



GSM/GPRS/GPS Tracker **GV55**

@Track Air Interface Protocol

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0. Revision history

Revision	Date	Author	Description of change
V1.01	2012-08-04	Wokky.Lin	Initial
V1.02	2012-08-20	Wokky.Lin	1. Modify the description of IGL in Location Report +RSP. 2. Modify the default value of GTHRM in GTALL.
V1.02	2012-08-27	Wokky.Lin	Modify the length and Rang/format of <Unique ID> parameter in some +EVT report.
V1.02	2012-11-19	Wokky.Lin	Add parameters <GSM Interval> and <PDP Interval> to the command AT+GTDG and the message +RESP:GTALL.
V1.02	2012-11-22	Bart.yuan	Add explanation for +RESP:GTHBM in <Report ID/Report Type>.
V1.03	2012-12-20	Wokky.Lin	Modify the description of bit 11 in +RSP Mask and +EVT Mask.
V1.03	2013-01-12	Wokky.Lin	Modify the length of +ACK Mask and +HBD Mask in GTHRM command and reports. Delete the reserved fields in +ACK Mask, +HBD Mask, +RSP Mask and +EVT Mask.
V1.03	2013-01-30	Wokky.Lin	Delete the <Device name> optional parameter in Hex report.
V1.03	2013-02-07	John.Wang	Add a new command AT+GTPDS for Preserve special device logical state
V1.04	2013-03-07	John.Wang	Add parameter <DOS Report> to the command AT+GTOUT and the message+RESP:GTALL.
			Add parameter<Validity Time> to the command AT+GTDIS and the message+RESP:GTALL.
			Add parameter< Trigger Mode >and< Trigger Report > to the command AT+GTGEO and the message +RESP:GTALL.
			Modify the range of the parameter < Validity > in command AT+GTSPD.
			Add new command AT+GTBZA and AT+GTSPA.
			Add parameter < Sub AT Command > to the command AT+GTRTO.

			Modify the description of the parameter <i><IGF Report Interval></i> in command AT+GTFRI .
V1.04	2013-03-09	John.Wang	Modify the report format of message +RESP:GTALL and add parameter of new functions. Remove the parameter <i><check interval></i> in message FRI of +RESP:GTALS. Add <i><message type></i> of SSR, BZA and SPA in the ACK report of HEX protocol. Add description of command AT+GTDOS and AT+GTGES in HEX protocol
V1.04	2013-04-07	John.Wang	Add crash data report in HEX format
V1.04	2013-04-08	John.Wang	Modify the default value of +CRD Mask in command AT+GTHRM
V1.04	2013-04-12	John.Wang	Add a new bit in the Mask parameter in command AT+GTPDS
V1.04	2013-04-16	John.Wang	Remove +RESP:GTGSM from +EVT
V1.04	2013-05-08	John.Wang	Modify the description of the parameter <i><IGF Report Interval></i> in command AT+GTFRI. Add a NOTE to the parameter <i><Mode></i> in command AT+GTFRI. Modify the default value of +CRD Mask in command AT+GTHRM
V1.05	2013-05-30	John.Wang	Add parameter <i><no ignition></i> to command AT+GTDIS .
V1.05	2013-06-03	Evan.Tu	Add parameter <i><SMS ACK Enable></i> in command AT+GTSRI
V1.05	2013-06-26	John.Wang	Add new command AT+GTGPJ for reporting GPS Jamming status.
V1.05	2013-7-17	Wokky.Lin	Modify the description of <i><Unique ID></i> in chapter 4. HEX Format Report Message.

1. Overview

1.1. Scope of This Document

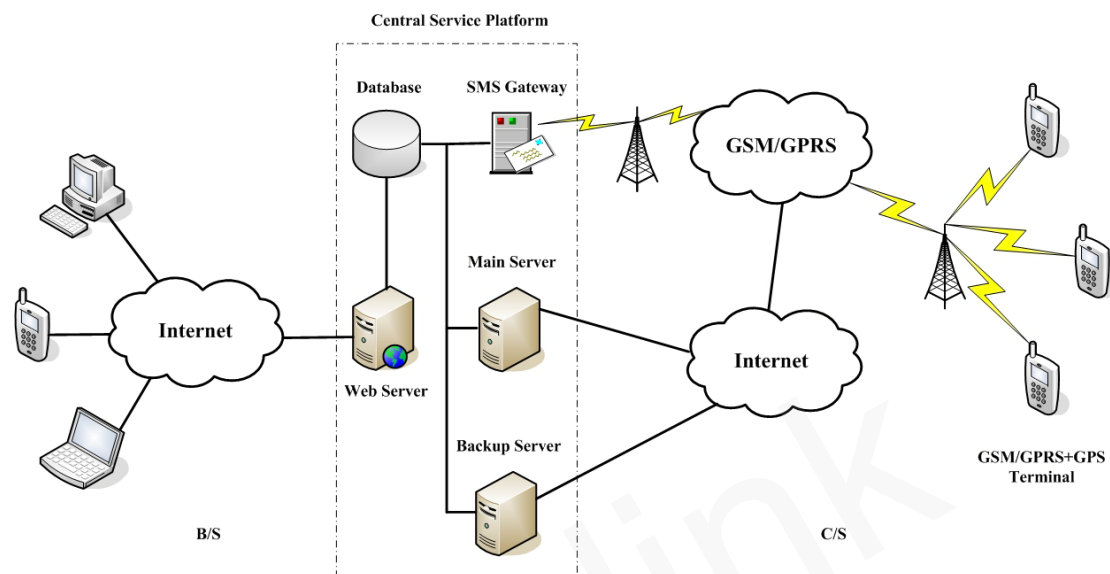
The @Track Air Interface Protocol is a digital communication interface based on printable ASCII characters over SMS or GPRS which is used for all communication between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms with an acknowledgement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

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

1.2. Terms and Abbreviation

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

2. System Architecture



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

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

3. Message Description

3.1. Message Format

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

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

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

The characters 'XXX' identify the deferent message.

The "<parameter1>,<parameter2>,..." carry the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighbouring parameter characters. The parameter string may contain the ASCII characters: '0'-'9', 'a'-'z', 'A'-'Z'.

Detailed descriptions of each message format are located in the specific message sections.

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

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

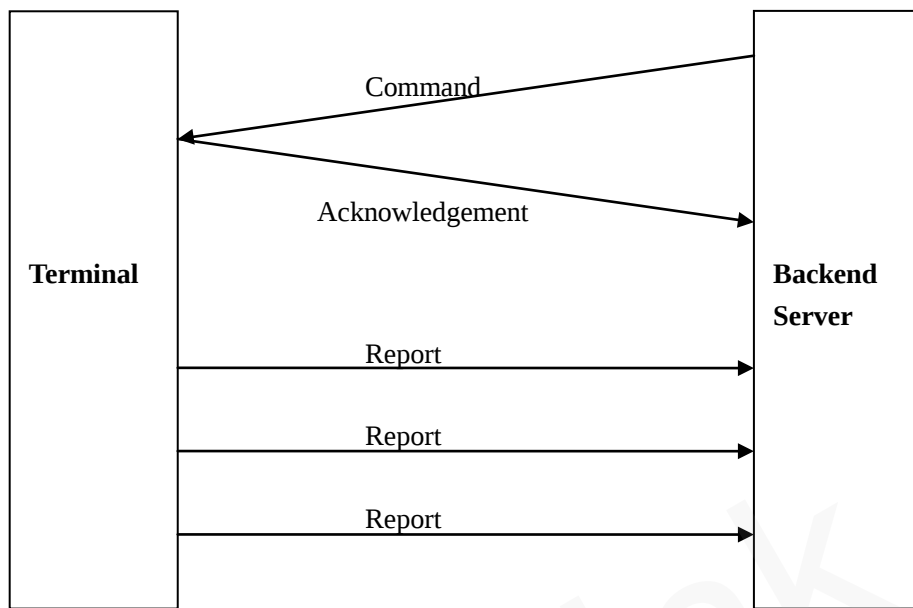


Figure 1: @Tracker Protocol messages flow

3.2. Command And Acknowledgement

3.2.1. Bearer Setting Information

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

➤ **AT+GTBSI=**

Example: AT+GTBSI=gv55,cmnet,,,,,,,,,0000\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Password>: The valid character of password is '0' – '9', 'a' – 'z', 'A' – 'Z'. The default value is "gv55".
- ✧ <APN>: Access point name (APN).
- ✧ <APN User Name>: the GPRS APN user name. If the parameter field is empty, the current value of this parameter will be cleared.
- ✧ <APN Password>: the GPRS APN password. If the parameter field is empty, the current value of this parameter will be cleared.
- ✧ <Reserved>: Not used at present. Please keep empty.
- ✧ <Serial Number>: the serial number for the command. It will be invoked in the ACK message of the command.
- ✧ <Tail Character>: a character to indicate the end of the command. And it must be "\$".

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

➤ **+ACK:GTBSI,**

Example: +ACK:GTBSI,0F0100,135790246811220,,0000,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Protocol Version>: The protocol version that the terminal conforms to. The first two characters point out the device type. As in the example, “0F” means GV55. The middle two characters point out the major version number of protocol and the last two characters point out the minor version number of protocol. And both version numbers are hex digital. For example, “020A” means version 2.10.
- ✧ <Unique ID>: The IMEI of the terminal.
- ✧ <Device Name>: The specified name of the device.
- ✧ <Serial Number>: A serial number which is equal to the <Serial Number> in the corresponding command to distinguish which command the ACK message is for.
- ✧ <Send Time>: The local time to send the ACK message.
- ✧ <Count Number>: A self-increasing count number in each acknowledgment message and report message. It begins from 0000 and increases by 1 for each message. And it rolls back after “FFFF”.
- ✧ <Tail Character>: a character to indicate the end of the command. Must be “\$”.

Note:

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

3.2.2. Backend Server Register Information

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

➤ **AT+GTSRI=**

Example:

AT+GTSRI=gv55,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001\$

AT+GTSRI=gv55,3,,1,some.host.name,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001\$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Report Mode	1	0 – 6	0
Reserved	0		
Buffer Mode	1	0 1 2	1
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0 5 – 360min	0
SACK Enable	1	0 1	0
Protocol Format	1	0 1	0
SMS ACK Enable	1	0 1	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

- 0: Stop reporting.
 - 1: TCP short-connection preferred mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. And if it fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will try to send data via SMS to the SMS gateway.
 - 2: TCP short-connection forced mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. And if it fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the memory buffer if buffer report function is enabled. Otherwise the data is dropped.
 - 3: TCP long-connection mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heart beat data. The backend server should respond to the heart beat data from the terminals.
 - 4: UDP mode. The terminal will send data to the backend server by UDP protocol. Receiving protocol commands via UDP is supported if the GPRS network allows it. It is recommended to enable heartbeat sending and **+RESP:GTPDP** report when UDP receiving is the case.
 - 5: Force on SMS. Only use the SMS for transmitting.
 - 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using UDP protocol. The difference is the terminal will use fixed local port rather than random port to communicate with the server in this mode. Thus the backend server could use identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the primary server.
- ✧ *<Buffer Mode>*: The working mode the buffer report function. When buffer report function is enabled, if the device goes into areas without GSM/GPRS network covering, it will stores all report locally. When the device goes back to areas with GSM/GPRS network covering, it will then send all the buffered reports through GPRS.
- 0: Disable the buffer report function.
 - 1: Low priority. Enable the buffer report function. Under this working mode, the device will send the buffered messages after sending the normal messages.
 - 2: High priority. Enable the buffer report function. Under this working mode, the device will send all the buffered messages before sending any normal message except for the SOS message (**+RESP:GTSOS**).
- ✧ *<Main Server IP / Domain Name>*: The IP address or the domain name of the primary server.
- ✧ *<Main Server Port>*: The port of the primary server.
- ✧ *<Backup Server IP>*: The IP address of the backup server.
- ✧ *<Backup Server Port>*: The port of the backup server.
- ✧ *<SMS Gateway>*: Maximum 20 characters including the optional national code starting with “+” for SMS messages sending. Short code (for example: 10086) is also supported.
- ✧ *<Heartbeat Interval>*: the interval of sending heartbeat package message (**+ACK:GTHBD**)

when report mode is TCP long-connection mode or UDP mode. If set to 0, no heartbeat package message sending.

- ✧ **<SACK Enable>**: This defines whether the backend server should respond to the terminal with SACK message when receiving messages from the terminal.
 - 0: the backend server does not reply SACK message after receiving message from the terminal.
 - 1: the backend server replies SACK message when receiving any message from the terminal.
- ✧ **<Protocol Format>**: This defines the format of the report message sent from the device to the backend server. 0 means using the ASCII format, 1 means the HEX format.
- ✧ **<SMS ACK Enable>**: A numeric to indicate whether to send the acknowledge message to the original number when the command was sent by SMS.
 - 0: the device will send the acknowledge message to the backend server according to the configuration of with the mode configured by the **<Report Mode>**.
 - 1: the device will send the acknowledge message to the original number via SMS if the command was received via SMS.

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

➤ **+ACK:GTSRI,**

Example: +ACK:GTSRI,0F0100,135790246811220,,0001,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

Note:

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

3.2.3. Quick Start Setting

The command **AT+GTQSS** is used to configure the GPRS parameter and backend server information in one command if all these settings are within 160 bytes, otherwise use **AT+GTBSI** and **AT+GTSRI** in two steps.

➤ **AT+GTQSS=**

Example:

AT+GTQSS=gv55,cmnet,,,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,0002\$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Report Mode	1	0 – 6	0
Reserved	0		
Buffer Mode	1	0 1 2	1
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0 5 – 360min	0
SACK Enable	1	0 1	0
Protocol Format	1	0 1	0
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

➤ **+ACK:GTQSS,**

Example:
+ACK:GTQSS,0F0100,135790246811220,,0002,20090214093254,11F0\$

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

3.2.4. Global Configuration

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

➤ AT+GTCFG=

Example: AT+GTCFG=gv55,123456,gv55,,,,,,,,,,,,,0,0003\$ AT+GTCFG=gv55,,1,123.4,,0,1,,2FF,,1,1,300,0,,1,,0,0003\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
New Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	gv55
ODO Enable	1	0 1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
Reserved	0		
Reserved	0		
Report Composition Mask	<=4	0000 – FFFF	003F
Power Saving Mode	1	0 – 2	1
Reserved	0		
Event Mask	<=4	0000 – FFFF	3FFF
Reserved	0		
LED On	1	0 1	0
Info Report Enable	1	0 1	0
Info Report Interval	<=5	30 – 86400sec	300
Location By Call	1	0 1 2	0
Reserved	0		
Backup Battery Charge Mode	1	0 1	0
AGPS Mode	1	0 1	0
GSM Report	4	0000 – FFFF	000F
GPS Lost Time	2	0 – 30min	0
Serial Number	4	0000 – FFFF	

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

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

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

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

- ✧ <Power Saving Mode>: Set mode of power saving function. If mode of power saving function is set to 0, the GPS will be open always. If mode of power saving function is set to 1, the fixed report, geo-fence and speed alarm report functions are suspended when the device is at a standstill or the engine is off (ignition on before). If mode of power saving function is set to 2, it is mostly like mode 1 and the difference is that the fixed report will not be suspended and the fix and send interval of it will be set to <IGF Report Interval> in **AT+GTFRI** when the engine is off.

