GL300 @Track Air Interface Protocol

GSM/GPRS/GNSS Tracker

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0. Revision History

Version	Date	Author	Description of Change
0.02	2014-11-20	Evan Tu	1. Initial.
1.00	2014-11-20	Evan Tu	1. Release.
1.01	2015-04-14	Evan Tu	1. Modified the default value of the parameter <*Mask*> in the command **AT+GTPDS**. 2. Deleted BLA configuration from the message **+RESP:GTALL**. 3. Added 4 reserved parameters of **AT+GTTMA** to the message **+RESP:GTALL**.
1.02	2015-05-15	Evan Tu	1. Changed the <*Flash type*> to <*Reserved*> in **+RESP:GTINF**.
1.03	2015-06-04	Evan Tu	1. Deleted the parameter <*EPB mode*> from the command **AT+GTCFG**. 2. Deleted 3 parameters <*PM rest threshold*>, <*PM motion threshold*> and <*Enter movement by command*>. 3. Deleted the parameter <*Lock state*> from **+RESP:GTINF**.
1.04	2015-06-08	Evan Tu	1. Added the parameter <*EPB mode*> to the command **AT+GTCFG**. 2. Added 3 parameters <*PM rest threshold*>, <*PM motion threshold*> and <*Enter movement by command*>. 3. Added the parameter <*Lock state*> to **+RESP:GTINF**.
1.05	2015-06-25	Evan Tu	1. Changed the minimum value of the parameters <*Distance*> and <*Mileage*> to 20 in the command **AT+GTFRI**.
2.00	2015-08-28	Evan Tu	1. Added jamming state to the report message **+RESP:GTGSV**.
2.01	2015-09-21	Evan Tu	1. Added a new command **AT+GTRVC**. 2. Added mode 2 of the parameter <*Function key indicator*> in the command **AT+GTFKS**.
2.02	2015-09-23	Evan Tu	1. Modified the definition of the protocol command **AT+GTRVC**.
3.00	2015-11-05	Evan Tu	1. Changed the minimum value of the parameters <*Check interval*> and <*Send interval*> to 1s in the command **AT+GTFRI**. 2. Changed the minimum value of the parameters <*Ignition check interval*> and <*Ignition send interval*> to 1s in the command **AT+GTFRI**.

3.01	2015-12-16	Evan Tu	1. Added a subcommand **RTO-11** to **AT+GTRTO**.
4.00	2016-03-08	Evan Tu	1. Added a new parameter <*Output Direction*> to the command **AT+GTRTO.**
5.00	2016-06-08	Evan Tu	1. Modified the range of the parameter <*Command ID*> in **+RESP:GTUPC**.
6.00	2016-07-27	Evan Tu	1. Added a new input event (Bit41: Battery low) to the command **AT+GTUDF**.
6.01	2016-09-05	Evan tu	1. Changed the maximum value of the parameter <*Debounce time*> to 1000 in the command **AT+GTDIS**.
6.02	2016-09-12	Evan Tu	1. Added the parameters <*GTCMD*> and <*GTUDF*> to **+RESP:GTALL** / **+RESP:GTALM**. 2. Added a new report message **+RESP:GTALM**. 3. Changed the maximum value of the parameter <*Debounce time*> to 800 in the command **AT+GTDIS**.
7.00	2016-11-16	Evan Tu	1. Added <*RF sleep mode*> in **AT+GTOWH** to reduce power consumption. 2. Added two new input events (Bit 42 and Bit 43), namely, outside/inside-working-hours events.
7.01	2016-12-07	Evan Tu	1. Added a new command **AT+GTGAM**.
7.02	2017-01-20	Evan Tu	1. Added a new parameter <*Battery low threshold*> to the command **AT+GTCFG**. 2. Modified the description for <*EPB mode*> in the command **AT+GTCFG**. 3. Modified the descriptions for <*EBK rest threshold*> and <*EBK motion threshold*> in the command **AT+GTNMD**.
8.00	2017-05-04	Evan Tu	1. Added Mode 9 to <*Report mode*> in **AT+GTQSS**.
9.00	2017-09-12	Evan Tu	1. Added Mode 3 to <*Mode*> in **AT+GTGLM**. 2. Added a new parameter <*Hyperlink format*> to **AT+GTGLM**. 3. Added a new command **AT+GTRMD**.
10.00	2017-12-13	Evan Tu	1. Added Mode 2 to <*Mode*> in **AT+GTRMD**.
10.01	2017-12-18	Evan Tu	1. Added a new parameter <*Report time type*> in **AT+GTGLM**.
11.00	2018-02-27	Machal Zhao	1. Added a new command **AT+GTSMS**. 2. Extended the length of <*Data*> in the command **AT+GTDAT** to 1280.
11.01	2018-03-20	Machal Zhao	1. Added a new command **AT+GTHBM**.
11.02	2018-04-10	Machal Zhao	1. Extended the range of <*GEO ID*> in the command **AT+GTGEO** to 0-19.
11.03	2018-04-20	Machal Zhao	1. Added the sub command D in the command

			AT+GTRTO for deleting buffered messages.
11.04	2018-05-21	Machal Zhao	1. Added the sub command 16 in the command **AT+GTRTO** to enable or disable UART port. 2. Added the report message **+RESP:GTUSW**.
11.05	2018-09-21	Bennett Cui	1. Added the <*GNSS working mode*> parameter in the **AT+GTCFG** command.
12.00	2018-11-19	Batty Zhang	1. Changed the value range of <*Medium speed*> in **AT+GTHBM** from 60-100km/h to 20-100km/h.
12.01	2019-05-09	Linus Li	1. Deleted the sub command 11 and 16 in the command **AT+GTRTO**.
13.00	2019-08-08	Booth Qu	1. Added the **AT+GTFVR** command.
13.01	2019-08-08	Booth Qu	1. Changed the value range of < *Password* > in all commands from 4 – 6 to 4 - 20.
13.02	2019-08-19	Booth Qu	1. Modified the descriptions for <*Extended Status Report*>, <*Identifier Number*> and <*Update Status Mask*> in the **AT+GTUPC** command. 2. Added the **+RESP:GTEUC** message.
13.03	2019-10-16	David Tang	1. Added a new parameter <*Wrap corner point*> to **AT+GTFRI**. 2. Modified the descriptions for <*Report type*> in the **+RESP:GTFRI** message.
	2019-10-16	Booth Qu	1. Added a new parameter <*Movement debounce* > to **AT+GTNMD**.
	2020-01-03	Booth Qu	1. Changed the value range of <*Password*> in all commands from 4 – 20 to 4 - 6.

1. Overview

1.1 Scope

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

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

1.2 Reference

Table 1: Reference

SN	Document Name	Remark
[1]	GL300 External Battery Kit User Manual.pdf	

1.3 Terms and Abbreviations

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

Table 2: Terms and Abbreviations

2. System Architecture

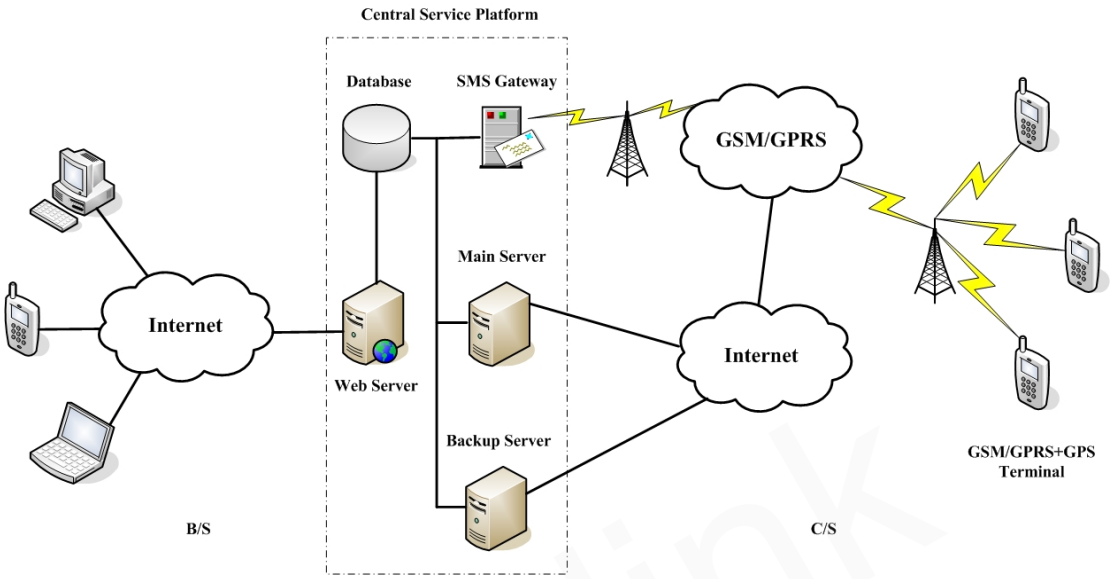

Figure 1: System Architecture

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

- ✧ The backend server should be able to access the internet and listen for the connection originating from the terminal.
- ✧ The backend server should be able to support 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. Message format which varies with message type is shown in the table below:

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

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

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

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

Detailed descriptions of each message format are available in the corresponding message sections.

