for real-time photographing.

➢ **AT+GTTAP=**

Example: AT+GTTAP=gv350m,0,,,1,,,,,FFFF$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Camera ID	1	0-3	
Reserved	0		
Reserved	0		
Photo Resolution	1	1-3	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

➢ **+ACK:GTTAP,**

Example: +ACK:GTTAP,F10310,868446036599153,gv350m,0986,20190826134802,176F$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$		$

3.2.6.11. FTP Server Settings

The command **AT+ GTFTP** is used to configure the FTP Server Settings as to where and how to upload pictures. When the device is configured correctly and the <Server Type> in the command **AT+ GTCMS** is 1, the pictures will be transferred to FTP server.

➢ **AT+ GTFTP =**

Example: AT+GTFTP=gv350m,116.228.146.250,21,SW_RD/Projects/,,,1,,,,,,000B$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Server Address	<=60		
Server Port	<=5	0 – 65535	0
Full Name	<=60		
User Name	<=10		
Login Password	<=10		
Transfer Mode	1	0/1	0
Oper Type	1	0/1	0
Report to FTP Server	1	0/1	0
File Name Prefix	<=20		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Server Address>: The IP address or the domain name of the FTP server.

✧ <Server Port>: The server port of the FTP server.

✧ <Full Name>: The file path to save a picture.

✧ <User Name>: The user name to login to the FTP server.

✧ <Login Password>: The password to login to the FTP server.

✧ <Transfer Mode>: The mode to transfer picture.

● 0: Passive mode.

● 1: Active mode.

✧ <Oper Type>: The transfer mode to transfer picture when transfer fails.

● 0: Continue to upload the failed picture.

● 1: Discard uploaded part and re-upload the failed picture from scratch.

✧ <Report to FTP Server>: Whether to report **+RESP:GTFTP** to the server after transferring a file.
- ● 0: Disable the function.
- ● 1: Enable the function.

✧ <File Name Prefix>: The prefix of file name of a picture. <File Name Prefix> can't be ".jpg" for GV350M uses it as the suffix of the <File Name> in the report **+RESP:GTFTP**.

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

➢ **+ACK:GTFTP,**

Example:
+ACK:GTFTP,F10310,868446036599153,gv350m,FFFF,20190826135417,1787$

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. FOTA

3.2.7.1. Update Configuration Over The air

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

➢ **AT+GTUPC=**

Example:
AT+GTUPC=gv350m,0,10,0,1,168,http://www.queclink.com/configure.ini,1,,,,0001$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0'-'9','a'-'z','A'-'Z'	gv350m
2	Max Download Retries	1	0 – 3	0
3	Download Timeout	<=2	5 – 30 min	10
4	Download Protocol	1	0	0
5	Report Enable	1	0/1	0
6	Update Interval	<=4	0 – 8760 hour	0
7	Download URL	<=100	URL	

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

✧ <Password>: The valid characters of password include '0'-9', 'a'-'z', 'A'-'Z'. The default value is "gv350m".

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

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

✧ <Download Protocol>: The protocol is used to download the firmware package. Only HTTP is supported now. Set it to 0.

✧ <Report Enable>: A numeric to indicate whether to send the report **+RESP:GTUPC** to indicate the configuration was updated over the air.
   ● 0: Do not send the report +RESP:GTUPC
   ● 1: Send the report +RESP:GTUPC

✧ <Update Interval>: The time interval (hour) for updating the configuration over the air.

✧ <Download URL>: Specify the URL to download the configuration parameters. If the URL is end with "/", it means this is a path without any file. <imei>. Ini will be added as the file name at the end of URL.

✧ <Mode>: A numeric to indicate the working mode of downloading configuration over the air
   ● 0: Disable.
   ● 1: Enable

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

Notice:
If the <download URL> ends with "/", it means this is a path without any file. <imei>. ini will be added as the file name at the end of URL. If it is greater than 100, an error will be reported.

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

➢ **+ACK:GTUPC,**

Example:
+ACK:GTUPC,F10310,868446036599153,gv350m,1093,20190826083639,1903$

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

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

3.2.7.2. Upgrade Of Fuel Sensor

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

➢ **AT+GTUFS=**

Example: AT+GTUFS=gv350m,3,30,0,,,http://220.178.67.210:8208/GV350M/deltabin/csb_des_07_build1116.bin,,,,,0001$			
Parameter	Length (Byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Max Download Retries	1	0 – 3	0
Download Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server Password	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server URL	100	Legal URL	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

✧ <Protocol Type>: The protocol used to download the package.
   ● 0: HTTP. Only HTTP is supported now.

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

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

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

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

➢ **+ACK: GTUFS,**

Example:
+ACK:GTUFS,F10310,868446036599153,gv350m,1094,20190826083818,190B$

Parameter	Length (Byte)	Range/Format	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. CANBUS Upgrade

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

➢ **AT+GTCFU=**

Example:
AT+GTCFU=gv350m,1,30,0,,,http://220.178.67.210:8208/GV65/deltabin/csb_des_07 _build1116.bin,,,,,0001$

Parameter	Length (Byte)	Range/Format	Default
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Max Retries	1	0 – 3	0
Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server Password	<=20	'0-9', '_', 'a-z','A-Z'	
Server URL	100	Legal URL	
Cancel	<=1	0|1	0
Reserved	0		
Reserved	0		

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

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

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

✧ <Protocol Type>: The protocol used to download the package.
- 0: HTTP. Only HTTP is supported now.

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

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

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

✧ <Cancel>:
- 0 or empty: Start CAN100 upgrade procedure.
- 1: Cancel CAN100 upgrade procedure.

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

➢ **+ACK: GTCFU,**

Example:
+ACK:GTCFU,F10310,868446036599153,gv350m,1109,20190826085405,1937$

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

3.2.8. Others

3.2.8.1. Hour Meter Counter

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

➢ **AT+GTHMC=**

Example:
AT+GTHMC=gv350m,1,12345:12:34,,,,,,,,,0015$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Hour Meter Enable	1	0/1	0
3	Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✦ <Hour Meter Enable>: Enable or disable hour meter counter function. If hour meter counter function is enabled, ignition time will be accumulated automatically when ignition on.
- 0: Disable hour meter counter function
- 1: Enable hour meter counter function

✦ <Initial Hour Meter Count>: Initial value of hour meter. Range is 00000:00:00– 99999:00:00, from left to right, the units separately are hour, minute and second. The <Hour Meter Count> in **+RESP:GTFRI**, **+RESP:GTIGN** or **+RESP:GTIGF** will be increased based on the value of first-time ignition on.

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

➢ **+ACK:GTHMC,**

Example:			
+ACK:GTHMC,F10310,868446036599153,gv350m,0167,20190823093901,0F7B$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

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

3.2.8.2. White Number List Configuration

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

➢ **AT+GTWLT=**

Example: AT+GTWLT=gv350m,1,1,2,13813888888,13913999999,,,,,000C$			
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Number Filter	1	0|4	4
3	Phone Number Start	1|2	1-10	1
4	Phone Number End	1|2	1-10	1
5	White Number List	<=20*10		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Number Filter>: The working mode of this function.
  ● Bit 0: reserved.
  ● Bit 1: reserved
  ● Bit 2: Query location via SMS. Gateway Number and SOS Number will ignore the White Number List Configuration function.
  For each bit, set it to 1 to enable the function and 0 to disable it. If the value of Bit 2 are 0, using query location SMS function is disabled.
✧ <Phone Number Start>: A numeric to indicate the first index of the white number to input. For example, if it is 1, it will update the white Number list from the 1st one.
✧ <Phone Number End>: A numeric to indicate the last index of the white number to input. For example, if it is 2, it will update the white Number list until the 2nd one.
✧ <White Number List>: A phone number list including multiple phone numbers. And two neighboring phone numbers are separated with ",". The number of the phone numbers in the list depends on the parameters <Phone Number Start> and <Phone Number End>. For

example, if <Phone Number Start> is 1 and <Phone Number End> is 2, the <White Number List> should include 2 phone numbers and the two numbers are separated with ",".

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

➢ **+ACK:GTWLT,**

Example: +ACK:GTWLT,F10310,868446036599153,gv350m,0168,20190823094603,0F8A$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.8.3. CANBUS Configuration

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

➢ **AT+GTCAN=**

Example: AT+GTCAN=gv350m,1,30,250,FFFFFFFF,0,,0,,,FFFF$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Mode	1	0/1/2	0
CAN Report Interval	<=5	0/5 – 86400sec	0
Baudrate	3	250 | 500 (kbps)	
CAN Report Mask	<=8	0 - FFFFFFFF	C00FFFFF
Additional Event	1	0/1	0
Reserved	0		
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	001FFFFF
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ <Mode>: Controls the mode of CAN function.
- 0: Disable.
- 1: J1939 mode.
- 2: CAN100 mode

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

✧ <Baudrate>: The baudrate of the CAN bus. It is valid only when <Mode> is set to J1939 mode.

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

✧ <CAN Report Mask>: Bitwise report mask to configure the composition of CAN report.
Note:
Bit 22 <Total Distance Impulses> in this <CAN Report Mask> only controls the composition of **+RESP:GTCAN** in HEX format.

Bit	Item to Mask	Description
Bit 31	**<GSM Information>**	Including <MCC>, <MNC>, <LAC>, <Cell ID> and the <Reserved> parameter "00"
Bit 30	**<GPS Information>**	Including <GPS Accuracy>, <Speed>, <Azimuth>, <Altitude>, <Longitude>, <Latitude>, <GPS UTC Time>
Bit 29	<CAN Report Expansion Mask>	If this bit is set to 1, the parameter <CAN Report Expansion Mask> in **GTCAN** is valid. If this bit is set to 0, the parameter <CAN Report Expansion Mask> in **GTCAN** is not valid.
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<Total Distance Impulses>	Vehicle total distance measured in Impulses (if distance from dashboard is not available)
Bit 21	<Total Vehicle Engine Overspeed Time>	The total time when vehicle engine speed is greater than the limit defined in CAN100 configuration

Bit 20	<Total Vehicle Overspeed Time>	The total time when vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	<Doors>	An 8-bit hex number. Each bit indicates information of one door.
Bit 18	<Lights>	An 8-bit hex number. Each bit indicates information of one particular light.
Bit 17	<Detailed Information/Indicators>	A 16-bit hex number. Each bit indicates information of one indicator.
Bit 16	<Tachograph Information>	Two bytes. The higher byte describes driver 2 (whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	<Axle Weight>	Vehicle axle weight
Bit 14	<Total Idle Fuel Used>	The fuel consumption when device is in static state with ignition on
Bit 13	<Total Engine Idle Time>	The duration when device is in static state with ignition on
Bit 12	<Total Driving Time>	Total driving time (speed is not 0)
Bit 11	<Total Engine Hours>	Total time of engine running
Bit 10	<Accelerator Pedal Pressure>	Pressure applied onto accelerator pedal
Bit 9	<Range>	The mileage to drive with remaining fuel
Bit 8	<Fuel Level>	The level of fuel in vehicle's tank (in liters or percentage)
Bit 7	<Fuel Consumption>	The fuel consumption of the engine
Bit 6	<Engine Coolant Temperature>	Engine coolant temperature
Bit 5	<Engine RPM>	Revolutions per minute of the engine
Bit 4	<Vehicle Speed>	The real-time speed of vehicle
Bit 3	<Total Fuel Used>	The total fuel consumption
Bit 2	<Total Distance>	Vehicle total distance
Bit 1	<Ignition Key>	Ignition state
Bit 0	<VIN>	Vehicle Identification Number

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

Bit	Item to Mask	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<Rapid Accelerations>	Total number of rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value)
Bit 21	<Rapid Braking>	Total number of rapid braking since installation (calculation based on CAN-Logistic's settings of speed decrease time and value)
Bit 20	<Expansion Information>	A decimal number. Each bit contains information of one indicator.
Bit 19	<Registration Number>	The vehicle registration number
Bit 18	<Tachograph Driver 2 Name>	The name of tachograph driver 2
Bit 17	<Tachograph Driver 1 Name>	The name of tachograph driver 1
Bit 16	<Tachograph Driver 2 Card Number>	The card number of tachograph driver 2
Bit 15	<Tachograph Driver 1 Card Number>	The card number of tachograph driver 1
Bit 14	<Total Brake Applications>	Counts of applying brake pedal (braking process initiated by brake pedal)
Bit 13	<Total Accelerator Kick-down Time>	Total time when accelerator pedal is pressed over 90%
Bit 12	<Total Cruise Control Time>	Total time when vehicle speed is controlled by cruise-control module
Bit 11	<Total Effective Engine Speed Time>	Total time when vehicle engine speed is effective
Bit 10	<Total Accelerator Kick-downs>	Counts of accelerator pedal kick-downs (pressing

		the pedal over 90%)
Bit 9	<Pedal Braking Factor>	Counts of braking with brake pedal or with engine. The more decreasing speed with brake pedal, the higher the pedal braking factor is.
Bit 8	<Engine Braking Factor>	Counts of braking with brake pedal or with engine. The more decreasing speed with the engine, the higher the engine braking factor is.
Bit 7	<Analog Input Value>	Analog input value
Bit 6	<Tachograph Driving Direction>	Vehicle driving direction from tachograph
Bit 5	<Tachograph Vehicle Motion Signal>	Vehicle motion signal from tachograph
Bit 4	<Tachograph Overspeed Signal>	Tachograph overspeed signal for the vehicle
Bit 3	<Axle Weight 4th>	Weight of vehicle's fourth axle
Bit 2	<Axle Weight 3rd>	Weight of vehicle's third axle
Bit 1	<Axle Weight 1st>	Weight of vehicle's first axle
Bit 0	<Ad-Blue Level>	The level of Ad-Blue

Note:

When J1939 mode is selected, only 17 items of the CANBUS device information are supported now, as show below:

<Doors>
<Lights>
<Axle Weight>
<Total Idle Fuel Used>
<Total Engine Idle Time>
<Total Driving Time>
<Total Engine Hours>
<Accelerator Pedal Pressure>
<Fuel Level>
<Fuel Consumption>
<Engine Coolant Temperature>
<Engine RPM>
<Vehicle Speed>
<Total Fuel Used>
<Total Distance>
<Ignition Key>

<VIN>

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

➢ **+ACK: GTCAN,**

Example: +ACK:GTCAN,F10310,868446036599153,gv350m,0176,20190823101326,0F9C$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.8.4. CANBUS Alarm

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

Note:

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

➢ **AT+GTCLT=**

Example: AT+GTCLT=gv350m,1,0,0,000FFFFF,00000000,00000000,00000000,30,8,,,,,,,,,,0006$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4–6	'0'–'9' 'a'–'z' 'A'–'Z'	gv350m
Group ID	<=2	0 –19	0
Mode	1	0/1	0
Debounce Time	<=3	0 – 255(×1s)	0

CAN Data Mask	8	0 - FFFFFFFF	000FFFFF
Alarm Mask 1	<=8	0 – FFFFFFFF	0
Alarm Mask 2	<=8	0 – FFFFFFFF	0
Alarm Mask 3	<=8	0 – FFFFFFFF	0
High RPM Threshold	<=3	1 – 100(x100 rpm)	30
Low RPM Threshold	<=3	0 – 99(x100 rpm)	8
CAN Report Expansion Mask	8	0 - FFFFFFFF	001FFFFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000–FFFF	
Tail Character	1	$	$

✧ <Group ID>: ID of the CANBUS alarm group. Total 20 groups are supported.

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

- 0: Disable.
- 1: Enable.

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

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

Bit	Item to Mask	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	<CAN Report Expansion Mask>	If this bit is set to 1, the parameter <CAN Report Expansion Mask> in **GTCLT** is valid. If this bit is set to 0, the parameter <CAN Report Expansion Mask> in **GTCLT** is not valid.
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	

Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<Total Distance Impulses>	Vehicle total distance measured in impulses (if distance from dashboard is not available)
Bit 21	<Total Vehicle Engine Overspeed Time>	The total time when vehicle engine speed is greater than the limit defined in CAN100 configuration
Bit 20	<Total Vehicle Overspeed Time>	The total time when vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	<Doors>	An 8-bit hex number. Each bit contains information of one door.
Bit 18	<Lights>	An 8-bit hex number. Each bit contains information of a particular light.
Bit 17	<Detailed Information/ Indicators>	A 16-bit hex number. Each bit contains information of one indicator.
Bit 16	<Tachograph Information>	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	<Axle Weight>	Vehicle axle weight
Bit 14	<Total Idle Fuel Used>	The total fuel consumption when device is in static state with ignition on
Bit 13	<Total Engine Idle Time>	The duration when device is in static state with ignition on
Bit 12	<Total Driving Time>	Total driving time of driver (speed is not 0)
Bit 11	<Total Engine Hours>	Total time of engine running
Bit 10	<Accelerator Pedal Pressure>	The pressure applied on acceleration pedal
Bit 9	<Range>	The number of kilometers to drive on remaining fuel
Bit 8	<Fuel Level>	The level of fuel in vehicle's tank (in Liters or Percentage)
Bit 7	<Fuel Consumption>	The fuel consumption of the engine
Bit 6	<Engine Coolant Temperature>	The temperature of the engine coolant
Bit 5	<Engine RPM>	Revolutions per minute of the engine

Bit 4	<Vehicle Speed>	The real-time speed of vehicle
Bit 3	<Total Fuel Used>	The total fuel consumption
Bit 2	<Total Distance>	Vehicle total distance
Bit 1	<Ignition Key>	Ignition state
Bit 0	<VIN>	Vehicle identification number

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

Note:

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

Bit	Alarm Mask 1
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	OLL – oil level low indicator (1 – on, 0 – off or not available)
Bit 27	SC – service call indicator (1 – on, 0 – off or not available)
Bit 26	AIR – airbags indicator (1 – on, 0 – off or not available)
Bit 25	CHK –"check engine" indicator (1 – on, 0 – off or not available)
Bit 24	ESP – ESP failure indicator (1 – on, 0 – off or not available)
Bit 23	ABS – ABS failure indicator (1 – on, 0 – off or not available)
Bit 22	EH – engine hot indicator (1 – on, 0 – off or not available)
Bit 21	OP – oil pressure indicator (1 – on, 0 – off or not available)
Bit 20	BF – brake system failure indicator (1 – on, 0 – off or not available)
Bit 19	BAT– battery indicator (1 – on, 0 – off or not available)
Bit 18	CLL – coolant level low indicator (1 – on, 0 – off or not available)
Bit 17	BFL – brake fluid low indicator (1 – on, 0 – off or not available)
Bit 16	W – webcast (1 – on, 0 – off or not available)
Bit 15	T – trunk (1 – opened, 0 – closed)
Bit 14	D – doors (1 – any door opened, 0 – all doors closed)
Bit 13	FFL – front fog lights (1 – on, 0 – off)

Bit 12	RFL – rear fog lights (1 – on, 0 – off)
Bit 11	HB – high beams (1 – on, 0 – off)
Bit 10	LB – low beams (1 – on, 0 – off)
Bit 9	RL – running lights (1 – on, 0 – off)
Bit 8	R – reverse gear (1 – on, 0 – off)
Bit 7	CL – central lock (1 – locked, 0 – unlocked)
Bit 6	H – handbrake (1 – pulled-up, 0 – released)
Bit 5	C – clutch pedal (1 – pressed; 0 – released)
Bit 4	B – brake pedal (1 – pressed; 0 – released)
Bit 3	CC – cruise control (1 – active, 0 - disabled)
Bit 2	AC – air conditioning (1 – on, 0 - off)
Bit 1	DS – driver seatbelt indicator (1 – indicator on, 0 – off).
Bit 0	FL – fuel low indicator (1 – indicator on, 0 – off).

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

Bit	Alarm Mask 2
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Hood (1 – opened, 0 – closed)
Bit 20	Trunk (1 – opened, 0 – closed)
Bit 19	Rear Right Door (1 – opened, 0 – closed)
Bit 18	Rear Left Door (1 – opened, 0 – closed)

Bit 17	Passenger Door (1 – opened, 0 – closed)
Bit 16	Driver Door (1 – opened, 0 – closed)
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	Reserved
Bit 5	Hazard Lights (1 – on, 0 – off)
Bit 4	Rear Fog Light (1 – on, 0 – off)
Bit 3	Front Fog Light (1 – on, 0 – off)
Bit 2	High Beam (1 – on, 0 – off)
Bit 1	Low Beam (1 – on, 0 – off)
Bit 0	Running Lights (1 – on, 0 – off)

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

Bit	Alarm Mask 3
Bit 31	Reserved
……	……
Bit 3	Over High RPM Event (1 – Triggered, 0 – not triggered).
Bit 2	Under High RPM Event (1 – Triggered, 0 – not triggered).
Bit 1	Over Low RPM Event (1 – Triggered, 0 – not triggered).
Bit 0	Under Low RPM Event (1 – Triggered, 0 – not triggered).

✧ <High RPM Threshold>: This is upper limit of the engine rpm. If the current engine rpm is more than <High RPM Threshold>, it will trigger high RPM event.

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

✧ <CAN Report Expansion Mask>: Expand CANBUS information in **+RESP:GTCLT** report. Bitwise

mask to configure the composition of CANBUS expansion information of **+RESP:GTCLT** report.

Bit	Item to Mask	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	Reserved	
Bit 27	Reserved	
Bit 26	Reserved	
Bit 25	Reserved	
Bit 24	Reserved	
Bit 23	Reserved	
Bit 22	<Rapid Accelerations>	Number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value)
Bit 21	<Rapid Braking>	Number of total rapid braking since installation (calculation based on CAN-Logistic's settings of speed decrease time and value)
Bit 20	<Expansion Information>	A decimal number. Each bit represents information of one indicator.
Bit 19	<Registration Number>	The vehicle registration number
Bit 18	<Tachograph Driver 2 Name>	The name of tachograph driver 2
Bit 17	<Tachograph Driver 1 Name>	The name of tachograph driver 1
Bit 16	<Tachograph Driver 2 Card Number>	The card number of tachograph driver 2
Bit 15	<Tachograph Driver 1 Card Number>	The card number of tachograph driver 1
Bit 14	<Total Brake Applications>	Counts of applying brake pedal (braking process initiated by brake pedal)
Bit 13	<Total Accelerator Kick-down Time>	Total time when accelerator pedal is pressed over 90%
Bit 12	<Total Cruise Control Time>	Total time when vehicle speed is controlled by cruise-control module

Bit 11	<Total Effective Engine Speed Time>	Total time when vehicle engine speed is effective
Bit 10	<Total Accelerator Kick-downs>	Counts of accelerator pedal kick-downs (pressing the pedal over 90%)
Bit 9	<Pedal Braking Factor>	Counts of braking with brake pedal or with engine. The more decreasing speed with brake pedal, the higher the pedal braking factor is.
Bit 8	<Engine Braking Factor>	Counts of braking with brake pedal or with engine. The more decreasing speed with the engine, the higher the engine braking factor is.
Bit 7	<Analog Input Value>	Analog input value
Bit 6	<Tachograph Driving Direction>	Vehicle driving direction from tachograph
Bit 5	<Tachograph Vehicle Motion Signal>	Vehicle motion signal from tachograph
Bit 4	<Tachograph Overspeed Signal>	Tachograph overspeed signal for the vehicle
Bit 3	<Axle Weight 4th>	Weight of vehicle's fourth axle
Bit 2	<Axle Weight 3rd>	Weight of vehicle's third axle
Bit 1	<Axle Weight 1st>	Weight of vehicle's first axle
Bit 0	<Ad-Blue Level>	The level of Ad-Blue

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

➢ **+ACK: GTCLT,**

Example:
+ACK:GTCLT,F10310,868446036599153,gv350m,0,0182,20190823101856,0FBB$

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

3.2.8.5. Command String Storage

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

➢ **AT+GTCMD=**

Example:			
AT+GTCMD=gv350m,**1,1,AT+GTRTO=gv350m,0,,,,,,,000B$,,,,,0005$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv350m
Mode	1	0-1	0
Stored cmd ID	3	0 – 31	
Command String	200	AT command	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Mode>: The working mode for storing command.
  ● 0: Delete stored command.
  ● 1: Add new command.
✧ <Stored cmd ID>: A numeric to identify the stored command.
✧ <Command String>: The content of the stored command.

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

➢ **+ACK:GTCMD**

Example:			
+ACK:GTCMD,F10310,868446036599153,gv350m,0234,20190823102244,0FF3$			
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	$	$

3.2.8.6. User Defined Function

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

➢ **AT+GTUDF=**

Example:			
AT+GTUDF=gv350m,1,1,FFFFFFFF,30,0,0,FFFFFFFF,1,,,,,0005$			
Parameter	Length (Byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gv350m
Mode	1	0-2	0
Group ID	<=2	0 – 31	
Input ID Mask	<=16	0-FFFFFFFFFFFFFFFF	
Debounce Time	<=5	0-86400(s)	0
Inzizo Mask	<=5	00000-FFFFF	0
Outzizo Mask	<=5	00000-FFFFF	0
Stocmd ID Mask	<=8	0-FFFFFFFF	
Stocmd Ack	1	0/1	0
Inpeo Mask	<=5	00000-FFFFF	0
Outpeo Mask	<=5	00000-FFFFF	0
Reserved			
Reserved			
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Mode>: The working mode of the user defined function.
- 0: Disable.
- 1: Enable.
- 2: Delete the group.