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

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

- Bit 0 for **+RESP:GTPNA**
- Bit 1 for **+RESP:GTPFA**
- Bit 2 for **+RESP:GTMPN**
- Bit 3 for **+RESP:GTMPF**
- Bit 4 is reserved
- Bit 5 for **+RESP:GTBPL**
- Bit 6 for **+RESP:GTBTC**
- Bit 7 for **+RESP:GTSTC**
- Bit 8 for **+RESP:GTSTT**
- Bit 9 is reserved.
- Bit 10 for **+RESP:GTPDP**
- Bit 11 for the power on **+RESP:GTRTL**
- Bit 12 for the ignition report **+RESP:GTIGN** and **+RESP:GTIGF**

- Bit 13 for the ignition on location report **+RESP:GTIGL**

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

- ✧ **<LED On>**: Configure the working mode of power LED and GPS LED.
 - 0: Each time the device powers on, both LED's will work for 30 minutes and then are turned off deadly.
 - 1: turn on Power LED and GPS LED if necessary.
- ✧ **<Info Report Enable>**: Enable/disable the device information report function (**+RESP:GTINF**). The device information include state of the device, ICCID, GSM signal strength, voltage of external power supply, battery voltage, charging status, Power and GPS LED working mode, the last known time of GPS fix, all digit inputs and outputs status, time zone information and daylight saving setting..
 - 0: Disable the device information report function.
 - 1: Enable the device information report function.
- ✧ **<Info Report Interval>**: The interval of reporting the device information.
- ✧ **<Location By Call>**: Configure how to handle the incoming call.
 - 0: Just hang up the call.
 - 1: Hang up the call and report the current position (**+RESP:GTLBC**).
 - 2: Hang up the call and report the current position with Google Map link through SMS to the phone number of the incoming call.
- ✧ **<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, only charge the backup battery when ignition on is detected. The charge process will begin 3 minutes after the ignition on. The charge process is stopped when ignition off.
- ✧ **<AGPS Mode>**: A numeric to indicate whether to enable AGPS. AGPS is helpful to improve the ratio to get GPS position successfully and reduce the time to get GPS position.
 - 0: Disable the AGPS function.
 - 1: Enable the AGPS function.
- ✧ **<GSM Report>**: Control how or when to report cells' information.

Bit 14 – 15, the 2 high bits mean GSM report mode

 - 0: Not allow the cells' information report.
 - 1: Allow the cells' information report after failed to get GPS position if cell's information available.
 - 2: Report the message **+RESP: GTGSM** after getting GPS position successfully every time if cell's information available.
 - 3: Report the message **+RESP:GTGSM** no matter what result of getting GPS position every time if cell's information available.

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

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

For each bit, set it to 1 to enable corresponding event report, 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 fix, it will send the event report **+RESP:GTGSS** to indicate the GPS signal lost. When the GPS signal is recovered or a successful fix obtained again, the device will send the event report **+RESP:GTGSS** to indicate the recovery. 0 means disable this function.

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

➤ **+ACK:GTCFG,**

Example:			
+ACK:GTCFG,0F0100,135790246811220,,0003,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5. Digital Output

The **AT+GTOUT** command is used to output specified wave shape from the digital output ports. Total three wave shapes is supported as below. If set to wave shape 1, the device will maintain this wave shape at the specified output port after power reset.

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

Wave shape 1:

- ✓ $\langle \text{Duration} \rangle = 0\text{ms}$, $\langle \text{Toggle Times} \rangle = 0$

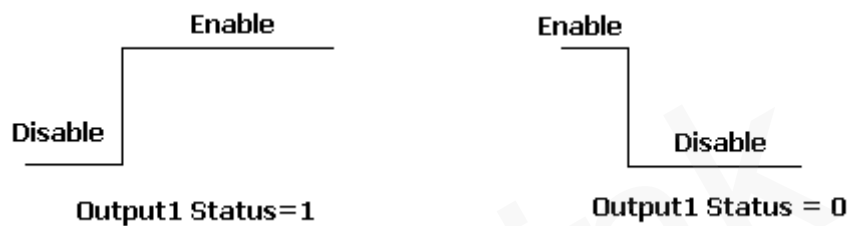


Figure 2: Wave Shape 1

Wave shape 2:

- ✓ $\langle \text{Duration} \rangle = 500\text{ms}$, $\langle \text{Toggle Times} \rangle = 1$

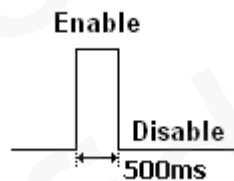


Figure 3: Wave Shape 2

Wave shape 3:

- ✓ $\langle \text{Duration} \rangle = 800\text{ms}$, $\langle \text{Toggle Times} \rangle = 3$

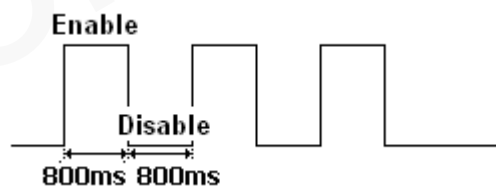


Figure 4: Wave Shape 3

➤ AT+GTOUT=

Example:

AT+GTOUT=gv55,1,,,0,0,0,,,,1,,,,,,,,0004\$

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

Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Output1 Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Output2 Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
DOS Report	1	0–3	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

The acknowledgment message of AT+GTOUT command:

➤ +ACK:GTOUT,

Example:
+ACK:GTOUT,0F0100,135790246811220,,0004,20090214093254,11F0\$

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

3.2.6. Digital Input Port Setting

The command **AT+GTDIS** is used to configure the parameters of 2 digital input ports. Input *<Ignition Detection>* is dedicated for ignition detection. The other one is customizable. If the logical status is changed on the customizable digital input, the device will report message **+RESP:GTDIS** to the backend server.

➤ **AT+GTDIS=**

Example: AT+GTDIS=gv55,0,2,,0,1,1,4,1,,,,,,,,,,,,,0005\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Ignition Detection	1	0	0
Sample Period	<=2	0 1 – 12(×2s)	1
Reserved	0		
No ignition	1	0 1	0
Input ID 1	1	1	1
Enable	1	0 1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Validity Time	<=2	0 1 – 12(×2s)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	

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

- ✧ <Ignition Detection>: ID of the ignition detection port.
- ✧ <Input ID 1>: the digital input port ID.
- ✧ <Sample Period>: the sampling period of the non-interruptible input port.
- ✧ <Enable>: Enable or disable the interrupt input.
 - 0: Disable
 - 1: Enable
- ✧ <No ignition >: No Ignition wire connection.
 - 0: Enable
 - 1: Disable
- ✧ <Debounce Time>: The time for interruptible input port debouncing.
- ✧ <Validity Time>: The validity time of the input port, 0 means not to check the validity time.
This is the time for the input maintaining the new state before the device accepts the new state.

The acknowledgment message of AT+GTDIS command:

➤ +ACK:GTDIS,

Example:			
+ACK:GTDIS,0F0100,135790246811220,,0005,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.7. Input/Output Port Binding

This command is used to configure the user defined output-port action triggered by input ports. If the IO combination is set and the corresponding condition appears, the device will output specified wave shape on the specified output port. Otherwise, the device will restore the initial status of the specified output port. And the device will report message **+RESP:GTIOB** to the backend server when the logical status of bound input ports changes.

➤ AT+GTIOB=

Example: AT+GTIOB=gv55,1,F,A,3,1,0,8,3,,,,,0006\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
IOB ID	1	0 – 3	
Input Mask	1	0 – 3	0
Trigger Mask	1	0 – 3	0
Input Sample Period	<=2	0 1 – 12(×2s)	0
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <IOB ID>: ID of the user defined IO binding.
- ✧ <Input Mask>: Bitwise mask for input ports composition. Each bit, from bit 0 to bit 1, represents one digital input port. Set to 1 to enable and 0 to disable corresponding input port.
 - bit0: ignition detection
 - bit1: digital input 1
- ✧ <Trigger Mask>: bitwise mask for trigger condition composition of the corresponding input ports. Each bit, from bit 0 to bit 1, represents the logical status of the corresponding input port to trigger the IOB event. Set to 1 to use enable status as the trigger condition and 0 to use

disable status. Only when the logical status of all the input ports in one IO binding meets the trigger condition is the IOB event triggered.

- bit0: ignition detection
 - bit1: digital input 1
- ✧ <Input Sample Period>: The period to check the status of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use independent sample period to check the input port status even for the same input port.
- ✧ <Output ID>: ID of the output port to output specified wave when the trigger condition meets. 0 means no wave will be output.

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

➤ **+ACK:GTIOB,**

Example:			
+ACK:GTIOB,0F0100,135790246811220,,1,0006,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ { 'A' – 'Z', '0' – '9' }	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
IOB ID	1	0 – 2	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.8. External Power Supply Monitoring

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

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

➤ **AT+GTEPS=**

Example: AT+GTEPS=gv55,2,250,12000,3,2,1,1,0,0,1,,,,,0007\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1 2	0
Min Threshold	<=5	250 – 28000 mV	
Max Threshold	<=5	250 – 28000 mV	
Sample Period	<=2	0 1 – 12(×2s)	0
Debounce Time	1	0 – 5 (×1s)	0
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

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

- 2: Enable the external power supply monitoring. If the current voltage is outside the range of (<Min Threshold>, <Max Threshold>), the **+RESP:GTEPS** alarm will be triggered.
- ✧ <Min Threshold>: The lower limit to the voltage of the external power supply to trigger the alarm.
- ✧ <Max Threshold>: The upper limit to the voltage of the external power supply to trigger the alarm.
- ✧ <Sample Period>: The sampling period to measure the external power supply.
- ✧ <Debounce Time>: The time for debouncing to avoid exceptional voltage drop of the external power supply.
- ✧ <Output ID>: Specify the ID of the output port (1 to 2) to output specified wave shape when the **+RESP:GTEPS** alarm is triggered. If set to 0, no output wave.
- ✧ <Sync with FRI>: Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the fixed report message.
 - 0: Do not report external power supply voltage with fixed report message.
 - 1: Report external power supply voltage with fixed report message.

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

➤ **+ACK:GTEPS,**

Example:			
+ACK:GTEPS,0F0100,135790246811220,,0007,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.9. Fixed Report Information

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

➤ **AT+GTFRI=**

Example:

AT+GTFRI=gv55,0,,,,,,,,,,,,,0009\$

AT+GTFRI=gv55,1,1,,1,1000,2300,,30,,,,,600,,,,,0009\$

AT+GTFRI=gv55,2,1,,1,1000,2300,,,500,,,,,,,,,0009\$

AT+GTFRI=gv55,3,1,,1,1000,2300,,,1000,,,,,,,,,0009\$

AT+GTFRI=gv55,4,1,,1,1000,2300,,60,,300,,,,,,,,,0009\$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 – 4	0
Discard No Fix	<=2	0 1	1
Reserved	0		
Period Enable	1	0 1	1
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
Reserved	0		
Send Interval	<=5	5 – 86400sec	30
Distance	<=5	50 – 65535m	1000
Mileage	<=5	50 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	5 - 86400sec	600
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ **<Mode>**: The working mode of the fixed report.
 - 0: Disable this function.
 - 1: Fixed Timing Report. The positional report message is sent to the backend server periodically according to the parameter **<Send Interval>**.
 - 2: Fixed Distance Report. The positional report message is sent to the backend server when the straight-line distance between the current GPS position and the last sent GPS position is greater than or equal to the distance specified by parameter **<Distance>**. This function need connect the vehicle ignition signal to the ignition detection port of the device.
 - 3: Fixed Mileage Report. The positional report message is sent to the backend server when the path length between the current GPS position and the last sent GPS position is greater than or equal to the mileage specified by parameter **<Mileage>**. This function need connect the vehicle ignition signal to the ignition detection port of the device.
 - 4: Optimum Report. Simultaneously observe both time interval and path length between two adjacent reports. Report device position if the calculated time interval per current time against the last report time is greater than the **<Send Interval>**, and the length of path between the current position and the last position is greater than the **<Mileage>** setting. This function need connect the vehicle ignition signal to the ignition detection port of the device.
- ✧ **<Discard No Fix>**: Disable/enable reporting when there is no GPS fixing
 - 0: Enable reporting
 - 1: Disable reporting
- ✧ **<Period Enable>**: Disable/enable the time range specified by **<Start time>** and **<End time>**. If the time range is enabled, the position reporting is limited within the time range.
- ✧ **<Start Time>**: The start time of the scheduled fixed report. The valid format is “HHMM”. The value range of “HH” is “00”–“23”. The value range of “MM” is “00”–“59”.
- ✧ **<End Time>**: The end time of the scheduled fixed report. The valid format and range are same as **<Start Time>**.
- ✧ **<Send Interval>**: Period to send the position information. The value range is 5 – 86400 and the unit is second. If **<report mode>** in **AT+GTSRI** is set to force on SMS, this should be greater than 15 seconds.
- ✧ **<Distance>**: the specified distance to send the position information when **<Mode>** is 2. Unit: meter.
- ✧ **<Mileage>**: the specified length to send the position information when **<Mode>** is 3 and 4. Unit: meter.
- ✧ **<Corner Report>**: The threshold to determine whether the device is turning around a corner. 0 to disable the corner report. For other values, the device will compare the current heading with the last known corner, if the difference is greater than or equal to this value, send the corner report with **+RESP:GTFRI**.
- ✧ **<IGF Report Interval>**: Period to fix and send the position information when **<Power Saving Mode>** in **AT+GTCFG** is set to 0/2 and the engine is off, and if **<IGF Report Interval>** less than 60 seconds the GPS will be open always. Its value range is 5 – 86400 and the unit is second.

Note:

If current <mode> is not 0 and the <Power Saving Mode> in AT+GTCFG is set to 0 or 2, the message +RESP:GTFRI will be sent to the backend server periodically according to the parameter <IGF Report Interval> when engine is off.

The acknowledgment message of AT+GTFRI command:

➤ +ACK:GTFRI,

Example: +ACK:GTFRI,0F0100,135790246811220,,0009,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.10. Geo-Fence Information

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

➤ **AT+GTGEO=**

Example: AT+GTGEO=gv55,0,3,121.412248,31.187891,1000,600,1,1,0,0,,,,,000A\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
GEO ID	1	0 – 4	
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 5 – 86400sec	0
Output ID	1	0 – 2	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		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ **<GEO ID>**: ID of the Geo-Fence. Total five zones, 0 to 4, are supported.
- ✧ **<Mode>**: The working mode of the Geo-Fence to report the message **+RESP:GTGEO** to the backend server.
 - 0: disable the zone's Geo-Fence function.
 - 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.

- 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
- 3: Both entering and exiting.
- ✧ <Longitude>: The longitude of a point which is defined as the center of the Geo-Fence circular region. The format is “(-)xxx.xxxxxx” and the value range is from “-180.000000” to “180.000000”. The unit is degree. West longitude is defined as negative starting with minus “-” and east longitude is defined as positive without “+”.
- ✧ <Latitude>: The latitude of a point which is defined as the centre of the Geo-Fence circular region. The format is “(-)xx.xxxxxx” and the value range is from “-90.000000” to “90.000000”. The unit is degree. South Latitude is defined as negative starting with minus “-” and north Latitude is defined as positive without “+”.
- ✧ <Radius>: The radius of the Geo-Fence circular region. The value range is (50 – 6000000) and the unit is meter.
- ✧ <Check Interval>: The interval of GPS checking for the Geo-Fence alarm.
- ✧ <Trigger Mode >:
 - 0 Disable auto trigger mode
 - 21 Automatically set Geo Fence after ignition off. In this mode, the device will automatically set a Geo-Fence with the current location as the center point of the Geo-Fence when ignition is off. This Geo-Fence will only report exiting alarm. The Geo-Fence will be cancelled after exiting
 - 22 Manually enable Geo-Fence after ignition off. In this mode, the device will automatically set a Geo-Fence with the current location as the center point of the Geo-Fence when ignition is off. This Geo-Fence will only report exiting alarm. When the device exits this Geo-Fence, it will cancel this Geo-Fence and disable the trigger mode at the same time. If the driver wants to use this trigger mode again, he has to manually set the trigger mode again
- ✧ <Trigger Report>: Whether to report +RESP:GTGES message when the specified trigger mode is triggered and when the Geo-Fence is cancelled
 - 0 Disable report +RESP:GTGES.
 - 1 Enable report +RESP:GTGES.