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

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

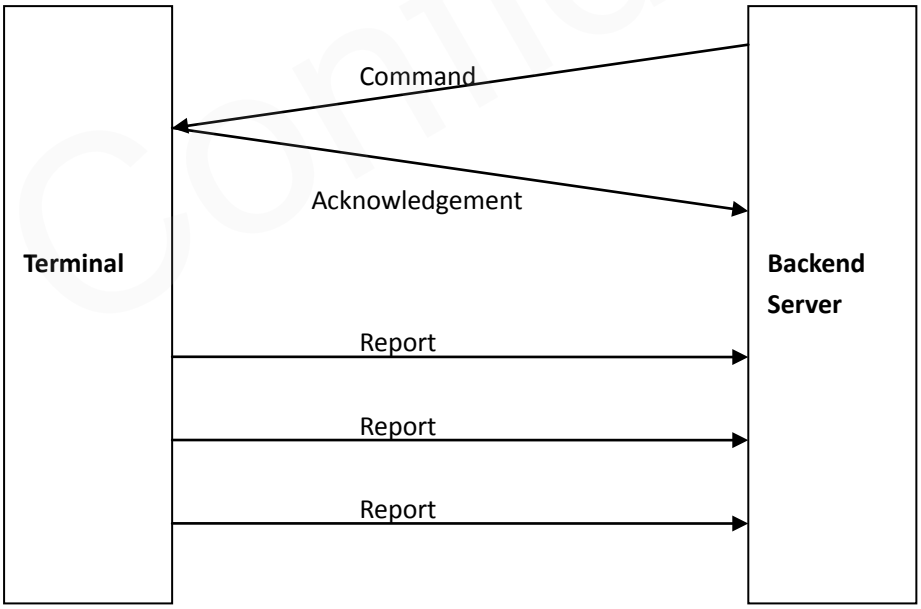

Figure 2: @Track Protocol Message Flow

When the device receives commands over the air, it supports several commands in one SMS or GPRS packet without separation symbol between two adjacent commands. Make sure the total size of the several commands is no longer than 160 bytes if the commands are sent via SMS. Here is an example of sending three commands in one SMS.

AT+GTFRI=gl300,1,1,,,0000,2359,60,60,,,1F,0,,,,,,,0007$AT+GTGEO=gl300,0,3,101.412248,21.187891,1000,600,,,,,,,,0008$AT+GTSPD=gl300,1,5,40,30,60,,,,,,,,,,,,,0009$

There are three commands (**AT+GTFRI**, **AT+GTGEO** and **AT+GTSPD**) in the message above. And the terminal will handle the three commands one by one after it receives the message via SMS and it will report the following three acknowledgement messages to the backend server one by one.

+ACK:GTFRI,300600,135790246811220,,0007,20100310172830,11F0$

+ACK:GTGEO,300600,135790246811220,,0,0008,20100310172900,11F1$

+ACK:GTSPD,300600,135790246811220,,0009,20100310172930,11F2$

3.2 Command and Acknowledgement

3.2.1 Server Connection

3.2.1.1 Quick Start Setting

The command **AT+GTQSS** is used to set the GPRS parameters and backend server information if the length of all the settings is within 160 bytes; otherwise the two commands **AT+GTBSI** and **AT+GTSRI** are used to configure those settings.

- **AT+GTQSS=**

Example: **AT+GTQSS=gl300,cmnet,,,4,,,116.226.44.17,9001,116.226.44.16,9002,+8613812341234,0,1,,,0001$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	‘0’ – ‘9’, ‘a’ – ‘z’, ‘A’ – ‘Z’	gl300
APN	<=40		
APN user name	<=30		
APN password	<=30		
Report mode	1	0 – 7|9	0
Reserved	0		
Buffer enable	1	0|1|2	1
Main server IP /	<=60		

Domain name			
Main server port	<=5	0 – 65535	0
Backup server IP	<=15		0.0.0.0
Backup server port	<=5	0 – 65535	0
SMS gateway	<=20		
Heartbeat interval	<=3	0|5 – 360min	0
SACK enable	1	0|1	0
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*Password*>: The valid characters for the password include '0'-9', 'a'-'z', and 'A'-'Z'. The default value is "gl300".
- <*APN*>: Access point name (APN).
- <*APN user name*>: The GPRS APN user name. If the parameter field is empty, the current value for the parameter will be cleared.
- <*APN password*>: The GPRS APN password. If the parameter field is empty, the current value for the parameter will be cleared.
- <*Report mode*>: Supported report modes are as follows:
  - 0: Stop mode.
  - 1: TCP short-connection preferred mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. If the terminal fails to establish a TCP connection with the backend server (including Main Server and Backup Server), it will try to send data via SMS.
  - 2: TCP short-connection forced mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. If the terminal fails to establish a TCP connection with the backend server (including Main Server and Backup Server), the data will be stored in the Buffer (if the Buffer function is enabled) or discarded (if the Buffer function is disabled).
  - 3: TCP long-connection mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heartbeat data. Please note that in this mode the backend server should respond to the heartbeat data from the terminals.
  - 4: UDP mode. The terminal will send data to the backend server by UDP protocol. It supports receiving protocol commands via UDP. Make sure the IP address and UDP port of the device can be accessed over the internet, which is generally realized by enabling heartbeat package and the message **+RESP:GTPDP**.
  - 5: Forced SMS mode. Only SMS is used for data transmission.
  - 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using UDP protocol. The difference is that the terminal will use a fixed local port rather than a random port to communicate with the server in this mode. Thus the backend

server could use the identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the primary server.

- 7: TCP long-connection with the backup server mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heartbeat data. The backend server should respond to the heartbeat data from the terminals. If the main server is lost, the terminal will try to connect to the backup server. If the backup server is also lost, it will try to connect with the main server again.
- 9: UDP with the backup server mode. SACK needs to be enabled. If the terminal fails to send data to the primary server, it will try to send the data to the backup server. If the terminal also fails to send data to the backup server, it will try to send the data to the primary server again.

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

✧ <*Buffer enable*>: Enable/disable the Buffer function. Please refer to Chapter 3.3.5 for details of the Buffer function.

- 0: Disable the Buffer function.
- 1: Enable the Buffer function.
- 2: High priority - Enable the buffer report function. Under this working mode, the device will send all the buffered messages before sending normal messages except the SOS message (**+RESP:GTSOS**).

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

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

✧ <*Backup server IP*>: The IP address of the backup backend server.

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

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

✧ <*Heartbeat interval*>: The interval for the terminal sending heartbeat package to the backend server. If it is set to 0, no heartbeat package will be sent.

✧ <*SACK enable*>: A numeral to indicate whether the backend server should reply with a SACK message to the device.

- 0: The backend server does not reply with a SACK message after receiving a message from the device.
- 1: The backend server should reply with a SACK message after receiving a message from the device.

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

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

Note: If <*Report mode*> is set to 4 (UDP mode), it is strongly recommended to enable SACK or heartbeat mechanism (in this case, <*Heartbeat interval*> should not be set to 0). Otherwise, the backend server may not be able to send commands to the terminal.