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

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

Bit 0 (00000001): Select ID1

Bit 1 (00000002): Select ID2

Bit 2 (00000004): Select ID3

Bit 3 (00000008): Select ID4

For example:

Bit (00000003): Select ID1, ID2

Bit (00000017): Select ID1, ID2, ID3, ID5

ID	Bit	Item to Mask
1	Bit 0	Power on finished
2	Bit 1	Ignition on
3	Bit 2	Ignition off
4	Bit 3	The GPRS network is attached
5	Bit 4	The GPRS network is not attached
6	Bit 5	The GSM network registered
7	Bit 6	The GSM network not registered
8	Bit 7	Network roaming
9	Bit 8	Network non roaming

10	Bit 9	SIM card is locked
11	Bit 10	GPS is turned on
12	Bit 11	GPS is turned off
13	Bit 12	The device is stationary
14	Bit 13	The device is moving
15	Bit 14	External charge inserted
16	Bit 15	No external charge
17	Bit 16	The device is charging
18	Bit 17	The device is not charging
19	Bit 18	Digital input 2 is low
20	Bit 19	Digital input 2 is high
21	Bit 20	Digital input 1 is low
22	Bit 21	Digital input 1 is high
23	Bit 22	SIM card is inserted
24	Bit 23	SIM card is not inserted
25	Bit 24	GPS external antenna is inserted
26	Bit 25	GPS external antenna is not inserted
27	Bit 26	Inside the speed range
28	Bit 27	Outside the speed range
29	Bit 28	Messages need to be sent
30	Bit 29	No messages need to be sent
31	Bit 30	Digital input 3 is low
32	Bit 31	Digital input 3 is high
33	Bit 32	Backup battery inserted
34	Bit 33	No backup battery
35	Bit 34	No change of SIM card
36	Bit 35	SIM card change

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

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

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

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

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

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

✧ <Stocmd ID Mask>: Bitwise masks of the stored commands which will be executed when the group state is TRUE (i.e. all the included input events occur.).

✧ <Stocmd Ack>: A numeric to indicate whether to send acknowledgement report when the stored commands are executed.

● 0: Do not send acknowledgement report when the stored command is executed.

● 1: Send acknowledgement report when the stored command is executed.

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

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

3	Bit 2	Inside the Peo 2
4	Bit 3	Inside the Peo 3
5	Bit 4	Inside the Peo 4
6	Bit 5	Inside the Peo 5
7	Bit 6	Inside the Peo 6
8	Bit 7	Inside the Peo 7
9	Bit 8	Inside the Peo 8
10	Bit 9	Inside the Peo 9
11	Bit 10	Inside the Peo 10
12	Bit 11	Inside the Peo 11
13	Bit 12	Inside the Peo 12
14	Bit 13	Inside the Peo 13
15	Bit 14	Inside the Peo 14
16	Bit 15	Inside the Peo 15
17	Bit 16	Inside the Peo 16
18	Bit 17	Inside the Peo 17
19	Bit 18	Inside the Peo 18
20	Bit 19	Inside the Peo 19

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

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

Note:

Maximum 5 stored commands in a group will be executed.

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

➢ **+ACK:GTUDF**

Example:				
+ACK:GTUDF,F10310,868446036599153,gv350m,1154,20190827074132,2167$				
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	$		$

3.2.8.7. Real Time Operation

The command **AT+GTRTO** is used to fetch information from device or have the device execute certain actions.

➢ **AT+GTRTO=**

Example:					
AT+GTRTO=gv350m,A,,,,,,0012$					
SN	**Parameter**	**Length (Byte)**	**Range/Format**		**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'		gv350m
2	Sub Command	2	00 – 16 | 22 | 30		
3	CAN100 Operation Mode/AT Command/ Configuration Mask	1/3/16	0-1/"SRI"/0000000000000000 – FFFFFFFFFFFFFFFF		
4	Output direction/ CAN100 Car Model ID	1/1-5	0-3/1-65535		
5	Reserved	0			
6	Reserved	0			
7	Reserved	0			
	Serial Number	4	0000 – FFFF		
	Tail Character	1	$		$

✧ <Sub Command>:
- 0: **GPS**. Get the GPS related information via report **+RESP:GTGPS**.
- 1: **RTL**. Request the device to report its current location immediately via report **+RESP:GTRTL**.
- 2: **READ**. Get the current configuration of the device via report **+RESP:GTALM or +RESP:GTALS** or **+RESP:GTALC**.
- 3: **REBOOT**. Reboot the device.
- 4: **RESET**. Reset all parameters to factory settings. Parameters configured by **AT+GTBSI**, **AT+GTSRI, AT+GTCFG ,AT+GTPIN** and **AT+GTTMA** will not be reset.
- 5: **PWROFF**. Power off the device.
- 6: **CID**. Get the ICCID of the SIM card which is being used by the device via report **+RESP:GTCID**.
- 7: **CSQ**. Get the current received signal strength of the device via report **+RESP:GTCSQ**.
- 8: **VER**. Get the version information of the device via report **+RESP:GTVER**.
- 9: **BAT**. Get the battery level and adapter state of the device via report **+RESP:GTBAT**.
- A: **IOS**. Get state of all the IO ports via report **+RESP:GTIOS**.
- B: **TMZ**. Get the time zone settings via report **+RESP:GTTMZ**.
- C: **GIR**. Get cell information via report **+RESP:GTGSM**.
- D: **AIF.** Get APN, ICCID, base station ID, RSSI, cell ID, and IP via **+RESP:GTAIF.**
- E: **GSV**: Request the device to report the GPS positioning level.
- F: **INF**: Read the device information report function. The corresponding information will be reported via the report **+RESP:GTINF**.
- 10: **CAN**. Get CAN information via report **+RESP:GTCAN**. Only when the CANBUS function valid.
- 11: **UVN**. Get the version number information of UFSxxx fuel sensor via report **+RESP:GTUVN**. Only when the working mode of **AT+GTURT** is 4 and the <Digital Fuel Sensor Type> is 4 will the **+RESP:GTUVN** report be valid.
- 12: **CVN**. Get the version number information of CAN100 via message **+RESP:GTCVN**. It works only when the CANBUS function is valid.
- 13: **CSN**. Get the serial number information of CAN100 via message **+RESP:GTCSN**. It works only when the CANBUS function is valid.
- 14: **DELBUF**. Delete all the buffered reports.
- 22: **COP** (*CAN Operation)*. Set car model for CAN or read car model from CAN.
- 30: **RSS.** Get the real time information of the sensors via message **+RESP:GTRSS**.

✧ <CAN100 Operation Mode/AT Command/Configuration Mask>:
- <CAN100 Operation Mode>: If the sub command is 0x22, this parameter will work as follows.

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

    1: Set car model. Please use <*CAN Car Model ID*> to set car model.
- <AT Command>: To get a single AT command's configuration when <Sub Command> is set to 2, follow the format in the following example. For example, to get the

configuration of AT+GTFRI, please set AT+GTRTO=GV350M,2,FRI,,,,,0015$, and get it via **+RESP:GTALS**.

- <Configuration Mask>: If <Sub Command> is set to 2, the configuration information of the specified <Configuration Mask> can be obtained via the message +RESP:GTALC. The Configuration Mask must be 16 bytes. If it's less than 16 bytes, '0' will be added in the high bytes of the Configuration Mask.

Configuration Mask Table:

Bit	Item to Mask
Bit 63	FMI
Bit 62	GPJ
Bit 61	GAM
Bit 60	CMD
Bit 59	Reserved
Bit 58	GLM
Bit 57	CLT
Bit 56	UPC
Bit 55	Reserved
Bit 54	TAP
Bit 53	CMS
Bit 52	FSC
Bit 51	EFS
Bit 50	Reserved
Bit 49	Reserved
Bit 48	UDF
Bit 47	SIM
Bit 46	CAN
Bit 45	MUT
Bit 44	PEO
Bit 43	RMD
Bit 42	PGN
Bit 41	TMP
Bit 40	CFU

Bit 39	FTP
Bit 38	UFS
Bit 37	SPA
Bit 36	BZA
Bit 35	Reserved
Bit 34	Reserved
Bit 33	PDS
Bit 32	ACD
Bit 31	IDA
Bit 30	Reserved
Bit 29	SSR
Bit 28	Reserved
Bit 27	FFC
Bit 26	CRA
Bit 25	HRM
Bit 24	WLT
Bit 23	Reserved
Bit 22	URT
Bit 21	HBM
Bit 20	HMC
Bit 19	IDL
Bit 18	AIS
Bit 17	DOG
Bit 16	OWH
Bit 15	PIN
Bit 14	Reserved
Bit 13	SOS
Bit 12	SPD
Bit 11	GEO
Bit 10	FRI

Bit 9	TMA
Bit 8	IOB
Bit 7	OUT
Bit 6	DIS
Bit 5	EPS
Bit 4	TOW
Bit 3	CFG
Bit 2	Reserved
Bit 1	SRI
Bit 0	BSI

✧ <Output Direction/CAN100 Car Model ID>:

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

- 0: The report will be sent to the server.
- 1: The report will be sent to the main serial port.
- 2: Reserved.
- 3: If the command is received via SMS, the report will be sent to the original SMS number; otherwise the report will be sent to the 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.

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

➢ **+ACK:GTRTO,**

Example:			
+ACK:GTRTO,F10310,868446036599153,gv350m,GPS,0388,20190823111008,10FD$			
Parameter	**Length (Byte)**	**Range/Format**	**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	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$		$

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

3.2.8.8. GPS-Assisted Motion Measurement

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

➢ **AT+GTGAM=**

Example: AT+GTGAM=gv350m,1,1,25,10,60,,,,,,FFFF$				
SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
2	Mode	1	0|1	1
3	Speed Mode	1	0|1	1
4	Motion Speed Threshold	<=2	5-50km/h	25
5	Motion Cumulative Time	<=3	10-100s	10
6	Motionless Cumulative Time	<=3	10-250s	60
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: The working mode of the GPS-assisted motion measurement function.
  ● 0: Disable this function.
  ● 1: Enable this function.
✧ <Speed Mode>: It combines with GPS speed to measure the status of movement.
  ● 0: Disable the function.
  ● 1: Enable the function.
✧ <Motion Speed Threshold>: The speed threshold combined with GPS speed to measure the status of movement.
✧ <Motion Cumulative Time>: If the average speed in <*Motion Cumulative Time*> is higher than <*Motion Speed Threshold*>, the device is considered to be in motion status.

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

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

➤ **+ACK:GTGAM,**

Example:
+ACK:GTGAM,F10311,868446036591044,gv350m,FFFF,20191011091238,1937$

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

3.2.8.9. SMS Location Request

This command can only be sent via SMS. Device will send SMS report with Google Maps hyperlink and the current location to corresponding phone number or report **+RESP:GTLBC** to backend server immediately.

Command Format	get position
Example	get position

Get Position: This command is used for current location query.

3.3. Reports

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

3.3.1. Position Report

➤ **+RESP:GTTOW,**

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

➤ **+RESP:GTDIS,**

If the state of digital inputs changes, the device will send the report **+RESP:GTDIS** to the server.

➢ **+RESP:GTIOB,**

After the IO combination is properly set, if the corresponding condition occurs, the device will send the report **+RESP:GTIOB** to the server.

➢ **+RESP:GTSPD,**

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

➢ **+RESP:GTSOS,**

If the SOS alarm is enabled, the device will send the report **+RESP:GTSOS** to the server when SOS event is triggered by corresponding digital input port.

➢ **+RESP:GTRTL,**

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

➢ **+RESP:GTPNL,**

Power on location

➢ **+RESP:GTDOG,**

The watchdog rebooting report

➢ **+RESP:GTIGL,**

The location report for ignition on and ignition off

➢ **+RESP:GTHBM,**

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

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

Example:

+RESP:GTTOW,F10310,868446036599153,gv350m,,00,1,1,0.0,0,125.7,114.015462,22.537224, 20190826013537,0460,0001,253D,AEC3,,0.0,20190826093536,1456$

+RESP:GTDIS,F10310,868446036599153,gv350m,,11,1,2,0.0,153,262.2,114.014197,22.540042 ,20190823055555,0460,0001,253D,AEC3,,0.0,20190823135556,1232$

+RESP:GTIOB,F10310,868446036599153,gv350m,,01,1,1,0.0,0,177.0,114.014265,22.539300,2 0190823060718,0460,0001,253D,AEC3,,0.0,20190823140719,124C$

+RESP:GTSPD,F10310,868446036599153,gv350m,,01,1,1,0.0,0,100.7,114.015401,22.537173,2 0190823094208,0460,0001,253D,AEC3,,0.0,20190823174208,1417$

+RESP:GTSOS,F10310,868446036599153,gv350m,,10,1,1,0.0,0,100.2,114.015294,22.537137,2 0190826024901,0460,0001,253D,AEC3,,0.0,20190826104900,14CA$

+RESP:GTRTL,F10310,868446036599153,gv350m,,00,1,2,0.0,0,123.5,114.015447,22.537188,2 0190823031038,0460,0001,253D,AEC3,,0.0,20190823111039,1101$

+RESP:GTDOG,F10310,868446036599153,gv350m,,13,1,2,0.0,0,239.9,114.015427,22.537118,

---

20190826032817,0460,0001,253D,AEC3,,0.0,20190826112817,155D$
+RESP:GTIGL,F10310,868446036599153,gv350m,,00,1,2,0.0,0,151.0,114.015284,22.537202,20
190823065816,0460,0001,253D,AEC3,,0.0,20190823145817,12C8$
+RESP:GTPNL,F10310,868446036599153,gv350m,,00,1,1,0.0,147,144.5,114.014461,22.53808
7,20190823065148,0000,0000,0000,0000,,0.0,20190823145148,12A4$
+RESP:GTHBM,F10310,868446036599153,gv350m,,11,1,1,65.7,240,20.3,113.993844,22.52765
5,20190827091020,0460,0000,27BD,134E,,6493.3,20190827091021,025C$

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

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

Report ID has different meanings in different reports as below.

● The ID of digital input port which triggers the report **+RESP:GTDIS** and **+RESP:GTSOS**. The range is 1 – 3.

● The ID of the bound IO which triggers the report **+RESP:GTIOB**. The range is 0 – 3.

● The ID of the digital input port which triggers the reboot report **+RESP:GTDOG**. The valid value is 1 - 3.

● The speed level at which the harsh behavior is detected in report **+RESP:GTHBM**. 3 is high speed, 2 is medium speed and 1 is low speed. If mode 2 is selected, the value is always 0, indicating unknown speed. For the rest of the reports, it will always be 0.

● Meanings of different report type in different reports are as below: in the **+RESP:GTDIS** report generated by the digital input

　0: The current logical state of the input port is disabled state.

　1: The current logical state of the input is enabled state.

● In the **+RESP:GTIOB** report generated by bound IO

　0: The current logical state of the bound IO does not meet the alarm condition.

　1: The current logical state of the bound IO meets the alarm condition.

● In the report of speed alarm **+RESP:GTSPD**

　0: Outside the predefined speed range.

　1: Inside the predefined speed range.

● In the report of protocol watch dog reboot report **+RESP:GTDOG**

　1: Reboot report for time based working mode

　2: Reboot report for ignition on working mode

　3: Reboot report for input triggered reboot

　4: Reboot report for no network watchdog

　5: Reboot report for no activation watchdog

　6: Reboot report for sending failure timeout watchdog

● In the report of ignition on and ignition off report **+RESP:GTIGL**

　0: Ignition on.

　1: Ignition off.

● In the report of harsh behavior monitoring report **+RESP:GTHBM**

　0: Harsh braking behavior

　1: Harsh acceleration behavior

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

✧ <Number>: The number of the GPS position included in the report. Generally, it equals to 1.

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

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

✧ <Azimuth>: The azimuth of the GPS positioning.

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

- ✧ <Longitude>: The longitude of the current location.
- ✧ <Latitude>: The latitude of the current location.
- ✧ <GPS UTC Time>: The UTC time from the GPS chip.
- ✧ <MCC>: Mobile country code. It is 3-digit in length and ranges from 000 to 999. If bit 3 is not set to 1 in field <Report Composition Mask> within **AT+GTCFG**, the length of this field is 0 in ASCII format report.
- ✧ <MNC>: Mobile network code. It is 3-digit in length and ranges from 000 to 999. If bit 3 is not set to 1 in field <Report Composition Mask> within **AT+GTCFG**, the length of this field is 0 in ASCII format report.
- ✧ <LAC>: Location area code in hex format.
- ✧ <Cell ID>: Cell ID in hex format.
- ✧ <Mileage>: The current total mileage.

➢ **+RESP:GTFRI,**

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

Example:
+RESP:GTFRI,F10310,868446036599153,gv350m,13242,10,1,1,0.0,0,231.2,114.015734,22.537908,20190823013021,0460,0001,253D,AEC3,,0.0,,,100,110000,,,20190823093022,0F76$

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

LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input 1	<=5	0～32000 mV	
Backup Battery Percentage	<=3	0 – 100	
Device Status	6	000000 – FFFFFF	
Reserved	0		
Reserved	0		
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

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

Report ID has six meanings as below.

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

Report type has six meanings as below.

- ● 0: The normal FRI report.
- ● 1: Normal corner report.
- ● 2: FRI report when the device enters into Geo-Fence status, known/unknown roaming status after FFC function is enabled. FRI report frequency will be changed according to the settings of FFC.
- ● 3: Corner report after FFC function is enabled. The corner report will be reported according to the corner angle of FFC.
- ● 4: Normal Mileage report when FRI report mode is mode 5.
- ● 5: Reserved.
- ● 6: Mileage report when FFC function is enabled and FRI report mode is 5 in FFC. The

Mileage report will be sent according to the mileage of FFC

✧ <Number>: The number of the GPS position included in the report. Generally, it equals to 1.

✧ <Hour Meter Count>: If hour meter counter function is enabled by the command **AT+GTHMC**, total hours will be counted after ignition on and will be reported in this field. The range is 00000:00:00– 99999:00:00, from left to right, the units separately are hour, minute and second. If this function is disabled, this field will be empty.

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

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

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

The current state of the device:

● 16 (**Tow**): The vehicle was towed after ignition off.

● 1A (**Fake Tow**): The vehicle might have been towed after ignition off.

● 11 (**Ignition off Rest**): The vehicle is ignition off and motionless.

● 12 (**Ignition off Motion**): The vehicle had been moving before this action was regarded as car-towing event after ignition off.

● 21 (**Ignition On Rest**): The vehicle is ignition on and motionless.

● 22 (**Ignition On Motion**): The device is ignition on and moving.

● 41 (**Sensor Rest**): The vehicle is motionless and no ignition signal is detected.

● 42 (**Sensor Motion**): The vehicle is moving and no ignition signal is detected.

The input ports state: A bitwise hex integer to represent the logical state of the digital input. From the lowest bit to the highest bit, each bit represents ignition detection and one of the digital inputs 1 – 3 respectively. For each bit, 0 means disable state, 1 means enable state.

The output ports state: A bitwise hex integer to represent the logical state of the digital output. From the lowest bit to the highest bit, each bit represents one of the digital outputs 1 – 3 respectively. For each bit, 0 means disable state, 1 means enable state.

➢ **+RESP:GTERI,**

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

Example:
+RESP:GTERI,F10310,868446036599153,gv350m,00000002,11636,10,1,2,0.0,0,247.8,114.015482,22.537480,20190826034720,0460,0001,253D,AEC3,,0.0,,,100,110000,,7,2880219F0A0000D0,1,01AD,28BAFC7D08000041,1,01AF,2866EE9E0A000089,1,01B2,28D64BC50800006C,1,01AE,2809769D0A00006F,1,01AC,28E3597E08000090,1,01AD,28CBCA7D080000F6,1,01AF,20190826114719,15BF$

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

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ERI Mask	8	00000000 – FFFFFFFF	
External Power Supply	<=5	0 – 32000 mV	
Report ID/Report Type	2	X(1-6)X(0-6)	
Number	1	0 – 1	
GPS Accuracy	<=2	0/1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input 1	<=5	0～32000 mV	
Backup Battery Percentage	<=3	0 – 100	
Device Status	6	000000 – FFFFFF	
Reserved	0		
1-wire Device Number (optional)	<=1	0-8	
1-wire Device ID (optional)	<=16		
1-wire Device TYPE (optional)	1	1	
1-wire Device DATA (optional)	4		

Fuel Sensor number (optional)	<=2	0-99	
Sensor Type	1	0 – 6	
Reserved	0		
Percentage (optional)	<=3	0 –100	
Volume (optional)	<=5	0 –10000	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <1-wire Device Number>: The number of 1-wire devices connected to GV350M. If it is 0, the following fields <1-wire Device ID>, <1-wire Device Type>, <1-wire Device Data> will not display. If there are more than one 1-wire devices connected, the following fields <1-wire Device ID>, <1-wire Device Type>, <1-wire Device Data> will be displayed to show the information of all connected 1-wire devices. If Bit 1 of <ERI Mask> in **AT+GTFRI** is enabled, the part <1-wire Data> will display, otherwise, the part <1-wire Data> will not display.

✧ <1-wire Device ID>: Means the 1-wire device ID read from the device. If the bit 1 is not set to 1 in field <ERI Mask> within **AT+GTFRI**, the length of this field is 0 in ASCII format report.

✧ <1-wire Device TYPE>: Means the 1-wire device type. If the bit 1 is not set to 1 in field <ERI Mask> within **AT+GTFRI**, the length of this field is 0 in ASCII format report.

  ● 1: Temperature sensor.

✧ <1-wire Device DATA>: Means the data read from the 1-wire devices. If the value of <1-wire Devices Type> is the temperature sensor, this indicates the temperature value. To convert the value of the two bytes in hex to decimal, multiply it by 0.0625 to get the temperature value in Celsius degrees. If the first 5 bits of the high byte are 1, the temperature value is below zero Celsius degrees and the value is represented in two's complement format. To obtain the temperature in decimal, plus the hexadecimal data by 1 and then multiply it by 0.0625 to get the value in Celsius degrees.

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

➢ **+RESP:GTEPS,**

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

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

Example:

+RESP:GTEPS,F10310,868446036599153,gv350m,13109,10,1,1,0.0,0,100.2,114.015294,22.537
137,20190826031008,0460,0001,253D,AEC3,,0.0,20190826111007,14FD$

+RESP:GTAIS,F10310,868446036599153,gv350m,13393,11,1,1,0.0,0,131.3,114.014838,22.5384
04,20190823061047,0460,0001,253D,AEC3,,0.0,20190823141049,1254$

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

✧ <External Power/Analog Input VCC>: The value of the external power supply voltage or the analog input voltage. When the voltage of the analog input meets the alarm condition set by command **AT+GTEPS** or **AT+GTAIS**, the device will send the current analog input voltage

along with **+RESP:GTEPS** or **+RESP:GTAIS** report to the server.

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

Report ID has different meanings in these two reports.

● The ID of analog input port which triggers report **+RESP:GTEPS**. The value is 1.

● The ID of analog input port which triggers report **+RESP:GTAIS**. The range is 1.

Report type has two meanings as below:

● 0: Outside of the predefined range.

● 1: Inside of the predefined range.

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

➢ **+RESP:GTGIN**

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

➢ **+RESP:GTGOT**

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

Example:			
+RESP:GTGIN,F10310,868446036599153,gv350m,,,1,00001,,,,,1,1,0.0,0,229.4,114.014870,22.537136,20190823072056,0460,0001,253D,AEC3,,0.0,,,,,20190823152057,13AC$** **+RESP:GTGOT,F10310,868446036599153,gv350m,,,0,00001,,,,,1,1,0.0,0,125.4,114.015543,22.537238,20190823082505,0460,0001,253D,AEC3,,0.0,,,,,20190823162505,13EA$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved			
Reserved			
Area Type	1	0-1	
GEO ID Group	<=5	20bit 1-FFFFF (GEOID 0 – 19)	
Reserved			
Reserved			
Reserved			
Reserved			
Number	1	0 – 1	

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

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

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

➤ **+RESP:GTGES**

Before using Parking-Fence function, make sure checking interval is not 0 and select the correct trigger mode. It is not related to GEO-fence mode. Corresponding parameters can be configured by command **AT+GTGEO**, device will report **+RESP:GTGES** when it detects that vehicle enters or exits Parking-Fence.

Example:
+RESP:GTGES,F10310,868446036599153,gv350m,,0,1,21,50,10,1,1,0.0,0,229.4,114.014870,22.537136,20190823075233,0460,0001,253D,AEC3,,0.0,20190823155234,13C2$

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

✧ <Trigger GEO ID>: The ID of Geo-Fence, The range is 0 – 19.

✧ <Trigger GEO Enable>: Current Parking-Fence is active or inactive.

● 0: Current Parking -Fence is inactive.

● 1: Current Parking -Fence is active.

➢ **+RESP:GTLBC,**

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

Example:
+RESP:GTLBC,F10310,868446036599153,gv350m,15889570956,1,1,0.0,0,99.9,114.015413,22.537122,20190823021035,0460,0001,253D,AEC3,,20190823101036,0F96$

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

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

➢ **+RESP:GTIDA,**

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

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

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

Example:
+RESP:GTIDA,F10101,862170013895931,,,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	0/1/2	
Number	1	0 – 1	
GPS Accuracy	<=2	0/1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Reserved			
Reserved			

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

✧ <ID>: The current ID.

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

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

    1: The ID is authorized.

    2: The ID has logged out.