The acknowledgment message of AT+GTGEO command:

➤ +ACK:GTGEO,

Example: +ACK:GTGEO,0F0100,135790246811220,,0,000A,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	‘0’ – ‘9’ ‘a’ – ‘z’ ‘A’ – ‘Z’ ‘-’ ‘_’	

GEO ID	1	0 – 4	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.11. Tow Alarm Configuration

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

➤ **AT+GTTOW=**

Example: AT+GTTOW=gv55,1,5,0,120,1,0,5,10,4,10,4,,,,,,,,,000B\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Tow Enable	1	0 1	0
Engine Off to Tow	<=2	5 – 15 min	10
Fake Tow Delay	<=2	0 – 10 min	1
Tow Interval	<=5	30 – 86400 sec	300
Tow Output ID	1	0 – 2	0
Tow Output Status	1	0 1	0
Tow Output Duration	<=3	0 – 255 (×100ms)	0
Tow Output Toggle Times	<=3	0 – 255	0
Rest Duration	<=3	1 – 255 (×15sec)	2
Motion Duration	<=2	1 – 10 (×100ms)	3
Motion Threshold	1	2 – 4	2
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Tow Enable>: Enable or disable tow alarm (+**RESP:GTTOW**).

- 0: Disable the tow alarm
- 1: Enable the tow alarm
- ✧ <Engine Off to Tow>: A time parameter to judge whether the device is considered being towed after the engine off. If the motion sensor doesn't detect stillness within the specified time after engine off, the device is being towed.
- ✧ <Fake Tow Delay>: After engine off and stillness detected, if the motion sensor detects moving again, the device turns into a state called fake tow. If the device keeps in fake tow after a period of time defined by the parameter <Fake Tow Delay>, it is considered being towed.
- ✧ <Tow Interval>: The period to send tow alarm message.
- ✧ <Tow Output ID>: The ID of the output port to output the specified wave shape when tow event is detected.
- ✧ <Tow Output Status>: Please refer to the parameter <Output1 - 2 Status> in chapter 3.2.5.
- ✧ <Tow Output Duration>: Please refer to the parameter <Duration> in chapter 3.2.5.
- ✧ <Tow Output Toggle Times>: Please refer to the parameter <Toggle Times> in chapter 3.2.5.
- ✧ <Rest Duration>: A time parameter to make sure that the device enters stillness status, i.e. the status of the device will be changed to stillness if the motion sensor detects stillness and maintains for a period of time defined by the parameter <Rest Duration>.
- ✧ <Motion Duration>: A time parameter to make sure that the device enters motion status, i.e. the status of the device will be changed to motion if the motion sensor detects motion and maintains for a period of time defined by the parameter <Motion Duration>.
- ✧ <Motion Threshold>: The threshold for the motion sensor to measure whether the device is moving.

The acknowledgment message of AT+GTTOW command:

➤ +ACK:GTTOW,

Example:			
+ACK:GTTOW,0F0100,135790246811220,,000B,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.12. Speed Alarm

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

➤ **AT+GTSPD=**

Example:

AT+GTSPD=gv55,1,80,120,60,300,1,1,0,0,,,,,,,,,000C\$

AT+GTSPD=gv55,2,80,120,60,300,1,1,0,0,,,,,,,,,000C\$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1 2 3	0
Min Speed	<=3	0 – 400km/h	0
Max Speed	<=3	0 – 400km/h	0
Validity	<=4	0 – 3600sec	60
Send Interval	<=4	30 – 3600sec	300
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	

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

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

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

➤ **+ACK:GTSPD,**

Example: +ACK:GTSPD,0F0100,135790246811220,,000C,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.13. SOS Function

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

➤ **AT+GTSOS=**

Example: AT+GTSOS=gv55,1,1,+8613812341234,1,1,0,0,,,,,000D\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 – 2	0
Digital Input ID	1	0 1	0
SOS Number	<=20		
Output ID	1	0– 2	0
Output Status	1	0 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

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

➤ **+ACK:GTSOS,**

Example:
+ACK:GTSOS,0F0100,135790246811220,,000D,20090214093254,11F0\$

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

3.2.14. Excessive Idling Detection

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

➤ AT+GTIDL=

Example: AT+GTIDL=gv55,1,2,1,0,,,1,1,0,0,,,,,000F\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1	0
Time to Stationary	<=2	1 – 30 min	2
Time to Movement	1	1 – 5 min	1
Debounce distance	<=4	0 100-9999m	0
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	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.

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

✧ <Time to Stationary>: If the vehicle is detected to be stationary with ignition on for this time

long, it is considered to be in idling status.

- ✧ <Time to Movement>: After the vehicle enters into idling status, if it moves again or turns ignition off and keeps in that status for this time long, the vehicle is considered to leave idling status.
- ✧ <Debounce distance> After the vehicle enters into idling status, if it moves further than <Debounce distance>, the vehicle will be considered to leave idling status.
- ✧ <Output ID>: Specify the ID of the output port (1 to 2) to output specified wave shape when the vehicle enters into idling status. If set to 0, no output wave.

The acknowledgment message of AT+GTIDL command:

➤ +ACK:GTIDL,

Example: +ACK:GTIDL,0F0100,135790246811220,,000F,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.15. Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh behavior of drive with GPS and motion sensor. Three harsh behaviors would be monitored, the harsh braking, the harsh acceleration and the harsh turn. There are two methods to monitor the harsh behavior, one is by GPS, the other is by motion sensor and GPS. For the function to work, the engine is on and the status is movement.

➤ **AT+GTHBM=**

Example: AT+GTHBM=gv55,1,,,100,21,6,,60,21,6,,,21,15,,1,1,8,3,,,,,0010\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1 2 3	0
Reserved	0		
Reserved	0		
High Speed	<=3	100 – 400km/h	100
ΔV_{hb}	<=3	0 – 100km/h	0
ΔV_{ha}	<=3	0 – 100km/h	0
Reserved	0		
Medium Speed	<=3	60 – 100km/h	60
ΔV_{mb}	<=3	0 – 100km/h	0
ΔV_{ma}	<=3	0 – 100/km/h	0
Reserved	0		
Reserved	0		
ΔV_{lb}	<=3	0 – 100/km/h	0
ΔV_{la}	<=3	0 – 100/km/h	0
Reserved	0		
Output ID	1	0 – 2	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

Accelerate Threshold	<=3	15-50	20
Accelerate Duration	<=3	50-250(*8ms)	65
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

✧ **<Mode>**: Working mode.

- 0: Disable this function
- 1: Enable this function, detected by GPS only.
- 2: Enable this function, detected by motion sensor only. Motion sensor can detect three types of harsh behavior, and device can provide detail information about harsh behavior by using GPS, you need keep GPS open always to collect all the information needed.
- 3: Enable this function, 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 is attached to is considered to be 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 medium speed. If the last known speed is less than **<Medium Speed>**, the vehicle is considered to be low speed.
- ✧ **<ΔVhb>**: The threshold for harsh braking in 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 in high speed level. If set to 0, do not monitor harsh braking behavior in high speed level.
- ✧ **<ΔVha>**: The threshold for harsh acceleration in 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 in high speed level. If set to 0, do not monitor harsh acceleration behavior in 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 in 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 in medium speed level. If set to 0, do not monitor harsh acceleration behavior in medium speed level.
- ✧ **<ΔVlb>**: The threshold for harsh braking in 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 in low speed level. If set to 0, do not monitor harsh braking behavior in low speed level.

- ✧ < ΔV_{la} >: The threshold for harsh acceleration in 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 in low speed level. If set to 0, do not monitor harsh acceleration behavior in low speed level.
- ✧ <Output ID>: Specify the ID of the output port (1 to 2) to output specified wave shape when the harsh behavior is detected. If set to 0, no output wave.
- ✧ <Turn and Break Threshold >: The threshold for the motion sensor to measure whether the device is in harsh turn or harsh break status.
- ✧ <Turn and Break Duration >: The time parameter to confirm that the device enters harsh turn or harsh break status. I.e. The driver behaviors must maintain for a period of time larger than it defined by < Turn and Break Duration > so that harsh turn or harsh break behaviors event can be triggered.
- ✧ <Accelerate Threshold >: The threshold for the motion sensor to measure whether the device is in harsh accelerate behavior status.
- ✧ <Accelerate Duration>: The time parameter to confirm that the device enters harsh accelerate status. I.e. The driver behaviors must maintain for a period of time larger than it defined by < Accelerate Duration > so that harsh accelerate behaviors event can be triggered.

The acknowledgment message of AT+GTHBM command:

➤ +ACK:GTHBM,

Example: +ACK:GTHBM,0F0100,135790246811220,,0010,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, $X \in \{'A' - 'Z', '0' - '9'\}$	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.16. Time Adjustment

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

➤ AT+GTTMA=

Example:

AT+GTTMA=gv55,-,3,30,0,20090917203500,,,,,0011\$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Sign	1	+ -	+
Hour Offset	<=2	0 – 23	0
Minute Offset	<=2	0 – 59	0
Daylight Saving	1	0 1	0
UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character			

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

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

➤ +ACK:GTTMA,

Example:

+ACK:GTTMA,0F0100,135790246811220,,0011,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.17. Outside Working Hours

To protect the privacy of the driver 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 to protect the privacy. When this function is enabled, the device will report empty latitude, empty longitude, empty GSM tower information in all the report messages except for **+RESP:GTSOS**.

➤ **AT+GTOWH=**

Example: AT+GTOWH=gv55,1,1F,0900,1200,1300,1730,,,1,1,1,0,0,,,,,0012\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
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 – 1	0
Output ID	1	0 – 2	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.

- 0: Disable this function.

- 1: Manual mode. By using the equipment connected to the specified digital input, the driver manually enable the time checking. If the device finds it is outside the working hours, it will hide the location information in the report messages. Otherwise report normally.
 - 2: Full manual mode. By using the equipment connected to the specified digital input, the driver has full control to the privacy protection. The device will not check the time against the working hours arrange. It just hides the location information when the input is enabled and reports normally when the input is disabled.
 - 3: Automatic mode. Under this mode, the device will ignore the status of the digital input. It will automatically check the current time against the working hours arrange. If outside the working hours, hide the location information. Otherwise report normally.
- ✧ <Day of Work>: Specify the working days in a week in a bitwise manner.
- Bit 0 for Monday
 - Bit 1 for Tuesday
 - Bit 2 for Wednesday
 - Bit 3 for Thursday
 - Bit 4 for Friday
 - Bit 5 for Saturday
 - Bit 6 for Sunday
- For each bit, 0 means off 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 input ID used to trigger this function when mode is 1. The working parameter of the specified input must be set by **AT+GTDIS** first. If using interruptible digital input, please connect slide button instead of tact button to that input for this function.
- ✧ <Output ID>, <Output Status>, <Duration> and <Toggle Times>: When this function is enabled and current is off duty time, the specified wave will be output to the specified output.

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

➤ **+ACK:GTOWH,**

Example: +ACK:GTOWH,0F0100,135790246811220,,0012,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ { 'A' – 'Z', '0' – '9' }	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

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

3.2.18. Protocol Watchdog

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

➤ AT+GTDG=

Example: AT+GTDG=gv55,1,,1,0130,,1,1,,60,60,,0013\$ AT+GTDG=gv55,2,30,,,1,1,,60,60,,0013\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1 2	0
Ignition Frequency	<=3	10 – 120 min	60
Interval	<=2	1 – 30 day	30
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0 1	1
Input ID	1	0 1	0
Reserved	0		
GSM Interval	4	0 5-1440 min	60
PDP Interval	4	0 5-1440 min	60
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Mode>: Working mode.
 - 0: Disable this function
 - 1: Reboot periodically according to the <Interval> and <Time> setting.
 - 2: Reboot when ignition on.
- ✧ <Ignition Frequency>: When the working mode is 2, if the time interval between two adjacent ignitions is greater than the specified value, the device will automatically reboot upon ignition on.
- ✧ <Interval>: The interval to reboot the device in day.
- ✧ <Time>: At what time to perform the reboot operation when <Interval> is met.
- ✧ <Report Before Reboot>: Whether to report the +RESP:GTDG message before reboot. 0

means no report, 1 to report. If this is enabled, the device will make a real-time location before sending the message in order to send it with the current location information.

- ✧ <Input ID>: ID of the digital input port which is used to trigger the manually reboot. 0 means do not use manual reboot. Only digital input port 1 is supported.
- ✧ <GSM Interval>: The time in minute before rebooting the device when the device lose GSM signal. 0 means not rebooting the device.
- ✧ <PDP Interval>: The time in minute before rebooting the device when the device cannot activate PDP context. 0 means not rebooting the device.

The acknowledgment message of AT+GTDG command:

➤ +ACK:GTDG,

Example: +ACK:GTDG,0F0100,135790246811220,,0013,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ { 'A' – 'Z', '0' – '9' }	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.19. Auto-unlock PIN

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

➤ AT+GTPIN=

Example: AT+GTPIN=gv55,1,0000,,,,,0014\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Enable Auto-unlock PIN	1	0 1	1
PIN	4 – 8	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Enable Auto-unlock PIN>: 1 to enable the auto-unlock PIN function, 0 to disable.
- ✧ <PIN>: PIN Code used to unlock the SIM PIN.

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

➤ +ACK:GTPIN,

Example: +ACK:GTPIN,0F0100,135790246811220,,0014,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ { 'A' – 'Z', '0' – '9' }	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	

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

3.2.20. Real Time Operation

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

➤ AT+GTRTO=

Example: AT+GTRTO=gv55,A,,,,,0015\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Sub Command	1	0 – C	
Sub AT Command	3		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Sub Command>: Valid value is 0–9, A, B, C.

- 0: **GPS**. Get the GPS related information via message **+RESP:GTGPS**.
- 1: **RTL**. Request the terminal to report its current position immediately via message **+RESP:GTRTL**.
- 2: **READ**. Get the current configuration of the terminal via message **+RESP:GTALL**.
- 3: **REBOOT**. Reboot the terminal.
- 4: **RESET**. Reset all parameters to factory setting and clear all buffer messages. Parameters configured by **AT+GTBSI** and **AT+GTSRI**, **AT+GTCFG** and **AT+GTTMA**, **AT+GTPIN** will not be reset.
- 5: **PWROFF**. Power off the device.
- 6: **CID**. Get the ICCID of the SIM card which is being used by the terminal via message **+RESP:GTCID**.
- 7: **CSQ**. Get the current GSM signal level of the terminal via message **+RESP:GTCSQ**.
- 8: **VER**. Get the version information of the device via message **+RESP:GTVER**.
- 9: **BAT**. Get the battery level and adapter status of the terminal via message **+RESP:GTBAT**.
- A: **IOS**. Get status of all the IO ports via message **+RESP:GTIOS**.
- B: **TMZ**. Get the time zone settings via message **+RESP:GTTMZ**.

- C: **GIR**. Get cell information via message **+RESP:GTGSM**.

✧ <Sub AT Command>: Including all the AT commands we defined which save configuration parameters in the device. For example, if you want to get configuration of **AT+GTFRI**, please set **AT+GTRTO=gv55,2,FRI,,,,,0015\$**, and then get it from **+RESP:GTALS**.