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

➢ **+ACK:GTQSS,**

Example: **+ACK:GTQSS,301303,860599004785994,,0005,20190920101621,000C$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- ✧ <*Protocol version*>: The combination of the device type and the version number of the applied protocol. The first two characters "XX" indicate the device type. "30" indicates GL300 New Version. The middle two characters are the major version number and the last two characters are the minor version number. Both the major version and the minor version numbers are hex digits. For example, "0202" means version 2.02.
- ✧ <*Unique ID*>: The ID of the device. The IMEI of the current SIM card inside the terminal is used for this field.
- ✧ <*Device name*>: Please refer to the parameter <*Device name*> in the command **AT+GTCFG**.
- ✧ <*Serial number*>: The same serial number which is sent to the device with the corresponding command. The backend server could use it to distinguish which command the ACK message is for.
- ✧ <*Send time*>: The local time to send the ACK message.
- ✧ <*Count number*>: The self-increasing count number will be included into every acknowledgment message and report message. The count begins from 0000 and increases by 1 every time. It will roll back after "FFFF".

3.2.1.2 Bearer Setting Information

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

➢ **AT+GTBSI=**

Example: **AT+GTBSI=gl300,cmnet,,,,,,,0002$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
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	$	$

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

- **+ACK:GTBSI,**

Example: **+ACK:GTBSI,301303,860599004785994,,0003,20190920100658,0008$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.1.3 Backend Server Registration Information

The command **AT+GTSRI** is used to configure the information of the backend server that the terminal reports to and the report mode that defines the communication method between the backend server and the terminal.

- **AT+GTSRI=**

Example: **AT+GTSRI=gl300,4,,,116.226.44.17,9001,116.226.44.16,9002,+8613812341234,0,1,,,,,0003$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Report mode	1	0 – 7|9	0
Reserved	0		
Buffer enable	1	0|1|2	1
Main server IP / domain name	<=60		
Main server port	<=5	0 – 65535	0
Backup server IP	<=15		0.0.0.0
Backup server port	<=5	0 – 65535	0
SMS gateway	<=20		
Heartbeat interval	<=3	0|5 – 360min	0
SACK enable	1	0|1	0
SMS ACK enable	1	0|1	0
Quick link enable	1	0|1	0

Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✧ <*SMS ACK enable*>: This defines whether the ACK confirmation should be sent via SMS when the command is sent via SMS.

- 0: The device will send the ACK confirmation with the mode configured by the <*Report mode*>.
- 1: The device will send the ACK confirmation via SMS to the phone number from which the command is sent via SMS.

✧ <*Quick link enable*>: This defines whether the device should establish TCP connection under certain condition.

- 0: Disable the feature.
- 1: The device should establish TCP connection immediately when a call is coming in. This feature will be valid only when the report mode is set to TCP long connection.

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

➢ **+ACK:GTSRI,**

Example: **+ACK:GTSRI,301303,860599004785994,,0004,20190920101534,000A$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2 Device Configuration

3.2.2.1 Global Configuration

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

➢ **AT+GTCFG=**

Example: **AT+GTCFG=gl300,gl300,gl300,0,0.0,0,10,3F,0,,7EFF,1,1,0,300,1,1,20491231235959,0,0,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
New password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	

Device name	20	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	gl300
ODO enable	1	0|1	0
ODO mileage	<=9	0.0 – 4294967.0Km	0.0
GNSS on need	1	0|1|2|3	1
GNSS fix delay	2	5 – 60sec	5
Report item mask	4	0000 – 007F	001F
GSM report	1	0|1|2|3	0
Reserved	0		
Event mask	4	0000-7FFF	0FFF
EBK mode	1	0|1	0
LED on	1	0|1|2	1
Info report enable	1	0|1	1
Info report interval	<=5	30 – 86400sec	300
Location by call	1	0|1	1
Expiry enable	1	0|1	0
Expiry time	14	YYYYMMDDHHMMSS	20491231 235959
AGPS mode	1	0|1	0
Sleep enable	1	0|1	0
Battery low threshold	<=2	0-99	0
GNSS Working Mode	1	0 - 2	0
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*New password*>: It is set to change the current password.
- <*Device name*>: The name of the device which appears in each uplink message.
- <*ODO enable*>: Enable/disable the odograph function of calculating the total mileage. The current mileage is included in the message **+RESP:GTINF**.
  - 0: Disable the ODO mileage function.
  - 1: Enable the ODO mileage function.
- <*ODO mileage*>: The value of the current total mileage.
- <*GNSS on need*>: Whether to turn off GNSS chip after retrieving GNSS position information.
  - 0: Do not turn off GNSS chip.
  - 1: Turn off GNSS chip after retrieving GNSS information every time.
  - 2: Do not turn off GNSS chip in ignition on state or movement state.
  - 3: Keep GNSS chip always off.
- <*GNSS fix delay*>: This is the time to wait after GNSS fix succeeds. After GNSS fix succeeds, the device will wait for the period of time specified by <*GNSS fix delay*> and then acquire the GNSS fix result. This is because the position obtained immediately after GNSS fix succeeds may not be accurate. For example, if <*GNSS fix delay*> is set to 7, the device will wait for 7 seconds after GNSS fix succeeds and then acquire the position as the fix result). The range of the parameter value is 5 – 60, and the default value is 5. Unit: second.
- <*Report item mask*>: Bitwise mask to configure the composition of all the uplink messages.

Each bit represents a field in the uplink message. If a bit is set to 1, the corresponding field will be filled if it is included in the uplink message. Otherwise, the field will be empty.

Bit 0 (0001): <*Speed*>

Bit 1 (0002): <*Azimuth*>

Bit 2 (0004): <*Altitude*>

Bit 3 (0008): GSM and cell information, including <*MCC*>, <*MNC*>, <*LAC*>, <*CellID*>

Bit 4 (0010): <*Send time*>

Bit 5 (0020): <*Device name*>

✧ <*Event mask*>: A Hex value to configure which event reports will be sent to the backend server. Each bit corresponds with a report message. If a bit is set to 1, the corresponding report message will be sent to the backend server. If a bit is set to 0, the message will not be sent to the backend server. Here is the mapping between each bit and report message(s).

Bit 0 (0001): **+RESP:GTPNA**

Bit 1 (0002): **+RESP:GTPFA**

Bit 2 (0004): **+RESP:GTEPN**

Bit 3 (0008): **+RESP:GTEPF**

Bit 4 (0010): Reserved

Bit 5 (0020): **+RESP:GTBPL**

Bit 6 (0040): **+RESP:GTBTC**

Bit 7 (0080): **+RESP:GTSTC**

Bit 8 (0100): **+RESP:GTSTT**

Bit 9 (0200): Reserved

Bit 10 (0400): **+RESP:GTPDP**

Bit 11 (0800): **+RESP:GTPNL**

Bit 12 (1000): **+RESP:GTIGN** and **+RESP:GTIGF**

Bit 13 (2000): **+RESP:GTIGL**

Bit 14 (4000): **+RESP:GTPFL**

✧ <*GSM report*>: If GNSS fix for the report messages **+RESP:GTSOS**, **+RESP:GTRTL**, **+RESP:GTLBC** and **+RESP:GTFRI** fails and the parameter <*GSM report*> is set to 1, the terminal reports the message **+RESP:GTGSM** including the information of the serving cell and the neighbor cells after those messages.

- 0: Do not allow the cell information report after failing to get GNSS position.
- 1: Allow the cell information report after failing to get GNSS position.
- 2: Do not report the message **+RESP:GTGSM** if no cell information is found.
- 3: Allow the cell information report no matter whether it gets GNSS position or not.

✧ <*EBK mode*>: A numeral to indicate whether to connect an **EBK**.

- 0: Do not connect an **EBK**.
- 1: Connect an **EBK**.

✧ <*LED on*>: It configures the working mode of LEDs.

- 0: Each time after the device powers on or the parameter value is updated to 0 from other values, GNSS LED will work for 150 seconds and then turn off. GSM LED and Power LED work normally.
- 1: All LEDs work normally.
- 2: All LEDs are off except the following cases: a. All LEDs will work for a period time

after power on. b. Power LED will flash fast during power off process. c. Power LED will work normally in charging status when a charger is inserted in power off state.