3.3.2. Device Information Report

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

➢ **+RESP:GTINF,**

Example:
+RESP:GTINF,F10310,868446036599153,gv350m,22,89860117851023145722,14,0,1,,,4.19,0,1 ,,,20190823034212,1,,01,00,,,20190823114213,116E$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11/12/21/22/41/42/1A/16	
ICCID	20		
CSQ RSSI	<=2	0 – 31	
CSQ BER	<=2	0 – 7/99	
External Power Supply	1	0/1	
External Power VCC	<=5	0 – 32000mV	
INF Expand Mask	4	0000 – FFFF	
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0/1	
LED On	1	0/1	
Reserved	0		
Reserved			

Last Fix UTC Time	14	YYYYMMDDHHMMSS	
External GPS Antenna	1	0/1/3	
Analog Input1 Voltage	<=5	0~32000mV	
Digital Input	2	00 – 0F	
Digital Output	2	00 – 07	
1-wire Device Number (optional)	<=1	0-8	
1-wire Device ID (optional)	<=16		
1-wire Device TYPE (optional)	1	1	
1-wire Device DATA (optional)	4		
Reserved	0		
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <State>: The current motion state of the device.
- 16 (**Tow**): The vehicle was towed after ignition off.
- 1A **(Fake Tow):** The vehicle might have been towed after ignition off.
- 11 (**Ignition off Rest**): The vehicle is ignition off and motionless.
- 12 (**Ignition off Motion**): The vehicle had been moving before this action was regarded as car-towing event after ignition off.
- 21 (**Ignition On Rest**): The vehicle is ignition on and motionless.
- 22 (**Ignition On Motion**): The device is ignition on and moving.
- 41 (**Sensor Rest**): The vehicle is motionless and no ignition wire is detected.
- 42 (**Sensor Motion**): The vehicle is moving and no ignition wire is detected.

✧ <CSQ RSSI>: The received signal strength indication (RSSI) of the EGPRS/LTE Cat-M1/LTE Cat-NB1 signal.

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

✧ <CSQ BER>: The bit error rate of the EGPRS/LTE Cat-M1/LTE Cat-NB1 signal. The range is 0-7 and 99 means unknown.

✧ <External Power Supply>: Whether the external power supply is connected.

- 0: External power supply not connected
- 1: External power supplies connected.

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

✧ <INF Expand Mask>: Bitwise mask to configure the composition of expanded information in **+RESP:GTINF**.
  - Bit 0 for 1-wire device information.
  - Bit 1 – 15 Reserved.

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

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

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

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

✧ <Analog Input1 voltage>: The voltage of the analog input 1.

✧ <Digital Input>: A bitwise hex integer to represent the logical state of the digital input. From the lowest bit to the highest bit, each bit represents ignition detection and one of the digital inputs 1 – 3 respectively. For each bit, 0 means disabled state and 1 means enabled state.

✧ <Digital Output>: A bitwise hex integer to represent the logical state of the digital output. From the lowest bit to the highest bit, each bit represents one of the digital outputs 1 – 3 respectively. For each bit, 0 means disabled state and 1 means enabled state.

✧ <1-wire Device Number>: The number of 1-wire devices connected to GV350M. If it is 0 or empty, the following fields <1-wire Devices ID>, <1-wire Devices Type>, <1-wire Devices Data> will not display. If there are more than one 1-wire devices connected, the following fields <1-wire Device ID>, <1-wire Device Type>, <1-wire Device Data> will be displayed to show the information of all connected 1-wire devices.

3.3.3. Report of Real Time Querying

3.3.3.1. +RESP:GTGPS

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

➢ **+RESP:GTGPS,**

Example:
+RESP:GTGPS,F10310,868446036599153,gv350m,,,,007F,,1,20190823031007,20190823111008, 10FE$

Parameter	Length (Byte)	Range/Format	Default

Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Reserved	0		
External GPS Antenna	1	0/1/3	
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.3.3.2. +RESP:GTALM

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

➢ **+RESP:GTALM,**

Example:
+RESP:GTALM,F10310,868446036599153,gv350m,22,2,GEO,0,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,1,0,0.000000,0.000000,50,0,0,0,0,0,0,,,2,0,0.000000,0.000000,50,0,0,0,0,0,0,,,3,0,0.000000,0.000000,50,0,0,0,0,0,0,,,4,0,0.000000,0.000000,50,0,0,0,0,0,0,,,5,0,0.000000,0.000000,50,0,0,0,0,0,0,,,6,0,0.000000,0.000000,50,0,0,0,0,0,0,,,7,0,0.000000,0.000000,50,0,0,0,0,0,0,,,8,0,0.000000,0.000000,50,0,0,0,0,0,0,,,9,0,0.000000,0.000000,50,0,0,0,0,0,0,,,10,0,0.000000,0.000000,50,0,0,0,0,0,0,,,11,0,0.000000,0.000000,50,0,0,0,0,0,0,,,12,0,0.000000,0.000000,50,0,0,0,0,0,0,,,13,0,0.000000,0.000000,50,0,0,0,0,0,0,,,14,0,0.000000,0.000000,50,0,0,0,0,0,0,,,15,0,0.000000,0.000000,50,0,0,0,0,0,0,,,16,0,0.000000,0.000000,50,0,0,0,0,0,0,,,17,0,0.000000,0.000000,50,0,0,0,0,0,0,,,18,0,0.000000,0.000000,50,0,0,0,0,0,0,,,19,0,0.000000,0.000000,50,0,0,0,0,0,0,,,SPD,0,0,0,60,300,0,0,0,0,,,,,,,,,,,SOS,0,0,,0,0,0,0,,,,,PIN,1,1234,,,,,,OWH,0,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,,DOG,1,60,7,0200,,1,0,0,480,480,480,20190823111111,1104$

Parameter	Length (Byte)	Range/Format	Default

Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Total Packets	2	10	
Current Packet	<=2	1 – 10	
Configurations	<1500		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

✧ <Current Packet>: Sequence number of current packet.

✧ <Configurations>: Current configuration of device. The 1st report contains configuration for the commands from **BSI** to **FRI**, the 2nd is for the commands from **GEO** to **DOG**, the 3rd is for the commands from **AIS** to **SSR**, the 4th to the 7th are for the **IDA**, the 8th is for the commands from **ACD** to **TMP**, the 9th is for the command **RMD**, the 10th to 13th reports are for the command **PEO**, the 14th is for the commands from **MUT** to **SIM**, the 15th is for the command **UDF,** the 16th are for the commands from **EFS** to **UPC**, the 17th are for the commands from **CLT** to **GLM**, the 18th to 21th are for the command **CMD** and the 22th is for the command **GAM** to **FMI.**

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

3.3.3.3. +RESP:GTALC

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

➢ **+RESP:GTALC,**

Example:
+RESP:GTALC,F10310,868446036599153,gv350m,D779FFF3AF7FBFFB,1,1,BSI,,,,,,,1,3,0,SRI,3,,1,
218.17.46.11,876,,0,,0,0,0,0,,,CFG,,gv350m,0,0.0.,,,007F,0,,3BFF,0,1,0,300,10,,0,0,1F,0,,,,,,24,10,
5,,0,,TOW,0,10,1,300,0,0,0,0,2,3,3,,,,,,,,,EPS,3,10000,13000,0,1,0,0,0,0,1,200,,0,DIS,0,,5,0,1,0,0,
0,2,0,0,0,3,0,0,0,,,,,,,,,OUT,0,0,0,0,,,,IOB,0,0,0,0,0,0,0,0,,,,,1,0,0,0,0,0,0,0,,,,,2,0,0,0,0,0,0,0,,,,,3,
0,0,0,0,0,0,0,,,,,TMA,+,8,0,0,,,FRI,1,0,,1,0000,0000,,60,1000,1000,,0,120,00000000,,,,GEO,0,0,0
.000000,0.000000,50,0,0,0,0,0,0,,,1,0,0.000000,0.000000,50,0,0,0,0,0,0,,,2,0,0.000000,0.00
0000,50,0,0,0,0,0,0,,,3,0,0.000000,0.000000,50,0,0,0,0,0,0,,,4,0,0.000000,0.000000,50,0,0,
0,0,0,0,,,5,0,0.000000,0.000000,50,0,0,0,0,0,0,,,6,0,0.000000,0.000000,50,0,0,0,0,0,0,,,7,
0,0.000000,0.000000,50,0,0,0,0,0,0,,,8,0,0.000000,0.000000,50,0,0,0,0,0,0,,,9,0,0.000000,0

.000000,50,0,0,0,0,0,0,0,,,10,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,11,0,0.000000,0.000000,50,0,0,0,0,0,0,0,0,,,12,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,13,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,14,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,15,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,16,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,17,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,18,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,19,0,0.000000,0.000000,50,0,0,0,0,0,0,0,,,20190823111424,111F$
+RESP:GTALC,F10310,868446036599153,gv350m,D779FFF3AF7FBFFB,1,2,SPD,0,0,0,60,300,0,0,0,0,,,,,,,,,,,SOS,0,0,,0,0,0,0,,,,,PIN,1,1234,,,,,OWH,0,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,,DOG,1,60,7,0200,,1,0,0,480,480,480,AIS,1,0,0,0,0,,0,0,0,0,0,10,30,10,20,0,IDL,0,2,1,,,,,0,0,0,0,0,,,,HMC,1,00000:00:00,,,,,,,,,HBM,0,,,100,0,0,,60,0,0,,0,0,,0,0,0,0,30,50,20,65,URT,0,0,5,8,1,0,0,,,,1,0,5,8,1,0,0,,,,WLT,4,15889570956,,,,,,,,,,,,,HRM,,,7F,00FE7FFF,00FE7FFF,7F7F,FF,7F,007F,000007F0,,CRA,0,7,,10,10,10,10,0,0,0,0,,FFC,0,0,0,30,500,500,300,,0,,,1,0,0,30,500,500,300,,0,,,2,0,0,30,500,500,300,,0,,,3,0,0,30,500,500,300,,0,,,4,0,0,30,500,500,300,,0,,,SSR,0,2,1,5,0,,,,IDA,0,1,64,,,30,0,30,,,0,0,0,0,,,,,20190823111424,1120$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Configuration Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Next Packet	1	0-1	0
Current Packet	<=2	1-20	1
BSI	3	BSI	BSI
LTE APN	<=47		
LTE APN User Name	<=30		
LTE APN Password.	<=30		
GPRS APN	<=47		
GPRS APN User Name	<=30		
GPRS APN Password	<=30		
Network Mode	1	0 – 3	0
LTE Mode	1	0 – 3	
SRI	3	SRI	SRI
Report Mode	1	0 – 7	0
Reserved	0		
Buffer Mode	1	0/1/2	1

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Main Server IP/ Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP/Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0/5 – 360min	0
Enable SACK	1	0/1/2	0
Protocol Format	1	0/1	0
SMS ACK Enable	1	0/1	0
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4–7	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv350m
Enable ODO	1	0/1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
Reserved	0		
Reserved	0		
Report Component Mask	4	0000 – FFFF	003F
Power Saving Mode	1	0 –3	1
Reserved	0		
Event Mask	4	0000 – FFFF	3BFF
Pin Mode	1	0/1	0
LED On	1	0/1	0
Enable Info Report	1	0/1	0
Info Report Interval	<=5	30 – 86400sec	300
Location request mask	1	00|10|20	00
Reserved	0		
Backup Battery	1	0/1	0

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Charge Mode			
AGPS Mode	1	0/1	0
GSM Report	4	0000 – FFFF	001F
GPS Lost Time	2	0 – 30min	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Wakeup Hour Interval	<=3	1-720	24
Sensor Wakeup Debounce	<=2	0-60(s)	10
Work time per Wakeup	<=2	3-60	5
Reserved	0		
1-wire Device Sample Period	<=3	0/10– 255(s)	0
INF Expand Mask	<=4	0000 – FFFF	0
TOW	3	TOW	TOW
Mode	1	0/1	0
Tow Detection Time	<=2	5 – 15 min	10
Fake Tow Delay	<=2	0 – 10 min	1
Report Interval	<=5	30 – 86400 sec	300
Tow Output ID	1	0 – 3	
Tow Output Status	1	0/1	
Tow Output Duration	<=3	0 – 255 (×100ms)	0
Tow Output Toggle Times	<=3	0 – 255	0
Rest Duration	<=3	1 – 255 (×15sec)	2
Motion Duration	<=2	1 – 10 (×100ms)	3
Motion Threshold	1	2 – 4	3
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0-3	0
Min. Threshold	<=5	250 – 32000 mV	250
Max. Threshold	<=5	250 – 32000 mV	250
Sample Period	<=2	0/1 – 12(×2s)	0
Debounce Time	1	0 – 5(×1s)	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0/1	0
Hysteresis Error	<=4	0 – 2000	0
Reserved	0		
MPN/MPF Valid Time	1	0 – 5 (×1s)	0
DIS	3	DIS	DIS
Ignition Detection	1	0	0
Position Type	1	0 –1	0
Debounce Time	<=2	0 – 20(×10ms)	5
Ignition Detection	1	0/1	0
Input ID 1	1	1	1
Enable	1	0/1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Valid 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
Valid Time	<=2	0/1 – 12(×2s)	0
Input ID 3	1	3	3
Enable	1	0/1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Valid Time	<=2	0/1 – 12(×2s)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OUT	3	OUT	OUT
DOS Report	1	0-7	0
Long Operation1	<=3	0 – 120min	0
Long Operation2	<=3	0 – 120min	0
Long Operation3	<=3	0 – 120min	0
Reserved	0		
Reserved	0		
Reserved	0		
IOB	3	IOB	IOB
IOB ID0	1	0	0
Input Mask	2	00 – 0F	0
Trigger Mask	2	00 – 0F	0
Input Sample Period	<=2	0/1 – 12(×2s)	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0

Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID1	1	1	1
Input Mask	2	00– 0F	0
Trigger Mask	2	00 – 0F	0
Input Sample Period	<=2	0/1 – 12(×2s)	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID2	1	2	2
Input Mask	2	00 – 0F	0
Trigger Mask	2	00 – 0F	0
Input Sample Period	<=2	0/1 – 12(×2s)	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved			

IOB ID3	1	3	3
Input Mask	2	00 – 0F	0
Trigger Mask	2	00 – 0F	0
Input Sample Period	<=2	0/1 – 12(×2s)	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TMA	3	TMA	TMA
Sign	1	+/-	+
Hour Offset	<=2	0-12	00
Minute Offset	<=2	0-59	00
Daylight Saving	1	0/1	0
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 5	0
Discard No Fix	<=2	0/1	1
Reserved	0		
Enable Period	1	0/1	1
Begin Time	4	HHMM	0000
End Time	4	HHMM	0000
Reserved	0		
IGN Report Interval	<=5	0/5 – 86400sec	30
Distance	<=5	50 – 65535m	1000
Mileage	<=5	50 – 65535m	1000

Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0/5-86400sec	600
ERI Mask	8	00000000-FFFFFFFF	00000000
Reserved	0		
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	0
Longitude	<=11	(−)xxx.xxxxxx	0.000000
Latitude	<=10	(−)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0/21/22	0
Trigger Report	1	0/1	0
Reserved	0		
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 – 3	0
Longitude	<=11	(−)xxx.xxxxxx	0.000000
Latitude	<=10	(−)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50

Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0/21/22	0
Trigger Report	1	0/1	0
Reserved	0		
Reserved	0		
GEO ID2	1	2	2
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0/21/22	0
Trigger Report	1	0/1	0
Reserved	0		
Reserved	0		
GEO ID3	1	3	3
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50

Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 –3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0/21/22	0
Trigger Report	1	0/1	0
Reserved	0		
Reserved	0		
GEO ID4	1	4	4
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0/21/22	0
Trigger Report	1	0/1	0
Reserved	0		
Reserved	0		
GEO ID5	1	5	5
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50

Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0/21/22	0
Trigger Report	1	0/1	0
Reserved	0		
Reserved	0		
GEO ID6	1	6	6
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0/21/22	0
Trigger Report	1	0/1	0
Reserved	0		
Reserved	0		
GEO ID7	1	7	7
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	0.000000
Latitude	<=10	(–)xx.xxxxxx	0.000000
Radius	<=7	50 – 6000000m	50

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

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

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

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

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

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

Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Trigger Mode	<=2	0/21/22	0
Trigger Report	1	0/1	0
Reserved	0		
Reserved	0		
SPD	3	SPD	SPD
Mode	1	0/1/2/3/4	0
Min Speed	<=3	0 – 400km/h	0
Max Speed	<=3	0 – 400km/h	0
Valid Time	<=4	15 – 3600sec	60
Send Interval	<=4	30 – 3600sec	300
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

Digital Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0/1/2	1
Ignition Frequency	<=3	10 – 120min	60
Reboot Interval	<=2	1 – 30	7
Reboot Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0/1	1
Input ID	1	0-3	0
Unit	1	0/1	0
No Network Interval	4	0/5-1440 min	480
No Activation Interval	4	0/5-1440 min	480
Send Failure Timeout	4	0/5-1440 min	480
AIS	3	AIS	AIS
Analog Input ID1	1	1	1
Mode	1	0/1/2/3/4/5	0
Min. Threshold	<=5	0～32000mV	0
Max. Threshold	<=5	0～32000mV	0
Sample Period	<=2	0/1 – 12(×2s)	0
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0

Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0/1	0
Fuel Level Debounce	<=3	0-150	10
Fuel Sensor Delay Time	<=3	0-600 sec	30
Fuel Loss Alarm	<=2	0-50	10
Sampling Number	<=3	0-150	20
Fuel Level Change Threshold	<=2	0-50%	0
IDL	3	IDL	IDL
Mode	1	0/1	0
Idling Detection Time	2	1 – 30 min	2
Idling End Time	1	1 – 5 min	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Debounce Option	1	0-1	0
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Enable Hour Meter	1	0/1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
Mode	1	0/1/2/3	0
Reserved	0		
Reserved	0		
High Speed	<=3	100 – 400km/h	100
ΔVhb	<=3	0 – 100km/h	0
ΔVha	<=3	0 – 100km/h	0
Reserved	0		
Medium Speed	<=3	60 – 400km/h	60
ΔVmb	<=3	0 – 100km/h	0
ΔVma	<=3	0 – 100km/h	0
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100km/h	0
ΔVla	<=3	0 – 100km/h	0
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Turn and Break Threshold	<=3	30-70	30
Turn and Break Duration	<=3	40-100(*8ms)	50
Acceleration Threshold	<=3	15-50	20
Acceleration Duration	<=3	50-250(*8ms)	65
URT	3	URT	URT

UART Port	1	0	0
Working Mode	<=2	0 – 9|20	0
Baud rate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 2	0
Enable Sleep	1	0/1	0
Reserved (optional)			
Reserved (optional)			
Reserved (optional)			
UART Port	1	1	1
Working Mode	<=2	0 – 9|20	0
Baud rate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 2	0
Enable Sleep	1	0/1	0
Reserved (optional)			
Reserved (optional)			
Reserved (optional)			
WLT	3	WLT	WLT
Number Filter	1	0|4	4
White Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HRM	3	HRM	HRM
Reserved	0		
Reserved	0		

+ACK Mask	2	00 – FF	7F
+RSP Mask	8	00000000 – FFFFFFFF	00FE7FFF
+EVT Mask	8	00000000 – FFFFFFFF	00FE7FFF
+INF Mask	<=8	00000000 – FFFFFFFF	7F7F
+HBD Mask	2	00 – FF	FF
+DAT Mask	<=8	00000000 – FFFFFFFF	7F
+CRD Mask	4	0000–FFFF	7F
+CAN Mask	8	00000000 – FFFFFFFF	7F0
Reserved	0		
CRA	3	CRA	CRA
Mode	1	0/1	0
G-Sensor Sensitivity	<=2	1 – 99(*0.1g)	7
Reserved	0		
GPS Data Pre-Crash	<=2	0-10	10
GPS Data Post-Crash	<=2	0-10	10
G-Sensor Data Pre-Crash	<=2	1-10	10
G-Sensor Data Post-Crash	<=2	1-10	10
Output ID	1	0 – 3	0
Output Status	1	0/1	
Duration	<=3	0～255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
FFC	3	FFC	FFC
Priority	1	0	0
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500

FRI IGF Report Interval	<=5	0/5-86400s	300
Reserved			
Corner Report	<=3	0 – 180	0
Reserved			
Reserved			
Priority	1	1	1
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0/5-86400s	300
Reserved			
Corner Report	<=3	0 – 180	0
Reserved			
Reserved			
Priority	1	2	2
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0/5-86400s	300
Reserved			
Corner Report	<=3	0 – 180	0
Reserved			
Reserved			
Priority	1	3	3
Mode	1	0-3	0
FRI Mode	1	0-5	0

FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0/5-86400s	300
Reserved			
Corner Report	<=3	0 – 180	0
Reserved			
Reserved			
Priority	1	4	4
Mode	1	0-3	0
FRI Mode	1	0-5	0
FRI IGN Report Interval	<=5	5-86400s	30
FRI Report Distance	<=5	50-65535m	500
FRI Report Mileage	<=5	50-65535m	500
FRI IGF Report Interval	<=5	0/5-86400s	300
Reserved			
Corner Report	<=3	0 – 180	0
Reserved			
Reserved			
SSR	3	SSR	SSR
Mode	1	0/1	0
Stop Detection Time	2	1 – 30 min	2
Motion Detection Time	1	1 – 5 min	1
Start Speed	2	1 – 10 Km/h	5
Long Stop Detection Time	<=5	0 – 43200 min	0
Reserved	0		
Reserved	0		
Reserved	0		
IDA	3	IDA	IDA
Mode	1	0/1/2	0

GV350M Series @Track Air Interface Protocol

Start Index	<=2	1 – 250	
End Index	<=2	1 – 250	
ID Number List	<=8*20	'0' – '9','a' – 'f', 'A' – 'F'	
Timeout After Ignition Off	<=3	0/15 – 600sec	30
Report Mode	1	0 – 7	0
ID Valid Time	<=3	15 – 600sec	30
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ACD	3	ACD	ACD
iButton Timer	<=2	0|1 – 10(s)	0
Output ID	1	0-3	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle	<=3	0 – 255	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
PDS	3	PDS	PDS
Mode	1	0/1/2	1

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Mask	<=4	0-7FF	7FF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BZA	3	BZA	BZA
Output ID	1	0-3	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0/1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 2 Output Status	1	0/1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 3 Output Status	1	0/1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 4 Output Status	1	0/1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SPA	3	SPA	SPA
Mode	1	0/12	0
Speed Threshold 1	<=3	0 – 400km/h	50
Reserved	0		
Valid Time	<=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		
Valid Time	<=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		
Valid Time	<=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		

Valid Time	<=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		
UFS	3	UFS	UFS
Max Download Retries	1	0 – 3	0
Download Timeout	2	10-30min	10
Protocol Type	1	0	0
Server User Name	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server Password	<=20	'0-9', '_', 'a-z', 'A-Z'	
Server URL	100	Legal URL	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FTP	3	FTP	FTP
Server Address	<=60		
Server Port	<=5	0 – 65535	0
Full Name	<=60		
User Name	<=10		
Login Password	<=10		
Transfer Mode	1	0/1	0
Oper Type	1	0/1	0
Report to FTP Server	1	0/1	0

File Name Prefix	<=20		
Reserved	0		
Reserved	0		
TMP	3	TMP	TMP
Alarm ID	1	0	0
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	1	1
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		

Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	2	2
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0

Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	3	3
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	4	4
Mode	1	0-3	0

Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	5	5
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10

Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Alarm ID	1	6	6
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Alarm ID	1	7	7
Mode	1	0-3	0
Sensor ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Reserved	0		
Low Temperature	<=3	-55 – 125℃	0
High Temperature	<=3	-55 – 125℃	0
Reserved	0		
Reserved	0		
Valid Time	<=2	1 – 10	2
Send Interval	<=2	0 – 60	10
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PGN	3	PGN	PGN
Sub Command	1	0-2	
PGN Num	<=2	0~99	
PGN[n]	4	0000~FFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

RMD	3	RMD	RMD
Mode	1	0/1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Home Operator List	<=6*10		
Reserved	0		
Reserved	0		
Roaming Operator List	<=6*100		
Reserved	0		
Reserved	0		
Black Operator List	<=6*20		
Reserved	0		
Reserved	0		
Known Roaming Event Mask	<=6	000000 – FFFFFF	7FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event Mask	<=6	000000 – FFFFFF	7FFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	
Duration	<=3	0～255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		

PEO	3	PEO	PEO
PEO ID	1	**0 – 19**	0
Mode	1	0 – 3	0
Longitude1	<=11	(–)xxx.xxxxxx	
Latitude1	<=10	(–)xx.xxxxxx	
…			
Longitude10	<=11	(–)xxx.xxxxxx	
Latitude10	<=10	(–)xx.xxxxxx	
Check Interval	<=5	0/5 – 86400sec	0
Output ID	1	0 – 3	0
Output Status	1	0/1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
MUT	3	MUT	MUT
Working Mode	<=2	0|1|11|12	0
Baud rate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 3	1
Parity Bits	1	0 – 4	0
Enable Sleep	1	0|1	1
Reserved (optional)			
Reserved (optional)			
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