Exception: To get local time information, please use "TMZ".

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

➤ **+ACK:GTRTO,**

Example: +ACK:GTRTO,0F0100,135790246811220,,IOS,0015,20090214093254,11F1\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub Command	<=6	Sub Command String	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

3.2.21. Hour Meter Counter

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

➤ **AT+GTHMC=**

Example: AT+GTHMC=gv55,1,12345:12:34,,,,,,,,,0018\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Hour Meter Enable	1	0 1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00

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

- ✧ **<Hour Meter Enable>**: Enable or disable hour meter counter function. If hour meter counter function is enabled, hour meter count will be increased when the device is in ignition.
 - 0: Disable hour meter counter function
 - 1: Enable hour meter counter function
- ✧ **<Initial Hour Meter Count>**: Initial hours meter count. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00– 99999:00:00. When ignition is on at the first time, the **<Hour Meter Count>** which is reported in **+RESP:GTFR1**, **+RESP:GTIGN** or **+RESP:GTIGF** will be increased based on this value.

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

➤ **+ACK:GTHMC,**

Example:			
+ACK:GTHMC,0F0100,135790246811220,,0018,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.22. Jamming Detection

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

➤ **AT+GTJDC=**

Example: AT+GTJDC=gv55,1,10,40,,,,,1,1,15,5,,0019\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1	0
Signal Threshold	<=3	0 – 255	10
C1 Threshold	<=3	0 – 255	40
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 1	0
Duration	<=3	0~255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Mode>: Working mode.

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

✧ <Signal Threshold>, <C1 Threshold>: The built-in jamming detection algorithm uses these two parameters to judge whether the device is currently being jammed. The smaller the parameter, the more sensitive.

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

➤ **+ACK:GTJDC,**

Example:
+ACK:GTJDC,0F0100,135790246811220,,0019,20090214093254,11F0\$

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

3.2.2.3. White List

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

➤ **AT+GTWLT=**

Example: AT+GTWLT=gv55,1,1,2,13813888888,13913999999,,,,,0018\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Call Filter	1	0 1	0
Start Index	<=2	1 – 10	
End Index	<=2	1 – 10	
Phone Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ **<Call Filter>**: The working mode of this function.
 - 0: Disable this function. Allow any phone number to use the location by call.
 - 1: White list for location by call. Only phone numbers saved in the white list could use the location by call function.
- ✧ **<Start Index>, <End Index>**: The index range of the white list to which the phone numbers are to be updated. For example, the **<Start Index>** is set to 1 and the **<End Index>** is set to 2. Then the first two phone numbers in the white list will be updated by the numbers provided in the parameter **<Phone Number List>**. The **<Start Index>** and **<End Index>** defines the total amount of phone numbers that will be updated. If either one is empty, there should be no **<Phone Number List>** parameter followed.
- ✧ **<Phone Number List>**: A list of phone numbers, which are separated by comma, to be updated to the white list. The amount of the phone numbers are defined by **<Start Index>** and **<End Index>**.

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

➤ **+ACK:GTWLT,**

Example: +ACK:GTWLT, 0F0101,135790246811220,,0018,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

Note:

It is necessary to make sure the total size of the command is not greater than 160 if it is sent via SMS.

3.2.24. Crash Detection

The command **AT+GTCRA** is used to configure the parameter for crash detection. When the detection condition is matched, the device will report **+RESP: GTCRA** event message and data packets **+RESP: GTCRD** to the backend server.

➤ **AT+GTCRA=**

Example: AT+GTCRA=gv55,1,5,,,,,0,1,10,6,,0019\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1	0
Sensitivity	1	1 – 9	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0

Output Status	1	0 1	
Duration	<=3	0~255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Mode>: Working mode.

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

✧ <Sensitivity>: Sensitivity of the crash detection. The smaller the number is, the more sensitive this function would be.

The acknowledgment message of AT+GTCRA command:

➤ +ACK:GTCRA,

Example: +ACK:GTCRA, 0F0101,135790246811220,,0019,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.25. Preserve special device logical state Setting

The command AT+GTPDS is used to preserve some special logical states for the device.

The special logical states chosen by the value of component mask will be preserved or reset according to the mode.

➤ AT+GTPDS=

Example: AT+GTPDS=gv55,1,1F,,,,,,FFFF\$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1 2	0
Mask	4	0000-FFFF	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ < Mode >:

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

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

- Bit 0: States of GEO
- Bit 1: Reserved bit
- Bit 2: Reserved bit
- Bit 3: Information of last known position
- Bit 4: State of ignition
- Bit 5: State of wave shape 1

The acknowledgment message of AT+GTPDS command:

➤ +ACK:GTPDS,

Example: +ACK:GTPDS, 0F0101,135790246811220,,000D,20090214093254,FFFF\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ { 'A' – 'Z', '0' – '9' }	
Unique ID	15	IMEI	

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

3.2.26. Start Stop Report

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

➤ AT+GTSSR=

Example: AT+GTSSR=gv55,1,2,1,5,,,,,000F\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1	0
Time to Stop	2	1 – 30 min	2
Time to Start	1	1 – 5 min	1
Start Speed	2	1 – 10 Km/h	5
Long Stop	3	0 – 43200 min	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Mode>: Working mode.

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

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

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

- ✧ **<Start Speed>**: The start speed threshold to determine whether the vehicle is start or not. When the device is detected to be moving with ignition on by the built-in motion sensor, it will start to check the speed from GPS. If the device speed stays greater than this **<Start Speed>** longer than **<Time to Start>**, the vehicle is regarded to be start status. The event report **+RESP:GTSTR** will be reported. Otherwise, if the device speed stays less than or equal with this **<Start Speed>** longer than **<Time to Stop>**, the vehicle is regarded to quit start status. The event report **+RESP:GTSTP** will be reported. If GPS fix abnormal more than 1 minute, only use the built-in motion sensor to detect the start / stop status and do not check the speed.
- ✧ **<Long Stop>**: After the vehicle enters into stop status and stay stop for this time long, the **+RESP:GTLSP** will be sent, and 0 means disable this function.

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

➤ **+ACK:GTSSR,**

Example:			
+ACK:GTSSR,060100,135790246811220,,000F,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.27. Buzzer Alarm Definition

This command is used to set the buzzer alarm, there are four kinds of alarms, each alarm output different sound with the buzzer, and all the alarms are settable in this command, before we use those alarms, we should configure the output ID which connect to the buzzer and enable it.

➤ **AT+GTBZA=**

Example: AT+GTBZA=gv55,2,,,1,2,10,,,0,6,10,,,0,10,10,,,0,20,10,,,,,,0000\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Output ID	1	0 2 3	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 2 Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 3 Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Alarm 4 Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0

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

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

0: Disable buzzer.

1: Reserved

2: Connect Ouput 2 to the external buzzer.

3: Build-in buzzer.

The acknowledgment message of AT+GTBZA command:

➤ +ACK:GTBZA,

Example:			
+ACK:GTBZA, 0F0100,135790246811220,,000D,20090214093254,FFFF\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ { 'A' – 'Z', '0' – '9' }	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.28. Over Speed Alarm with Buzzer notification

This command is used to set the speed thresholds and binding one kind of alarm types for the buzzer alarm, and if the current speed meets one of the thresholds, the buzzer will make a sound according to the alarm type.

➤ AT+GTSPA

Example: AT+GTSPA=gv55,1,20,,2,1,,40,,2,2,,,60,,2,3,,,80,,2,4,,,,,,000C\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Mode	1	0 1 2	0
Speed Threshold 1	<=3	0 – 400km/h	50
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 2	<=3	0 – 400km/h	70
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 3	<=3	0 – 400km/h	90
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 4	<=3	0 – 400km/h	110
Reserved	0		
Validity	<=4	0 – 3600sec	60

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

✧ <Mode>: The working mode

- 0: Disable
- 1: Strict mode, in this mode will check the speed and trigger the buzzer alarm during speed up or down.
- 2: Warning mode, in this mode will only check the speed and trigger the buzzer alarm during speed up.

✧ <Speed Threshold>: The speed threshold.

✧ <Validity>: If the speed meets the alarm condition and maintains a period of time defined by <Validity>, the buzzer alarm will be triggered.

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

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

➤ **+ACK:GTSPA,**

Example: +ACK:GTSPA, 0F0100,135790246811220,,000D,20090214093254,FFFF\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ { 'A' – 'Z', '0' – '9' }	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.29. GPS Jamming Status Report

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

➤ **AT+ GTGPJ=**

Example: AT+GTGPJ=gv55,1,15,3,,,,,1,1,15,5,,0019\$			
Parameter	Length(byte)	Range/Format	Default
Password	4-6	'0'-'9' 'a'-'z' 'A'-'Z'	gv55
Mode	1	0 1	0
CW Threshold	<=2	0 - 31	15
BB Threshold	<=2	0 - 15	3
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 - 2	0
Output Status	1	0 1	0
Duration	<=3	0 - 255(×100ms)	0
Toggle Times	<=3	0 - 255	0
Reserved	0		
Serial Number	4	0000-FFFF	
Tail Character	1	\$	\$

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

NOTE: This function is only supported by UBLOX-7 device.

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

➤ **+ACK:GTGPJ**

Example:
+ACK:GTGPJ,0F0100,135790246811220,,0019,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000–XXXXFF, 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	\$	\$

3.3. Report

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

3.3.1. Position Related Report

➤ **+RESP:GTTOW,**

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

➤ **+RESP:GTDIS,**

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

➤ **+RESP:GTIOB,**

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

➤ **+RESP:GTGEO,**

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

➤ **+RESP:GTSPD,**

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

➤ **+RESP:GTSOS,**

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

➤ **+RESP:GTRTL,**

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

➤ **+RESP:GTDOG,**

The protocol watchdog reboot message.

➤ **+RESP:GTIGL,**

The location message for ignition on.

➤ **+RESP:GTHBM,**

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

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

Example:

+RESP:GTTOW,0F0100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTDIS,0F0100,135790246811220,,,20,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTIOB,0F0100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTGEO,0F0100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTSPD,0F0100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTSOS,0F0100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTRTL,0F0100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTDOG,0F0100,135790246811220,,,01,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTIGL,0F0100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTHBM,0F0100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTHBM,0F0100,135790246811220,,,11,1,1,24.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, 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(0-3)	
Number	1	0 – 1	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

Report ID has different meanings in different messages as below.

- The ID of digital input port which triggers the report message **+RESP:GTDIS** and **+RESP:GTSOS**. The range is 1 .
- The ID of the bound IO which triggers the report message **+RESP:GTIOB**. The range is 0 – 3.
- The ID of Geo-Fence in the report message **+RESP:GTGEO**. The range is 0 – 4.
- The ID of the digital input port which triggers the reboot message **+RESP:GTDOG**. The valid value is 1 .
- The speed level of which the harsh behavior is detected in message **+RESP:GTHBM**. 3 is high speed, 2 is medium speed and 1 is low speed. If the mode 2 was be chosen, the value is always 0, indicate unknown speed.

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

Report type has different meanings in different messages as below.

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

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

- ✧ **<Number>**: The number of the GPS position included in the report message. Generally, it equals to 1.
- ✧ **<GPS Accuracy>**: The HDOP defined in NMEA0183 (The National Marine Electronics Association (NMEA) is a non-profit association of manufacturers, distributors, dealers, educational institutions, and others interested in peripheral marine electronics occupations. The NMEA 0183 standard defines an electrical interface and data protocol for communications between marine instrumentation.). The range of value is 0 – 50. Here 0 means no GPS fix.
- ✧ **<Speed>**: The current speed. Unit: km/h
- ✧ **<Heading>**: The Heading of the GPS fixing.
- ✧ **<Altitude>**: The height above the sea level.
- ✧ **<Longitude>**: The longitude of the current position.
- ✧ **<Latitude>**: The latitude of the current position.
- ✧ **<GPS UTC Time>**: The UTC time from the GPS chip.

- ✧ <MCC>: Mobile country code. It is 3 digits in length and ranges from 000–999.
- ✧ <MNC>: Mobile network code. It is 3 digits in length and ranges from 000–999.
- ✧ <LAC>: Location area code in hex format.
- ✧ <Cell ID>: Cell ID in hex format.
- ✧ <Mileage>: The current total mileage.

➤ **+RESP:GTFRI,**

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

Example:

+RESP:GTFRI,0F0100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,12345:12:34,,,80,210100,,,,20090214093254,11F0\$

+RESP:GTFRI,0F0100,135790246811220,,,00,2,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,0,4.3,92,70.0,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,2000.0,12345:12:34,,,80,210100,,,,20090214093254,11F0\$

+RESP:GTFRI,0F0100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,12345:12:34,,92,80,210100,,,,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Voltage	<=5	0 – 99999 mV	
Report ID/Report Type	2	X(1-4)X(0-1)	
Number	<=2	0 – 2	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Reserved	0		
Reserved	0		
Backup Battery Percentage	<=3	0 – 100	
Device Status	6	000000 – FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ *<External Power Voltage>*: The voltage of the external power supply. If using command **AT+GTEPS** to set the device report the external power supply voltage periodically with fixed report, the device will send the current voltage along with **+RESP:GTFRI** message to the backend server. If not set, this field will be empty.

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

Report ID has four meanings as below.

- 1: fixed timing report.
- 2: fixed distance report.
- 3: fixed mileage report.
- 4: fixed timing and mileage report.

Report type has two meanings as below.

- 0: the normal fixed report.
- 1: corner report which indicates that the device just turns around a corner.

- ✧ *<Number>*: The number of the GPS position included in the report message. In the message **+RESP:GTFRI**, it probably includes one or two. If multi-position in one **+RESP:GTFRI** message, the green part repeats.

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

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

- ✧ <Backup Battery Percentage>: The current volume of the backup battery in percentage.
- ✧ <Device Status>: The state of the device. The left two bits indicate the current motion state of the device, the middle two bits indicate the input ports status, the right two bits indicate the output ports status.

The current motion state of the device.

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

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

The output ports status: A bitwise hex integer to represents the logical status of the digital output. From the lowest bit to the highest bit, each bit represents one of the digital outputs 1 – 2 respectively. For each bit, 0 means disable status, 1 means enable status.

➤ +RESP:GTEPS,

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

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

Example: +RESP:GTEPS,0F0100,135790246811220,,13500,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Voltage	<=5	0 – 99999mV	

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

- ✧ <External Power Voltage>: The value of the external power voltage. When the voltage of the external input meets the alarm condition as set by command **AT+GTEPS**, the device will send the current external input voltage with **+RESP:GTEPS** to the backend server
- ✧ <Report ID/Report Type>: The report ID and the type of the report type in hex format. 4 high bits mean report ID and 4 low bits means report type.
Report ID has different meanings in these two messages.
 - The ID of analog input port which triggers report message **+RESP:GTEPS**. The value is 0.
 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 position included in the report message. Generally, it equals to 1.

➤ **+RESP:GTLBC,**

If the parameter <Location By Call> is enabled by the command **AT+GTCFG**, the device will

get and send the current position to the backend server by the message **+RESP:GTLBC** when there is an incoming call.

Example:

+RESP:GTLBC,0F0100,135790246811220,,+8613800000000,1,4,3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0\$

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

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

➤ **+RESP:GTGES**

Report **+RESP:GTGES** according to parameter **<Trigger Mode>** and **<Trigger report>** of

AT+GTGEO command.**Example:**

+RESP:GTGES,0F0100,135790246811220,gv55,,00,0,100,30,11,1,1,24.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141, ,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
Report ID/Report Type	2	X(0-4)X(0-1)	
Trigger Mode	<=3	0 21 22	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 5 – 86400sec	
Number	<=2	0 – 15	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ < Report Type >: Current Parking-Fence is active or inactive.