- <*Info report enable*>: Enable/disable the device information report (**+RESP:GTINF**). The device information includes state of the device, ICCID, GSM signal strength, adapter connection status, battery voltage, charging status, Power and GNSS LED working mode, <*GNSS on need*> setting, GNSS antenna type, GNSS antenna status, the time of last known GNSS fix.
  - 0: Disable the device information report.
  - 1: Enable the device information report.
- <*Info report interval*>: The interval for reporting the device information.
- <*Location by call*>: It determines how to handle the incoming call.
  - 0: Just hang up the call.
  - 1: Hang up the call and report the current position.
- <*Expiry enable*>: Enable/disable the expiry function to stop all the GNSS fixing and reports.
  - 0: Disable the Expiry function.
  - 1: Enable the Expiry function.
- <*Expiry time*>: The time to stop all the GNSS fixing and any reports. The valid format is "YYYYMMDDHHMMSS". The value range of "YYYY" is "2000"-"3000". The value range of "MM" is "01"-"12". The value range of "DD" is "00"-"31". The value range of "HH" is "00"-"23". The value range of "MM" is "00"-"59". The value range of "SS" is "00"-"59". Please note that RTC time is used here.
- <*AGPS mode*>: A numeral to indicate whether to enable AGPS. AGPS helps increase the chances of getting GNSS position successfully and reduce the time needed to get GNSS position.
  - 0: Disable the AGPS function.
  - 1: Enable the AGPS function.
- <*Sleep enable*>: Enable/disable the sleep mode when charging.
  - 0: Disable the sleep mode when charging.
  - 1: Do not disable the sleep mode when charging.
- <*Battery low threshold*>: The percentage value to measure whether internal battery is in low power state. If the remaining capacity percentage of internal battery is lower than the value specified by this field, the device will report the **+RESP:GTBPL** message to the backend server. If this field is set to 0, then the device will use default low voltage 3.55V as the threshold for low power judgment.
- <*GNSS working mode*>: The working mode of GNSS chip.
  - 0: GPS and GLONASS positioning systems. In this mode, the device gets position(s) with GPS and GLONASS systems.

    Note: If the current GNSS chip does not support GPS and GLONASS combination mode, the device will get position by GPS only.
  - 1: GPS positioning system. In this mode, the device gets position(s) only with GPS system.
  - 2: GLONASS positioning system. In this mode, the device gets position(s) only with GLONASS system.

Note: AGPS file needs to be downloaded from the specified URL for the AGPS function (which now costs about 10 KB per day).

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

- **+ACK:GTCFG,**

Example: **+ACK:GTCFG,301303,860599004785994,,0028,20190920101713,000D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.2 Non-movement Detection

The **AT+GTNMD** command is used to configure the parameters for non-movement detection.

- **AT+GTNMD=**

Example: **AT+GTNMD=gl300,,3,2,3,,,,,,,,,0005$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	‘0’ – ‘9’, ‘a’ – ‘z’, ‘A’ – ‘Z’	gl300
Mode	1	0-F	0
Non-movement duration	<=3	1 – 255(×15sec)	2
Movement duration	<=2	1 – 50(×128ms)	3
Movement threshold	1	2 – 9	2
Rest fix interval	5	5 – 86400sec	300
Rest send interval	5	5 – 86400sec	300
EBK rest threshold	1	2 – 9	2
EBK motion threshold	1	2 – 9	3
URC report	1	0|1	0
Enter movement by command	1	0|1	0
Movement debounce	1	0|1	0
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*Mode*>: A hex numeral to determine how the function works. Each bit of the hex numeral indicates a different behavior that the device could do. If a bit is 1, the device will perform the corresponding action in the description below. Otherwise, it will not behave as described.
  - Bit 0 (1): Suspend the FRI report (including the FRI report of **+RESP:GTGSM**) and Geo-Fence report when non-movement is detected.
  - Bit1 (2): Report the message **+RESP:GTNMR** to the backend server when it detects non-movement.
  - Bit 2 (4): Report the message **+RESP:GTNMR** to the backend server when it detects movement.
  - Bit 3 (8): Change the fix interval and send interval of FRI report (including the FRI report of **+RESP:GTGSM**) to <*Rest fix interval*> and <*Rest send interval*> when non-movement is detected. In this case, the device just modifies the fix interval and send interval of FRI (including the FRI report of **+RESP:GTGSM**) but does not suspend the FRI report (including the FRI report of **+RESP:GTGSM**) even if Bit 0 is 1.
- <*Non-movement duration*>: A time parameter to measure whether the device enters non-movement status. If it is detected by the motion sensor that the device stays in non-movement for a period of time specified by <*Non-movement duration*>, the device will be considered as in non-movement status.
- <*Movement duration*>: A time parameter to measure whether the device enters movement status. If it is detected by the motion sensor that the device stays in movement for a period of time specified by <*Movement duration*>, the device will be considered as in movement status.
- <*Movement threshold*>: The threshold for the motion sensor to determine whether the device is in movement. The smaller the value, the more easily the device is considered to be in movement.
- <*Rest fix interval*>: The fix interval for the FRI report when the device is in rest state and Bit 3 of <*Mode*> is 1.
- <*Rest send interval*>: The send interval for the FRI report when the device is in rest state and Bit 3 of <*Mode*> is 1.
- <*EBK rest threshold*>: The threshold for the EBK motion sensor to determine whether the EBK enters non-movement state.
- <*EBK motion threshold*>: The threshold for the EBK motion sensor to determine whether the EBK enters movement state.
- <*URC report*>: Enable/disable sensor state output through URC.
  - 0: Do not output the sensor's state to UART.
  - 1: Output "SENSOR:REST" / "SENSOR:MOTION" to UART to indicate state change. "SENSOR:REST" means state change from MOTION to REST. "SENSOR:MOTION" means state change from REST to MOTION.
- <*Enter movement by command*>: A numeral to indicate whether to force the device to enter movement state after receiving the **AT+GTRTO** command with the subcommand **RTL** or getting state update in **AT+GTLSW** from EBK.
  - 0: Do not change motion status after receiving the commands.

- 1: Force the device to enter movement state after receiving one of the commands.

✧ <*Movement debounce*>: Enable/disable movement debounce function.

- 0: Disable this function.
- 1: A parameter to determine whether the device enters moving state. After the motion sensor detects movement and the moving state is maintained for the period of time 25s when <*Non-movement duration*> is 1 or 40s when <*Non-movement duration*> is 2, the device will be considered in moving state. This parameter will be invalid if <*Non-movement duration*> is greater than 2.

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

➢ **+ACK:GTNMD,**

Example: **+ACK:GTNMD,301303,860599004785994,,0029,20190920101725,000E$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.3 Time Adjustment

The command **AT+GTTMA** is used to adjust local time. If the GNSS fix is successful, the local time will be automatically adjusted according to the GNSS UTC time.

➢ **AT+GTTMA=**

Example: **AT+GTTMA=gl300,-,3,30,0,20090917203500,,,,,0006$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Sign	1	+|-	+
Hour offset	<=2	0 – 23	00
Minute offset	<=2	0 – 59	00
Daylight saving	1	0|1	0
UTC time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	

Tail character	1	$	$

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

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

➢ **+ACK:GTTMA,**

Example: **+ACK:GTTMA,301303,860599004785994,,002A,20190920101728,000F$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.4 Function Key Settings

The **AT+GTFKS** command is used to configure the functions of the power key and the function key.

➢ **AT+GTFKS=**

Example: **AT+GTFKS=gl300,1,,1,1,1,,,ffff$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Power key mode	1	0|1|2	1
Full power up	1	0|1	1
Function key mode	1	0|1|2|3	3
Power key indicator	0	0|1	0
Function key indicator	0	0|1|2	0
SOS Report mode	1	1|2|3	3
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*Power key mode*>: A numeral to indicate the working mode of the power key.
  - 0: Pressing the power key does not power off the device.
  - 1: Pressing the power key powers off the device.
  - 2: Long press power key for 1.5 seconds to activate the SOS mode.
- <*Full power on*>: A numeral to indicate whether the terminal powers on completely after the terminal is powered on by the charger inserted.
  - 0: Do not power on the terminal completely. And the terminal will be charging, but not working.
  - 1: Power on the terminal completely. The terminal will work normally just like it is powered on by long pressing the power key.
- <*Function key mode*>: The mode of the function key operation.
  - 0: Ignore the function key operation.
  - 1: Geo-Fence mode. Long press the function key to enable/disable the Geo-Fence ID 0. After the function key is long pressed, the terminal will report the message **+RESP:GTSWG** to inform whether Geo-Fence ID 0 is enabled/disabled via this operation.
  - 2: Geo-Fence in current position mode. Enable/disable the Geo-Fence ID 0 when the function key is long pressed and use the current position as the center of Geo-Fence ID 0. After long pressing the function key, the terminal will report the message **+RESP:GTSWG** immediately. And if this operation is expected to enable Geo-Fence ID 0, the terminal will start GNSS fixing to get the current position as the center of Geo-Fence ID 0. After GNSS fix finishes, it will report the message **+RESP:GTGCR** to inform the result of GNSS fix and whether Geo-Fence ID 0 is enabled successfully.
  - 3: SOS mode. After long pressing the function key for 3 seconds, the device will report the current position according to the result of the latest GNSS fix and then start GNSS fixing. After the GNSS fix finishes or timeout expires, the device will report the SOS message according to the result of the GNSS fix.
- <*Power key indicator*>: A numeral to indicate the working mode of the motor via power key operation.
  - 0: Disable the motor vibration when the power key is long pressed.
  - 1: Enable the motor vibration when the power key is long pressed to power off.
- <*Function key indicator*>: A numeral to indicate the working mode of the motor via function key operation.
  - 0: Disable the motor vibration when the function key is long pressed.
  - 1: Make one vibration when the function key is long pressed.
  - 2: Make one long vibration when the function key is long pressed to enable Geo-Fence ID 0. If the function key is long pressed to disable Geo-Fence 0, make two short vibrations.
- <*SOS report mode*>: A numeral to indicate the mode of reporting GNSS location for SOS event.
  - 1: Report only the last GNSS location immediately after SOS event is triggered.
  - 2: Try to report the current GNSS location after SOS event is triggered.
  - 3: Report the last GNSS location immediately after SOS event is triggered and then