CAN	3	CAN	CAN
Mode	1	0/1/2	0
CAN Report Interval	<=5	0/5 – 86400sec	0
Reserved	0		
CAN Report Mask	<=8	0 - FFFFFFFF	C00FFFFF
Additional Event	1	0/1	0
Reserved	0		
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	001FFFFF
Reserved	0		
Reserved	0		
SIM	3	SIM	SIM
Mode	1	0/1/2	0
ICCID	20		
Reserved	0		
Reserved	0		
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UDF	3	UDF	UDF
Mode	1	0-2	0
Group ID	<=2	0 – 31	
Input ID Mask	<=16	0-FFFFFFFFFFFFFFFF	
Debounce Time	<=5	0-86400(s)	0
Inzizo Mask	<=5	00000-FFFFF	0

Outzizo Mask	<=5	00000-FFFFF	0
Stocmd ID Mask	<=8	0-FFFFFFFF	
Stocmd Ack	1	0/1	0
Inpeo Mask	<=5	00000-FFFFF	0
Outpeo Mask	<=5	00000-FFFFF	0
Reserved	0		
Reserved	0		
EFS	3	EFS	EFS
Reserved	0		
Reserved	0		
Ex Full Value	<= 5	0 – 65535	9999
Ex Fuel Sensor Delay	<=3	0 – 600 sec	30
Ex Fuel Loss Alarm	<=2	0 – 50 %	10
Reserved	0		
Reserved			
Reserved			
Reserved			
Report Sensor Data	1	0/1	0
Reserved			
Reserved	0		
Reserved	0		
Reserved	0		
FSC	3	FSC	FSC
Reserved			
Table ID	1	0 – 4	0
Sensor Type	<= 2	0 – 6/20 – 23	20
Enable	1	0/1	0
Max. Tank Volume	<= 5	0 –10000	100
Reserved			
Num of Node	<= 2	0/2 – 11	0

Node 1 Value	<= 5	0～99999	
Node 1 Percentage	<= 2	0 – 100	
⋮			
Node N Value	<= 5	0～99999	
Node N Percentage	<= 2	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
CMS	3	CMS	CMS
Camera ID	1	0-3	
Number	<=2	1-10	1
Interval	<=2	1-60s	5
Photo Compression Ratio	<=3	20-250	150
Photo Resolution	1	1-3	2
Digital Input ID	1	0/1-3	0
Attribute Mask	<=4	0000 - FFFF	0x0003
Server Type	1	0/1	0
EHD Support	1	0/1	0
Output ID	1	0 – 3	0
Output Status	1	0/1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
TAP	3	TAP	TAP
Camera ID	1	0-3	
Reserved	0		
Reserved	0		
Photo Resolution	1	1-3	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UPC	3	UPC	UPC
Max. Download Retry	1	0 – 3	0
Download Timeout	<=2	5 – 30 min	10
Download Protocol	1	0	0
Enable Report	1	0/1	0
Update Interval	<=4	0 – 8760 hour	0
Download URL	<=100	URL	
Mode	1	0/1	0
Reserved	0		
Reserved	0		
Reserved	0		
CLT	3	CLT	CLT
Group ID	<=2	**0 –19**	0
Mode	1	0/1	0
Debounce Time	<=3	0 – 255(×1s)	0
CAN Data Mask	8	0 - FFFFFFFF	000FFFFF
Alarm Mask 1	<=8	0 – FFFFFFFF	0
Alarm Mask 2	<=8	0 – FFFFFFFF	0
Alarm Mask 3	<=8	0 – FFFFFFFF	0
High RPM Threshold	<=3	1 – 100(x100 rpm)	30

Low RPM Threshold	<=3	0 – 99(x100 rpm)	8
CAN Report Expansion Mask	8	0 - FFFFFFFF	001FFFFF
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GLM	3	GLM	GLM
Google Mode	1	0/1/2	0
Direct Number List	<=20*3		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CMD	3	CMD	CMD
Mode	1	0-1	0
Stored cmd ID	3	**0 – 31**	
Command	200	AT command	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GAM	3	GAM	GAM
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative	<=3	10-250s	60

Time			
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 – 3	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
FMI	3	FMI	FMI
FMI Command Index0	1	0	0
FMI Feature Enable	1	0|1	0
FMI Report Mask	<=16	0 – FFFFFFFFFFFFFFFF	FFFFFFFF
Fixed Time Report Interval	<=2	0 – 30 min	1
Ping Interval	<=3	0 – 240 min	5
Auto Enable	1	0|1	1
Command Buffer Mask	<= 16	0 – FFFFFFFFFFFFFFFF	00000000
Unicode Support	1	0|1	0

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FMI Command Index13	2	13	13
PVT Enable	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FMI Command Index33	2	33	33
Server Address	<=60		
Server Port	<=5	0 – 65535	0
File Path	<=60		
User Name	<=20		
Login Password	<=20		
Transfer Mode	1	0|1	0
Name Prefix	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

● 0: This is a complete information packet.

● 1: This is not a complete information packet.

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

3.3.3.4. +RESP:GTCID

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

➢   **+RESP:GTCID,**

Example:

+RESP:GTCID,F10310,868446036599153,gv350m,89860117851023145722,20190823112523,1153$				
Parameter	**Length (Byte)**	**Range/Format**		**Default**
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}		
Unique ID	15	IMEI		
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'		
ICCID	20			
Send Time	14	YYYYMMDDHHMMSS		
Count Number	4	0000 – FFFF		
Tail Character	1	$		$

3.3.3.5. +RESP:GTCSQ

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

➢ **+RESP:GTCSQ,**

Example: +RESP:GTCSQ,F10310,868446036599153,gv350m,15,0,20190823113347,1159$				
Parameter	**Length (Byte)**	**Range/Format**		**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}		
Unique ID	15	IMEI		
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'		
CSQ RSSI	<=2	0 – 31		
CSQ BER	<=2	0 – 7/99		
Send Time	0/14	YYYYMMDDHHMMSS		
Count Number	4	0000 – FFFF		
Tail Character	1	$		$

✧ <CSQ RSSI>: The signal strength level.

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

✧ <CSQ BER>: The quality of the network signal. The range is 0-7 and 99 means unknown.

3.3.3.6. +RESP:GTVER

After the device receives the command **AT+GTRTO** to get the versions (including firmware version, hardware version and module version), it will send the version information to the server by the report **+RESP:GTVER**.

➢ **+RESP:GTVER,**

Example:
+RESP:GTVER,F10310,868446036599153,gv350m,GV350M,0601,0107,,BG96,BG96MAR02A07M1G,20190823113421,115B$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Device Type	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Firmware Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Reserved	0	0	
Modem Hardware Version	<=20		
Modem Software Version	<=50		
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Device Type>: The type of the device.
✧ <Firmware Version>: Firmware version. The first two characters represent the major version and the last two characters represent the minor version. For example: **010A** means the version GV350MR00A01V10.
✧ <Hardware Version>: Hardware version. The first two characters represent the major version and the last two characters represent the minor version. For example: **010A** means the version **1.10**.
✧ <Modem Hardware Version>:The hardware version of the modem, for example: SIMCOM_SIM7000C
✧ <Modem Software Version>: The software version of the modem, for example: 1351B01SIM7000

3.3.3.7. +RESP:GTBAT

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

➢ **+RESP:GTBAT,**

Example:			
+RESP:GTBAT,F10310,868446036599153,gv350m,1,,,4.19,0,1,20190823113454,115E$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Supply	1	0/1	
External Power VCC	<=5	0 – 32000mV	
Reserved	0		
Backup Battery VCC	<=4	0.00 – 4.50 V	
Charging	1	0/1	
LED On	1	0/1	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.8. +RESP:GTIOS

After the device receives the command **AT+GTRTO** to get all the IO ports state, it will send the status to the server by the report **+RESP:GTIOS**.

➢ **+RESP:GTIOS,**

Example:			
+RESP:GTIOS,F10310,868446036599153,gv350m,,0,01,00,20190823113536,1160$			
Parameter	**Length (Byte)**	**Range/Format**	**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	0	

Analog Input1 Voltage	<=5	0 –32000 mV	
Digital Input	2	00 – 0F	
Digital Output	2	00 – 07	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.9. +RESP:GTTMZ

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

➢ **+RESP:GTTMZ,**

Example:
+RESP:GTTMZ,F10310,868446036599153,gv350m,+0800,0,20190823113824,1163$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0/1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.10. +RESP:GTAIF

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

➢ **+RESP:GTAIF,**

Example:
RESP:GTAIF,F10310,868446036599153,gv350m,,,,,,,89860117851023145722,16,0,AEC3,10.100.13.247,,,,,,1,20190823114121,116A$

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

Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
LTE APN	<=47		
LTE APN User Name	<=30		
LTE APN Password	<=30		
GPRS APN	<=47		
GPRS APN User Name	<=30		
GPRS APN Password	<=30		
ICCID	20		
CSQ RSSI	<=2	0 – 31	
CSQ BER	<=2	0 – 7/99	
Cell ID	0/4/8	XXXXXXXX	
IP addr	<=15	0.0.0.0	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Network Type	1	0,1,3	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <CSQ RSSI>: The signal strength level.

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

✧ <CSQ BER>: The strength of the signal. The range is 0-7 and 99 means unknown.
✧ <Cell ID>: Cell ID in hex format.
✧ <IP Addr>: The IP address of the device.
✧ <Network Type>: Current network type.
  ➢ 0: Unregistered.

➢ 1: 2G
➢ 3: 4G

3.3.3.11. +RESP:GTALS

After the device receives the command **AT+GTRTO** to get sub AT command configuration information, it will send the configuration information to the server by the report **+RESP:GTALS**. Different AT Command gets different configuration information. For example, to get FRI configuration: **AT+GTRTO=GV350M,2,FRI,,,,,0015$**

➢ **+RESP:GTALS,**

Example:
+RESP:GTALS,F10310,868446036599153,gv350m,BSI,,,,,,,,1,3,0,20190823111936,113B$

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

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

3.3.3.12. +RESP:GTGSV

After the device receives the command **AT+GTRTO** to get the satellites information, it will send the satellites information by the report +RESP:GTGSV to the server.

➢ **+RESP:GTGSV,**

Example:
+RESP:GTGSV,F10310,868446036599153,gv350m,10,2,21,3,0,5,26,6,35,9,29,12,25,17,40,19,34,23,24,28,0,20190823114146,116C$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device name	20		
SV count	2	0-16	
SV id	2	> =0	
SV power	2	> =0	
………			
SV id	2	> =0	
SV power	2	> =0	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <SV count>: The number of satellites the GPS received.

✧ <SV id>: Satellite id, when no satellites, zero as special number to fill.

✧ <SV power>: Satellite power, when no satellites, zero used as special number to fill.

3.3.3.13. +RESP:GTCVN

After the device receives the command **AT+GTRTO** to get the version number of the CAN100, it will send the information to the server by the report **+RESP:GTCVN**.

➢ **+RESP:GTCVN,**

Example:

+RESP:GTCVN,F10310,868446036599153,gv350m,2.2.3a,,,,,20190823114749,117D$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CAN100 SW Version	<=7	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.3.3.14. +RESP:GTCSN

After the device receives the command **AT+GTRTO** to get the serial number of the CAN100, it will send the information to the server by the report **+RESP:GTCSN**.

➢ **+RESP:GTCSN,**

Example:

+RESP:GTCSN,F10310,868446036599153,gv350m,199999,,,,,20190823114847,1181$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CAN100 Serial Number	<=10	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

3.3.3.15. +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,F10310,868446036599153,gv350m,19,,,,,20190823115627,1196$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CAN100 Car Model ID	<=5	0-65535	
CAN100 Car Name	<=50	'0' – '9' 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<CAN100 Car Model ID>*: The model ID of the car with which CAN100 device works. If the value is 0, it means that no model has been obtained.

✧ *<CAN100 Car Name>*: It indicates the readable make and model of the car.

3.3.3.16. +RESP:GTUVN

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

➢ **+RESP:GTUVN,**

Example:
+RESP:GTUVN,F10310,868446036599153,gv350m,2,02,B,,,,,20190823114720,117A$

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

✧ <Sensor Protocol Version>: The protocol version of the UFSxxx fuel sensor.

✧ <Sensor SW Version>: The SW version of the UFSxxx fuel sensor.

✧ <Sensor HW Version>: The HW version of the UFSxxx fuel sensor.

3.3.3.17. +RESP:GTRSS

After the device receives the command **AT+GTRTO** to get the real time information of the temperature and motion sensor, it will send the information to the server by the report **+RESP:GTRSS**.

➢ **+RESP:GTRSS,**

Example:
+RESP:GTRSS,F10311,868446036591044,gv350m,0,1,0,28A348C508000051,26,,,,,20191011065434,1819$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion Sensor Status	1	0|1	
Sensor Number	<=1	0-8	
Sensor Type (optional)	<=1		

Sensor ID (optional)	<=16		
Temperature (optional)	<=5	(-)XX.X	
Humidity (optional)	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Motion Sensor Status>:
- 0: motionless
- 1: motion

✧ <Sensor Number>: The number of temperature sensors connected to GV350.
If it is 0, the following fields <Sensor Type>, <Sensor ID>, <Temperature> and <Humidity>will not display. If there are more than one sensor connected, these fields will display to show the information of all connected sensors.

✧ <Sensor Type>: Means the type of the sensor.
- 0: 1-wire sensor

✧ <Temperature>: the real time temperature.

✧ <Humidity>: reserved.

3.3.4. Event Report

The following event reports are triggered when certain events occur.

+RESP:GTPNA: Power on report

+RESP:GTPFA: Power off report

+RESP:GTMPN: The report for connecting main power supply

+RESP:GTMPF: The report for disconnecting main power supply

+RESP:GTBTC: Backup battery starts charging report

+RESP:GTSTC: Backup battery stops charging report

+RESP:GTBPL: Backup battery low

+RESP:GTSTT: Device motion state indication when the motion state is changed

+RESP:GTANT: External GPS antenna status indication when the state is changed

+RESP:GTPDP: GPRS connection establishment report

+RESP:GTIGN: Ignition on report

+RESP:GTIGF: Ignition off report

+RESP:GTIDN: Enter into idling status

+RESP:GTIDF: Leave idling status

+RESP:GTGPJ: GPS Jamming status

+RESP:GTGSM: The report for the information of the serving cell and the neighbour cells, this report does not support the HEX format

+RESP:GTGSS: GPS signal status

+RESP:GTCRA: Crash incident report

+RESP:GTSTR: Vehicle enters into start status

+RESP:GTSTP: Vehicle enters into stop status

+RESP:GTLSP: Vehicle enters into long stop status.

+RESP:GTFLA: Unusual fuel consumption alarm

+RESP:GTDOS: Output status change with waveform 1

+RESP:GTTMP: Temperature alarm

+RESP:GTRMD: The report for entering or leaving GSM roaming state

+RESP:GTPHL: Reporting location information before reporting photo data

+RESP:GTFTP: Reporting location information after transferring a file to FTP server

+RESP:GTEXP: Reporting malfunction information of digital fuel sensor

+RESP:GTUPC: Reporting information about UPC

+RESP:GTCLT: CANBUS information alarm

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

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

Example:
+RESP:GTPNA,F10310,868446036599153,gv350m,20190823145131,12A2$
+RESP:GTPFA,F10310,868446036599153,gv350m,20190823145123,12A1$
+RESP:GTPDP,F10310,868446036599153,gv350m,20190823145200,12A6$

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

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

➢ **+RESP:GTCRA,**

Example:

+RESP:GTMPN,F10310,868446036599153,gv350m,1,0.0,0,163.3,114.015199,22.537285,20190823065504,0460,0001,253D,AEC3,,20190823145504,12B7$

+RESP:GTMPF,F10310,868446036599153,gv350m,2,0.0,0,159.7,114.015176,22.537324,20190823065458,0460,0001,253D,AEC3,,20190823145458,12B2$

+RESP:GTBTC,F10310,868446036599153,gv350m,0,0.0,0,70.9,114.015425,22.537430,20190823065124,0000,0000,0000,0000,,20190823145140,12A3$

+RESP:GTCRA,F10310,868446036599153,gv350m,1,0.0,0,100.2,114.015294,22.537137,20190826015251,0460,0001,253D,AEC3,,20190826095251,1487$

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

➢ **+RESP:GTGPJ,**

Example:

+RESP:GTGPJ,F10310,868446036599153,gv350m,22,1,1,0.0,0,100.2,114.015294,22.537137,20190826031324,0460,0001,253D,AEC3,,20190826111324,150B$

Parameter	Length (Byte)	Range/Format	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	1	0-255	
GPS Jamming State	1	0-3	
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <CW Jamming Value>: Current continuous wave jamming value.
✧ <GPS Jamming State>: Current jamming state.
  ● 0: Unknown or feature disabled.
  ● 1: (Ok) no significant jamming.
  ● 2: (Warning) interference visible but fix OK.
  ● 3: (Critical) interference visible and no fix.

➢ **+RESP:GTSTC,**

Example:
+RESP:GTSTC,F10310,868446036599153,gv350m,,1,0.0,0,140.4,114.014726,22.537778,201908
23065204,0460,0001,253D,AEC3,,20190823145204,12A7$

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

➢ **+RESP:GTBPL,**

Example:
+RESP:GTBPL,F10310,868446036599153,gv350m,3.65,1,0.0,0,127.3,114.015412,22.537133,20190828123510,0460,0001,253D,AEC3,,20190828203510,1365$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Backup Battery VCC	<=4	0.00 – 4.50 V	
GPS Accuracy	<=2	0/1 – 50	0, Last

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

➢ **+RESP:GTSTT,**

Example:
+RESP:GTSTT,F10310,868446036599153,gv350m,11,1,0.0,0,231.2,114.015734,22.537908,2019 0823005837,0460,0001,253D,AEC3,,20190823085837,0F72$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11/12/21/22/41/42/16	
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	

GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0/2	00	00
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

- 16 (**Tow**): The vehicle is ignition off and it is towed.
- 11 (**Ignition off Rest**): The vehicle is ignition off and it is motionless.
- 12 (**Ignition off Motion**): The vehicle had been moving before this action was regarded as car-towing event after ignition off.
- 21 (**Ignition On Rest**): The vehicle is ignition on and it is motionless.
- 22 (**Ignition On Motion**): The vehicle is ignition on and it is moving.
- 41 (**Sensor Rest**): The vehicle is motionless without ignition signal detected.
- 42 (**Sensor Motion**): The vehicle is moving without ignition signal detected.

➢ **+RESP:GTANT,**

Example:
+RESP:GTANT,F10310,868446036599153,gv350m,0,1,0.0,267,158.0,114.015288,22.537235,20190823065703,0460,0001,253D,AEC3,,20190823145704,12BE$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External GPS Antenna	1	0/1/3	
GPS Accuracy	<=2	0/1-50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	

GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <External GPS Antenna>: The current state of the external GPS antenna.
 ● 0: The external GPS antenna of the device is working.
 ● 1: The external GPS antenna of the device is in open circuit state.
 ● 3: The external GPS antenna of the device is in unknown state.

➢ **+RESP:GTIGN,**

Example:
+RESP:GTIGN,F10310,868446036599153,gv350m,3,2,0.0,0,151.0,114.015284,22.537202,20190823065816,0460,0001,253D,AEC3,,,0.0,20190823145817,12C7$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition Off	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	

Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Duration of Ignition Off>: Duration since last ignition off. If it is greater than 999999 seconds, report 999999 seconds.

✧ <Hour Meter Count>: If hour meter counter function is enabled by the command **AT+GTHMC**, total hours counted when ignition on will be reported in this field. If the function is disabled, this field will be reserved. The range is 00000:00:00– 99999:00:00, from left to right, the units separately are hour, minute and second.

➢ **+RESP:GTIGF,**

Example:
+RESP:GTIGF,F10310,868446036599153,gv350m,1,2,0.0,0,151.0,114.015284,22.537202,20190823065816,0460,0001,253D,AEC3,,,0.0,20190823145818,12CA$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition on	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	

LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0/2	00	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Duration of Ignition on>: Duration since last ignition on. If it is greater than 999999 seconds, report 999999 seconds.

✧ <Hour Meter Count>: If hour meter counter function is enabled by the command **AT+GTHMC**, total hours counted when ignition on will be reported in this field. If the function is disabled, this field will be reserved. The range is 00000:00:00– 99999:00:00, from left to right, the units separately are hour, minute and second.

➤ **+RESP:GTIDN,**

Example:
+RESP:GTIDN,F10310,868446036599153,gv350m,,,1,0.0,0,171.9,114.015289,22.537811,20190823100045,0460,0001,253D,AEC3,,0.0,20190823180046,1440$

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

MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0/2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

> **+RESP:GTIDF,**

Example:
+RESP:GTIDF,F10310,868446036599153,gv350m,12,234,1,0.0,0,171.9,114.015289,22.537811,20190823100439,0460,0001,253D,AEC3,,0.0,20190823180440,1445$

Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion State	2	11/12/1A/16/22	
Duration of Idling Status	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	

Reserved	0/2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Motion State>: The current motion state after the vehicle exits idling state.

✧ <Duration of Idling Status>: Duration of idling state. If it is greater than 999999 seconds, report 999999 seconds.

➢ **+RESP:GTGSM**

Example:
+RESP:GTGSM,F10310,868446036599153,FRI,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0460,0001,253D,AEC3,18,,20190826112225,152B$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Fix Type	3	SOS/RTL/LBC/TOW/FRI/GIR/ERI	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4		
Cell ID1	0/4/8	XXXXXXXX	
RX Level1	2	0-91	
Reserved	0		
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
Cell ID2	0/4/8	XXXXXXXX	
RX Level2	2	0-91	
Reserved	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		

Cell ID3	0/4/8	XXXXXXXX	
RX Level3	2	0-91	
Reserved	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
Cell ID4	0/4/8	XXXXXXXX	
RX Level4	2	0-91	
Reserved	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	0/4/8	XXXXXXXX	
RX Level5	2	0-91	
Reserved	0		
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4		
Cell ID6	0/4/8	XXXXXXXX	
RX Level6	2	0-91	
Reserved	0		
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0/4/8	XXXXXXXX	
RX Level	2	0-91	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Fix Type>: A string to indicate the type of GPS positioning of the current cell information.

"SOS": This cell information is for SOS requirement.

"RTL": This cell information is for RTL requirement.

"LBC": This cell information is for LBC requirement.

"TOW": This cell information is for TOW requirement.

"FRI": This cell information is for FRI requirement.

"GIR": This cell information is for sub command "**C**" in **AT+GTRTO** command.

"ERI": This cell information is for ERI requirement.

✧ <MCC(i)>: MCC of the neighbor cell i (i is the index of the neighbor cell).

✧ <MNC(i)>: MNC of the neighbor cell i.

✧ <LAC(i)>: LAC in hex format of the neighbor cell i.

✧ <Cell ID(i)>: Cell ID in hex format of the neighbor cell i.

✧ <RX Level(i)>: The signal strength of the neighbor cell i. This parameter is of 6-bit.The dBm steps:

0: -110 dBm

1 to 62: -109 to -48 dBm

63: -47 dBm

✧ <MCC>: MCC of the serving cell.

✧ <MNC>: MNC of the serving cell.

✧ <LAC>: LAC in hex format of the serving cell.

✧ <Cell ID>: Cell ID in hex format of the serving cell.

✧ <RX Level>: The signal strength of the serving cell.

Note:

1. It may include information of several neighbor cells. If no neighbor cell is found, all the fields of the neighbor cell will be empty.

2. "ffff" in the field of <LAC(i)>, <Cell ID(i)> means the device doesn't know the value.

3. This report cannot be sent via SMS.

➢ **+RESP:GTGSS**

Example:
+RESP:GTGSS,F10310,868446036599153,gv350m,0,,21,,0,0.0,217,134.4,114.015434,22.537194,20190823095057,0460,0001,253D,AEC3,,20190823175507,1437$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Signal Status	1	0/1	
Satellite Number	2	0 - 24	
Device State	2	11/12/21/22/41/42/16/1A	

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

✧ <GPS Signal Status>: 0 means GPS signal lost or GPS positioning failed; 1 means GPS signal has recovered and GPS positioning succeeded.

✧ <Satellite Number>: The number of the visible satellites when fix succeeded. If fix failed, the parameter is reserved.

✧ <Device State>: The current movement state of the device.
  ● 16 (**Tow**): The vehicle was towed after ignition off.
  ● 1A **(Fake Tow):** The vehicle might have been towed after ignition off.
  ● 11 (**Ignition off Rest**): The vehicle is ignition off and motionless.
  ● 12 (**Ignition off Motion**): The vehicle had been moving before this action was regarded as car-towing event after ignition off.
  ● 21 (**Ignition On Rest**): The vehicle is ignition on and motionless
  ● 22 (**Ignition On Motion**): The device is ignition on and moving
  ● 41 (**Sensor Rest**): The vehicle is motionless and no ignition signal is detected.
  ● 42 (**Sensor Motion**): The vehicle is moving and no ignition signal is detected.

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

Example:

+RESP:GTSTR,F10310,868446036599153,gv350m,,,0,0.0,217,134.4,114.015434,22.537194,201
90823095057,0460,0001,253D,AEC3,,0.0,20190823175326,1434$

+RESP:GTSTP,F10310,868446036599153,gv350m,,,1,0.0,0,171.9,114.015289,22.537811,201908
23095611,0460,0001,253D,AEC3,,0.0,20190823175611,143A$

+RESP:GTLSP,F10310,868446036599153,gv350m,,,1,0.0,0,171.9,114.015289,22.537811,201908
23095811,0460,0001,253D,AEC3,,0.0,20190823175812,143E$

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

 ➢ **+RESP:GTFLA**

Example:

+RESP:GTFLA,F10310,868446036599153,gv350m,00,32,29,1,0.0,0,125.9,114.015614,22.537144,20190827084342,0460,0001,253D,AEC3,,20190827084342,233F$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Input ID	2	00|10|01	
Last Fuel Level	<=4	0 – 100	
Current Fuel Level	<=4	0 – 100	
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Input ID>: ID of the input to which the fuel sensor is connected. It is in hex format. 4 high bits mean serial port and 4 low bits mean ID of the input.
- ● 00: UART1
- ● 10: UART2
- ● 01: ID of the input.