- 0 Current Parking-Fence is inactive.
- 1 Current Parking-Fence is active.

3.3.2. Device Information Report

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

➤ **+RESP:GTINF**,

Example:

+RESP:GTINF,0F0100,135790246811220,,16,898600810906F8048812,16,0,1,12000,,4.2,0,0,,20090214013254, , ,00,00,+0800,0,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11 12 21 22 41 42 1A 16	
ICCID	20		
CSQ RSSI	<=2	0 – 31 99	
CSQ BER	<=2	0 – 7 99	
External Power Supply	1	0 1	
External Power Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery Voltage	<=4	0.0 – 4.2 V	
Charging	1	0 1	
LED On	1	0 1	
Reserved	0		
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		

Reserved	0		
Digital Input	2	00 – 01	
Digital Output	2	00 – 02	
Time Zone Offset	5	± HHMM	
Daylight Saving	1	0 1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

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

- ✧ <CSQ BER>: The quality of the GSM signal. The range is 0-7, 99 for unknown.
- ✧ <External Power Supply>: Whether the external power supply is connected.
 - 0: Not connected
 - 1: Connected
- ✧ <External Power Voltage>: The voltage of the external power supply.
- ✧ <Backup Battery Voltage>: The voltage of the backup battery. The value of this field is only valid when the external power is not connected.
- ✧ <Charging>: Whether the backup battery is charging when the main power supply is connected.
 - 0: Not charging
 - 1: Charging

- ✧ <Last Fix UTC Time>: The UTC time of the latest successful GPS fixing.
- ✧ <Digital Input>: A bitwise hex integer to represents the logical status of the digital input. From the lowest bit to the highest bit, each bit represents ignition detection and one of the digital inputs 1 respectively. For each bit, 0 means disable status, 1 means enable status.
- ✧ <Digital Output>: A bitwise hex integer to represents the logical status of the digital output. From the lowest bit to the highest bit, each bit represents one of the digital outputs 1 – 2 respectively. For each bit, 0 means disable status, 1 means enable status
- ✧ <Time Zone Offset>: The time offset of the local time zone to the UTC time.
- ✧ <Daylight Saving>: The current setting of the daylight saving.
 - 0: Daylight saving is disabled
 - 1: Daylight saving is enabled

3.3.3. Report of Real Time Querying

3.3.3.1. +RESP:GTGPS

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

➤ **+RESP:GTGPS,**

Example: +RESP:GTGPS,0F0100,135790246811220,,,,,0000,,,20090214013254,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Reserved	0		
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

3.3.3.2. +RESP:GTALL

After the device receives the command **AT+GTRTO** to read all the configurations, it will send all configurations to the backend server by the message **+RESP:GTALL**. This message only sends via GPRS even if the report mode is force on SMS. The **+RESP:GTALL** is not support the HEX report.

➤ **+RESP:GTALL,**

+RESP:GTALL,0F0105,868034001591460,bbbbbbbb,BSI,cmnet,,,,,,,,SRI,3,,2,220.178.67.210
,10005,192.0.0.0,,30,1,0,0,,,CFG,gv55,bbbbbbbb,1,11.5,,,007F,0,,3FFF,,1,1,600,1,,0,1,001F,5,
TOW,1,10,1,60,0,0,0,0,2,3,2,,,,,,,,EPS,0,0,0,0,0,0,0,0,0,0,,,DIS,0,1,,1,1,1,1,0,,,,,,,,,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,,,,,TMZ,+0800,0,,,,,FRI,1,1,,1,000
0,0000,,120,100,100,,60,30,,,,,GEO,0,2,117.201474,31.832875,500,60,0,0,0,0,21,1,,,1,3,117.201
290,31.833123,1000,60,0,0,0,0,0,0,,,2,0,117.201290,31.833123,1500,60,0,0,0,0,0,1,,,3,1,117.201
290,31.833123,500,30,0,0,0,0,0,0,,,4,3,117.201290,31.833123,2000,60,0,0,0,0,0,0,,,SPD,2,0,30,3
,30,0,0,0,0,,,,,,,,,SOS,0,1,15855122957,2,1,3,5,,,,,PIN,1,,,,,OWH,0,1f,0900,1200,1300,1800,,
0,0,0,0,0,,,,,DOG,2,20,30,0200,,1,1,,60,60,,IDL,1,2,5,100,,,0,0,0,0,0,,,,,HMC,1,00000:00:00,,,,,,,,
HBM,3,,,100,1,1,,60,1,1,,,5,6,,0,0,0,0,30,50,20,65,JDC,0,10,40,,,,,0,0,0,0,,WLT,0,,,,,,,,,HRM
,,,ef,fe1fbf,fe1fbf,fffd,ef,7d,,,,,CRA,0,5,,,,,0,0,0,0,,PDS,0,0,,,,,OUT,0,,,,,BZA,0,,,,0,0,0,,0,0,0,
,,0,0,0,,0,0,0,,,,,SPA,0,50,,60,0,,,70,,60,0,,,90,,60,0,,,110,,60,0,,,,,SSR,1,2,1,4,5,,,,,GPJ,0,12,
3,,,,1,1,15,5,,20130715164450,0B96\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
BSI	3	BSI	BSI
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SRI	3	SRI	SRI
Report Mode	1	0 – 6	
Reserved	0		
Buffer Mode	1	0 1 2	
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		

Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0 5 – 360min	
SACK Enable	1	0 1	
Protocol Format	1	0 1	0
SMS ACK Enable	1	0 1	0
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ODO Enable	1	0 1	
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Power Saving Mode	1	0 – 2	
Reserved	4	0000 – FFFF	0000
Event Mask	4	0000 – FFFF	
Reserved	0		
LED On	1	0 1	
Info Report Enable	1	0 1	
Info Report Interval	<=5	30 – 86400sec	
Location By Call	1	0 1 2	
Reserved	0		
Backup Battery Charge Mode	1	0 1	
Agps Mode	1	0 1	
GSM Report	4	0000 – FFFF	
GPS Lost Time	2	0 – 30min	0

TOW	3	TOW	TOW
Tow Enable	1	0 1	
Engine Off to Tow	≤ 2	5 – 15min	
Fake Tow Delay	≤ 2	0 – 10min	
Tow Interval	≤ 5	30 – 86400sec	
Tow Output ID	1	0 – 2	
Tow Output Status	1	0 1	
Tow Output Duration	≤ 3	0 – 255($\times 100$ ms)	
Tow Output Toggle Times	≤ 3	0 – 255	
Rest Duration	≤ 3	1 – 255($\times 15$ sec)	
Motion Duration	≤ 2	1 – 10($\times 100$ ms)	
Motion Threshold	1	2 – 4	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0 1 2	
Min Threshold	≤ 5	250 – 28000 mV	
Max Threshold	≤ 5	250 – 28000 mV	
Sample Period	≤ 2	0 1 – 12($\times 2$ s)	
Debounce Time	1	0 – 5($\times 1$ s)	
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100$ ms)	
Toggle Times	≤ 3	0 – 255	

Sync with FRI	1	0 1	
Reserved	0		
Reserved	0		
Reserved	0		
DIS	3	DIS	DIS
Ignition Detection	1	0	0
Sample Period	≤ 2	$0 1 - 12(\times 2s)$	
Reserved	0		
No ignition	1	0 1	0
Input ID 1	1	1	1
Enable	1	0 1	
Debounce Time	≤ 2	$0 - 20(\times 10ms)$	
Validity Time	≤ 2	$0 1 - 12(\times 2s)$	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB	3	IOB	IOB
IOB ID0	1	0	0
Input Mask	1	0 - F	
Trigger Mask	1	0 - F	
Input Sample Period	≤ 2	$0 1 - 12(\times 2s)$	

Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	
Toggle Times	≤ 3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID1	1	1	1
Input Mask	1	0 – F	
Trigger Mask	1	0 – F	
Input Sample Period	≤ 2	0 1 – 12($\times 2\text{s}$)	
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	
Toggle Times	≤ 3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IOB ID2	1	2	2
Input Mask	1	0 – F	
Trigger Mask	1	0 – F	
Input Sample Period	≤ 2	0 1 – 12($\times 2\text{s}$)	
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100\text{ms}$)	
Toggle Times	≤ 3	0 – 255	
Reserved	0		
Reserved	0		

Reserved	0		
Reserved			
IOB ID3	1	3	3
Input Mask	1	0 – F	
Trigger Mask	1	0 – F	
Input Sample Period	<=2	0 1 – 12(× 2s)	
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(× 100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TMZ	3	TMZ	TMZ
Time Zone	5	- +HHMM	
Daylight Saving	1	0 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 4	
Discard No Fix	<=2	0 1	
Reserved	0		
Period Enable	1	0 1	
Begin Time	4	HHMM	
End Time	4	HHMM	
Reserved	0		
Send Interval	<=5	0 5 – 86400sec	

Distance	<=5	300 – 65535m	
Mileage	<=5	300 – 65535m	
Reserved	0		
Corner Report	<=3	0 – 180	
IGF Report Interval	<=5	5 - 86400sec	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 5 – 86400sec	
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 – 3	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 5 – 86400sec	

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

Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
GEO ID4	1	4	4
Mode	1	0 – 3	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 5 – 86400sec	
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Trigger Mode	<=2	0 21 22	0
Trigger Report	1	0 1	0
Reserved	0		
Reserved	0		
SPD	3	SPD	SPD
Mode	1	0 1 2	
Min Speed	<=3	0 – 400km/h	
Max Speed	<=3	0 – 400km/h	
Validity	<=4	0 – 3600sec	
Send Interval	<=4	30 – 3600sec	
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 4	
Digital Input ID	1	0 1	
SOS Number	<=20		
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
Enable Auto-unlock PIN	1	0 1	
PIN	1	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
OWH	3	OWH	OWH
Mode	1	0 1 2 3	
Day of Work	<=2	0 – 7F	
Working Hours Start1	4	HHMM	
Working Hours End1	4	HHMM	
Working Hours Start2	4	HHMM	
Working Hours End2	4	HHMM	
Reserved	0		
Reserved	0		
Digital Input ID	1	0 – 1	
Digital Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0 1 2	
Ignition Frequency	<=3	10 – 120min	
Interval	<=2	1 – 30	
Time	4	HHMM	
Reserved	0		
Report Before Reboot	1	0 1	
Input ID	1	0 1 2	
Reserved	0		
GSM Interval	4	0 5-1440 min	60
PDP Interval	4	0 5-1440 min	60

Reserved	0		
IDL	3	IDL	IDL
Mode	1	0 1	
Time to Stationary	2	1 – 30 min	
Time to Movement	1	1 – 5 min	
Speed	2	0 – 20 km/h	
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Hour Meter Enable	1	0 1	
Initial Hour Meter Count	11	00000:00:00-99999:00:00	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
HBM Enable	1	0 1 2 3	

Reserved	0		
Reserved	0		
High Speed	≤ 3	100 – 400km/h	
ΔV_{hb}	≤ 3	0 – 100km/h	
ΔV_{ha}	≤ 3	0 – 100km/h	
Reserved	0		
Medium Speed	≤ 3	100 – 400km/h	
ΔV_{mb}	≤ 3	0 – 100km/h	
ΔV_{ma}	≤ 3	0 – 100km/h	
Reserved	0		
Reserved	0		
ΔV_{lb}	≤ 3	0 – 100km/h	
ΔV_{la}	≤ 3	0 – 100km/h	
Reserved	0		
Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	≤ 3	0 – 255($\times 100ms$)	
Toggle Times	≤ 3	0 – 255	
Turn and Break Threshold	≤ 3	30-70	30
Turn and Break Duration	≤ 3	40-100(*8ms)	50
Accelerate Threshold	≤ 3	15-50	20
Accelerate Duration	≤ 3	50-250(*8ms)	65
JDC	3	JDC	JDC
Mode	1	0 1	0
Signal Threshold	≤ 3	0 – 255	10
C1 Threshold	≤ 3	0 – 255	40
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Output ID	1	0 – 2	
Output Status	1	0 1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
WLT	3	WLT	WLT
Call Filter	1	0 1 2	
Phone Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HRM	3	HRM	HRM
Reserved	0		
Reserved	0		
ACK Mask	1	'0' – '9' 'a' – 'f' 'A' – 'F'	FF
Response Mask	4	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFFFFFF
Event Mask	4	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFFFFFF
Information Mask	2	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFF
HBD Mask	1	'0' – '9' 'a' – 'f' 'A' – 'F'	FF
Crash Data Mask	2	'0' – '9' 'a' – 'f' 'A' – 'F'	FFFF
Reserved	0		
Reserved	0		
Reserved	0		
CRA	3	CRA	CRA
Mode	1	0 1	0
Sensitivity	1	1 – 9	5
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 1	
Duration	<=3	0~255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
PDS	3	PDS	PDS
Mode	1	0 1 2	0
Mask	4	0000-FFFF	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OUT	3	OUT	OUT
DOS Report	1	0-3	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BZA	3	BZA	BZA
Output ID	1	0 2 3	0
Reserved	0		
Reserved	0		
Reserved	0		
Alarm 1 Output Status	1	0 1	

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

Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 2	<=3	0 – 400km/h	70
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 3	<=3	0 – 400km/h	90
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Speed Threshold 4	<=3	0 – 400km/h	110
Reserved	0		
Validity	<=4	0 – 3600sec	60
Alarm Type	1	0 1 – 4	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SSR	3	SSR	SSR
Mode	1	0 1	0
Time to Stop	2	1 – 30 min	2

Time to Start	1	1 – 5 min	1
Start Speed	2	1 – 10 Km/h	5
Long Stop	3	0 – 255 min	0
Reserved	0		
Reserved	0		
Reserved	0		
GPJ	3	GPJ	GPJ
Mode	1	0 1	0
CW Threshold	<=2	0 - 31	15
BB Threshold	<=2	0 - 15	3
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0 1	
Duration	<=3	0~255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.3. +RESP:GTALS

After the device receives the command **AT+GTRTO** to get sub AT command configuration information, it will send the configuration information to the backend server by the message **+RESP:GTALS**. Different AT Command get different configuration information. For example, get FRI configuration, **AT+GTRTO=gv55,2,FRI,,,,,0015\$**

➤ **+RESP:GTALS,**

Example:

+RESP:GTALS,0F0100,862170010822169,gv55,FRI,1,0,,0,0000,0000,,30,1000,1000,,40,60,0

0000000,20121205072258,00C3\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub AT Command	3	'a' – 'z' 'A' – 'Z' '	
Mode	1	0 – 4	
Discard No Fix	<=2	0 1	
Reserved	0		
Period Enable	1	0 1	
Start Time	4	HHMM	
End Time	4	HHMM	
Reserved	0		
Send Interval	<=5	5 – 86400sec	
Distance	<=5	50 – 65535m	
Mileage	<=5	50 – 65535m	
Reserved	0		
Corner Report	<=3	0 – 180	
IGF Report Interval	<=5	0 5-86400sec	
ERI Mask	8	00000000-FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.4. +RESP:GTCID

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

➤ **+RESP:GTCID,****Example:****+RESP:GTCID,0F0100,135790246811220,,898600810906F8048812,20090214093254,11F0\$**

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

3.3.3.5. +RESP:GTCSQ

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

➤ **+RESP:GTCSQ,****Example:****+RESP:GTCSQ,0F0100,135790246811220,,16,0,20090214093254,11F0\$**