try to get the current GNSS location to be reported.

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

➢ **+ACK:GTFKS,**

Example: **+ACK:GTFKS,301303,860599004785994,,002B,20190920101731,0010$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.5 Auto-unlock SIM PIN

The **AT+GTPIN** command is used to configure whether to automatically unlock the PIN of the SIM card in the device.

➢ **AT+GTPIN=**

Example: **AT+GTPIN=gl300,1,1234,1,,,,,000E$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0'-'9', 'a'-'z', 'A'-'Z'	gl300
Auto-unlock PIN	1	0|1	1
PIN	4-8	'0'-'9'	
PIN check	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	

✧ <*Auto-unlock PIN*>: A numeral to indicate whether to auto-unlock the SIM PIN for the device.

- 0: Do not unlock SIM PIN automatically.
- 1: Each time the device powers on, it will detect whether the SIM card is locked with a PIN. If it is locked, the device will unlock the PIN automatically only one time.

✧ <*PIN*>: The PIN code which is used for unlocking PIN automatically. If it is empty, the PIN code saved in the device will be cleared.

✧ <*PIN check*>: A numeral to indicate whether to lock the device with SIM PIN.

- 0:Do not lock the device with the SIM PIN.
- 1:Lock the device with the SIM PIN.

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

➢ **+ACK:GTPIN,**

Example: **+ACK:GTPIN,301303,860599004785994,,002C,20190920101735,0011$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.6 Protocol Watchdog

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

➢ **AT+GTDOG=**

Example: **AT+GTDOG=gl300,1,,1,0130,,1,1,,,,,0011$** **AT+GTDOG=gl300,2,30,,,,1,1,,,,,0011$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	‘0’ – ‘9’, ‘a’ – ‘z’, ‘A’ – ‘Z’	gl300
Mode	1	0|1|2	0
Ignition frequency	<=3	10-120	60
Interval	<=2	1-30	30
Time	4	HHMM	0200
Reserved	0		
Report before reboot	1	0|1	1
Input ID	1	0|1	0
Unit	1	0|1	0
GSM interval	4	0|5-1440min	60min
PDP interval	4	0|5-1440min	60min
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*Mode*>: The working mode of the watchdog function.
  - 0: Disable this function.
  - 1: Reboot periodically according to the <*Interval*> and <*Time*> settings.
  - 2: Reboot upon ignition on.
- <*Ignition frequency*>: If the working mode is 2 and the time interval between two adjacent ignition-ons is greater than the value specified by this parameter, the device will automatically reboot upon ignition on.
- <*Interval*>: The interval for rebooting the device.
- <*Time*>: At what time to perform the reboot operation when the <*Interval*> condition is met.
- <*Report before reboot*>: Whether to report the **+RESP:GTDOG** message before reboot. 0 means "Do not report the message before reboot", and 1 means "Report the message before reboot". If this parameter is enabled, the device will initiate a real-time location fix before sending the message with the current location information.
- <*Input ID*>: The ID of the digital input port which is used to trigger the manual reboot. 0 means "Do not use manual reboot". Only port 1 is supported.
- <*Unit*>: The unit of the <*Interval*> value.
  - 0: Day.
  - 1: Hour.
- <*GSM interval*>: The time interval in minutes for rebooting the terminal when the device is not registered on GSM network.
- <*PDP interval*>: The time interval in minutes before rebooting the terminal if PDP context activation fails.

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

- **+ACK:GTDOG,**

Example: **+ACK:GTDOG,301303,860599004785994,,002D,20190920101738,0012$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.7 Network Selection

The **AT+GTNTS** command is used to configure network when the signal strength is low.

- **AT+GTNTS =**

Example: **AT+GTNTS=gl300,1,20,2,46001,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Enable	1	0|1	0
RSSI threshold	3	0 – 35	30
Interval	3	0 – 300min	10
Oper1	10		
Oper2	10		
Oper3	10		
GSM interval	3	0 – 300min	10
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*Enable*>: Enable/disable the network selection (NTS) function.
  - 0: Disable the network selection function.
  - 1: Enable the network selection function.
- <*RSSI threshold*>: The threshold of the CSQ value.
- <*Interval*>: The time interval for changing to another operator.
- <*Oper1*>: The first network operator to be selected if the CSQ value is below the <*RSSI threshold*> for a period of time longer than <*Interval*>.
- <*Oper2*>: The second network operator to be selected if the CSQ value is below the <*RSSI threshold*> for a period of time longer than <*Interval*>.
- <*Oper3*>: The third network operator to be selected if the CSQ value is below the <*RSSI threshold*> for a period of time longer than <*Interval*>.
- <*GSM interval*>: The time in minutes to be waited before changing the operator in case of no GSM network.

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

➢ **+ACK:GTNTS,**

Example: **+ACK:GTNTS,301303,860599004785994,,002E,20190920101742,0013$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.8 Outside Working Hours

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

➢ **AT+GTOWH=**

Example: **AT+GTOWH=gl300,1,1F,0900,1200,1300,1730,,,1,,,,,,,,0012$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300
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
RF sleep mode	0	0|1	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 this function.

- 0: Disable this function.
- 1: Manual mode. Use the specified digital input (refer to the parameter <*Digital Input ID*>) to control whether to check working hours. If the digital input is enabled, and it is outside the working hours, the device will hide the location information. Otherwise the location information will be reported normally.
- 2: Full manual mode. Use the specified digital input (refer to the parameter <*Digital Input ID*>) to control whether to hide the location information. The device hides the location information when the input is enabled and reports the location information

normally when the input is disabled.

- 3: Automatic mode. Under this mode, the device will ignore the status of the digital input and will automatically check the current time against the working hour range. If it is outside of the working hours, the device will hide the location information. Otherwise the device will report the location information normally.

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

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

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

✧ <*Working hours start1*>, <*Working hours end1*>: The first period of the working hours in a day.

✧ <*Working hours start2*>, <*Working hours end2*>: The second period of the working hours in a day.

✧ <*Digital input ID*>: The input ID used to trigger this function when the mode is 1 or 2. Only digital input port 1 is supported.

✧ <*RF sleep mode*>: It specifies whether to shut down the radio when the device is outside w*orking hours* in order to reduce power consumption.

- 0: Do not shut down radio.
- 1: Shut down radio.

Note: If network connection is lost by <*RF sleep mode*>, the command **AT+GTDOG** will not trigger "No Network" or "No Activation" watchdog reboot.

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

➢ **+ACK:GTOWH,**

Example: **+ACK:GTOWH,301303,860599004785994,,002F,20190920101745,0014$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.2.9 Jamming Detection

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

- **AT+GTJDC=**

Example: **AT+GTJDC= gl300,1,25,,5,10,10,,,,,,,0016$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300
Mode	1	0|1|2	0
Signal threshold	<=3	0 – 31	25
Reserved	0		
Jamming cell number threshold	<=2	0-99	5
Enter jamming timer threshold	<=3	0-300 sec	10
Quit jamming timer threshold	<=4	0-3600sec	10
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

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

- 0: Disable the jamming detection function.
- 1: Enable jamming detection function: If jamming is detected, the device will report the **+RESP:GTJDR** message upon entering into "jamming" status.
- 2: Enable jamming detection function: If jamming is detected, the device will report the **+RESP:GTJDS** message upon entering into or quitting "jamming" status.