✧ <Last Fuel Level>: The fuel level saved before last ignition off when FLA event occurs.

✧ <Current Fuel Level>: The fuel level when the FLA event occurs.

➢ **+RESP:GTDOS**

Example:

+RESP:GTDOS,F10310,868446036599153,gv350m,1,1,1,0.0,0,107.4,114.015504,22.537196,20190823055004,0460,0001,253D,AEC3,,20190823135005,1219$

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

✧   <Waveform 1 Output ID>: ID of the output with waveform 1

✧   <Waveform 1 Output Status>: The output status with waveform 1

➢   **+RESP:GTTMP**

Example:

+RESP:GTTMP,F10310,868446036599153,gv350m,11618,01,1,2,0.0,0,247.8,114.015482,22.537480,20190826035526,0460,0001,253D,AEC3,,0.0,,,00,00,,,,2880219F0A0000D0,,27,20190826115526,15DB$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power VCC	<=5	0 – 32000 mV	
Report ID/Report Type	2	X(0-7)X(0-1)	
Number	1	0 – 1	
GPS Accuracy	<=2	0/1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0/2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Analog Input1 Voltage	<=5	0 – 32000 mV	
Digital Input	2	00 – 0F	
Digital Output	2	00 – 07	
Reserved	0		
Reserved	0		
Reserved	0		
Temperature Sensor device ID	16	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	0		
Temperature Sensor	<=3	-55 – 125℃	

device DATA			
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

Report ID: The ID of temperature sensor. The range is 0-7.

Report type: 0 means beyond the predefined temperature range. 1 means within the predefined temperature range.

✧ <Temperature Sensor Device ID>: The ID of the temperature sensor.

✧ <Temperature Sensor Device DATA>: The current temperature detected by the sensor.

➢ **+RESP:GTRMD,**

Example:
+RESP:GTRMD,F10310,868446036599153,gv350m,2,1,0.0,0,100.2,114.015294,22.537137,2019 0826031109,0460,0001,253D,AEC3,,20190826111109,1501$

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

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

✧ <Roaming State>: A numeric to indicate the roaming state.
- 0: Home
- 1: Known roaming
- 2: Unknown roaming
- 3: Blocking report

➢ **+RESP:GTPHL,**

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

Example:

+RESP:GTPHL,F10310,868446036599153,gv350m,0,,20190826134803,1,0.0,0,100.6,114.015379, 22.537494,20190826054804,0460,0001,253D,AEC3,,,,,,20190826134803,1770$

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

LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	2	00	00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

> **+RESP:GTFTP,**

Example:
+RESP:GTFTP,F10310,868446036599153,gv350m,,Amy_0_20190826135656.jpg,1,0.0,0,100.6,114.015379,22.537494,20190826055731,0460,0001,253D,AEC3,,20190826135730,1793$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
File Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '.'	
GPS Accuracy	<=2	0/1-50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	

Cell ID	0/4/8	XXXXXXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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

➢ **+RESP:GTEXP,**

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

Example:
+RESP:GTEXP,F10310,868446036599153,gv350m,4,,,0002,1,0.0,0,125.9,114.015614,22.537144 ,20190827085652,0460,0001,253D,AEC3,,20190827085653,236C$

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

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

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

✧ <HW Fault Code>:

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

➢ **+RESP:GTUPC:**

Example:
+RESP:GTUPC,F10310,868446036599153,gv350m,000,100,http://218.17.46.11:1456/gv350m/ deltabin/555.ini,20190826083639,1904$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Command ID	<=3		
Result	3	100/101/102/103/200/201/202/300/301/3 02	
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 parameters. It is always 0 before the device starts to update the configuration. It is the total number of the commands when the response code is 301. It is wrong format of command ID when the response code is 302.

✧ <Result>: A numeric 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.

➢ **+RESP:GTCLT,**

Example:
+RESP:GTCLT,F10310,868446036599153,gv350m,0,0,0,1,,,200FFFFF,,2,H20460,1040.50,528,25, 98,L/H51.2,,,66,154.30,150.80,281.90,2517.00,6684,,,1,,1FFFFF,,,,,,,,,,,,,,,,,,,,,1,0.0,0,102.3,11 4.015249,22.537184,20190823021914,0460,0001,253D,AEC3,,20190823101916,0FE6$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000–XXFFFF,X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'-''_'	
Group ID	<=2	0 – 19	
Alarm Mask 1	<=8	0 – FFFFFFFF	
Alarm Mask 2	<=8	0 – FFFFFFFF	
Alarm Mask 3	<=8	0 – FFFFFFFF	
Reserved	0		
Reserved	0		
CANBUS Data Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9''A' - 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0/1/2	
Total Distance	<=12	H(0 – 99999999)/I(0 –2147483647)	
Total Fuel Used	<=9	0.00 –999999.99l	
Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 - 455Km/h	
Engine Coolant Temperature	<=4	-40 – +215 ℃	

Fuel Consumption	<=5	0.0 – 999.9L/100km/Inf/NaN	
Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100.00)	
Range	<=8	0 – 99999999	
Accelerator Pedal Pressure	<=3	0 – 100%	
Total Engine Hours	<=8	0.00 – 99999.99h	
Total Driving Time	<=8	0.00 – 99999.99h	
Total Engine Idle Time	<=8	0.00– 99999.99h	
Total Idle Fuel Used	<=9	0.00 –999999.99l	
Axle Weight	<=5	0 –65535kg	
Tachograph Information	4	00-FFFF	
Detailed Information/Indicators	4	00-FFFF	
Lights	2	0-FF	
Doors	2	0-FF	
Total Vehicle Overspeed Time	<=8	0.00 – 99999.99h	
Total Vehicle Engine Overspeed Time	<=8	0.00 – 99999.99h	
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	
Ad-Blue Level	<=3	0-100L	
Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0/1	
Tachograph Vehicle Motion Signal	1	0/1	
Tachograph Driving Direction	1	0/1	
Analog Input Value	<=5	0-99999mv	
Engine Braking Factor	<=6	0-999999	

Pedal Braking Factor	<=6	0-999999	
Total Accelerator Kick-downs	<=6	0-999999	
Total Effective Engine Speed Time	<=8	0.00 – 99999.99h	
Total Cruise Control Time	<=8	0.00 – 99999.99h	
Total Accelerator Kick-down Time	<=8	0.00 – 99999.99h	
Total Brake Applications	<=6	0-999999	
Tachograph Driver 1 Card Number	<=10	0-9999999999	
Tachograph Driver 2 Card Number	<=10	0-9999999999	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=10	0-9999999999	
Expansion Information	4	00-FFFF	
Rapid Braking	<=6	0-999999	
Rapid Accelerations	<=6	0-999999	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 –999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

CAN IC FOTA Upgrade Report

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

➢ **+RESP:GTCFU:**

Example: +RESP:GTCFU,F10310,868446036599153,gv350m,100,,20190826085406,1938$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Code	3		
New Version (optional)			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧   <Code>: Information code.
- 100: Confirm ok. Start upgrade.
- 101: The upgrading process is refused because of GTCFU parameters error, GTURT working mode error, GTCAN mode error or no network.
- 102: The upgrading process is refused because of low power.
- 200: Start downloading package.
- 201: Downloading package succeeds.
- 202: Downloading package fails.
- 300: Start upgrade.
- 301: Upgrade successful. The reserved parameter is used as follows.

New Version	<=10		

- 302: Upgrade fails.

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

Digital Fuel Sensor FOTA Upgrade Report

The device will send the report **+RESP:GTUFS** to the server during the upgrade process.

➢ **+RESP:GTUFS:**

Example:
+RESP:GTUFS,F10310,868446036599153,gv350m,100,,20190826083819,190C$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Code	3		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Code>: Information code.
- 100: Confirm ok. Start upgrade.
- 101: The upgrading process is refused because of GTUFS parameters error or GTURT setting error.
- 103: The upgrading process is refused because of low power.
- 200: Start download package.
- 201: Downloading package succeeds.
- 202: Downloading package fails.
- 300: Start upgrade.
- 301: Upgrade succeeds.
- 302: Upgrade fails.

3.3.5. Data Report

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

+RESP:GTPHD: Reporting photo data.

➢ **+RESP:GTPHD,**

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

Example:
+RESP:GTPHD,F10310,868446036599153,gv350m,0,,20190826134803,6,1,912,/9j/2wCEAA0JCQs

JCA0LCgsODQ0PEx8UExEREyYbHRcfLSgwLy0oLCsyOEg9MjVENissP1U/REpNUFFQMDxYX1hOXkhPUE0BDQ4OExATJRQUJU00LDRNTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTf/AABEIAHgAoAMBIQACEQEDEQH/3QAEAAr/xAGiAAABBQEBAQEBAQAAAAAAAAQIDBAUGBwgJCgsQAAIBAwMCBAMFBQQEAAABfQECAwAEEQUSITFBBhNRYQcicRQygZGhCCNCscEVUtHwJDNicoIJChYXGBkaJSYnKCkqNDU2Nzg5OkNERUZHSElKU1RVVldYWVpjZGVmZ2hpanN0dXZ3eHl6g4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqays7S1tre4ubrCw8TFxsfIycrS09TV1tfY2drh4uPk5ebn6Onq8fLz9PX29/j5+gEAAwEBAQEBAQEBAQAAAAAAAAECAwQFBgcICQoLEQACAQIEBAMEBwUEBAABAncAAQIDEQQFITEGEkFRB2FxEyIygQgUQpGhscEJIzNS8BVictEKFiQ04SXxFxgzGiYnKCkqNTY3ODk6Q0RFRkdISUpTVFVWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqays7S1tre4ubrCw8TFxsfIycrS09TV1tfY2drh4uPk5ebn6Onq8vP09fb3+Pn6/2gAMAwEAAhEDEQA/AMELUgWmjMeowas21zLazJNE5V0OQf6H2r/2gAMAwEAAhEDEQA/AMELUgWmjMeowas21zLazJNE5V0OQf6H2rFWVgwkUEGuckXNSVe5XeOmomHBIBx2NAHbxaVpD/AGbVdPPkkiVGBhJ3CN+/X6msTXCNCNOuo7o7o,,,,,20190826134803,1771$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Camera ID	1	0-3	
Reserved	0		
Photo Time	14	YYYYMMDDHHMMSS	
Total Frames	<=3		
Current Frame Index	<=3		
Photo Data Length	<=4		
Photo Data	<=1300		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

✧ <Total Frames>: Total number of data frames that report to server.

✧ <Current Frame Index>: The index of frames.

✧ <Photo Data Length>: Data length of the current frame.

> **+RESP:GTFSD,**

This report is used for reporting fuel sensor data.

Example:

+RESP:GTFSD,F10310,868446036599153,gv350m,39,*QL,524J,06,00497,0500,0136,00497,0293#
,,,,,20190827075328,21AB$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Data Length	2		
Sensor Data	<=128	ASCII Code	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

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

3.3.6. Buffer Report

If the buffer report function is enabled by command **AT+GTSRI**, the device will save the reports in local buffer when the following occurs.
✧ No network signal.
✧ Failed to activate network context for the TCP or UDP connection.
✧ Network failed to establish the TCP connection with the server.
These reports will be sent to the server when connection to the server recovers. The buffer reports are saved to the built-in non-volatile memory in case the device is reset. The device can buffer up to 10000 reports.

Detailed information about buffer report is listed as below.
✧ Only **+RESP** reports are buffered.
✧ In the buffer report, the original header string "**+RESP**" is replaced by "**+BUFF**". Other contents such as the original sending time and count number will be kept the same.
✧ Buffered reports will be sent only via network by TCP or UDP protocol. They cannot be sent

via SMS. If the current report mode is Force on SMS, the buffered reports will not be sent until the report mode is changed to TCP or UDP.

✧ The buffered reports will be sent after other real-time reports if <Buffer Mode> in **AT+GTSRI** is set to 1.

✧ The buffered reports will be sent before other real-time reports if <Buffer Mode> in **AT+GTSRI** is set to 2. The SOS report has the highest priority and is sent before the buffered reports.

Example:

The following is an example of the buffered report:

+BUFF:GTFRI,F10101,862170019025640,,,00,,1,4.3,92,70.0,121.354335,31.222073,20140511093254,0460,0003,36100010,014B,00,2000.0,12345:12:34,,,80,210100,,,,20140511093254,11F0$

3.3.7. Data Transfer Report

The device supports transferring data between the server and the peripheral device connected to its second serial port. GV350M supports bi-directional data transmission. In both directions, the data is transmitted to the device via transparent transfer.

a) Transfer data from the peripheral device to the server

According to the <working mode> of the command **AT+GTURT**, there are two ways for the peripheral device communicates with GV350M.

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

b) Transfer data from the server to the peripheral device

If the server needs to send data to the peripheral device, it can send command **AT+GTDAT** with the data to GV350M and GV350M will pick out the pure data and send it to the second serial port. In this way the peripheral device can get the data from the serial port.

Data to the server

➢ **+RESP:GTDAT (Short Format),** If the length of Data to the server more than 100, the report **+RESP:GTGDAT (Short Format)** is only sent via TCP short connection even if the report mode is Force on SMS mode.

Example:			
+RESP:GTDAT,F10310,868446036599153,gv350m,0,123456,20190827074248,218C$			
Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
UART Port	1	0-2	

Data to the Backend Server	<=1280	ASCII Code	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTDAT (Long Format),** The report **+RESP:GTGDAT (Short Format)** is only sent via TCP short connection even if the report mode is Force on SMS.

Example:
+RESP:GTDAT,F10310,868446036599153,gv350m,9,0,,123456,3,0.0,0,156.2,114.015075,22.536909,20190827074319,0460,0001,253D,AEC3,,,,,,20190827074319,218E$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Report Type	1	0-9|20	
UART Port	1	0-2	
Reserved	0		
Data to the Backend Server	<=1280	ASCII Code	
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		

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

✧ <Report Type>: the value of <Report Type> refer to <Working Mode> of AT+GTURT or AT+GTMUT.

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

Example:
data to the serial port

3.3.8. Data Transfer Report Based on Specified Terminator Character or Data Length

The device supports data transfer from the peripheral device to the server. According to the <Working Mode> of the command **AT+GTURT**, there are two ways for the peripheral device to communicate with GV350M.

Data to the server
➢ **+RESP:GTDTT (Short Format)**

Example:
+RESP:GTDTT,F10101,359464040000411,,8,12345678,20121225024543,003D$

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

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

> **+RESP:GTDTT (Long Format)**

Example:
+RESP:GTDTT,F10101,359464040000411,,6,,,8,12345678,0,,,,0,0,,0460,0000,5678,5D7B,00,,,,,20121225025048,0048$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
UART Port	1	0-1	
Reserved	0		
Data Type	1	0-1	
Data Length	4	1-1280	
Data to the Backend Server	<=1280		
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	2	00	00
Reserved	0		
Reserved	0		

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

✧ <Data Type>: 0 means binary data, and 1 means binary data written in hexadecimal ASCII format.

✧ <Data Length>: It represents the length of the original data.

✧ <Data to the server>: It is hexadecimal data when **AT+GTURT** <Mode> is 7, and pure HEX data when <Mode> is 6 or 8 (input through UART).

3.3.9. Crash Data Report

The report contains 10s XYZ-axis acceleration data before and after crash. When crash accident is detected, the 10s XYZ-axis acceleration data before crash will be reported to backend server packed with three frames. And the device will continue to record 10s XYZ-axis data and then report to backend server packed with the other three frames. The report **+RESP:GTCRD** is only sent via TCP short connection even if the report mode is Force on SMS.

➢ **+RESP:GTCRD,**

Example:
+RESP:GTCRD,F10310,868446036599153,gv350m,0,10,1,000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0007FF7B000B0006FF7B000B0006FF7A000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7A000B0006FF7B000B0006FF7B000B0007FF7B000B0007FF7B000B0006FF7A000B0006FF7B000B0006FF7B000B0007FF7B000B0006FF7B000B0006FF7B000B0007FF7A000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0007FF7B000B0007FF7B000B0006FF7B000B0007FF7B000B0007FF7B000B0006FF7B000B0006FF7B000A0006FF7B000B0006FF7B000B0006FF7A000B0006FF7B000B0007FF7B000B0006FF7B000B0006FF7A000B0006FF7B000B0006FF7B000B0007FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0007FF7B000B0006FF7B000B0006FF7B000B0007FF7B000B0007FF7B000B0007FF7B000B0007FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0007FF7B000B0006FF7B000B0006FF7B000B0006FF7A000B0006FF7B000B0006FF7B000B0006FF7A000B0007FF7B000B0007FF7B000B0007FF7B000B0007FF7B000B0006FF7B000B0006FF7B000B0007FF7B000B0007FF7B000B0006FF7B000B0007FF7B000B0007FF7B000B0006FF7B000B0006FF7B000B0006FF7B000B0006FF7A000B0006FF7B000B0007FF7B000B0006FF7B000B0007FF7B000B0006FF7B000B0007FF7B000B0006FF7A000B0006FF7B000B0007FF7A000B0007FF7B000B0006FF7B000B0007FF7B000B0007FF7B000B0006FF7B,20190826095251,1488$

Parameter	Length (Byte)	Range/Format	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|2	1-10	
Frame Number	1|2	1 -10	
Data	<=1200	'0'-'9' 'a'-'f'	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Data Type>: It means the crash data is recorded before crash or after crash.
   ● 0: Before crash.
   ● 1: After crash.
✧ <Total Frame>: Total number of data frames reported to server.
✧ <Frame Number>: The sequence of data frame.
✧ <Data>: There are 1200 ASCII characters in one frame. 12 characters are a group. The first 4 characters of the 12 characters represent X axis acceleration data, the next 4 characters represent Y axis and last 4 characters is Z axis. The ASCII "0001" equals to "0x0001"in hex format, and the ASCII "afff " equals to "0xAFFF" in hex format.

Example:
+RESP:GTCRD,F10101,862170019025640,,0,3,1,000100010055… ,20120330120443,005C$
This is the oldest XYZ-axis acceleration data:
Translate to hex format: X (axis acceleration data) = 0x0001; Y = 0x0001; 0 Z = 0x0055;
Equal to decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;

+RESP:GTCRD,F10101,862170019025640,,1,3,3,…ffffffff10052,20120330115736,005A$
This is the latest XYZ-axis acceleration data:
Translated to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; 0 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. With the linear feature, the acceleration data 1312 represents +16g and -1312 represents -16g.

3.3.10. Crash GPS Information Report

+RESP:GTCRG
The report contains 10s GPS information before and after crash. When crash is detected, the 10s GPS information before crash will be reported to backend server. And the device will continue to record the 10s GPS information after crash and report the packed data to the server. The report

+RESP:GTCRG is only sent via TCP short connection even if the report mode is Force on SMS.

➢ **+RESP:GTCRG**

Example:
+RESP:GTCRG,F10310,868446036599153,gv350m,0,10,1,1,0.0,0,100.2,114.015294,22.537137,20190826015242,2,1,0.0,0,100.2,114.015294,22.537137,20190826015243,3,1,0.0,0,100.2,114.015294,22.537137,20190826015244,4,1,0.0,0,100.2,114.015294,22.537137,20190826015244,5,1,0.0,0,100.2,114.015294,22.537137,20190826015245,6,1,0.0,0,100.2,114.015294,22.537137,20190826015246,7,1,0.0,0,100.2,114.015294,22.537137,20190826015247,8,1,0.0,0,100.2,114.015294,22.537137,20190826015248,9,1,0.0,0,100.2,114.015294,22.537137,20190826015249,10,1,0.0,0,100.2,114.015294,22.537137,20190826015250,20190826095251,1489$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Data Type	1	0/1	0
GPS Valid Time Number	2	0 – 10	
GPS Point Index	<=2	1	
GPS Accuracy	<=2	0/1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
......			
GPS Point Index	<=2	10	
GPS Accuracy	<=2	0/1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(−)xxxxx.x m	
Longitude	<=11	(−)xxx.xxxxxx	
Latitude	<=10	(−)xx.xxxxxx	

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

✧ <Data Type>: The data reported to backend server is recorded before or after crash.
- 0: Before crash.
- 1: After crash.

✧ <GPS Valid Time Number>: The number of the successfully fixed GPS positions included in the report.

✧ <GPS Point Index>: The index of GPS point.

3.3.11. CANBUS Report

If the CANBUS Report function is enabled by the command **AT+ GTCAN**, the device will send the CANBUS device information by the report **+RESP:GTCAN** to the server periodically.

➢ **+RESP:GTCAN,**

Example:
+RESP:GTCAN,F10310,868446036599153,gv350m,0,1,FFFFFFFF,LFV82A1BS36355376,2,H20460, 1040.50,528,25,98,L/H51.2,,,66,154.30,150.80,281.90,2517.00,6684,,,1,,,,0,,,1,0.0,0,118.9,114. 015458,22.537211,20190823021704,0460,0001,253D,AEC3,,20190823101706,0FB1$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Report Type	1	0/1/2	
CANBUS Device State	1	0/1	
CANBUS Report Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0/1/2	
Total Distance	<=12	H(0 – 99999999)/I(0 – 2147483647)	
Total Fuel Used	<=9	0.00 – 999999.99l	
Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 - 455Km/h	
Engine Coolant Temperature	<=4	-40 – +215 ℃	

Fuel Consumption	<=5	L/100km(0.0–999.9)/L/H(0.0–999.9)	
Fuel Level	<=7	L(0.00–9999.99)/P(0.00 – 100.00)	
Range	<=8	0 – 99999999hm	
Accelerator Pedal Pressure	<=3	0 – 100%	
Total Engine Hours	<=8	0.00 – 99999.99h	
Total Driving Time	<=8	0.00 – 99999.99h	
Total Engine Idle Time	<=8	0.00– 99999.99h	
Total Idle Fuel Used	<=9	0.00 –999999.99l	
Axle Weight	<=5	0 – 65535kg	
Tachograph Information	4	00-FFFF	
Detailed Information/ Indicators	4	00-FFFF	
Lights	2	0-FF	
Doors	2	0-FF	
Total Vehicle Overspeed Time	<=8	0.00 – 99999.99h	
Total Vehicle Engine Overspeed Time	<=8	0.00 – 99999.99h	
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	
Ad-Blue Level	<=3	0-100%	
Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0/1	
Tachograph Vehicle Motion Signal	1	0/1	
Tachograph Driving Direction	1	0/1	
Analog Input Value	<=5	0-99999mv	
Engine Braking Factor	<=6	0-999999	

Pedal Braking Factor	<=6	0-999999	
Total Accelerator Kick-downs	<=6	0-999999	
Total Effective Engine Speed Time	<=8	0.00 – 99999.99h	
Total Cruise Control Time	<=8	0.00 – 99999.99h	
Total Accelerator Kick-down Time	<=8	0.00 – 99999.99h	
Total Brake Applications	<=6	0-999999	
Tachograph Driver 1 Card Number	<=10	0-9999999999	
Tachograph Driver 2 Card Number	<=10	0-9999999999	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=10	0-9999999999	
Expansion Information	4	00-FFFF	
Rapid Braking	<=6	0-999999	
Rapid Accelerations	<=6	0-999999	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0/1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	

LAC	4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Report Type>: A numeric to indicate the report type.
- 0: Periodical report.
- 1: Real time request report.
- 2: Ignition on/off report.

✧ <CANBUS Device State>: A numeric to indicate the communication state with the external CANBUS device.
- 0: Abnormal. It fails to receive data from the external CANBUS device.
- 1: Normal. It is able to receive data from the external CANBUS device.

✧ <CANBUS Report Mask>: Please refer to the <CAN Report Mask> in **AT+GTCAN**.

✧ <Ignition Key>: A numeric to indicate the Ignition state.
- 0: Ignition off.
- 1: Ignition on.
- 2: Engine on.

✧ <Total Distance>: Vehicle total distance. The number is always increasing. The unit is hectometer (H) or distance impulse (I) (if distance from dashboard is not available).

✧ <Total Fuel Used>: Number of liters of fuel used. The unit is liter.

✧ <Fuel Level>: The level of fuel in vehicle tank. The unit is liter (L) or percentage (P).

✧ <Range>: The number of hectometer to drive on remaining fuel. The unit is hectometer.

✧ <Vehicle Speed>: The vehicle speed based on wheel. The unit is km/h.

✧ <Engine RPM>: The revolutions per minute. The unit is rpm.

✧ <Accelerator Pedal Pressure>: The unit is percentage.

✧ <Engine Coolant Temperature>: The unit is Celsius. Negative value is preceded by negative sign (-), e.g. "-2". When the value is positive, no extra character is inserted, e.g. "20".

✧ <Fuel Consumption>: The fuel consumption is calculated based on values read from vehicle. The unit is L/100km (M) or L/H (H).

✧ <Total Engine Hours>: Time of engine running. The unit is hour.

✧ <Total Driving Time>: Time of engine running (speed is not 0). The unit is hour.