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

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

CSQ RSSI	Signal Strength (dBm)
0	<-133
1	-111

2 – 30	-109 – -53
31	>-51
99	Unknown

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

3.3.3.6. +RESP:GTVR

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

➤ **+RESP:GTVR**,

Example:			
+RESP:GTVR,0F0100,135790246811220,,GV55,0100,0101,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Software Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

3.3.3.7. +RESP:GTBAT

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

➤ **+RESP:GTBAT**,

Example:
+RESP:GTBAT,0F0100,135790246811220,,1,12000,,4.40,0,0,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Supply	1	0 1	
External Power Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery Voltage	<=4	0.0 – 4.2 V	
Charging	1	0 1	
LED On	1	0 1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.3.8. +RESP:GTIOS

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

➤ **+RESP:GTIOS,****Example:**
+RESP:GTIOS,0F0100,135790246811220,,0,1200,1300,00,00,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Digital Input Status	2	00 – 03	
Digital Output Status	2	00 – 03	

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

3.3.3.9. +RESP:GTTMZ

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

➤ **+RESP:GTTMZ,**

Example:			
+RESP:GTTMZ,0F0100,135790246811220,,+0800,0,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Time Zone Offset	5	± HHMM	
Daylight Saving	1	0 1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3.4. 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:GTMPE:** The report for disconnecting main power supply
- +RESP:GTBTC:** Backup battery starts charging report
- +RESP:GTSTC:** Backup battery stop charging report.
- +RESP:GTBPL:** Backup battery low(4 times report before power off)
- +RESP:GTSTT:** Device motion state indication when the motion state is changed
- +RESP:GTPDP:** GPRS connection establishment report
- +RESP:GTIGN:** Ignition on report
- +RESP:GTIGF:** Ignition off report
- +RESP:GTIDN:** Enter into idling status
- +RESP:GTIDF:** Leave idling status
- +RESP:GTJDR:** Jamming indication
- +RESP:GTGSM:** The report for the information of the service cell and the neighbor cells.
- +RESP:GTGSS:** GPS signal status
- +RESP:GTCRA:** Crash incident report.
- +RESP:GTSTR:** Vehicle enters into start status
- +RESP:GTSTP:** Vehicle enters into stop status
- +RESP:GTLSP:** Vehicle enters into long stop status.
- +RESP:GTDOS:** Output status change with wave shape 1
- +RESP:GTGPJ:** Gps Jamming status report.

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

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

Example:

```
+RESP:GTPNA,0F0100,135790246811220,,20090214093254,11F0$
+RESP:GTPFA,0F0100,135790246811220,,20090214093254,11F0$
+RESP:GTPDP,0F0100,135790246811220,,20090214093254,11F0$
```

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

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

- +RESP:GTMPN,
- +RESP:GTMPE,
- +RESP:GTBTC,
- +RESP:GTJDR,
- +RESP:GTCRA,

Example:

```
+RESP:GTMPN,0F0100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,2009021401
3254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTMPE,0F0100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013
254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTBTC,0F0100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013
254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTJDR,0F0100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013
254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTCRA,0F0100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,2009021401
3254,0460,0000,18d8,6141,00,20090214093254,11F0$
```

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

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

➤ **+RESP:GTSTC,****Example:**

+RESP:GTSTC,0F0100,135790246811220,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0\$

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

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

➤ **+RESP:GTBPL,****Example:**

+RESP:GTBPL,0F0100,135790246811220,,3.53,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Backup Battery Voltage	<=4	0.0 – 4.2 V	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTSTT,****Example:**

+RESP:GTSTT,0F0100,135790246811220,,16,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
State	2	11 12 21 22 41 42 16	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

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

detected

➤ **+RESP:GTIGN,****Example:**
+RESP:GTIGN,0F0100,135790246811220,,1200,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition Off	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ *<Duration of Ignition Off>*: Duration since last time the ignition is off. If greater than 999999 seconds, report as 999999 seconds.

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

➤ **+RESP:GTIGF,****Example:**

+RESP:GTIGF,0F0100,135790246811220,,1200,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Duration of Ignition On	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

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

Example:

+RESP:GTIDN,0F0100,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTSTR,060100,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTSTP,060100,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

+RESP:GTLSP,060100,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

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

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

➤ **+RESP:GTIDE,****Example:**

+RESP:GTIDE,0F0100,135790246811220,,22,300,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion State	2	11 12 16 22	
Duration of Idling Status	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ *<Motion State>*: The current motion state when the vehicle leaves idling status.

✧ *<Duration of Idling Status>*: The time that the vehicle has been in idling status. If greater

than 999999 seconds, report as 999999 seconds.

➤ **+RESP:GTGSM**

Example:
+RESP:GTGSM,080100,135790246811220,FRI,0460,0000,1878,0871,20,,0460,0000,1878,0152,16,,,,,,,,,,,,,,,,,,,,,0460,0000,1878,0873,57,00,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Fix Type	3	SOS RTL LBC FRI GIR	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4		
Cell ID1	4		
RX Level1	2	0-63	
Reserved	2	00	
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
Cell ID2	4		
RX Level2	2	0-63	
Reserved	2	00	
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		
Cell ID3	4		
RX Level3	2	0-63	
Reserved	2	00	
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		

Cell ID4	4		
RX Level4	2	0-63	
Reserved	2	00	
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	4		
RX Level5	2	0-63	
Reserved	2	00	
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4		
Cell ID6	4		
RX Level6	2	0-63	
Reserved	2	00	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	4		
RX Level	2	0-63	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Fix Type> : A string to indicate what kind of GPS fixing this cell information is for.

"SOS" This cell information is for SOS requirement.

"RTL" This cell information is for RTL requirement.

"LBC" This cell information is for LBC requirement.

"FRI" This cell information is for FRI requirement.

"GIR" This cell information is for sub command "C" in AT+GTRTO command.

✧ <MCC(i)> : MCC of the neighbor cell *i* (*i* is the index of the neighbor cell).

✧ <MNC(i)> : MNC of the neighbor cell *i*.

✧ <LAC(i)> : LAC in hex format of the neighbor cell *i*.

- ✧ **<Cell ID(i)>** : Cell ID in hex format of the neighbor cell *i*.
- ✧ **<RX Level(i)>** : The signal strength of the neighbor cell *i*. This parameter is a 6-bit coded in 1 dB steps:
 - 0: -110 dBm
 - 1 to 62: -109 to -48 dBm
 - 63: -47 dBm
- ✧ **<MCC>**: MCC of the service cell.
- ✧ **<MNC>**: MNC of the service cell.
- ✧ **<LAC>**: LAC in hex format of the service cell.
- ✧ **<Cell ID>**: Cell ID in hex format of the service cell.
- ✧ **<RX Level>**: The signal strength of the service cell.

Note:

1. It probably includes only several neighbor cells' (even no neighbor cell) information. If some neighbor cell wasn't find, all the fields of the neighbor cell will be empty.
2. "ffff" in the field of **<LAC(i)>**, **<Cell ID(i)>** means the terminal doesn't know the value.
3. This message cannot be sent via SMS.

➤ **+RESP:GTGSS**

Example:

+RESP:GTGSS,0F0100,135790246811220,,1,9,11,,0,4,3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GPS Signal Status	1	0 1	
Satellite Number	2	0 - 24	
Device State	2	11 12 21 22 41 42 16	
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Heading	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	

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

✧ <GPS Signal Status>: 0 means lost GPS signal or no successful GPS fix, 1 means GPS signal recovered and successful GPS fix.

✧ <Satellite Number>: The number of the in sight satellites when fix successful, if fix failed, The parameter is reserved.

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

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

➤ +RESP:GTDOS

Example:

+RESP:GTDOS,0F0103,862170010190559,,2,0.0,57.7,117.201371,31.833041,20121015085137,0460,0000,5663,5A02,,2,1,20121015085153,0149\$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Wave1 output id	1	1-2	
Wave1 ouptut active	1	0 1	

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

- ✧ < Wave1 output id>: ID of the output With wave shape 1
- ✧ < Wave1 output active>: The output status with wave shape 1

➤ **+RESP:GTGPJ**

Example: +RESP:GTGPJ,0F0100,135790246811220,,16,0,4.3,92,70.0,121.354335,31.222073,20090214 013254,0460,0000,18d8,6141,00,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000-XXXXFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' "-" "_"	
CW Jamming Value	<=3	0-255	
GPS Jamming State	2	0 1 2 3	
GPS Accuracy	<=2	0	
Speed	<=5	0.0 –999.9 km /h	
Heading	<=3	0 – 359	

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

✧ <CW Jamming Value>: Current continues 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.

NOTE: +RESP:GTGPJ message will not be reported until first good fix.

3.3.5. Buffer Report

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

- ✧ GSM network is not available
- ✧ Failed to activate GPRS context for the TCP or UDP connection.
- ✧ Failed to establish the TCP connection with the backend server.

These messages will be sent to the backend server when connection to the server recovers again.

The buffer reports are saved to the built-in non-volatile memory in case the device is reset. The terminal can buffer up to 3000 messages.

Detailed information about buffer report is listed below.

- ✧ Only **+RESP** messages are buffered except that **+RESP:GTALL** is not buffered
- ✧ In the buffer report, the original header string “**+RESP**” is replaced by “**+BUFF**” while keeps the other content untouched including the original sending time and count number.
- ✧ Buffered messages will be sent only via GPRS by TCP or UDP protocol. They cannot be sent via SMS. If the current report mode is forcing on SMS, the buffered messages will be sent via TCP short connection.
- ✧ The buffered messages will be sent after the other normal messages sending if <Buffer

Mode> in **AT+GTSRI** is set to 1.

- ✧ The buffered messages will be sent before the other normal messages sending if *<Buffer Mode>* in **AT+GTSRI** is set to 2. The SOS message has the highest priority and is sent before the buffered messages.

Example:

The following is an example of the buffered message:

+**BUFF**:GTFRI,0F0101,868034001000579,gv55,0,10,1,1,0.4,60,56.6,117.201309,31.833082,20130107182151,0460,0000,5678,2079,00,21188.6,,,,100,210100,,,,20130107182154,01B8\$

3.3.6. Report Google Maps Hyperlink

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

➤ **Google Maps hyperlink**

Example:

gv55:

<<http://maps.google.com/maps?q=31.222073,121.354335>

F1 D2009/01/01T00:00:00>

Parameter	Length(byte)	Range/Format	Default
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Google Maps Hyperlink Header	30	http://maps.google.com/maps?q=	http://maps.google.com/maps?q=
Latitude	<=10	(-)xx.xxxxxx	
Longitude	<=11	(-)xxx.xxxxxx	
GPS Fix	<=3	F0 F1 – F50	
GPS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	

- ✧ *<GPS Fix>*: The accuracy of the location information. F0 means no GPS fix.

3.3.7. Crash Data Packet

The message contains 10s XYZ-axis acceleration data before and after crash. When crash accident is detected, the 10s XYZ-axis acceleration data before crash happened 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 other three frames.

➤ **+RESP:GTCRD,**

Example:

+**RESP**:GTCRD,060204,359231038715676,,0,3,1,000100010055000100020051000000000055000000100520001000100560001000100530000000000540000000100510001000000540000000

```
100530001000100550001000000530001000100540000000300510000000100530001ffff005300
00000100530001000000520000000000540003000100530002ffff0053000100010052000000020
0510001000300530001000000530001ffff00540000000100520000000300550002000100530001
000000520001000100550001000100540001ffff0053000000020053000000020056ffff000000530
00000000052000100000052000100020052000200010054000000010054ffff0002005200000001
00510001ffff00530002ffff00540001fffe00520001ffff00530000000200520000000200520002000
100520001000100560001000100520001ffff00530001000200560001ffff00510001000100550001
00000051000200020053000000000055000100000052000100010055000100010053ffffff00520
000ffff005200010002005300020001005400010000005500010002005300010000005300000001
00530001000100520000ffff00510001000000520002000000520002ffff005200010002005300000
00200540000000000540001fffe00530001ffff00520001000100520001000100530001000100520
000,20120330120443,005C$
```

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Data Type	1	0 1	
Total frame	1	3	
Frame Number	1	1 -3	
Data	1000	'0'-'9' 'a'-'f'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

Example:

+RESP:GTCRD,060204,359231038715676,,0,3,1,000100010055... ,20120330120443,005C\$

This is the oldest XYZ-axis acceleration data:

Convert 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,060204,359231038715676,,1,3,3,...ffffff10052,20120330115736,005A\$

This is the last XYZ-axis acceleration data:

Convert 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 the 82 in decimal format and -g is -82. With the linear feature, the acceleration data 1312 represents +16g and -1312 represents -16g.

3.4. Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server if communicating via GPRS. The heartbeat package is sent to the backend server at the interval defined by *<Heartbeat Interval>* in **AT+GTSRI** command.

➤ **+ACK:GTHBD**

Example: +ACK:GTHBD,0F0100,135790246811220,,20100214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

Whenever the backend server receives a heartbeat package, it should reply an acknowledgement to the device.

➤ **+SACK:GTHBD**

Example: +SACK:GTHBD,0F0100,11F0\$ +SACK:GTHBD,,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ *<Protocol Version>*: The device type and the protocol version that the backend server supported. This field is optional. The backend server could just send an empty field to decrease the length of the heartbeat data acknowledgement.
- ✧ *<Count Number>*: The backend server uses the *<Count Number>* extracted from the heartbeat package from the device as the *<Count Number>* in the server acknowledgement of the heartbeat.

3.5. Server Acknowledgement

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

➤ **+SACK:**

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

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

4. HEX Format Report Message

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

All the report messages are sorted into 5 categories and messages in the same category use the same header string, including acknowledgement to command (**+ACK**), location report (**+RSP**), event report (**+EVT**), information report (**+INF**) and the heartbeat data (**+HBD**).

The composition of the HEX report message could be customized by **AT+GTHRM** command. The actual length of each HEX report message varies depending on set some 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 backend server could use this checksum to verify the integrity of the received data.

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

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

4.1. Hex Report Mask

AT+GTHRM command consists of <+ACK Mask>, <+RSP Mask>, <+EVT Mask>, <+INF Mask>, <+HBD Mask> and <+CRD Mask> to control the composition of the corresponding HEX report message. In each HEX report message, the corresponding mask for the report is involved to indicate which part is reported.

➤ **AT+GTHRM=**

Example: AT+GTHRM=gv55,,,EF,FFFFFFFF,FFFFFFFF,FFFF,FF,FE0F,,,0018\$			
Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gv55
Reserved	0		
Reserved	0		
+ACK Mask	1	00– FF	EF
+RSP Mask	4	00000000 – FFFFFFFF	FE1FBF
+EVT Mask	4	00000000 – FFFFFFFF	FE1FBF
+INF Mask	2	0000 – FFFF	FFFD
+HBD Mask	1	00 – FF	EF
+CRD Mask	2	0000–FFFF	7D
Reserved	0		
Reserved	0		
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	<Unique ID>
Bit 3	<Firmware Version>

Bit 2	<Protocol Version>
Bit 1	<Device Type>
Bit 0	<Length>

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

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	< Satellites Information>
Bit 18	<Motion Status>
Bit 17	<Digital IO Status>
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	<External Power Voltage>
Bit 11	<Battery Level>
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>

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

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

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	< Satellites Information>
Bit 18	<Motion Status>
Bit 17	<Digital IO Status>
Bit 16	Reserved
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved

Bit 12	<External Power Voltage>
Bit 11	<Battery Level>
Bit 10	<Firmware Version>
Bit 9	<Protocol Version>
Bit 8	<Device Type>
Bit 7	<Length>
Bit 6	<Unique ID>
Bit 5	<Count Number>
Bit 4	<Send Time>
Bit 3	<MCC/MNC/LAC/Cell ID/Reserved>
Bit 2	<Altitude>
Bit 1	<Azimuth>
Bit 0	<Speed>

- ✧ <+INF Mask>: Component mask of the information report message. Bit 8 to Bit 15 indicate which group of items is included when reporting message other than +RESP:GTINF.