✧ <*Signal threshold*>, <*Jamming cell number threshold*>: The built-in jamming detection

algorithm uses these two parameters to measure whether the device is currently being jammed. The smaller the parameter value, the more sensitive the detection.

- <*Enter jamming timer threshold*>: If the device detects jamming, the device will trigger the "enter jamming" event based on <*Enter jamming timer threshold*>.
- <*Quit jamming timer threshold*>: If the device quits the jamming status, the device will trigger the "quit jamming" event based on <*Quit jamming timer threshold*>.

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

➢ **+ACK:GTJDC,**

Example: **+ACK:GTJDC,301303,860599004785994,,0030,20190920101748,0015$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.3 Position Related Report

3.2.3.1 Fixed Report Information

The command **AT+GTFRI** is used to configure the parameters for scheduled report.

➢ **AT+GTFRI=**

Example: **AT+GTFRI=gl300,0,,,,,,,,,,,,,,,,0007$** **AT+GTFRI=gl300,1,1,,,0000,2359,60,60,,,1F,,,,,,,,0007$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Mode	1	0|1|2|3|4|5|6	0
Discard no fix	1	0|1	1
Reserved	0		
Reserved	0		
Begin time	4	HHMM	0000
End time	4	HHMM	0000
Check interval	<=5	1 – 86400sec	180
Send interval	<=5	1 – 86400sec	180
Ignition check interval	<=5	1 – 86400sec	180
Ignition send interval	<=5	1 – 86400sec	180

Report mask	4	0000 – 007F	001F
Distance	<=5	20 – 65535m	1000
Mileage	<=5	20 – 65535m	1000
Movement detection mode	1	0|1	0
Movement speed	<=3	1-999km/h	5
Movement distance	<=4	1-9999m	50
Movement send number	1	1-5	5
Corner	<=3	0 – 180	0
Append mask	<=4	0 – 1	0
Wrap corner point	1	0|1	0
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*Mode*>: The working mode of the fixed report function.
  - 0: Disable fixed report function.
  - 1: Enable fixed time report.
  - 2: Enable fixed distance report. The device sends a report message each time the straight length that the device has moved exceeds the specified distance. It ignores the specific path the device has passed along. This function is invalid unless the GNSS chip is always on. Unit: meter.
  - 3: Enable fixed mileage report. The device sends a report each time the path length that the device has moved exceeds the specified length. It calculates the length of the specific path the device has passed along. This function is invalid unless the GNSS chip is always on. Unit: meter.
  - 4: Optimum report. The device simultaneously checks both time interval and path length between two adjacent reports. It will report device position if the calculated time interval between current time and the time of the last report is greater than <*Send Interval*>, and the length of path between the current position and the last position is greater than the <*Mileage*>. In order for this function to work, <*GNSS on need*> must be 0 (Never turn off GNSS chip) or 2 (Never turn off GNSS chip in ignition on state or movement state).
  - 5: Enable the fixed time report of **+RESP:GTGSM**.
  - 6: Fixed time or mileage report. The device either checks time interval or path length between two adjacent reports. It will report the device position if the calculated time interval between current time and the time of last report is greater than <*Send Interval*>, or the length of path between the current position and the last position is greater than the <*Mileage*>.
- <*Discard no fix*>: 0 means “Report last known GNSS position if there is no GNSS fix”, and 1 means “Do not send position information if there is no GNSS fix.
- <*Begin time*>: The start time of scheduled report. The valid format is “HHMM”. The value range of “HH” is “00”-“23”. The value range of “MM” is “00”-“59”. Please note that system time is used here.

- <*End time*>: The end time of scheduled report. The valid format and range are same as those of <*Begin time*>.
- <*Check interval*>: The time interval for GNSS fix when the device attached vehicle is ignition off. Its value range is 1-86400 and the unit is second.
- <*Send interval*>: The time interval for sending the position information when the device attached vehicle is ignition off. The value range is 1-86400 and the unit is second. If <*Report mode*> in **AT+GTSRI** is set to forced SMS mode, this parameter should not be less than 15 seconds; otherwise the position information will be sent via TCP short connection.
- <*Ignition check interval*>: The time interval for GNSS fix when the device attached vehicle is ignition on. Its value range is 1-86400 and the unit is second.
- <*Ignition send interval*>: The time interval for sending the position information when the device attached vehicle is ignition on. The value range is 1-86400 and the unit is second.
- <*Report mask*>: Bitwise mask to configure the composition of GNSS position information for fixed report. If a bit is set to 1, the corresponding field will be filled in the position related messages. Otherwise, the field will be empty.

  Bit 0 (0001): <*Speed*>

  Bit 1 (0002): <*Azimuth*>

  Bit 2 (0004): <*Altitude*>

  Bit 3 (0008): GSM and cell information, including <*MCC*>, <*MNC*>, <*LAC*>, <*CellID*>

  Bit 4 (0010): <*Send time*>
- <*Distance*>: The specified distance for sending the position information when <*Mode*> is 2. This parameter is valid only if GNSS chip is always on. Unit: meter.
- <*Mileage*>: The specified path length for sending the position information when <*Mode*> is 3. This parameter is valid only if GNSS chip is always on. Unit: meter.
- <*Movement detection mode*>: Enable/disable the movement detection function.
  - 0: Disable the movement detection function.
  - 1: Enable the movement detection function. When the movement detection function is enabled, the device will be considered to be in non-movement if the speed, according to the GNSS fix result, is lower than <*Movement speed*> and the distance between the current GNSS point and the last moving GNSS point is less than <*Movement distance*>. After the device is considered to be in non-movement, it will report FRI messages (the speed field is shown as -1 in these messages) <*Movement send number*> times at most.
- <*Movement speed*>: The speed threshold for movement detection. The unit is km/h.
- <*Movement distance*>: The distance threshold for movement detection. The unit is meter.
- <*Movement send number*>: If the device is considered to be staying at one position according to the speed threshold and distance threshold, the device will send out at most the number of reports specified by this parameter before it moves again.
- <*Corner*>: A numeral to indicate whether to report the **+RESP:GTFRI** message according to the heading change, i.e. the change in direction of the device movement.
  - 0: Disable the function. Do not detect whether the device has changed its direction.
  - 1 – 180: The angle used to determine whether the device turns around. If the heading change is greater than the value specified by <*Corner*>, the device will be considered to turn around. Unit: degree.

✧ <*Append mask*>: Bitwise mask to configure the composition of appended items in the message **+RESP:GTFRI**. Each bit represents a field to be appended in the message **+RESP:GTFRI**. If a bit is set to 1, the corresponding field will be present in the message **+RESP:GTFRI**.

Mask Bit	Item
Bit 0 (0001)	I/O status
Bit 1 (0002)	Reserved
Bit 2 (0004)	Reserved
Bit 3 (0008)	Reserved
Bit 4 (0010)	Reserved
Bit 5 (0020)	Reserved
Bit 6 (0040)	Reserved
Bit 7 (0080)	Reserved
Bit 8 (0100)	Reserved
Bit 9 (0200)	Reserved
Bit 10 (0400)	Reserved
Bit 11 (0800)	Reserved
Bit 12 (1000)	Reserved
Bit 13 (2000)	Reserved
Bit 14 (4000)	Reserved
Bit 15 (8000)	Reserved

✧ <*Wrap corner point*>: A numeral to indicate whether to wrap corner point together with other fixed GNSS points and wait until the condition to send **+RESP:GTFRI** reaches according to the value of <*Mode*>.

- 0: Do not wrap corner point and send the corner point immediately when it is found.
- 1: Wrap corner point and wait until the condition to send **+RESP:GTFRI** reaches according to the value of <*Mode*>.

Note:

Check Interval

If <*GNSS on need*> is set to 1 or <*GNSS on need*> is set to 2 without ignition on, the device has two modes of operating the GNSS module depending on the value of <*Check interval*>:

- Mode 1: If the <*Check interval*> is more than 60 seconds, the device will turn off the GNSS chip every time after GNSS fix finishes in order to save power.
- Mode 2: If the <*Check interval*> is less than 60 seconds, the device will never turn off the GNSS chip in this mode.