✧ <Total Engine Idle Time>: Time of engine running in idling status (vehicle at rest). The unit is hour.

✧ <Total Idle Fuel Used>: Number of liters of fuel used. The unit is liter.

✧ <Axle Weight>: Vehicle axle weight. The unit is kg.

✧ <Tachograph Information>: Two bytes. The high byte describes driver 2, while the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Valid Time Mark (0 – valid driver data, and 1 – no valid data)

R: Reserved

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

T2-T0: Driving time related states:

- 0: Normal/no limits reached.
- 1: 15min before 41h.
- 2: 41h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15min before 16h (without 8h rest during the last 24h).
- 6: 16h reached.
- 7: Other limit.

W1-W0: Driver working states:

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

✧ <Detailed Information/Indicators>: Two bytes. Each bit contains information of one indicator.

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

✧ <Lights>: One byte. Each bit contains information of one particular light.

- Bit 0: Running Lights (1 – on, 0 – off).
- Bit 1: Low Beam (1 – on, 0 – off).
- Bit 2: High Beam (1 – on, 0 – off).
- Bit 3: Front Fog Light (1 – on, 0 – off).
- Bit 4: Rear Fog Light (1 – on, 0 – off).
- Bit 5: Hazard Lights (1 – on, 0 – off).
- Bit 6: Reserved.
- Bit 7: Reserved.

✧ <Doors>: One byte.

For CAN100, each bit contains information of one door.

- Bit 0: Driver Door (1 – opened, 0 – closed).
- Bit 1: Passenger Door (1 – opened, 0 – closed).
- Bit 2: Rear Left Door (1 – opened, 0 – closed)
- Bit 3: Rear Right Door (1 – opened, 0 – closed).
- Bit 4: Trunk (1 – opened, 0 – closed).
- Bit 5: Hood (1 – opened, 0 – closed).
- Bit 6: Reserved.
- Bit 7: Reserved.

For J1939, this byte indicates all the doors' status. 1 means at least one door is open and 0 means all the doors are closed or in unknow status.

✧ <Ad-Blue level>: The level of Ad-Blue.

✧ <Axle Weight 1st>: Vehicle first axle weight. The unit is Kg.

✧ <Axle Weight 3rd>: Vehicle third axle weight. The unit is Kg.

✧ <Axle Weight 4th>: Vehicle fourth axle weight. The unit is Kg.

✧ <Tachograph Overspeed Signal>: The tachograph overspeed signal. The value 1 indicates "overspeed". The value 0 indicates "no overspeed".

✧ <Tachograph Vehicle Motion Signal>: The tachograph vehicle motion signal. The value 1 indicates "motion". The value 0 indicates "no motion".

✧ <Tachograph Driving Direction>: Vehicle driving direction obtained from tachograph.

✧ <Analog Input Value>: The value of analog input. The unit is mV.

✧ <Rapid Braking>: Counts of rapid braking of the vehicle.

✧ <Engine Braking Factor>: Counts of braking with brake pedal or with engine. The more decreasing speed with the engine, the higher the engine braking factor is.

✧ <Pedal Braking Factor>: Counts of braking with brake pedal or with engine. The more decreasing speed with brake pedal, the higher the pedal braking factor is.

✧ <Total Accelerator Kick-downs>: The count of accelerator pedal kick-downs (pressing the pedal over 90%).

✧ <Total Effective Engine Speed Time>: Total time when vehicle engine speed is effective. The unit is h.

✧ <Total Cruise Control Time>: Total time when vehicle speed is controlled by cruise-control module. The unit is h.

✧ <Total Accelerator Kick-down Time>: Total time when accelerator pedal is pressed over 90%. The unit is h.

✧ <Total Brake Applications>: The total number of braking processes initiated by brake pedal.

✧ <Tachograph Driver 1 Card Number>: The card number of tachograph driver 1.

✧ <Tachograph Driver 2 Card Number>: The card number of tachograph driver 2.

✧ <Tachograph Driver 1 Name>: The name of tachograph driver 1.

✧ <Tachograph Driver 2 Name>: The name of tachograph driver 2.

✧ <Registration Number>: The vehicle registration number.

✧ <Expansion Information>: A decimal number. Each bit contains information of one indicator.

- Bit 0: W – webasto (1 – on, 0 – off or not available).
- Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)

- Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
- Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
- Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
- Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
- Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
- Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
- Bit 8: ESP failure indicator (1 – on, 0 – off or not available).
- Bit 9: CHK – "check engine" indicator (1 – on, 0 – off or not available)
- Bit 10: AIR – airbags indicator (1 – on, 0 – off or not available)
- Bit 11: SC – service call indicator (1 – on, 0 – off or not available)
- Bit 12: OLL – oil level low indicator (1 – on, 0 – off or not available)

✧ <Rapid Braking>: Number of total rapid braking since installation (calculation based on CAN-Logistic's settings of speed decrease time and value).

✧ <Rapid Accelerations>: Number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value).

NOTE: only 17 items of the CANBUS device information are supported now, as show below:

<Doors>
<Lights>
<Axle Weight>
<Total Idle Fuel Used>
<Total Engine Idle Time>
<Total Driving Time>
<Total Engine Hours>
<Accelerator Pedal Pressure>
<Fuel Level>
<Fuel Consumption>
<Engine Coolant Temperature>
<Engine RPM>
<Vehicle Speed>
<Total Fuel Used>
<Total Distance>
<Ignition Key>
<VIN>

3.3.12. Google Maps Hyperlink Report

According to the settings of the command **AT+GTGLM** or SMS location request report via SMS, the device can send a SMS with Google Maps hyperlink to a mobile phone.

If the device receives SMS location request report via SMS, GV350M will send its current location to the original number via SMS with a Google Maps hyperlink if the original number is a direct

number (please refer to <Direct Number List> in the Chapter 3.2.7.6) or a number in the White Number List Configuration (please refer to <White Number List Configuration> in the Chapter 3.2.7.5)

GV350M will send an SMS with a Google Maps hyperlink to the direct phone numbers after the reports **+RESP:GTSOS** and **+RESP:GTGIN/+RESP:GTGOT**.

➢ **Google Maps hyperlink**

Example: SOS:gv350m http://maps.google.com/maps?q=22.537137,114.015294 F1 D2019/08/26 T02:58:15 B100% I0 S0.00 IN GEO-0 :gv350m http://maps.google.com/maps?q=22.537137,114.015294 F1 D2019/08/26 T03:03:05 B100% I0 S0.00			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
SMS Header	<=30	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Google Maps Hyperlink Header	30	http://maps.Google.com/maps?q=	http://maps.Google.com/maps?q=
Latitude	<=10	(−)xx.xxxxxx	
Longitude	<=11	(−)xxx.xxxxxx	
GPS positioning	<=3	F0/F1	
GPS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Battery Percentage	<=6	B0%-B100%	
Ignition state	2	I0/I1	
Speed	<=6	S0.0 – S999.9 km/h	

✧ <SMS Header>: A string that includes the device name and GPS positioning type ("SOS", "IN GEO-i", "OUT GEO-i", "LBC").
✧ <Google Maps Hyperlink>: A string of a Google Maps hyperlink.
✧ <GPS positioning>: The accuracy of the location information. F0 means no GPS positioning.
✧ <Battery Percentage>: The percentage of the backup battery.
✧ <Ignition state>: The state of ignition. 0 means ignition off and 1 means ignition on.
✧ <Speed>: The current speed. Unit: km/h.

3.4. Heartbeat Packet

Heartbeat is used to maintain the contact between the device and the server via network. The heartbeat packet is sent to the server at the interval defined by <Heartbeat Interval> in **AT+GTSRI** command.

➢ **+ACK:GTHBD**

Example: +ACK:GTHBD,F10310,868446036599153,gv350m,20190826105726,14D6$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Whenever the server receives a heartbeat packet, it should reply an acknowledgement to the device.

➢ **+SACK:GTHBD**

Example: +SACK:GTHBD,F10101,11F0$ +SACK:GTHBD,,11F0$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Protocol Version>: Device type and the protocol version that the server supported. This field is optional. The server can send an empty field to decrease the length of the heartbeat packet data acknowledgement.

✧ <Count Number>: Extracted from the heartbeat packets as the <Count Number> of server's acknowledgements to the heartbeat packets.

3.5. Server Acknowledgement

If server acknowledgement is enabled by **AT+GTSRI** command, the server will reply to the device whenever it receives a report 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

From this version, the @Tracker protocol supports reports in HEX format. For all the commands, they still use the ASCII format as described above. The device uses ASCII format reports by default. Use command **AT+GTQSS** or **AT+GTSRI** (set the <Protocol Format> to 1) to enable the HEX format reports.

All the reports are sorted into 5 categories (acknowledgement to command (**+ACK**), location report (**+RSP**), event report (**+EVT**), information report (**+INF**) and the heartbeat packet data (**+HBD**)). Reports of the same category have the same header string.

The composition of the HEX report could be customized by **AT+GTHRM** command. The actual length of each HEX report depends on the settings of the mask 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 server could use this checksum to verify the integrity of the received data.

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

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

4.1. Hex Report Mask

AT+GTHRM command uses <+ACK Mask>, <+RSP Mask>, <+EVT Mask>, <+INF Mask>, <+HBD Mask> and <+CRD Mask> to control the composition of the corresponding HEX report. In each HEX report, the corresponding mask for the report is included to indicate which part is reported.

➢ **AT+GTHRM=**

Example:
AT+GTHRM=gv350m,,,7F,FEFFFF,FEFFFF,2F7F,FF,,7F,,,0018$

Parameter	Length (Byte)	Range/Format	Default
Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv350m
Reserved	0		
Reserved	0		
+ACK Mask	2	00 – FF	7F
+RSP Mask	8	00000000 – FFFFFFFF	00FE7FFF
+EVT Mask	8	00000000 – FFFFFFFF	00FE7FFF
+INF Mask	<=8	00000000 – FFFFFFFF	7F7F
+HBD Mask	2	00 – FF	FF
+DAT Mask	<=8	00000000 – FFFFFFFF	7F
+CRD Mask	4	0000–FFFF	7F
+CAN Mask	8	00000000 – FFFFFFFF	7F0
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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

Bit	Item to Mask
Bit 7	Reserved
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Device Name>

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

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

Bit	Item to Mask
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	<Total Hour Meter Count>
Bit 22	<Current Hour Meter Count>
Bit 21	<Total Mileage>
Bit 20	<Current Mileage>
Bit 19	<External GPS Antenna Status/Satellites Information>
Bit 18	<Motion Status>
Bit 17	<Digital IO Status>
Bit 16	Reserved
Bit 15	Reserved
Bit 14	<Analog Input1 Voltage>
Bit 13	<Analog Input Mode>
Bit 12	<External Power Supply Voltage>
Bit 11	<Battery Level>
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>

Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Device Name>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<network Data>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

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

Bit	Item to Mask
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	<Total Hour Meter Count>
Bit 22	<Current Hour Meter Count>
Bit 21	<Total Mileage>
Bit 20	<Current Mileage>
Bit 19	<GPS Satellites Information>
Bit 18	<Motion Status>
Bit 17	<Digital IO Status>
Bit 16	Reserved
Bit 15	Reserved
Bit 14	<Analog Input1 Voltage>

Bit 13	<Analog Input Mode>
Bit 12	<External Power Supply Voltage>
Bit 11	<Battery Level>
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Device Name>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<Network Data>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

✧ <+INF Mask>: Component mask of the information report. Bit 0 to Bit 15 indicate which group of items is included when sending reports other than **+RESP:GTINF**.

Bit	Item to Mask
Bit 15	Reserved
Bit 14	**+RESP:GTTMZ**
Bit 13	**+RESP:GTCSQ**
Bit 12	**+RESP:GTCID**
Bit 11	**+RESP:GTBAT**
Bit 10	**+RESP:GTGPS**
Bit 9	**+RESP:GTIOS**
Bit 8	**+RESP:GTVER**
Bit 7	Expand INF Mask
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Firmware Version>
Bit 3	<Protocol Version>

Bit 2	<Device Type>
Bit 1	<Device Name>
Bit 0	<Length>

✧ <Expand INF Mask>: Bit 16 to Bit 31 of <+INF Mask>, component mask of the expand information report. Each bit indicates which expand information is included when reporting **+RESP:GTINF**.

Bit	Item to Mask
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	Reserved
Bit 5	**1_Wire Device Info**
Bit 4	**+RESP:GTCML**
Bit 3	**+RESP:GTCSN**
Bit 2	**+RESP:GTCVN**
Bit 1	**+RESP:GTUVN**
Bit 0	**+RESP:GTGSV**

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

Bit	Item to Mask
Bit 7	<UID>
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Device Name>

Bit 3	\<Firmware Version>
Bit 2	\<Protocol Version>
Bit 1	\<Device Type>
Bit 0	\<Length>

✧ <+DAT Mask>: Component mask of data report.

Bit	Item to Mask
Bit 31	Reserved
⋮	Reserved
Bit 7	Reserved
Bit 6	\<Count Number>
Bit 5	\<Send Time>
Bit 4	\<Device Name>
Bit 3	\<Firmware Version>
Bit 2	\<Protocol Version>
Bit 1	\<Device Type>
Bit 0	\<Length>

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

Bit	Item to Mask
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	\<Count Number>

Bit 5	<Send Time>
Bit 4	<Firmware Version>
Bit 3	<Protocol Version>
Bit 2	<Device Type>
Bit 1	<Device Name>
Bit 0	<Length>

✧ <+CAN Mask>: Component mask of the CANBUS Information packet in HEX format.

Bit	Item to Mask
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Reserved
Bit 20	Reserved
Bit 19	Reserved
Bit 18	Reserved
Bit 17	Reserved
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved

Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Device Name>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	Reserved
Bit 2	Reserved
Bit 1	Reserved
Bit 0	Reserved

The acknowledgment report of **AT+GTHRM** command:

➢ **+ACK:GTHRM,**

Example:
+ACK:GTHRM,F10310,868446036599153,gv350m,0952,20190826113845,1594$

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

4.2. Acknowledgement +ACK

➢ **+ACK,**

Example:
2B 41 43 4B 20 7F 24 F1 03 10 06 01 67 76 33 35 30 6D 00 00 00 10 07 07 E3 08 1A 0E 04 25 17 B1 BD 26 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+ACK	+ACK
Report Type	1		
Report Mask	1	00 – FF	
Length	1		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	0101
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
ID	1		
Serial Number	2	0000 – FFFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Report Type>: The ID of the command that the device received.

Command	ID
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
Reserved	3
AT+GTCFG	4
AT+GTTOW	5
AT+GTEPS	6

AT+GTDIS	7
AT+GTOUT	8
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14
Reserved	15
AT+GTRTO	16
Reserved	17
Reserved	18
AT+GTSIM	19
Reserved	20
AT+GTUPD	21
AT+GTPIN	22
AT+GTDAT	23
AT+GTOWH	24
AT+GTDOG	25
AT+GTAIS	26
Reserved	27
AT+GTIDL	28
AT+GTHBM	29
AT+GTHMC	30
Reserved	31
AT+GTURT	32
Reserved	33
AT+GTWLT	34
AT+GTHRM	35
AT+GTFFC	36

Reserved	37
AT+GTSSR	38
Reserved	39
Reserved	40
AT+GTEFS	41
AT+GTPGN	42
AT+GTIDA	43
AT+GTACD	44
AT+GTPDS	45
AT+GTCRA	46
AT+GTBZA	47
AT+GTSPA	48
Reserved	49
Reserved	50
AT+GTTMP	51
AT+GTFSC	52
AT+GTRMD	53
AT+GTPEO	54
AT+GTCMS	55
AT+GTTAP	56
AT+GTCAN	57
Reserved	58
AT+GTUFS	59
AT+GTFTP	60
AT+GTCMD	61
AT+GTUDF	62
AT+GTCFU	64
AT+GTGPJ	65
AT+GTUPC	70
AT+GTCLT	71

Reserved	74
AT+GTGLM	79
AT+GTMCP	80
Reserved	82
Reserved	83
Reserved	84
AT+GTMUT	85
AT+GTGAM	86

✧ <Report Mask>: Please refer to the <+ACK Mask> in **AT+GTHRM.**

✧ <Length>: The length of the acknowledgement report (total characters from header to the tail).

✧ <Unique ID>: I If Bit 4 of <+ACK Mask> is 0, IMEI of the device will be used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format report, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 4 of <+ACK Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	3	5	0	m		
HEX	67	76	33	35	30	6D	00	00

✧ <ID>: Sub-command ID of **AT+GTRTO** or the ID of **AT+GTIOB** and **AT+GTGEO.** Set it to 0 for other reports.

✧ <Send Time>: The local time to send the acknowledgement report. Total 7 bytes. The first 2 bytes are for year, the rest 5 bytes 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 <Report Type> to <Count Number>.

4.3. Location Report +RSP

Location related reports (including **+RESP:GTPNL, +RESP:GTTOW, +RESP:GTAIS, +RESP:GTDIS, +RESP:GTIOB**, **+RESP:GTFRI**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTRTL**, **+RESP:GTDOG, +RESP:GTIGL, +RESP:GTHBM** and **+RESP:GTEPS**) use this format.

➢ **+RSP,**

Example:
2B 52 53 50 0B 00 FE 7F FF 00 65 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 C0 00 01 31 B3 00 07 11 0C 00 01 01 00 00 00 00 00 00 89 06 CB BC 92 01 57 E3 D8 07 E3 08 1B 09 3A 25 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 07 2C 00 00 00 16 2D 11 07 E3 08 1B 09 3A 25 00 DD BD 3F 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+RSP	+RSP
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		

Report ID/Report Type	1		
Number	1	1	1
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Report Type>: The ID of location report.

Command	ID
+RESP:GTPNL	0
+RESP:GTTOW	1
Reserved	2
+RESP:GTLBC	3
+RESP:GTEPS	4

+RESP:GTDIS	5
+RESP:GTIOB	6
+RESP:GTFRI	7
Reserved	8
+RESP:GTSPD	9
+RESP:GTSOS	10
+RESP:GTRTL	11
+RESP:GTDOG	12
Reserved	13
+RESP:GTAIS	14
+RESP:GTHBM	15
+RESP:GTIGL	16
+RESP:GTIDA	17
+RESP:GTERI	18
Reserved	19
+RESP:GTGIN	20
+RESP:GTGOT	21

✧ <Report Mask>: It refer to the <+RSP Mask> in **AT+GTHRM.**

✧ <Unique ID>: If the Bit 6 of <+RSP Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format report, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 6 of <+RSP Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	3	5	0	m		
HEX	67	76	33	35	30	6D	00	00

✧ <Analog Input Mode>: The mode of the digital and analog input ports.

✧ <Digital Input Status>: The mask of digital input1, digital input2, digital input3 status.

Input status mask	ID
Ignition Detection	0x01
Digital Input1	0x02
Digital Input2	0x04
Digital Input3	0x08

✧ <Digital Output Status>: The mask of digital output1, digital output2, digital output3 status.

Input status mask	ID
Digital Output1	0x01
Digital Output2	0x02
Digital Output3	0x04

✧ <External GPS Antenna Status/Satellites>: The last 2 bits of the high nibble is for <External GPS Antenna Status> and the low nibble is for <Satellites>.

✧ <Report ID/Report Type>: The high nibble is for <Report ID> and the low nibble is for <Report Type>.

✧ <Speed>: Total 3 bytes. The first two bytes are for the integer part of the speed and the last byte is for the fraction part. The fraction part has only 1 digit.

✧ <Longitude>: The longitude of the current location. Total 4 bytes. The longitude is converted to an integer with 6 implicit decimals and this integer is reported in HEX format. If the value of the longitude is negative, it is represented in 2's complement format.

Longitude 121.390847	121390847			
HEX	07	3C	46	FF

✧ <Latitude>: The latitude of the current location. Total 4 bytes. The latitude is converted to an integer with 6 implicit decimals and this integer is reported in HEX format. If the value of the latitude is negative, it is represented in 2's complement format.

Latitude 31.164503	31164503			
HEX	01	DB	88	57

✧ <GPS UTC Time>: The UTC time from the GPS chip. Total 7 bytes. The first 2 bytes are for year, the rest 5 bytes for month, day, hour, minute and second respectively.

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

✧ <Current Mileage>: Total 3 bytes. The first 2 bytes are for the integer part of the current mileage and the last byte is for the fraction part. The fraction part has only 1 digit.

Current Mileage	0		0		
HEX	00	00	00		

✧ <Total Mileage>: Total 5 bytes. The first 4 bytes are for the integer part of the total mileage and the last byte is for the fraction part. The fraction part has only 1 digit.

Total Mileage	0				0
HEX	00	00	00	00	00

✧ <Total Hour Meter Count>: Total 6 bytes. The first 4 bytes are the hour part. The fifth byte is the minute part. The sixth byte is the second part.

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

Location report for **+RESP:GTSOS** uses below format.

➢ **+RSP,**

Example:
2B 52 53 50 0A 00 FE FF FF 00 68 29 01 01 01 02 67 76 33 30 30 63 00 00 00 00 00 00 00 00 00 00 00 08 00 1A 13 30 00 01 03 00 00 05 00 00 00 00 07 3C 46 81 01 DB 88 03 07 DE 01 0D 01 32 36 04 60 00 03 36 10 00 10 01 4B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DE 01 0D 09 32 35 00 62 90 82 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+RSP	+RSP
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	

Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Report ID/Report Type	1		
Reserved	1		
Number	1	1	1
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Location report **+RESP:GTIDA** uses the format below.

➢ **+RSP,**

Example:
2B 52 53 50 11 01 FE DF FF 00 71 25 08 03 09 09 67 76 33 30 30 2D 41 30 64 2F 7A 00 05 00 18 01 02 22 14 00 08 01 E2 52 0B 16 00 00 63 01 01 00 00 00 06 01 00 00 60 07 3C 4B D0 01 DB 87 53 07 E0 07 1D 09 28 20 04 60 00 01 14 4B 3E 5B 00 01 25 02 00 00 00 04 03 00 15 1E 00 00 00 03 27 2F 00 00 00 00 07 E0 07 1D 11 28 21 07 60 24 3C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+RSP	+RSP
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Report ID/Report Type	1	00	00
ID Length	1		
ID	<=20	'0' – '9' 'A' – 'Z'	
ID Report Type	1	0/1/2	
Number	1	1	
GPS Accuracy	1	0/1 – 50	

Parameter	Length (Byte)	Range/Format	Default
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <ID>: The ID that is currently being read.

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

　0: The ID is unauthorized.

　1: The ID is authorized.

　2: The ID has logged out.

Location report for **+RESP:GTERI** uses below format.

➢ **+RSP,**

Example:
2B 52 53 50 12 00 FE 2F FF 00 00 00 03 00 69 29 01 01 01 02 67 76 33 30 30 63 00 00 00 00 00 00 01 22 17 10 02 00 00 00 01 01 00 00 00 00 00 00 FF F4 07 3C 47 31 01 DB 88 79 07 DE 01 0D 01 2C 38 04 60 00 03 36 10 00 10 01 4B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DE 01 0D 09 2D 00 00 5D F1 B4 0D 0A

Parameter	Length (Byte)	Range/Format	Default

Report Header	4	+RSP	+RSP
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
ERI Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Report ID/Report Type	1		
Reserved	1	0	
1-wire Device Number (optional)	1	0-8	
1-wire Device ID (optional)	8		
1-wire Device TYPE (optional)	1		
Data Length (optional)	1		
1-wire Device Data (optional)	N		
Fuel Sensor number (optional)	1	0-99	
Sensor Type	1	0 – 6	
Reserved	2		
Percentage (optional)	1	0 –100	

Volume (optional)	2	0 –10000	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <UART Device Type>: Type of the device which connected to the second serial port.
  ● 0: No device connected
✧ <1-wire Device ID>: Means the 1-wire device ID read from the device.
✧ <1-wire Device TYPE>: Means the 1-wire device type
  ● 1: Temperature Sensor
✧ <Device Data Length>: It indicates the length of <1-wire Devices DATA>.
✧ <1-wire Device DATA>: Means the data read from the 1-wire devices. If the value of <1-wire Devices Type> is the temperature sensor, this indicates the temperature value. To convert the value of the two bytes in hex to decimal, multiply it by 0.0625 to get the temperature value in Celsius degrees. If the first 5 bits of the high byte are 1, the temperature value is below zero Celsius degrees and the value is represented in two's complement format. To

obtain the temperature in decimal, plus the hexadecimal data by 1 and then multiply it by 0.0625 to get the value in Celsius degrees.

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

Location report for **+RESP:GTGIN** and **+RESP:GTGOT** uses this format.

➢ **+RSP,**

Example:
2B4556541B00FEFFFF0068F1010101126776363030770000031AD0D00000031AD0108210C030001010000000000002806CBD6580157DF2A07E1021003380904600001253D0000989600000000000000010000000000000000000007E1021003380B574318C90D0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+RSP	+RSP
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Area Type	1	0/1	
Group Mask	1	01-1F	
GEO ID Group	8	64bit	

		0000000000000001-0000000000 0FFFFF (GEOID 0 - 19)	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Area Type>: This text belongs to Polygon or circle area, 0 means Polygon.

✧ <Group Mask>: The bitwise mask to confirm the reported <GEO ID Group>. For GV350M, only bit 0 is valid and it should be set to 1.