Bit	Item to Mask
Bit 15	+RESP:GTGIR
Bit 14	+RESP:GTTMZ
Bit 13	+RESP:GTCSQ
Bit 12	+RESP:GTCID
Bit 11	+RESP:GTBAT
Bit 10	+RESP:GTGPS
Bit 9	+RESP:GTIOS
Bit 8	+RESP:GTVER
Bit 7	Reserved
Bit 6	<Count Number>
Bit 5	<Send Time>
Bit 4	<Firmware Version>
Bit 3	<Protocol Version>
Bit 2	<Device Type>

Bit 1	<Unique ID>
Bit 0	<Length>

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

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

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

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	<Unique ID>

Bit 0	<Length>
--------------	----------

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

➤ **+ACK:GTHRM,**

Example: +ACK:GTHRM, 0F0100,135790246811220,,0019,20090214093254,11F0\$			
Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

4.2. Acknowledgement +ACK

➤ **+ACK,**

Example: 2B 41 43 4B 01 EF 24 0F 01 03 03 02 56 50 22 00 0A 00 27 07 00 07 F9 07 DD 01 1E 0A 15 0A 01 01 F9 19 0D 0A			
Parameter	Length(byte)	Range/Format	Default
Message Header	4	+ACK	+ACK
Message Type	1		
Report Mask	1	00 – FF	
Length	1		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	

ID	1		
Serial Number	2	0000 – FFFF	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Message Type>*: The ID of the command that the device received.

Command	ID
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
Reserved	3
AT+GTCFG	4
AT+GTTOW	5
AT+GTEPS	6
AT+GTDIS	7
AT+GTOUT	8
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14
Reserved	15
AT+GTRTO	16
Reserved	17
Reserved	18
Reserved	19
Reserved	20
AT+GTUPD	21
AT+GTPIN	22

Reserved	23
AT+GTOWH	24
AT+GTDG	25
Reserved	26
AT+GTJDC	27
AT+GTIDL	28
AT+GTHBM	29
AT+GTHMC	30
Reserved	31
Reserved	32
Reserved	33
AT+GTWLT	34
AT+GTHRM	35
AT+GTCRA	36
AT+GTPDS	38
AT+GTBZA	39
AT+GTSPA	40
AT+GTSSR	41
Reserved	42
AT+GTGPJ	43

- ✧ <Report Mask>: It refer to the <+ACK Mask> in **AT+GTHRM**.
- ✧ <Length>: The whole length of the acknowledgement message header to the tail characters.
- ✧ <Unique ID>: The Bit 4 of <+ACK Mask> is always 0 and IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

- ✧ <ID>: Sub-command ID of **AT+GTRTO** or the ID of **AT+GTIOB** and **AT+GTGEO**, for others, set to 0.
- ✧ <Send Time>: The local time to send the acknowledgement message. 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 *<Message Type>* to *<Count Number>*.

4.3. Location Report +RSP

Location report messages including **+RESP:GTTOW**, **+RESP:GTEPS**, **+RESP:GTDIS**, **+RESP:GTIOB**, **+RESP:GTFRI**, **+RESP:GTGEO**, **+RESP:GTSPD**, **+RESP:GTRTL**, **+RESP:GTDG**, **+RESP:GTIGL**, and **+RESP:GTHBM** use this format.

➤ **+RSP**,

Example:

2B 52 53 50 07 00 FE 0F BF 00 5D 0F 01 03 03 02 56 50 22 00 0A 00 27 07 5F 01 00 22 08 30
01 01 00 24 00 00 AE 00 28 06 FC 0F 06 01 E5 F6 04 07 DD 01 1E 00 14 04 04 60 00 00 55 0A
1A 11 00 00 07 00 00 00 00 07 00 0C 0C 23 00 00 00 0C 0C 23 07 DD 01 1E 08 14 05 00 C7 DE
11 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Digital Input Status	1	00 – 02	
Digital Output Status	1	00 – 02	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Report ID / Report Type	1		

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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

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

Command	ID
+RESP:GTRTL (PNL)	0
+RESP:GTTOW	1
Reserved	2
+RESP:GTLBC	3
+RESP:GTEPS	4
+RESP:GTDIS	5
+RESP:GTIOB	6
+RESP:GTFRI	7

+RESP:GTGEO	8
+RESP:GTSPD	9
+RESP:GTSOS	10
+RESP:GTRTL	11
+RESP:GTDOG	12
Reserved	13
Reserved	14
+RESP:GTHBM	15
+RESP:GTIGL	16

- ✧ *<Report Mask>*: It refer to the *<+RSP Mask>* in **AT+GTHRM**.
- ✧ *<Unique ID>*: The Bit 6 of *<+RSP Mask>* is always 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

- ✧ *<Digital Input Status>*: The mask of digital input1 status consist of the byte.

Input status mask	ID
Digital Input1	0x01
Reserved	
Reserved	
Reserved	

- ✧ *<Digital Output Status>*: The mask of digital output1 and digital output2 status consist of the byte.

Output status mask	ID
Digital Output1	0x01
Digital Output2	0x02
Reserved	
Reserved	

- ✧ *<Motion Status>*: 0x1A is a status which before 0x16 status.
- ✧ *<Satellites>*: The low nibble is for *<Satellites>*.
- ✧ *<Report ID / Report Type>*: The high nibble is for *<Report ID>* and the low nibble is for

<Report Type>

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

Longitude	121390847			
121.390847				
HEX	07	3C	46	FF

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

Latitude	31164503			
31.164503				
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 only has 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 only has 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 message for +RESP:GTLBC use below format

Example:

2B 52 53 50 03 00 FE 1F BF 00 66 0F 01 03 03 02 56 50 22 00 0A 00 27 07 62 2E 46 01 00 21 08
00 70 02 15 44 50 29 3F 01 01 00 00 03 00 81 00 40 06 FC 59 86 01 E5 BC 2D 07 DD 01 1E 03

28 08 04 60 00 00 56 78 5D 7B 00 00 00 01 00 00 00 0B 05 00 04 32 00 00 00 0E 2A 29 07 DD
 01 1E 0B 28 09 01 82 6A 27 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+RSP	+RSP
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
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	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ **<Number Length / Number Type>**: The high nibble is for **<Number Length>** and the low nibble is for **<Number Type>**. **<Number Length>** is the number of byte used to represent the phone number including this byte. **<Number Type>** indicates if there is a '+' sign before the phone number. 1 means has the sign, 0 means no sign.

	Number Length	Number Type
HEX	7	0

- ✧ **<Phone Number>**: Not more than 10 bytes. In each byte, use the high nibble and low nibble to represent one digit of the phone number respectively. If 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

Location report message for +**RESP:GTSOS** use below format

Example: 2B 52 53 50 0A 00 FE 1F BF 00 60 0F 01 03 03 02 56 50 22 00 0A 00 27 07 62 2E 64 01 00 21 09 10 00 01 01 00 00 06 00 81 00 32 06 FC 59 89 01 E5 BC 06 07 DD 01 1E 03 28 26 04 60 00 00 56 78 5D 7B 00 00 00 01 00 00 00 0B 05 00 05 14 00 00 00 0E 2B 0B 07 DD 01 1E 0B 28 27 01 84 D1 47 0D 0A			
Parameter	Length(byte)	Range/Format	Default
Message Header	4	+RSP	+RSP

Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Report ID / Report Type	1		
Reserved	1	00	00
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	2	0000 – FFFF	
Reserved	1	00	00

Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

4.4. Information Report +INF

Information report messages include **+RESP:GTINF**, **+RESP:GTGPS**, **+RESP:GTCID**, **+RESP:GTCSQ**, **+RESP:GTVER**, **+RESP:GTBAT**, **+RESP:GTIOS**, **+RESP:GTTMZ** and **+RESP:GTGIR**. These messages use the same format as below, however only **+RESP:GTINF** includes all the items while others only include related information to themselves.

➤ **+INF**,

Example: 2B 49 4E 46 01 FF FD 00 AD 56 50 22 00 0A 00 27 07 0F 01 03 03 02 01 01 01 0B 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00 00 21 00 0C 01 07 DD 01 1D 0C 34 15 00 00 00 7F 00 3C 01 2C 00 00 00 00 00 D1 00 00 00 04 5F 89 86 00 95 12 42 16 06 30 63 1F 00 00 08 00 06 07 04 60 00 00 56 65 01 EC 00 2F 04 60 00 00 55 0A 2B B8 00 2F 04 60 00 00 55 0A 11 D3 00 2C 04 60 00 00 56 65 20 6D 00 2A 04 60 00 00 56 63 3A 40 00 29 04 60 00 00 55 0A 2B B9 00 28 04 60 00 00 55 0A 03 58 00 3E 07 DD 01 1D 14 34 16 00 52 A1 2C 0D 0A			
Parameter	Length(byte)	Range/Format	Default
Message Header	4	+INF	+INF
Message Type	1		
Report Mask	2	0000 – FFFF	
Length	2		
Unique ID	8	IMEI	
Device Type	1	0F	+RESP:GTVER
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Hardware Version	2	0000 – FFFF	
MCU Version	2	0000 – FFFF	

Reserved	2	0000	
Reserved	1	00	
Reserved	2	0000	+RESP: GTIOS
Reserved	2	0000	
Reserved	1	00	
Reserved	2	0000	
Reserved	2	0000	
Reserved	2	0000	
Digital Input Status	1	00 – 02	
Digital Output Status	1	00 – 02	
Reserved	1	00	+RESP: GTGPS
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Reserved	1	00	
Satellites in View	1		
Power Saving Enable / OWH Mode / Outside Working Hour / AGPS	1		
Last Fix UTC Time	7	YYYYMMDDHHMMS S	
Reserved	1	00	
FRI Discard No Fix	1	0 1	
ResponseReport Items Mask	2		
IGN Interval	2		
IGF Interval	2		
Reserved	4	00000000	
Reserved	1	00	
External Power Supply / Backup Battery On / Charging / LED On / Backup Battery Charge Mode	1		+RESP: GTBAT
External Power Voltage	2	0	
Backup Battery Voltage	2	0 – 4200mV	

Backup Battery Level	1	00	
ICCID	10	ICCID	+RESP: GTCID
CSQ RSSI	1	0 – 31 99	+RESP: GTCSQ
CSQ BER	1	0 – 7 99	
Time Zone Offset Sign / Daylight Saving Enable	1		+RESP: GTTMZ
Time Zone Offset	2	HHMM	
GIR Trigger Type	1		+RESP: GTGIR
Cell Number	1		
MCC	2		
MNC	2		
LAC	2		
Cell ID	2		
TA	1		
RX Level	1		
Send Time	7	YYYYMMDDHHMMS S	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of information report message.

Command	ID
+RESP:GTINF	1
+RESP:GTGPS	2
+RESP:GTCID	4
+RESP:GTCSQ	5
+RESP:GTVER	6
+RESP:GTBAT	7
+RESP:GTIOS	8
+RESP:GTTMZ	9

+RESP:GTGIR	10
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- ✧ **<Report Mask>**: It refer to the **<+INF Mask>** in **AT+GTHRM**.
- ✧ **<Unique ID>**: The Bit 1 of **<+INF Mask>** is always 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

- ✧ **<Power Saving Enable / OWH Mode / Outside Working Hour/ >**: The highest bit, bit 7 is reserved, bit 5 and bit 6 is for **<Power Saving Enable>**, bit 4 and bit 3 are for **<OWH Mode>**, bit 2 is for **<Outside Working Hour>**. Bit 0 is for **<AGPS>**. **<Outside Working Hour>** is used to indicate whether the device is currently outside the working hour. 1 means outside.
- ✧ **<External Power 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 LED's are turned on. Bit 0 is for **<Backup Battery Charge Mode>**.
- ✧ **<ICCID>**: ICCID is a 20-digit string. In the HEX format message, every 4 bits are used to represent one digit of the 20 digits of the ICCID.

ICCID	89	86	00	00	09	09	17	21	49	53
HEX	89	86	00	00	09	09	17	21	49	53

- ✧ **<Time Zone Offset Sign / Daylight Saving Enable>**: Bit 1 is for **<Daylight Saving Enable>** to indicate whether the daylight saving function is currently enabled. Bit 0 is for **<Time Zone Offset Sign>** to indicate the positive or negative of the local time offset to UTC. 1 means negative.
- ✧ **<GIR Trigger Type>**: A string to indicate what kind of GPS fixing this cell information is for.
 - "SOS" This cell information is for SOS requirement.
 - "RTL" This cell information is for RTL requirement.
 - "LBC" This cell information is for LBC requirement.
 - "TOW" This cell information is for TOW requirement.
 - "FRI" This cell information is for FRI requirement.
 - "GIR" This cell information is for sub command "C" in **AT+GTRTO** command.

Fix Type	ID
SOS	1
RTL	2
LBC	3
TOW	4

FRI	5
GIR	6

- ✧ *<Cell Number>*: *<Cell Number>* express number of the IMSI. The IMSI consist of MCC, MNC, LAC, Cell ID.

4.5. Event Report +EVT

Event report messages including +RESP:GTPNA, +RESP:GTPFA, +RESP:GTMPN, +RESP:GTMPF, +RESP:GTBTC, +RESP:GTSTC, +RESP:GTSTT, +RESP:GTPDP, +RESP:GTIDN, +RESP:GTJDR, +RESP:GTSTR, +RESP:GTSTP and +RESP:GTLSP use this format.

➤ +EVT,

Example:

2B 45 56 54 09 00 FE 1F BF 00 5E 0F 01 03 03 02 56 50 22 00 0A 00 27 07 5F 00 00 01 00 22 0C 01 00 00 00 02 00 28 00 35 06 FC 5E 38 01 E5 E0 E4 07 DD 01 1D 0C 34 30 04 60 00 00 55 0A 03 58 00 00 01 07 00 00 00 01 07 00 2D 0A 00 00 00 00 2D 0A 07 DD 01 1D 14 34 31 00 53 78 1D 0D 0A

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

Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Message Type>: The ID of event report message.

Command	ID
+RESP:GTPNA	1
+RESP:GTPFA	2
+RESP:GTMPN	3
+RESP:GTMPF	4
Reserved	5
+RESP:GTBPL	6
+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
Reserved	10

Reserved	11
+RESP:GTPDP	12
+RESP:GTIGN	13
+RESP:GTIGF	14
+RESP:GTUPD	15
+RESP:GTIDN	16
+RESP:GTIDF	17
Reserved	18
Reserved	19
+RESP:GTJDR	20
+RESP:GTGSS	21
Reserved	22
+RESP:GTCRA	23
+RESP:GTDOS	25
+RESP:GTGES	26
+RESP:GTSTR	28
+RESP:GTSTP	29
+RESP:GTLSP	30
+RESP:GTGPJ	31

- ✧ **<Report Mask>**: It refer to the **<+EVT Mask>** in **AT+GTHRM**.
- ✧ **<Unique ID>**: The Bit 6 of **<+EVT Mask>** is always 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

Event report message **+RESP:GTBPL** uses this format.