Due to the length limit of the **+RESP:GTFRI** report message, it must be assured that: <*Send interval*> / <*Check interval*> <= 15. If the message length exceeds that limit, the command is discarded and the previous settings are kept unchanged.

If the device is in "Forced SMS Mode" (<*Report mode*> = 5) while the <*Send interval*> / <*Check Interval*> is greater than 1, the device will report only the last position in the fixed time report,

because only one position could be filled in a single SMS message (160 bytes at most).

Reporting Action Based on Time Range

- <*Begin time*> < <*End time*>: The report works in the time period of (Begin time, End time) every day.
- <*Begin time*> > <*End time*>: The report starts from <*Begin time*> and stops at <*End time*> the following day.
- <*Begin time*> = <*End time*>: The report works for the whole day.

Scheduled Report Mode

For fixed distance report, fixed mileage report and optimum report, <*GNSS on need*> must be 0 (Never turn off GNSS chip) or 2 (Never turn off GNSS chip in ignition on state or movement state). For fixed time report, it does not matter whether GNSS is always working.

Corner Report

Make sure <*GNSS on need*> is set to 0 or 2 to detect turning point.

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

➢ **+ACK:GTFRI,**

Example: **+ACK:GTFRI,301303,860599004785994,,0031,20190920101921,0016$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4 Alarm Settings

3.2.4.1 Geo-Fence Information

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

➢ **AT+GTGEO=**

Example: **AT+GTGEO=gl300,0,3,101.412248,21.187891,1000,600,,,,,,,,0008$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
GEO ID	<=2	0 – 19	
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000m	50
Check interval	<=5	0|30 – 86400sec	0
State mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*GEO ID*>: The ID of the Geo-Fence. A total of 20 zones (0-19) are supported.
- <*Mode*>: A numeral to indicate when to report the notification to the backend server.
  - 0: Disable the Geo-Fence for the specified GEO ID.
  - 1: Report the notification when entering the Geo-Fence.
  - 2: Report the notification when leaving the Geo-Fence.
  - 3: Report the notification when entering / leaving the Geo-Fence.
- <*Longitude*>: The longitude of a point which is defined as the center of the circular Geo-Fence region. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the minus sign "-" and east longitude is defined as positive without "+".
- <*Latitude*>: The latitude of a point which is defined as the center of the circular Geo-Fence region. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "-" and north latitude is defined as positive without "+".
- <*Radius*>: The radius of the circular Geo-Fence region. The value range is (50-6000000) and the unit is meter.
- <*Check interval*>: The interval of GNSS checking position information against the Geo-Fence alarm.
- <*State mode*>: A numeral to indicate the mode of reporting GEO state.
  - 0: The device should report when getting the GEO state for the first time.
  - 1: The device does not report until the GEO state changes.

Note: If the parameter <*Check interval*> is set to 0, <*Mode*> will be set to 0 automatically (For Geo-Fence ID 0, <*Mode*> will be restored for later use when Geo-Fence ID 0 is enabled via Function Key).

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

- **+ACK:GTGEO,**

Example: **+ACK:GTGEO,301303,860599004785994,,0,FFFF,20190920101936,0017$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
GEO ID	<=2	0 – 19	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.2 Speed Alarm

The **AT+GTSPD** command is used to configure speed alarm of the device. Based on the working mode set, the device will report speed alarm when its speed is outside or inside of a predefined range.

- **AT+GTSPD=**

Example: **AT+GTSPD=gl300,1,5,40,30,60,,,,,,,,,,,,,,0009$** **AT+GTSPD=gl300,2,0,80,30,60,,,,,,,,,,,,,,0009$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Mode	1	0|1|2	0
Min. speed	<=3	0 – 400km/h	0
Max. speed	<=3	0 – 400km/h	0
Duration	<=4	15 – 3600sec	60
Send interval	<=4	0|5 – 3600sec	300
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- ✧ <*Mode*>: A numeral to indicate the working mode of speed alarm.
  - 0: Disable speed alarm.
  - 1: Enable speed alarm: If the current speed is within the speed range defined by <*Min. speed*> and <*Max. speed*>, a speed alarm is sent.
  - 2: Enable speed alarm: If the current speed is outside the speed range defined by <*Min. speed*> and <*Max. speed*>, a speed alarm is sent.
- ✧ <*Min. speed*>: The lower limit of the speed range.
- ✧ <*Max. speed*>: The upper limit of the speed range.
- ✧ <*Duration*>: If the speed satisfies the speed range condition set by <*Mode*> and the status is maintained for a period of time specified by <*Duration*>, the speed alarm will be triggered.
- ✧ <*Send interval*>: If the speed alarm is triggered, the speed alarm message will be sent at the interval specified by this parameter. If <*Send interval*> is set to 0, the speed alarm message will be sent only once.

Note: The parameters <*Duration*> and <*Send interval*> are invalid if GNSS is not always on. The speed alarm will be reported immediately if the speed of the terminal detected is out of the allowed speed range while GNSS is not always on.

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

- ➢ **+ACK:GTSPD,**

Example: **+ACK:GTSPD,301303,860599004785994,,0033,20190920101952,0018$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.3 Temperature Alarm

The **AT+GTTEM** command is used to configure temperature alarm of the device. Based on the

working mode set, the device will report temperature alarm when its temperature is outside or inside of a predefined range.

➢ **AT+GTTEM=**

Example: **AT+GTTEM=gl300,1,-05,10,15,30,,,,,,000E$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300
Mode	1	0|1|2|3	0
Min. temperature	<=3	-20℃-60℃	0
Max. temperature	<=3	-20℃-60℃	0
Duration	<=4	0 – 3600sec	60
Send interval	<=4	0|5 – 3600sec	300
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✧ <*Mode*>: A numeral to indicate the working mode of temperature alarm.
- 0: Disable this function.
- 1: Report the alarm message **+RESP:GTTEM** when the current temperature is lower than the lowest temperature defined by <*Min. temperature*>.
- 2: Report the alarm message **+RESP:GTTEM** when the current temperature is inside the temperature range defined by <*Min. temperature*> and <*Max. temperature*>.
- 3: Report the alarm message **+RESP:GTTEM** when the current temperature is higher than the highest temperature defined by <*Max. temperature*>.

✧ <*Min. temperature*>: The lower limit of the temperature range.

✧ <*Max. temperature*>: The upper limit of the temperature range.

✧ <*Duration*>: If the temperature alarm function is enabled and the temperature stays within the specified temperature range for the period of time specified by <*Duration*>, a temperature alarm will be triggered.

✧ <*Send interval*>: If the temperature alarm is triggered, the temperature alarm message will be sent at the interval specified by this parameter. If <*Send interval*> is set to 0, the temperature alarm message will be sent only once.

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

➢ **+ACK:GTTEM,**

Example:

+ACK:GTTEM,301303,860599004785994,,0034,20190920101955,0019$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.4.4 Roaming Detection Configuration

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

- **AT+GTRMD=**

Example: **AT+GTRMD=gl300,0,,,,,1,2,46000F,46002F,,,1,1,,,,2,2,,,,1f,,,1f,,,,,,,,,,0001$** **AT+GTRMD=gl300,1,,,,,1,3,46000,46002,46003,,,2,2,46007,,,1,1,46001,,,3fff,,,2ff,,,,,,,,,,0002$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	‘0’ – ‘9’ ‘a’ – ‘z’ ‘A’ – ‘Z’	gl300
Mode	1	0|1|2	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Home operator start	1	1-10	
Home operator end	1	1-10	
Home operator list	<=6*10		
Reserved	0		
Reserved	0		
Roaming operator start	1	1-100	
Roaming operator end	1	1-100	
Roaming operator list	<=6*100		
Reserved	0		
Reserved	0		
Blacklist operator start	1	1-20	
Blacklist operator end	1	1-20	
Black list operator	<=6*20		
Reserved	0		
Reserved	0		

Known roaming event mask	<=6	000000 – FFFFFF	7FFF
Reserved	0		
Reserved	0		
Unknown roaming event mask	<=6	000000 – FFFFFF	7FFF
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 roaming detection function.
  - 0: Disable this function.
  - 1: Enable the roaming detection.
  - 2: Roaming detection with white list. The white list contains home operator list and roaming operator list. The operators not in white list will be considered as in "Blocking Report" state. In this state, the device works normally except that all reports will be buffered instead of being sent.
- <*Operator start*>: A numeral which indicates the first index of the whitelist operator numbers to be input. For example, if the value is 1, it will update the white list of operators from the 1st one. If the parameter is empty, there should be no whitelist number following the empty value.
- <*Operator end*>: A numeral which indicates the last index of the whitelist operator numbers to be input. For example, if the value is 2, it will update the white list of operators until the 2nd one. If the parameter is empty, there should be no white list number following the empty value.
- <*Home operator list*>: A white list of PLMN operator numbers. The numbers are comprised of MCC and MNC, both of which consist of 3 digits. The last digit of MNC can be omitted (e.g., both '46001F' and '46001' are the PLMN of CHINA UNICOM). The operators in this list will be considered as in "Home" state. And two adjacent operator numbers are separated with ','. The number of the operators in the list depends on the parameters <*Operator start*> and <*Operator end*>. For example, if <*Operator start*> is 1 and <*Operator end*> is 2, the operator list should include 2 operator numbers (empty value acceptable) and the two numbers are separated with ','. 'MCCFF' type code is used to identify operators across a whole country. For example, '460FF' covers the mobile network operators all across China.