✧ <GEO ID Group>: The bitwise mask for trigger condition composition of the corresponding GEO ID. For GV350M, only the lowest 20 bits are valid. Each bit, from bit 0 to bit 19, represents the logical state of the corresponding GEO ID to trigger the entering or exiting event. 1 means that the event of the GEO ID set has been triggered and 0 means has not.

Location report for **+RESP:GTLBC** use below format

➤ **+RSP,**

Example:

2B 52 53 50 03 00 FE FF FF 00 6E 29 03 03 03 05 67 76 33 30 30 76 63 00 64 00 00 00 00 00 00 00 00 00 00 00 11 17 00 70 13 61 17 10 64 7F 01 01 00 00 00 00 00 00 2C 07 3C 45 E4 01 DB 87 E9 07 DF 0A 14 02 11 05 04 60 00 03 36 10 00 10 41 23 00 00 00 00 00 00 00 7B 04 00 00 00 00 00 00 00 00 00 07 DF 0A 14 0A 11 06 22 AD 0C E9 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+RSP	+RSP
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Report ID/Report Type	1		
Number Length/ Number Type	1		
Phone Number	<=10		
Number	1	1 – 15	
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9km/h	

Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Number Length/Number Type>: The high nibble is for <Number Length> and the low nibble is for <Number Type>. <Number Length> is the number of byte used to represent the phone number. <Number Type> indicates if there is a '+' sign before the phone number. 1 means there is the sign and 0 means no such a sign.

	Number Length	Number Type
HEX	7	0

✧ <Phone Number>: No more than 10 bytes. Each byte uses the high nibble and low nibble to represent one digit of the phone number respectively. If the last low nibble has no digit to represent, fill in 0xF.

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

4.4. Information Report +INF

Information reports include **+RESP:GTINF**, **+RESP:GTGPS**, **+RESP:GTCID**, **+RESP:GTCSQ**, **+RESP:GTVER**, **+RESP:GTBAT**, **+RESP:GTIOS.** These reports use the same format as below. Only **+RESP:GTINF** includes all the items. The other reports only include information related to them.

➢ **+INF,**

Example:
2B 49 4E 46 01 7F 7F 00 61 67 76 33 35 30 6D 00 00 F1 03 10 06 01 01 07 00 00 00 00 00 01 31 B3 00 00 00 00 00 07 00 11 00 09 00 07 E3 08 1B 0A 08 31 00 00 00 7F 01 2C 02 58 00 00 00 00 00 D0 31 C0 10 5F 64 89 86 01 17 85 10 23 14 57 22 12 00 00 00 00 07 E3 08 1B 0A 08 31 01 22 B5 71 0D 0A

Parameter	Length(byte)	Range/Format	Default
Report Header	4	+INF	+INF
Report Type	1		
Report Mask	2	0000 – FFFF	
Expand INF Mask	2	0000 - FFFF	
Length	2		
Unique ID	8	IMEI/Device Name	
Device Type	1	F1	
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	
Reserved	2	0000	**+RESP:GTVER**
Reserved	2	0000	
Analog Input Mode	2		
Analog Input1 Voltage	2		
Reserved	2	0000	
Reserved	2	0000	**+RESP:GTIOS**
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Reserved	1	00	

Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	**+RESP:GTGPS**
Reserved	1	00	
External GPS Antenna Status/Satellites in View	1		
Power Saving Enable/OWH Mode/Outside Working Hour	1		
Last Fix UTC Time	7	YYYYMMDDHHMMSS	
Reserved	1	00	
FRI Discard No Fix	1	0/1	
Response Report Items Mask	2		
IGN Interval	2		
IGF Interval	2		
Reserved	4	00000000	
Reserved	1	00	
Main Supply/Backup Battery On/Charging/LED On/Backup Battery Charge Mode	1		**+RESP:GTBAT**
External Power Supply VCC	2	0	
Backup Battery VCC	2	0 – 4500mV	
Backup Battery Level	1	00	
ICCID	10	ICCID	**+RESP:GTCID**
CSQ RSSI	1	0 – 31/99	**+RESP:GTCSQ**
CSQ BER	1	0 – 7/99	
Time Zone Offset Sign/ Enable Daylight Saving	1		**+RESP:GTTMZ**
Time Zone Offset	2	HHMM	
SV Count	1		**+RESP:GTGSV**
SV id	1		
SV Power	1		
……			

SV id	1		
SV Power	1		
Sensor Num	1	0~2	+RESP: GTUVN
Sensor Protocol Version[i]	1		
Sensor SW Version[i]	2		
Sensor HW Version[i]	1		
UART ID[i]	1	0 ~ 2	
CAN100 SW Version Length	1	0-10	+RESP:GTCVN
CAN100 SW Version	<=10		
CAN100 Serial Number length	1	0-10	+RESP:GTCSN
CAN100 Serial Number	<=10		
CAN100 Car Model ID	2	0x0000-0xFFFF	+RESP:GTCML
CAN100 Car Name Length	1	0-50	
CAN100 Car Name	<=50		
1-wire Device Number	1	0-8	1_Wire Device Info
1-wire Device ID (optional)	8		
1-wire Device TYPE (optional)	1		
Data Length (optional)	1		
1-wire Device Data (optional)	N		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	

✧ <Report Type>: The ID of information report.

Command	ID
+RESP:GTINF	1
+RESP:GTGPS	2
Reserved	3
+RESP:GTCID	4

+RESP:GTCSQ	5
+RESP:GTVER	6
+RESP:GTBAT	7
+RESP:GTIOS	8
+RESP:GTTMZ	9
Reserved	10
+RESP:GTGSV	11
+RESP:GTUVN	12
+RESP:GTCVN	13
+RESP:GTCSN	20
+RESP:GTCML	26

✧ <Report Mask>: It refers to the <+INF Mask> in **AT+GTHRM.**

✧ <Unique ID>: If the Bit 1 of <+INF Mask> is 0, IMEI of the device is used as the unique ID. IMEI has 14 bytes in hexadecimal format. In the Hex format report, every two bytes are encoded into one byte as an integer. The 8th byte is reserved and its value is 0x00.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 1 of <+INF Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	3	5	0	M		
HEX	67	76	33	35	30	6D	00	00

✧ <Power Saving Enable/OWH Mode/Outside Working Hours/GPS Antenna Status>: The highest bit, bit 7 is reserved. Bit 5 and bit 6 are for <Power Saving Enable>, bit 4 and bit 3 are for <OWH Mode>, bit 2 is for <Outside Working Hours> and bit 0 is for <AGPS>. <Outside Working Hours> is used to indicate whether the device is currently outside the working hours. 1 means it is outside the working hours.

✧ <Main Supply/Backup Battery On/Charging/LED On/Backup Battery Charge Mode>: The highest bit, bit 7 is for <Main Supply> to indicate whether the external power supply is connected to the device. Bit 6 is for <Backup Battery On> to indicate whether the backup battery is working. Bit 5 is for <Charging> to indicate whether the backup battery is currently charging. Bit 4 is for <LED On> to indicate whether the LEDs are turned on. Bit 0 is for <Backup Battery Charge Mode>.

✧ <ICCID>: ICCID is a 20-digit string. In the HEX format report, every 4 bits are used to

represent one digit of the ICCID.

ICCID	89	86	00	00	09	09	17	21	49	53
HEX	89	86	00	00	09	09	17	21	49	53

✧ <Time Zone Offset Sign/Enable Daylight Saving>: Bit 1 is for <Enable Daylight Saving> which indicates whether the daylight saving function is currently enabled. Bit 0 is for <Time Zone Offset Sign> which indicates the positive or negative offset of the local time to UTC. 1 means "negative offset".

✧ <Cell Number>: It represents the number of the IMSI. The IMSI consists of MCC, MNC, LAC, and Cell ID.

✧ <CAN100 Car Model ID>: The car model ID of the CAN100 device. If the value is 0, this means that no model has been obtained.

✧ <CAN100 Car Name>: It is the readable make and model of the car.

✧ <1-wire Device Info>: It is present only when the 1_Wire Device Info bit in GTHRM is set. And if <1-wire Device Number> is 0, the other fields of <1_Wire Device Info> will not display.

4.5. Event Report +EVT

Event reports (**+RESP:GTPNA**, **+RESP:GTPFA**, **+RESP:GTMPN**, **+RESP:GTMPF**, **+RESP:GTBTC**, **+RESP:GTSTC**, **+RESP:GTSTT**, **+RESP:GTGPJ**, **+RESP:GTPDP,** **+RESP:GTIDN**, **+RESP:GTSTR**, **+RESP:GTCRA, +RESP:GTSTP, +RESP:GTLSP** and **+RESP:GTANT**) use this format.

➢ **+EVT,**

Example:
2B 45 56 54 02 00 FE 7F FF 00 64 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 2D 59 00 00 00 00 00 00 11 0A 01 01 00 00 00 00 00 00 64 06 CB BC 93 01 57 E5 16 07 E3 08 1A 06 2D 04 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 0E 2D 04 17 F8 7B 25 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		

Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Report Type>: The ID of event report.

Command	ID
+RESP:GTPNA	1
+RESP:GTPFA	2
+RESP:GTMPN	3
+RESP:GTMPF	4
Reserved	5
+RESP:GTBPL	6

+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
+RESP:GTANT	10
Reserved	11
+RESP:GTPDP	12
+RESP:GTIGN	13
+RESP:GTIGF	14
+RESP:GTUPD	15
+RESP:GTIDN	16
+RESP:GTIDF	17
+RESP:GTDAT	18
Reserved	19
Reserved	20
+RESP:GTGSS	21
+RESP:GTFLA	22
+RESP:GTSTR	23
+RESP:GTSTP	24
+RESP:GTCRA	25
Reserved	26
+RESP:GTDOS	27
+RESP:GTGES	28
+RESP:GTLSP	29
+RESP:GTTMP	30
+RESP:GTDTT	31
+RESP:GTRMD	33
+RESP:GTPHL	34
+RESP:GTEXP	35
Reserved	36
+RESP:GTUFS	37

+RESP:GTFTP	38
+RESP:GTUPC	39
+RESP:GTGPJ	40
+RESP:GTCLT	41
+RESP:GTCFU	42
Reserved	51
Reserved	52

✧ <Report Mask>: It refers to the <+EVT Mask> in **AT+GTHRM.**

✧ <Unique ID>: If the Bit 6 of <+EVT Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format report, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 6 of <+EVT Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	3	5	0	m		
HEX	67	76	33	35	30	6D	00	00

Event report **+RESP:GTBPL** uses this format.

➤ **+EVT,**

Example:
2B 45 56 54 06 00 FE 7F FF 00 66 F1 03 10 06 01 67 76 33 35 30 6D 00 00 09 00 00 00 00 00 00 00 00 1A 0C 0E 3D 01 01 00 00 00 00 00 00 D3 06 CB BE 4F 01 57 E4 63 07 E3 08 1C 0B 22 3B 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 1B 0A 00 00 00 17 25 27 07 E3 08 1C 13 22 3B 11 F3 D5 04 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	

Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Backup Battery VCC	2	0 – 4500 mV	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter	3	HHMMSS	

Count			
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event reports **+RESP:GTIGN** and **+RESP:GTIGF** use this format. For these two reports, the <Mileage> field will always be shown regardless the <Report Items Mask> setting.

➢ **+EVT,**

Example:
2B 45 56 54 0D 00 FE 7F FF 00 68 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 2D 62 00 00 00 00 01 00 21 0B 00 00 02 5E 01 01 00 00 00 00 00 00 01 9C 06 CB B7 95 01 57 E3 CE 07 E3 08 1A 06 37 14 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 0E 37 12 18 12 D0 08 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	

External GPS Antenna Status/Satellites in View	1		
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTCLT** uses the format below.

➢ **+EVT,**

> **Example:**
>
> **2B 45 56 54 29 01 FE DF FF 00 7F 25 04 01 0E 04 67 76 33 30 30 41 31 34 00 00 00 00 00 00 00 01 00 21 10 01 6A 6F 6E 65 79 5F 32 30 31 31 30 31 30 31 30 30 32 32 31 39 2E 6A 70 67 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04 60 00 00 56 63 5A 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DB 01 01 00 16 20 00 16 2A 33 0D 0A**

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Group ID	1	00– 19	
Alarm Mask 1	4	00000000 – FFFFFFFF	
Alarm Mask 2	4	00000000 – FFFFFFFF	
Alarm Mask 3	4	00000000 – FFFFFFFF	
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		

Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Group ID>: This is the ID of CANBUS alarm group. The CANBUS alarm function supports 20 groups.
✧ <Alarm Mask 1>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Detailed Information/Indicators> of the **+RESP:GTCAN** report.
✧ <Alarm Mask 2>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Lights> and <Doors> of the **+RESP:GTCAN** report.
✧ <Alarm Mask 3>: The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Engine RPM> of the **+RESP:GTCAN** report.

Event report **+RESP:GTUPC** uses this format.

Example:
2B 45 56 54 27 00 FE 7F FF 00 97 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 C0 00 00 00 00 00 00 11 0B 00 00 64 2F 68 74 74 70 3A 2F 2F 32 31 38 2E 31 37 2E 34 36 2E 31 31 3A 38 37 37 2F 67 76 33 35 30 6D 2F 64 65 6C 74 61 62 69 6E 2F 35 35 35 2E 69 6E 69 01 00 00 00 00 00 00 00 AD 06 CB BB 86 01 57 E3 D9 07 E3 08 1A 08 12 0A 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 10 17 2D 18 F0 12 91 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	

Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Command ID	1		
Result	2	100/101/102/103/200/201/202/300/301/302	
URL Length	1		
Download URL	<=60	Complete URL	1
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	

MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Command ID>: The command ID in the update configuration parameters. It is always 0 before the device starts to update the configuration. It indicates the total number of the successfully executed commands when the result code is 301. And it is the number of the commands which have failed to execute when the result code is 302.

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

● 100: The update command is starting.
● 101: The update command is confirmed by the device.
● 102: The update command is refused by the device.
● 103: The update process is refused because the battery is low.
● 200: The device starts to download the package.
● 201: The device finishes downloading the package successfully.
● 202: The device fails to download the package.
● 300: The device starts to update the device configuration.
● 301: The device finishes updating the device configuration successfully.
● 302: The device fails to update the device configuration.

✧ <URL Length>: The length of complete URL.

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

Event report **+RESP:GTUPD** uses this format.

Example:

2B 45 56 54 0F 00 FE 7F FF 00 67 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 B7 00 01 31 A1 00 07 11 09 00 64 00 01 01 00 00 00 00 00 00 98 06 CB BA C2 01 57 E3 0D 07 E3 08 1B 09 17 13 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 07 2C 00 00 00 16 2D 11 07 E3 08 1B 09 17 12 00 39 12 2C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Code	2		
Retry	1		
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	

MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTIDF** uses this format.

> **+EVT,**

Example:
2B 45 56 54 11 00 FE 7F FF 00 68 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 C0 00 00 00 00 00 00 11 0B 00 00 00 19 01 01 00 00 00 00 00 00 74 06 CB BD 03 01 57 E4 93 07 E3 08 1C 09 0C 0C 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 1B 0A 00 00 00 17 25 27 07 E3 08 1C 09 0C 0A 0F 5E 18 4C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		

Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Duration of Idling	4		
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D

			0x0A

Event report **+RESP:GTDAT** uses this format.

> **+EVT,**

Example:
2B 45 56 54 12 00 FE 7F FF 00 6C F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 2D 6B 00 00 00 00 00 00 11 0A 00 06 31 32 33 34 35 36 01 01 00 00 00 00 00 00 64 06 CB BC 93 01 57 E5 16 07 E3 08 1A 06 12 38 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 0E 12 37 17 D2 57 F7 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Data Length	2		
data			
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0

Parameter	Length	Range/Format	Default
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Data Length>: It indicates the length of <data> parameter.

Event report **+RESP:GTGSS** uses this format.

➢ **+EVT,**

Example:
2B 45 56 54 15 00 FE 7F FF 00 69 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 C0 00 00 00 00 00 00 00 11 0B 00 00 00 00 00 01 00 00 00 00 00 00 00 AD 06 CB BB 86 01 57 E3 D9 07 E3 08 1A 08 12 0A 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 10 13 0B 18 EB B4 4C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		

Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
GPS Signal Status	1	0/1	
Reserved	4	00000000	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	

Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

<GPS Signal Status>: 0 means GPS signal lost or GPS positioning failed; 1 means GPS signal has been recovered and GPS positioning succeeded.

Event report **+RESP:GTFLA** uses this format.

> **+EVT,**

Example:
2B 45 56 54 16 00 FE 7F FF 00 67 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 C9 00 00 00 00 00 00 11 0C 00 64 18 01 01 00 00 00 00 00 00 BD 06 CB BE 7B 01 57 E4 C2 07 E3 08 1C 07 32 38 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 06 20 00 00 00 17 0A 1D 07 E3 08 1C 07 32 37 0E E3 E6 6F 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		

Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Input ID	1	00-20	
Last Fuel Level	1	0 – 100	
Current Fuel Level	1	0 – 100	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	

Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTGPJ** uses this format.

> **+EVT,**

Example:
2B 45 56 54 28 00 FE 7F FF 00 66 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 B7 00 00 00 00 00 00 11 0B 24 02 01 01 00 00 00 00 00 00 AD 06 CB BB 86 01 57 E3 D9 07 E3 08 1A 07 07 1E 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 0F 07 1C 18 6D 85 14 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F8	F8
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
CW Jamming Value	1	0-255	

GPS Jamming State	1	0-3	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧   <CW Jamming Value>: Current continuous wave jamming value.
✧   <GPS Jamming State>: Current jamming state.
- 0: Unknown or feature disabled.
- 1: (Ok) no significant jamming.
- 2: (Warning) interference visible but fix OK.
- 3: (Critical) interference visible and no fix.

Event report **+RESP:GTDOS** uses this format.
➢   **+EVT,**

Example:
2B 45 56 54 1B 00 FE 7F FF 00 66 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 C0 00 00 00 00 00 01

07 21 07 01 01 01 00 00 00 00 00 00 00 99 06 CB BC CE 01 57 E2 89 07 E3 08 1A 09 36 03 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 0A 2B 00 00 00 00 0A 2B 07 E3 08 1A 09 37 0E 19 BA D4 9B 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Waveform 1 Output ID	1	1-3	
Waveform 1 Ouptut Active	1	0/1	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		

Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTGES** uses this format.

➢ **+EVT,**

Example:

2B 45 56 54 1C 00 FE 7F FF 00 6F F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 D2 00 00 00 00 00 00 11 08 00 01 15 00 00 00 32 00 00 00 0A 01 01 00 00 00 00 00 00 A8 06 CB BE ED 01 57 E4 88 07 E3 08 1C 08 26 01 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 06 20 00 00 00 17 0A 1D 07 E3 08 1C 08 26 00 0F 33 64 AB 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	

Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Trigger GEO ID	1	0-19	
Trigger GEO Enable	1	0/1	
Trigger Mode	1	0/21/22	
Radius	4	50 – 6000000m	
Check Interval	4	0/5 – 86400sec	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00

Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

Event report **+RESP:GTTMP** uses this format.
  ➢   **+EVT,**

Example:
2B 45 56 54 1E 00 FE 7F FF 00 71 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 2D 24 00 00 00 00 00 00 11 0B 00 01 28 80 21 9F 0A 00 00 D0 00 00 1A 01 01 00 00 00 00 00 01 9C 06 CB B7 95 01 57 E3 CE 07 E3 08 1A 06 2D 28 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 0E 2D 27 17 FF 76 A6 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		

Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Temperature Alarm ID	1	0 – 7	
Temperature Status	1	0/1	
Temperature Sensor Device ID	8	'0' – '9' 'a' – 'f' 'A' – 'F'	
Reserved	1	00	00
Temperature Sensor Device DATA	2	-55 – 125℃	
Number	1	1	1
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Temperature Alarm ID>: The ID of temperature alarm.

✧ <Temperature Status>: The state of current temperature. 0 means beyond the predefined temperature range. 1 means within the predefined temperature range.

✧ <Temperature Sensor Device ID>: The ID of the temperature sensor.

✧ <Temperature Sensor Device DATA>: The current temperature detected by the sensor.

Event report **+RESP:GTDTT** uses the format below.

➢ **+EVT,**

> **Example:**
>
> **2B 45 56 54 1F 00 FE 7F FF 00 68 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 C9 00 01 31 98 00 07 11 0C 00 00 01 2C 00 01 00 00 00 00 00 00 00 85 06 CB BC 8C 01 57 E3 E1 07 E3 08 1C 06 12 31 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 07 2C 00 00 00 16 2D 11 07 E3 08 1C 06 12 31 07 1B 7D B9 0D 0A**

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22	

		0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Reserved	1	00	00
Data Length	2		
Data			
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧   <Data Length>: It expresses the length of the <Data> parameter.

Event report **+RESP:GTRMD** uses the format below.
  ➤   **+EVT,**

Example:

2B 45 56 54 21 00 FE 7F FF 00 65 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 2E 25 00 00 00 00 00 00 11 0B 02 01 01 00 00 00 00 00 00 74 06 CB BD 03 01 57 E4 93 07 E3 08 1C 09 26 02 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 1B 0A 00 00 00 17 25 27 07 E3 08 1C 09 26 01 0F 82 FF AE 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Roaming State	1	0-3	
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		

Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTPHL** uses the format below, and it is only sent via GPRS even if the report mode is Force on SMS.

> **+EVT,**

Example:

2B 45 56 54 22 00 FE 7F FF 00 70 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 2D 62 00 00 00 00 00 00 11 0A 00 03 00 08 00 07 E3 08 1A 0E 02 3B 01 01 00 00 00 00 00 00 64 06 CB BC 93 01 57 E5 16 07 E3 08 1A 06 03 00 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 0E 02 3B 17 A6 B8 A6 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	

Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Attribute Mask	2	0000 – FFFF	
Attribute Length	2		
Camera ID	1	0-3	
Photo Time	7	YYYYMMDDHHMMSS	
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000– FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	

Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧   <Attribute Length>: The total length of attribute parameters which include <Camera ID> and <Photo Time>.

Event report **+RESP:GTEXP** uses the format below.

➢   **+EVT,**

Example:

2B 45 56 54 23 00 FE 7F FF 00 68 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 C9 00 00 00 00 00 00 11 0C 04 00 00 02 01 01 00 00 00 00 00 00 BD 06 CB BE 7B 01 57 E4 C2 07 E3 08 1C 07 33 38 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 06 20 00 00 00 00 17 0A 1D 07 E3 08 1C 07 33 37 0E EB 1B E5 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12	

		0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Digital Fuel Sensor Type	1	2/4	
Reserved	1		
Reserved Parameters	1		
HW Fault Code	1		
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTUFS** uses the format below.

➤ **+EVT,**

Example:
2B 45 56 54 25 00 FE 7F FF 00 67 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 AE 00 00 00 00 00 00 11 0B 00 64 02 01 00 00 00 00 00 00 00 00 AD 06 CB BB 86 01 57 E3 D9 07 E3 08 1A 08 12 0A 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 08 1D 24 18 FB F5 3C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Code	2		
Reserved	1	00	00
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	

Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report **+RESP:GTFTP** uses the format below.

➤ **+EVT,**

Example:
2B 45 56 54 26 00 FE 7F FF 00 7D F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 2D 59 00 00 00 00 00 00 11 0A 41 6D 79 5F 30 5F 32 30 31 39 30 38 32 36 31 34 30 31 31 31 2E 6A 70 67 00 01 01 00 00 00 00 00 00 64 06 CB BC 93 01 57 E5 16 07 E3 08 1A 06 01 2E 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 0E 01 2D 17 A1 C7 09 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		

Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Digital Input Status	1	00 – 0F	
Digital Output Status	1	00 – 07	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
File Name	<=40		
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000–FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	

Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <File Name>: The file name of picture. The value is the file name string ending with '\0'. The value is in ASCII format.

Event report **+RESP:GTCFU** uses the format below.

➢ **+EVT,**

Example:
2B 45 56 54 2A 00 FE 7F FF 00 67 F1 03 10 06 01 67 76 33 35 30 6D 00 00 64 31 B7 00 00 00 00 01 00 21 07 00 64 00 01 00 00 00 00 00 00 00 99 06 CB BC CE 01 57 E2 89 07 E3 08 1A 09 02 33 01 CC 00 01 25 3D 00 00 AE C3 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 E3 08 1A 09 08 11 19 5A A8 AE 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+EVT	+EVT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Analog Input Mode	2		
Analog Input1 Voltage	2		
Analog Input2 Voltage	2		

Analog Input3 Voltage	2		
Analog Input4 Voltage	2		
Digital Input Status	1	00 – 3F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11/0x12 0x21/0x22 0x41/0x42 0x16/0x1A	
External GPS Antenna Status/Satellites in View	1		
Code	2		
Reserved	1	00	00
Number	1	1	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Current Mileage	3	0.0 –65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

4.6. Data Report +DAT

Data reports **+RESP:GTPHD**, **+RESP:GTFSD, +RESP:GTEHD and +RESP:GTCRG** use the format below. They are only sent via GPRS even if the report mode is Force on SMS.