➤ **+EVT,**

Example: 2B 45 56 54 06 00 7E 1F 3F 0F 01 03 03 02 56 50 22 00 0B 31 5C 01 04 00 00 00 00 11 07 0D C1 01 00 00 01 02 01 0A 00 33 06 FC 59 81 01 E5 BC 2A 07 DD 01 1F 08 0B 15 04 60 00 01 55 04 69 D3 00 00 00 00 00 00 00 17 04 00 00 00 07 DD 01 1F 10 0B 18 00 B6 69 C2 0D 0A			
Parameter	Length(byte)	Range/Format	Default

Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Backup Battery Voltage	2	0 – 4200 mV	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00

Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report message **+RESP:GTIGN** and **+RESP:GTIGF** use this format. For these two messages, the *<mileage>* field will always be present in spite of the *<Report Items Mask>* setting.

➤ **+EVT,**

Example: 2B 45 56 54 0D 00 FE 1F BF 00 62 0F 01 03 03 02 56 50 22 00 0A 00 27 07 57 00 00 01 00 22 08 00 00 00 00 01 00 00 00 04 00 6B 00 38 06 FC 59 7D 01 E5 BC 00 07 DD 01 1D 0C 07 24 04 60 00 00 56 78 5D 7B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 01 1D 14 07 27 00 3E 0F 13 0D 0A			
Parameter	Length(byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	

Satellites in View	1		
Duration of Ignition On or Ignition Off	4	0 – 999999 sec	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report message **+RESP:GTUPD** uses this format. For this message, the *<Protocol Version>* and *<Firmware Version>* will always be present in spite of the *<Report Items Mask>* setting

➤ **+EVT,**

Example:

2B 45 56 54 0F 00 FE 1F BF 00 61 0F 01 03 03 02 56 50 22 00 0B 31 5C 01 62 2C C9 00 00 41
05 01 2C 00 01 00 00 00 01 00 00 00 43 06 FC 59 ED 01 E5 BC 09 07 DD 01 1F 0A 05 0E 04 60

00 01 55 04 58 2B 00 00 00 00 00 00 00 03 04 00 00 00 00 00 30 34 00 02 07 DD 01 1F 03 00 30
00 27 F7 0C 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Digital Input Status	1	00 – 02	
Digital Output Status	1	00 – 02	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Code	2		
Retry	1		
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	

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

Event report message **+RESP:GTIDF** uses this format.

➤ **+EVT,**

Example:

2B 45 56 54 11 00 FE 1F BF 00 62 0F 01 03 03 02 56 50 22 00 0A 00 27 07 5D 00 00 00 03 12 07
00 00 03 FF 01 00 00 01 01 00 99 00 21 06 FC 59 75 01 E5 BB BD 07 DD 01 1E 09 1C 07 04 60
00 00 56 78 5D 7B 00 00 00 02 00 00 00 0B 07 00 0B 28 00 00 00 00 00 07 DD 01 1E 11 1C
0A 03 C9 2A A1 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		

Digital Input Status	1	00 – 02	
Digital Output Status	1	00 – 02	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Duration of Idling	4		
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
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 message +**RESP:GTGSS** uses this format.

➤ +EVT,

Example:

2B 45 56 54 15 00 FE 1F BF 00 63 0F 01 03 03 02 56 50 22 00 0A 00 27 07 50 00 00 00 03 1A 05
 00 00 00 00 00 01 00 00 02 04 00 2A 00 35 06 FC 59 9A 01 E5 BC 2C 07 DD 01 1E 09 25 24 04
 60 00 00 56 78 5D 7B 00 00 00 02 00 00 00 0B 07 00 0B 28 00 00 00 00 00 00 07 DD 01 1E 12
 04 19 03 D7 64 41 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
GPS Signal Status	1	0 1	
Reserved	4	00000000	00000000
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	

MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
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 lost GPS signal or no successful GPS fix, 1 means GPS signal recovered and successful GPS fix.

Event report message **+RESP:GTDOS** uses this format.

➤ **+EVT,**

Example: 2B 45 56 54 19 00 FE 1F BF 00 60 0F 01 05 05 05 56 50 22 00 0F 5B 2E 00 5F 00 00 01 01 21 0A 01 01 01 00 00 00 00 00 85 00 38 06 FC 59 AA 01 E5 BB CE 07 DD 07 0B 08 07 29 04 60 00 00 56 78 20 79 00 00 00 02 00 00 00 00 02 00 00 00 00 00 00 00 00 07 DD 07 0B 10 07 2B 02 0D 42 59 0D 0A			
Parameter	Length(byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	06
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	

Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Wave1 output id	1	1-2	
Wave1 output active	1	0 1	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	

Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

Event report message +RESP:GTGES uses this format.

➤ +EVT,

Example: 2B 45 56 54 1A 00 FE 1F BF 00 68 0F 01 05 05 05 56 50 22 00 0F 5B 2E 00 5F 00 00 00 01 11 0B 01 15 00 00 00 32 00 00 00 1E 01 01 00 00 00 00 85 00 37 06 FC 59 9A 01 E5 BB D7 07 DD 07 0B 08 1C 11 04 60 00 00 56 78 20 79 00 00 00 02 00 00 00 00 02 00 00 00 00 00 00 00 07 DD 07 0B 10 1C 11 02 17 D2 D2 0D 0A			
Parameter	Length(byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	06
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Supply Voltage	2		
Digital Input Status	1	00 – 1F	
Digital Output Status	1	00 – 1F	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
Trigger GEO ID / Trigger GEO Enable	1		
Trigger Mode	1	0 21 22	

Radius	4	50 – 6000000m	
Check Interval	4	0 5 – 86400sec	
Number	1	1	
GPS Accuracy	1	0 1	
Speed	3	0.0 – 999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		
Latitude	4		
GPS UTC Time	7	YYYYMMDDHHMMSS	
MCC	2	0000 – FFFF	
MNC	2	0000 – FFFF	
LAC	2	0000 – FFFF	
Cell ID	2	0000 – FFFF	
Reserved	1	00	00
Current Mileage	3	0.0 – 65535.0 km	
Total Mileage	5	0.0 – 4294967.0 km	
Current Hour Meter Count	3	HHMMSS	
Total Hour Meter Count	6	HHHHHHHHMMSS	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ <Trigger GEO ID/Trigger GEO Enable>: The <Trigger GEO ID> and <Trigger GEO Enable > in hex format. High bit means <Trigger GEO ID> and low bit means <Trigger GEO Enable >.

- Trigger GEO ID : The ID of Geo-Fence, The range is 0 – 4.
- Trigger GEO Enable : Enable or disable the zone's Geo-Fence function.
 - 0: Disable the zone's Geo-Fence function
 - 1: Enable the zone's Geo-Fence function

Event report message +RESP:GTGPJ uses this format.

➤ +EVT,

Example:

2B 45 56 54 1F 00 FE 1F BF 00 60 0F 01 05 05 02 56 50 22 00 0F 5B 2A 09 5E 00 00 00 00 16
09 03 01 01 00 00 00 00 00 00 00 00 5B 06 FC 59 D5 01 E5 BB 91 07 DD 07 04 05 09 2A 04 60 00
00 56 78 20 79 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 07 DD 07 04 05 09 2C 00
2C 46 69 0D 0A

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+EVT	+EVT
Message Type	1		
Report Mask	4	00000000 – FFFFFFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Battery Level	1	0~100	
External Power Voltage	2		
Digital Input Status	1	00 – 03	
Digital Output Status	1	00 – 03	
Motion Status	1	0x11 0x12 0x21 0x22 0x41 0x42 0x16 0x1A	
Satellites in View	1		
CW Jamming Value	1	0-255	
GPS Jamming State	1	0 1 2 3	
Number	1	1	
GPS Accuracy	1	0	0
Speed	3	0.0 –999.9km/h	
Azimuth	2	0 – 359	
Altitude	2		
Longitude	4		

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

✧ <CW Jamming Value>: Current continues 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.

4.6. Heartbeat Data +HBD

➤ +HBD,

Example: 2B 48 42 44 EF 20 0F 01 03 03 02 56 50 22 00 0A 00 27 07 07 DD 01 1D 14 02 13 00 39 D2 5B 0D 0A			
Parameter	Length(byte)	Range/Format	Default
Message Header	4	+HBD	+HBD
Report Mask	1	00 – FF	
Length	1		

Device Type	1	0F	0F
Protocol Version	2	0000 – FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Report Mask>: It refer to the <+HBD Mask> in **AT+GTHRM**.
- ✧ <Unique ID>: The Bit 4 of <+HBD Mask> is always 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

If the mask of <UID> set as 0 in the <+HBD Mask> of **AT+GTHRM**, the heart beat message will not report IMEI information. If the mask of <UID> is set as 1, the heart beat message will report IMEI information

4.7. Crash Data Packet +CRD

➤+CRD,

Example:

```
2B 43 52 44 00 7D 02 19 0F 01 04 04 08 56 50 22 00 0F 5B 31 04 00 03 01 00 01 00 01 00 52 00
02 00 01 00 51 00 01 00 01 00 53 00 01 FF FF 00 52 00 01 FF FF 00 50 FF FF 00 00 00 54 00 01
00 00 00 52 00 01 00 00 00 52 00 02 00 00 00 54 00 01 00 00 00 53 00 02 00 00 00 53 00 01 00
00 00 52 00 02 00 01 00 52 00 01 00 00 00 52 00 00 00 01 00 50 00 00 00 01 00 55 00 01 00 01
00 51 00 01 00 01 00 51 00 02 00 00 00 53 00 01 FF FF 00 51 00 01 00 01 00 52 00 02 00 02 00
52 00 01 00 01 00 52 00 02 FF FF 00 52 00 03 FF FF 00 51 00 04 00 00 00 51 00 01 00 00 00 52
00 02 00 00 00 51 00 01 00 00 00 50 00 02 00 02 00 53 00 00 00 01 00 51 00 02 00 02 00 53 00
01 00 01 00 52 00 03 00 01 00 55 00 03 00 00 00 52 00 01 00 01 00 51 FF FF 00 00 00 52 00 02
00 02 00 53 00 02 FF FF 00 52 00 01 FF FF 00 52 00 00 00 01 00 54 00 01 00 00 00 52 00 01 00
01 00 51 00 02 00 00 00 54 00 03 00 00 00 53 00 01 00 01 00 52 00 02 00 02 00 53 00 01 00 00
00 53 00 01 00 00 00 52 00 02 00 01 00 52 00 02 00 01 00 54 00 00 00 00 00 54 00 02 00 00 00
52 00 01 00 00 00 52 00 01 00 01 00 51 00 02 FF FF 00 52 00 01 00 01 00 53 00 01 FF FF 00 51
00 01 00 01 00 52 00 01 00 01 00 53 00 01 00 00 00 52 00 04 00 02 00 53 00 02 00 01 00 51 00
```

```
01 00 01 00 54 00 03 00 02 00 52 00 03 FF FF 00 53 00 00 00 00 00 52 00 01 FF FF 00 53 00 01
00 01 00 52 00 03 00 01 00 51 00 02 00 02 00 53 00 00 00 01 00 52 00 01 FF FF 00 50 00 01 00
02 00 50 00 02 00 00 00 53 00 00 00 00 00 51 00 01 00 01 00 51 00 01 00 01 00 51 00 00 FF FF
00 52 00 01 00 02 00 51 00 02 00 00 00 52 00 02 00 00 00 53 00 03 00 00 00 52 00 00 07 DD 05
08 10 29 3A 00 18 10 CD 0D 0A
```

Parameter	Length(byte)	Range/Format	Default
Message Header	4	+CRD	+ CRD
Report Mask	2	0000 – FFFF	
Length	2		
Device Type	1	0F	0F
Protocol Version	2	0000–FFFF	
Firmware Version	2	0000 – FFFF	
Unique ID	8	IMEI	
Data Type	1	0 1	
Total frame	1	3	
Frame Number	1	1 2 3	
Data	500		
Send Time	7	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

- ✧ <Report Mask>: It refer to the <+CRD Mask> in AT+GTHRM.
- ✧ <Unique ID>: The Bit 1 of <+CRDMask> is 0, IMEI of the device as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

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

- ✧ <Data Type>: The data reported to backend server is recorded before or after crash.
 - 0: before crash.
 - 1: after crash.
- ✧ <Total Frame>: Total number of the messages that are sent to the backend server for the crash event.
- ✧ <Frame Number>: A numeric to indicate the sequence of the current message..
- ✧ <Data>: There are 500 bytes in one frame, 6 bytes as a group,the first 2 bytes of these 6 numbers represent X axis acceleration data, the middle 2 bytes represent Y axis and the last 2

bytes is Z axis.

4.8. Buffer Report in HEX Format

When HEX format messages go into the local buffer, the device will replace the 2nd byte of the report messages with 'B'. Thus, **+BSP** is buffered report for **+RSP**, **+BNF** is buffered report for **+INF**, **+CRD** is buffered report for **+BRD** and **+BVT** is buffered report for **+EVT**. The rest part of the report messages keep untouched.

Appendix: Message Index

✧ Command and ACK

AT+GTBSI

+ACK:GTBSI

AT+GTSRI

+ACK:GTSRI

AT+GTQSS

+ACK:GTQSS

AT+GTCFG

+ACK:GTCFG

AT+GTOUT

+ACK:GTOUT

AT+GTDIS

+ACK:GTDIS

AT+GTIOB

+ACK:GTIOB

AT+GTEPS

+ACK:GTEPS

AT+GTFRI

+ACK:GTFRI

AT+GTGEO

+ACK:GTGEO

AT+GTTOW

+ACK:GTTOW

AT+GTSPD

+ACK:GTSPD

AT+GTSOS

+ACK:GTSOS

AT+GTIDL

+ACK:GTIDL

AT+GTHBM

+ACK:GTHBM

AT+GTTMA

+ACK:GTTMA

AT+GTOWH

+ACK:GTOWH

AT+GTDOG

+ACK:GTDOG

AT+GTPIN

+ACK:GTPIN

AT+GTRTO

+ACK:GTRTO

AT+GTHMC
+ACK:GTHMC
AT+GTJDC
+ACK:GTJDC
AT+GTWLT
+ACK:GTWLT
AT+GTCRA
+ACK:GTCRA
AT+GTPDS
+ACK:GTPDS
AT+GTSSR
+ACK:GTSSR
AT+GTBZA
+ACK:GTBZA
AT+GTSPA
+ACK:GTSPA
AT+GTGPJ
+ACK:GTGPJ

✧ Position Related Report

+RESP:GTTOW
+RESP:GTEPS
+RESP:GTDIS
+RESP:GTIOB
+RESP:GTFRI
+RESP:GTGEO
+RESP:GTSPD
+RESP:GTSOS
+RESP:GTRTL
+RESP:GTLBC
+RESP:GTD OG
+RESP:GTIGL
+RESP:GTHBM
+RESP:GTDOS
+RESP:GTGES

✧ Device Information Report

+RESP:GTINF

✧ Report for Querying

+RESP:GTGPS
+RESP:GTALL
+RESP:GTCID
+RESP:GTCSQ

+RESP:GTVER
+RESP:GTBAT
+RESP:GTIOS
+RESP:GTTMZ
+RESP:GTALS

✧ Event Report

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTMPN
+RESP:GTMPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTPDP
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTIDN
+RESP:GTIDF
+RESP:GTJDR
+RESP:GTGSM
+RESP:GTGSS
+RESP:GTCRA
+RESP:GTSTR
+RESP:GTSTP
+RESP:GTLSP
+RESP:GTGPJ

✧ Crash Data Packet

+RESP:GTCRD

✧ Heartbeat

+ACK:GTHBD
+SACK:GTHBD

✧ Server Acknowledgement

+SACK

✧ Hex format report message

+ACK
+RSP
+EVT
+INF

+HBD

+CRD