➢ **+DAT,**

Example:

2B 44 41 54 01 00 00 00 7F 02 E3 F1 03 10 06 01 67 76 33 35 30 6D 00 00 00 03 00 08 00 07 E3 08
1A 0E 02 3B 00 06 00 01 02 AC FF D8 FF DB 00 84 00 0D 09 09 0B 09 08 0D 0B 0A 0B 0E 0D 0D 0F
13 1F 14 13 11 11 13 26 1B 1D 17 1F 2D 28 30 2F 2D 28 2C 2B 32 38 48 3D 32 35 44 36 2B 2C 3F
55 3F 44 4A 4D 50 51 50 30 3C 58 5F 58 4E 5E 48 4F 50 4D 01 0D 0E 0E 13 10 13 25 14 14 25 4D
34 2C 34 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D
4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D 4D FF C0 00 11 08
00 78 00 A0 03 01 21 00 02 11 01 03 11 01 FF DD 00 04 00 0A FF C4 01 A2 00 00 01 05 01 01 01
01 01 01 00 00 00 00 00 00 00 00 01 02 03 04 05 06 07 08 09 0A 0B 10 00 02 01 03 03 02 04 03 05
05 04 04 00 00 01 7D 01 02 03 00 04 11 05 12 21 31 41 06 13 51 61 07 22 71 14 32 81 91 A1 08 23
42 B1 C1 15 52 D1 F0 24 33 62 72 82 09 0A 16 17 18 19 1A 25 26 27 28 29 2A 34 35 36 37 38 39
3A 43 44 45 46 47 48 49 4A 53 54 55 56 57 58 59 5A 63 64 65 66 67 68 69 6A 73 74 75 76 77 78 79
7A 83 84 85 86 87 88 89 8A 92 93 94 95 96 97 98 99 9A A2 A3 A4 A5 A6 A7 A8 A9 AA B2 B3 B4 B5
B6 B7 B8 B9 BA C2 C3 C4 C5 C6 C7 C8 C9 CA D2 D3 D4 D5 D6 D7 D8 D9 DA E1 E2 E3 E4 E5 E6 E7
E8 E9 EA F1 F2 F3 F4 F5 F6 F7 F8 F9 FA 01 00 03 01 01 01 01 01 01 01 01 01 00 00 00 00 00 00 01
02 03 04 05 06 07 08 09 0A 0B 11 00 02 01 02 04 04 03 04 07 05 04 04 00 01 02 77 00 01 02 03 11
04 05 21 31 06 12 41 51 07 61 71 13 22 32 81 08 14 42 91 A1 B1 C1 09 23 33 52 F0 15 62 72 D1
0A 16 24 34 E1 25 F1 17 18 19 1A 26 27 28 29 2A 35 36 37 38 39 3A 43 44 45 46 47 48 49 4A 53
54 55 56 57 58 59 5A 63 64 65 66 67 68 69 6A 73 74 75 76 77 78 79 7A 82 83 84 85 86 87 88 89 8A
92 93 94 95 96 97 98 99 9A A2 A3 A4 A5 A6 A7 A8 A9 AA B2 B3 B4 B5 B6 B7 B8 B9 BA C2 C3 C4
C5 C6 C7 C8 C9 CA D2 D3 D4 D5 D6 D7 D8 D9 DA E2 E3 E4 E5 E6 E7 E8 E9 EA F2 F3 F4 F5 F6 F7 F8
F9 FA FF DA 00 0C 03 01 00 02 11 03 11 00 3F 00 84 2D 3C 25 68 62 39 46 3A 54 8B 2B A1 CA B1
07 DA 98 0C 9E 49 27 62 D2 33 3B 7A B1 C9 AA BB 59 5C 32 92 18 1C 82 3B 54 8C EA 2C 6C A1 9A
C5 1B 76 D9 26 F9 D9 18 F0 18 F5 2B EC 7A E3 DE A3 C4 96 D2 18 E6 4D C9 DC 77 1E E2 A5 94 87
88 D1 8F C8 C1 80 E4 1C 7F 4A A5 AC 07 E3 08 1A 0E 02 3B 17 A7 A5 1A 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+DAT	+DAT
Report Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	

Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Attribute Mask	2	0000 – FFFF	+RESP:GTPHD/+RESP:GTEHD
Attribute Length	2		
Camera ID	1	0-3	
Photo Time	7	YYYYMMDDHHMMSS	
Total Frames	2		
Current Frame Index	2		
Photo Data Length	2		
Photo Data	<=1000		
Data Length	2		+RESP:GTFSD
Sensor Data	<=128		
Reserved	1		
Data Type	1	0/1	+RESP:**GTCRG**
GPS Valid Time Number	1	0 – 10	
GPS Point Index	1	1	
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9 km/h	
Azimuth	2	0 – 359	
Altitude	2	(−)xxxxx.x m	
Longitude	4	(−)xxx.xxxxxx	
Latitude	4	(−)xx.xxxxxx	
GPS UTC Time	7	YYYYMMDDHHMMSS	
......			
GPS Point Index	1	10	
GPS Accuracy	1	0/1 – 50	
Speed	3	0.0 – 999.9 km/h	
Azimuth	2	0 – 359	
Altitude	2	(−)xxxxx.x m	
Longitude	4	(−)xxx.xxxxxx	

Latitude	4	(−)xx.xxxxxx	
GPS UTC Time	7	YYYYMMDDHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Report Type>: The ID of data report.

Command	ID
+RESP:GTPHD	1
+RESP:GTFSD	2
+RESP:GTEHD	3
+RESP:GTCRG	4

✧ <Report Mask>: Please refer to the <+DAT Mask> in **AT+GTHRM**.
✧ <Attribute Length>: The total length of attribute parameters which include <Camera ID> and <Photo Time>.
✧ <Data Type>: The data reported to backend server is recorded before or after crash.
  ● 0: Before crash.
  ● 1: After crash.
✧ <GPS Valid Time Number>: The number of the successfully fixed GPS positions included in the report.
✧ <GPS Point Index>: The index of GPS point.

4.7. Heartbeat Packet Report +HBD

➢ **+HBD,**

Example:
2B 48 42 44 FF 20 F1 03 10 06 01 67 76 33 35 30 6D 00 00 07 E3 08 1C 12 08 32 0F CF C8 03 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Report Mask>: It refers to the <+HBD Mask> in **AT+GTHRM.**

✧ <Unique ID>: If Bit 4 of <+HBD Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format report, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 4 of <+HBD Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	3	5	0	M		
HEX	67	76	33	35	30	6D	00	00

If the mask of <UID> is set to 0 in the <+HBD Mask> of **AT+GTHRM**, the heartbeat report will not include device name or IMEI information. If the mask of <UID> is set to 1, the heartbeat report will report device name or IMEI according to the mask of <Device Name>.

4.8. Crash Data Report +CRD

➢ +CRD,

Example:

2B 43 52 44 00 7F 02 7F F1 03 10 06 01 67 76 33 35 30 6D 00 00 00 02 01 02 58 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0A FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7C 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0A FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7C 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0C FF 7B 00 0B 00 0A FF 7C 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0A FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0A FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0A FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0C FF 7E 00 0B 00 0A FF 7A 00 0B 00 0B FF 7C 00 0A 00 0A FF 7A 00 0A 00 09 FF 78 00 0A 00 0B FF 7C 00 0B 00 0B FF 7B 00 0C 00 0C FF 7C 00 0C 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7B 00 0B 00 0B FF 7A 00 0B 00 0B FF 7B 00 0B 00 0C FF 7B 00 0A 00 13 FF 7C 00 0B 00 13 FF 7C 00 0C 00 0E FF 7A 00 0B 00 0B FF 7D 00 0B 00 04 FF 79 00 0A 00 08 FF 7C 00 0B 00 06 FF 7B 00 0B 00 0C FF 79 00 0A 00 10 FF 7D 07 E3 08 1C 09 0E 37 0F 62 10 71 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+CRD	+ CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI/Device Name	
Data Type	1	0/1	
Total Frame	1	1–10	
Frame Number	1	1–10	

Data Length	2	<=600	
Data	<=600		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✦ <Report Mask>: It refers to the <+CRD Mask> in **AT+GTHRM.**

✦ <Unique ID>: If Bit 1 of <+CRD Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format report, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If the Bit 1 of <+CRD Mask> is 1, the device name is used as the unique ID of the device. Refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	3	5	0	m		
HEX	67	76	33	35	30	6D	00	00

✦ <Length>: The length of the crash data report (total characters from header to the tail).
✦ <Data Type>: The data reported to backend server is recorded before or after crash.
   ● 0: Before crash.
   ● 1: After crash.
✦ <Total Frame>: Total number of data frames reported to server.
✦ <Frame Number>: The sequence of data frame.
✦ <Data>: There are 500 numbers in one frame. 6 numbers form as a group. The first 2 numbers of the 6 numbers represent X axis acceleration data, the next 2 numbers represent Y axis and last 2 numbers are Z axis.

4.9. CANBUS Report +CAN

CANBUS Report Information **+RESP:GTCAN** uses the format below.

➢ **+CAN,**

Example:
2B 43 41 4E 01 00 00 07 F0 01 46 F1 03 10 06 01 67 76 33 35 30 6D 00 00 01 00 FF FF FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FE

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 7F FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 F6 06 CB C1 11 01 57 E5 A6 07 E3 08 1B 0A 09 14 01 CC 00 01 25 3D 00 00 AE C3 00 07 E3 08 1B 0A 09 13 01 24 40 7C 0D 0A

Parameter	Length (Byte)	Range/Format	Default
Report Header	4	+CAN	+CAN
Report Type	1	01	01
Report Mask	4	0x00000000 – 0xFFFFFFFF	
Length	2		
Device Type	1	F1	F1
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Report Type	1	0/1/2	
CANBUS Device State	1	0/1	
CANBUS Report Mask	4	0x00000000 - 0xFFFFFFFF	
VIN	17		
Ignition Key	1	0/1/2	
Total Distance	4	H(0 – 99999999)/I(0 – 2147483647)	
Total Fuel Used	5	0.00 – 999999.99	
Engine RPM	2	0 – 16383 rpm	
Vehicle Speed	2	0 - 400Km/h	
Engine Coolant Temperature	2	-40 ℃ +215 ℃	
Fuel Consumption	3	L/100km(0.0–999.9)/L/H(0.0–999.9)	
Fuel Level (Liters)	5	L(0.00 – 999999.99)	
Fuel Level (Percentage)	5	P(0.00 – 99.99)	

Range	4	0 – 99999999hm	
Accelerator Pedal Pressure	2	0 – 100%	
Total Engine Hours	5	0.00 – 99999.99h	
Total Driving Time	5	0.00 – 99999.99h	
Total Engine Idle Time	5	0.00 – 99999.99h	
Total Idle Fuel Used	5	0.00 –999999.99l	
Axle Weight	2	0 – 65535kg	
Tachograph Information	2	00-FFFF	
Detailed Information/Indicators	2	00-FFFF	
Lights	1	0x00-0xFF	
Doors	1	0x00-0xFF	0
Total Vehicle Overspeed Time	5	0 – 99999.99h	
Total Vehicle Engine Overspeed Time	5	0 – 99999.99h	
Total Distance Impulses	4	0– 2147483648	
CANBUS Report Expansion Mask	4	0x00000000 - 0xFFFFFFFF	
Ad-Blue Level	2	0-100%	
Axle Weight 1st	2	0 – 65535kg	
Axle Weight 3rd	2	0 – 65535kg	
Axle Weight 4th	2	0 – 65535kg	
Tachograph Overspeed Signal	1	0/1	
Tachograph Vehicle Motion Signal	1	0/1	
Tachograph Driving Direction	1	0/1	
Analog Input Value	4	0-99999mv	
Engine Braking Factor	4	0-999999	
Pedal Braking Factor	4	0-999999	

Total Accelerator Kick-downs	4	0-999999	
Total Effective Engine Speed Time	5	0.00 – 99999.99h	
Total Cruise Control Time	5	0.00 – 99999.99h	
Total Accelerator Kick-down Time	5	0.00 – 99999.99h	
Total Brake Applications	4	0-999999	
Tachograph Driver 1 Card Number	5	0-9999999999	
Tachograph Driver 2 Card Number	5	0-9999999999	
Tachograph Driver 1 Name	40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	5	0-9999999999	
Expansion Information	2	0x0000-0xFFFF	
Rapid Braking	4	0-999999	
Rapid Accelerations	4	0-999999	
GPS Accuracy	1	0/1 – 50	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	4	00000000 – FFFFFFFF	
Reserved	1	00	00
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Character	2	0x0D 0x0A	0x0D 0x0A

✧ <Report Type>: The ID of CAN report.

Command	ID
+RESP:GTCAN	1

✧ <Report Mask>: Please refer to the <+CAN Mask> in **AT+GTHRM.**

✧ <Length>: The whole length of the report from header to the tail characters.

✧ <Unique ID>: If Bit 6 of <+CAN Mask> is 0, IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format report, every 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit6 of <+CAN Mask> is 1, the device name is used as the unique ID of the device. Please refer to the <Device Name> in **AT+GTCFG** for the device name. Device name is an 8-byte string. If the length of the <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format report, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the empty bytes will be set to 0.

Device Name	g	v	3	5	0	m		
HEX	67	76	33	35	30	6D	00	00

✧ <Report Type>: A numeric to indicate the report type.
- 0: Periodical report.
- 1: Real time request report.
- 2: Ignition on/off report.

✧ <CANBUS Device State>: A numeric to indicate the communication state with the external CANBUS device.
- 0: Abnormal. It fails to receive data from the external CANBUS device.
- 1: Normal. It is able to receive data from the external CANBUS device.

✧ <CANBUS Report Mask>: Please refer to the <CAN Report Mask> in **AT+GTCAN**.

✧ <Total Distance>: Vehicle distance. The number is always increasing. The unit is hectometer. If it is 0, the distance is not available.

✧ <Total Fuel Used>: A total of 5 bytes. The first 4 bytes are for the integer part of the total fuel used and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Engine Coolant Temperature>: The engine coolant temperature of vehicle. 2 bytes in total. If this value is negative, it is represented in 2's complement format.

✧ <Fuel Level (Liters)>: 5 bytes in total. The first 4 bytes are for the integer part of the fuel level (liters) and the last byte is for the fraction part. The fraction part has 2 digits. This field is controlled by Bit 8 in <CANBUS Report Mask>.

✧ <Fuel Level (Percentage)>: 5 bytes in total. The first 4 bytes are for the integer part of the fuel level (percentage) and the last byte is for the fraction part. The fraction part has 2 digits.

This field is controlled by Bit 8 in <CANBUS Report Mask>.

✧ <Fuel Consumption>: 3 bytes in total. The first byte indicates the unit. The unit of L/100km is represented as FE and the unit of L/H is represented as FF. The other two bytes indicate the value. The fuel consumption value is converted to an integer with 1 implicit decimal digit multiplied it by 10. The integer is reported in HEX format.

Fuel Consumption Value 12.1	121	
HEX	00	79

✧ <Total Engine Hours>: 5 bytes in total. The first 4 bytes are for the integer part of the total engine hours and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Driving Time>: 5 bytes in total. The first 4 bytes are for the integer part of the total driving time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Engine Idle Time>: 5 bytes in total. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Idle Fuel Used>: 5 bytes in total. The first 4 bytes are for the integer part of the total idle fuel used and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Tachograph Information>: Two bytes. The high byte describes driver 2 and the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

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

R: Reserved

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

T2-T0: Driving time related states:

- 0: Normal/no limits reached.
- 1: 15min before 41h.
- 2: 41h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15 min before 16h (without 8h rest during the last 24h).
- 6: 16h reached.
- 7: Other limit.

W1-W0: Driver working states:

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

✧ <Detailed Information/Indicators>: 2 bytes in total. Each bit contains information of one indicator.

- Bit 0: FL – fuel low indicator (1 – indicator on, 0 – off).
- Bit 1: DS – driver seatbelt indicator (1 – indicator on, 0 – indicator off).
- Bit 2: AC – air conditioning (1 – on, 0 - off).
- Bit 3: CC – cruise control (1 – active, 0 - disabled).
- Bit 4: B – brake pedal (1 – pressed; 0 – released).

- Bit 5: C – clutch pedal (1 – pressed; 0 – released).
- Bit 6: H – handbrake (1 – pulled-up, 0 – released).
- Bit 7: CL – central lock (1 – locked, 0 – unlocked).
- Bit 8: R – reverse gear (1 – on, 0 – off).
- Bit 9: RL – running lights (1 – on, 0 – off).
- Bit 10: LB – low beams (1 – on, 0 – off).
- Bit 11: HB – high beams (1 – on, 0 – off).
- Bit 12: RFL – rear fog lights (1 – on, 0 – off).
- Bit 13: FFL – front fog lights (1 – on, 0 – off).
- Bit 14: D – doors (1 – any door opened, 0 – all doors closed).
- Bit 15: T – trunk (1 – opened, 0 – closed).

✧ <Lights>: One byte. Each bit contains information of one particular light.
- Bit 0: Running Lights (1 – on, 0 – off).
- Bit 1: Low Beam (1 – on, 0 – off).
- Bit 2: High Beam (1 – on, 0 – off).
- Bit 3: Front Fog Light (1 – on, 0 – off).
- Bit 4: Rear Fog Light (1 – on, 0 – off).
- Bit 5: Hazard Lights (1 – on, 0 – off).
- Bit 6: Reserved.
- Bit 7: Reserved.

✧ <Doors>: One byte.

For CAN100, each bit contains information of one door.
- Bit 0: Driver Door (1 – opened, 0 – closed).
- Bit 1: Passenger Door (1 – opened, 0 – closed).
- Bit 2: Rear Left Door (1 – opened, 0 – closed)
- Bit 3: Rear Right Door (1 – opened, 0 – closed).
- Bit 4: Trunk (1 – opened, 0 – closed).
- Bit 5: Hood (1 – opened, 0 – closed).
- Bit 6: Reserved.
- Bit 7: Reserved.

For J1939, this byte indicates all the doors's status, 1 means at least one door is open, 0 means all the doors are closed or unknow status.

✧ <Total Vehicle Overspeed Time>: 5 bytes in total. The first 4 bytes are for the integer part of the total vehicle overspeed time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Vehicle Engine Overspeed Time>: 5 bytes in total. The first 4 bytes are for the integer part of the total vehicle engine overspeed time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Distance Impulses>: Vehicle distance in impulses. The number is always increasing. The unit is imp. If it is 0, the distance in imp is not available.

✧ <Ad-Blue Level>: The level of Ad-Blue. 2 bytes in total.

✧ <Axle Weight 1st>: Vehicle first axle weight. The unit is Kg.

✧ <Axle Weight 3rd>: Vehicle third axle weight. The unit is Kg.

✧ <Axle Weight 4th>: Vehicle fourth axle weight. The unit is Kg.

✧ <Tachograph Overspeed Signal>: The value 1 indicates "Overspeed". The value 0 indicates "No overspeed".

✧ <Tachograph Vehicle Motion Signal>: The vehicle motion signal from tachograph. The value 1 indicates "Motion". The value 0 indicates "No motion".

✧ <Tachograph Driving Direction>: Vehicle driving direction from tachograph.

✧ <Analog Input Value>: The value of analog input. The unit is mv.

✧ <Engine Braking Factor>: Counts of braking with brake pedal or with engine. The more decreasing speed with the engine, the higher the engine braking factor is.

✧ <Pedal Braking Factor>: Counts of braking with brake pedal or with engine. The more decreasing speed with brake pedal, the higher the pedal braking factor is.

✧ <Total Accelerator Kick-downs>: The count of accelerator pedal kick-downs (pressing the pedal over 90%).

✧ <Total Effective Engine Speed Time>: Total time when vehicle engine speed is effective. The unit is h. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Cruise Control Time>: Total time when vehicle speed is controlled by cruise-control module. The unit is h. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Accelerator Kick-down Time>: Total time when accelerator pedal is pressed over 90%. The unit is h. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fraction part. The fraction part has 2 digits.

✧ <Total Brake Applications>: The count of braking processes initiated by brake pedal.

✧ <Tachograph Driver 1 Card Number>: The card number of tachograph driver 1. The value is a numeric string and ends with 0x00.

✧ <Tachograph Driver 2 Card Number>: The card number of tachograph driver 2. The value is a numeric string and ends with 0x00.

✧ <Tachograph Driver 1 Name>: The name of tachograph driver 1. The value is a name string and ends with 0x00.

✧ <Tachograph Driver 2 Name>: The name of tachograph driver 2. The value is a name string and ends with 0x00.

✧ <Registration Number>: The vehicle registration number. The value is a numeric string of number and ends with 0x00.

✧ <Expansion Information>: A decimal number. Each bit contains information of one indicator.
   ● Bit 0: W – webasto (1 – on, 0 – off or not available).
   ● Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
   ● Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
   ● Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
   ● Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
   ● Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
   ● Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
   ● Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
   ● Bit 8: ESP failure indicator (1 – on, 0 – off or not available).
   ● Bit 9: CHK – "check engine" indicator (1 – on, 0 – off or not available)
   ● Bit 10: AIR – airbags indicator (1 – on, 0 – off or not available)

- Bit 11: SC – service call indicator (1 – on, 0 – off or not available)
- Bit 12: OLL – oil level low indicator (1 – on, 0 – off or not available)

✦ <Rapid Braking>: Number of total rapid braking since installation (calculation based on CAN-Logistic's settings of speed decrease time and value).

✦ <Rapid Accelerations>: Number of total rapid accelerations since installation (calculation based on CAN-Logistic's settings of speed increase time and value).

✦ <Send Time>: The local time to send the acknowledgement report. 7 bytes in total. The first 2 bytes are for year and the other 5 bytes are for month, day, hour, minute and second respectively.

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

4.10. Buffer Report in HEX Format

When HEX format reports are buffered in the memory, the device will replace the second byte of the reports with 'B'. Thus, **+BSP** is buffered report for **+RSP**, **+BNF** is buffered report for **+INF** and **+BVT** is buffered report for **+EVT**. The rest part of the reports is the same.

5. Appendix: Report Index

✧ Command and ACK

AT+GTBSI
+ACK:GTBSI
AT+GTSRI
+ACK:GTSRI
AT+GTQSS
+ACK:GTQSS
AT+GTCFG
+ACK:GTCFG
AT+GTPIN
+ACK:GTPIN
AT+GTDOG
+ACK:GTDOG
AT+GTTMA
+ACK:GTTMA
AT+GTOWH
+ACK:GTOWH
AT+GTPDS
+ACK:GTPDS
AT+GTFRI
+ACK:GTFRI
AT+GTFFC
+ACK:GTFFC
AT+GTGEO
+ACK:GTGEO
AT+GTPEO
+ACK:GTPEO
AT+GTTOW
+ACK:GTTOW
AT+GTSPD
+ACK:GTSPD
AT+GTSOS
+ACK:GTSOS
AT+GTRMD
+ACK:GTRMD
AT+GTBZA
+ACK:GTBZA
AT+GTSPA
+ACK:GTSPA
AT+GTIDL
+ACK:GTIDL

AT+GTHBM

+ACK:GTHBM

AT+GTSSR

+ACK:GTSSR

AT+GTTMP

+ACK:GTTMP

AT+GTHUM

+ACK:GTHUM

AT+GTGPJ

+ACK:GTGPJ

AT+GTOUT

+ACK:GTOUT

AT+GTEPS

+ACK:GTEPS

AT+GTDIS

+ACK:GTDIS

AT+GTIOB

+ACK:GTIOB

AT+GTAIS

+ACK:GTAIS

AT+GTURT

+ACK:GTURT

AT+GTIDA

+ACK:GTIDA

AT+GTCAN

+ACK:GTCAN

AT+GTCLT

+ACK:GTCLT

AT+GTRTO

+ACK:GTRTO

AT+GTDAT

+ACK:GTDAT

AT+GTWLT

+ACK:GTWLT

AT+GTGLM

+ACK:GTGLM

AT+GTHMC

+ACK:GTHMC

AT+GTCRA

+ACK:GTCRA

+ACK:GTUPC

AT+GTGAM

+ACK:GTGAM

✧ Position Report
+RESP:GTTOW
+RESP:GTEPS
+RESP:GTDIS
+RESP:GTIOB
+RESP:GTFRI
+RESP:GTSPD
+RESP:GTSOS
+RESP:GTGPJ
+RESP:GTRTL
+RESP:GTDOG
+RESP:GTAIS
+RESP:GTIGL
+RESP:GTHBM
+RESP:GTGES
+RESP:GTERI
+RESP:GTGIN
+RESP:GTGOT
+RESP:GTLBC
+RESP:GTIDA

✧ Device Information Report
+RESP:GTINF

✧ Report for Querying
+RESP:GTGPS
+RESP:GTALM
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTIOS
+RESP:GTTMZ
+RESP:GTAIF
+RESP:GTALS
+RESP:GTALC
+RESP:GTGSV
+RESP:GTUVN
+RESP:GTCVN
+RESP:GTCSN
+RESP:GTCML

✧ Event Report
+RESP:GTPNA
+RESP:GTPFA

+RESP:GTMPN
+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF
+RESP:GTGSM
+RESP:GTGSS
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTFLA
+RESP:GTDOS
+RESP:GTCRA
+RESP:GTTMP
+RESP:GTPDP
+RESP:GTUPC

✧ Data Transfer
+RESP:GTDAT (Short Format)
+RESP:GTDAT (Long Format)
+RESP:GTDTT(Short Format)
+RESP:GTDTT(Long Format)
+RESP:GTPHD
+RESP:GTFSD

✧ Crash Data Packet
+RESP:GTCRD

✧ CANBUS Report Information
+RESP:GTCAN

✧ Heartbeat
+ACK:GTHBD
+SACK:GTHBD

✧ Server Acknowledgement
+SACK

✧ Hex format report

+ACK

+RSP

+EVT

+DAT

+INF

+HBD

+CRD

+CAN