- <*Roaming operator list*>: It is mostly like the <*Home operator list*>, and the difference is that the operators in this list will be considered as in "Known Roaming" state.
- <*Blacklist operator*>: It is mostly like the <*Home operator list*>, and the difference is that the operators in this list will be considered as in "Blocking Report" state. In this state, the device works normally except that all reports will be buffered instead of being sent.

  Note: Operators that are not in <*Home operator list*>, <*Roaming operator list*> and <*Blacklist operator*> will be considered as in "Unknown Roaming" state.
- <*Known roaming event mask*>: Bitwise mask to configure which event report should be sent to the backend server when GSM roaming state is detected. If the roaming state is "Known Roaming", the <*Known roaming event mask*> will be valid; if the roaming state is "Unknown Roaming", the <*Unknown roaming event mask*> will be valid.
  - Bit 0 for **+RESP:GTPNA**
  - Bit 1 for **+RESP:GTPFA**
  - Bit 2 for **+RESP:GTEPN**
  - Bit 3 for **+RESP:GTEPF**
  - Bit 4 Reserved
  - Bit 5 for **+RESP:GTBPL**
  - Bit 6 for **+RESP:GTBTC**
  - Bit 7 for **+RESP:GTSTC**
  - Bit 8 for **+RESP:GTSTT**
  - Reserved
  - Bit 10 for **+RESP:GTPDP**
  - Bit 11 for the power on **+RESP:GTPNL**
  - Bit 12 for the ignition report **+RESP:GTIGN** and **+RESP:GTIGF**
  - Bit 13 for the ignition on location report **+RESP:GTIGL**
  - Bit 14 for **+RESP:GTPFL**
  - Reserved

  For each bit, set it to 1 to enable the corresponding event report, and 0 to disable the corresponding event report.
- <*Unknown roaming event mask*>: It is mostly like the <*Known Roaming Event Mask*>.

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

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

- **+ACK:GTRMD,**

Example: **+ACK:GTRMD,301303,860599004785994,,0035,20190920101958,001A$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	

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

Note:

Only an AT command string of no more than 250 bytes could be accepted by the device in the case of sending the command via Manage Tool (there is no such size limit in the case of sending the command via GPRS).

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

3.2.4.5 Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh driving behavior based on GNSS when the device is in moving state or ignition on state.

➢ **AT+GTHBM=**

Example: **AT+GTHBM=gl300,1,3,,100,21,6,,60,21,6,,,21,15,,,,,,,,,0010$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300
Mode	1	0 | 1	0
Behavior Duration	1	3-5	3
Reserved	0		
High Speed	<=3	100 – 400km/h	100
ΔVhb	<=3	0 – 100km/h	0
ΔVha	<=3	0 – 100km/h	0
Reserved	0		
Medium Speed	<=3	20 – 100km/h	60
ΔVmb	<=3	0 – 100km/h	0
ΔVma	<=3	0 – 100km/h	0
Reserved	0		

Reserved	0		
ΔVlb	<=3	0 – 100km/h	0
ΔVla	<=3	0 – 100km/h	0
Reserved	0		
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 harsh behavior monitoring function.
  - 0: Disable this function.
  - 1: Enable this function, detected by GNSS only. In this mode, two harsh behaviors are monitored, i.e. harsh braking and harsh acceleration. According to the speed read from GNSS, 3 levels of speed are defined including high speed, medium speed and low speed. For each speed level, 2 thresholds of speed change are defined to determine harsh braking and harsh acceleration. If the change of speed within 5 seconds is greater than the corresponding threshold, the device will report the **+RESP:GTHBM** message to the backend server to indicate the harsh behavior. The same harsh behavior within 30 seconds will only be reported once if only GNSS is used to measure harsh driving behavior.
- <*Behavior Duration*>: Speed change within <*Behavior Duration*> is measured for monitoring harsh behavior. Unit: second.
- <*High Speed*>, <*Medium Speed*>: If the last known speed of the device read from GNSS is greater than or equal to <*High Speed*>, the vehicle that the device is attached to is considered to be at high speed. If the last known speed is less than <*High Speed*> but greater than or equal to <*Medium Speed*>, the vehicle is considered to be at medium speed. If the last known speed is less than <*Medium Speed*>, the vehicle is considered to be at low speed.
- <*ΔVhb*>: The threshold for harsh braking at high speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at high speed level. If it is set to 0, it means "Do not monitor harsh braking behavior at high speed level".
- <*ΔVha*>: The threshold for harsh acceleration at high speed level. If the current speed is

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

- <*ΔVmb*>: The threshold for harsh braking at medium speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at medium speed level. If it is set to 0, it means “Do not monitor harsh braking behavior at medium speed level”.
- <*ΔVma*>: The threshold for harsh acceleration at medium speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at medium speed level. If it is set to 0, it means “Do not monitor harsh acceleration behavior at medium speed level”.
- <*ΔVlb*>: The threshold for harsh braking at low speed level. If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh braking is detected at low speed level. If it is set to 0, it means “Do not monitor harsh braking behavior at low speed level”.
- <*ΔVla*>: The threshold for harsh acceleration at low speed level. If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within 5 seconds, harsh acceleration is detected at low speed level. If it is set to 0, it means “Do not monitor harsh acceleration behavior at low speed level”.

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

- **+ACK:GTHBM,**

Example: **+ACK:GTHBM,301303,860599004785994,,0036,20190920102001,001B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.5 IO Application

3.2.5.1 Digital Input Port Settings

- **AT+GTDIS=**

Example: **AT+GTDIS=gl300,1,1,5,,,,,,0010$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	‘0’-‘9’, ‘a’-‘z’, ‘A’-‘Z’	gl300
Input ID	1	1	1

Mode	1	0|1|2|3	0
Debounce time	<=3	0-800 (×10ms)	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	

- <*Input ID*>: The ID of the digital input. It is always 1. If the field is empty, the device will ignore the settings of the digital input 1.
- <*Mode*>: A numeral to define the working mode of the digital output.
  - 0: Disable the digital input. The device ignores the status change of the digital input.
  - 1: Enable the digital input. If the status of the input changes, the device will report the message **+RESP:GTDIS** to the backend server to inform the latest status.
  - 2: If the status of the input is changed to 0, the device will disable the sleep mode. If the status of the input is changed to 1, the device will enable the sleep mode.
  - 3: If the status of the input is changed to 0, the device will trigger the SOS event.
- <*Debounce time*>: The time for debouncing interrupt status.

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

- **+ACK:GTDIS,**

Example: **+ACK:GTDIS,301303,860599004785994,,0037,20190920102044,001C$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6 Other Settings

3.2.6.1 Real Time Operation

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

- **AT+GTRTO=**

Example: **AT+GTRTO=gl300,0,,,,,,000B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Sub command	<=2	0 – F	
Single configuration command	3		
Output direction	1	0-3	
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*Sub command*>: A numeral to indicate the sub command to be executed.
  - 0: ***GNSS***. Request GNSS related information, including settings of <*GNSS on need*>, <*Report item mask*>, <*Report mask*> of fixed report, GNSS antenna type, GNSS antenna status and the time of last known successful GNSS fix.
  - 1: ***RTL***. Request the device to report its current position.
  - 2: ***READ***. Get the current configuration of the terminal via the message **+RESP:GTALL** / **+RESP:GTALM** / **+RESP:GTALS**.
  - 3: ***REBOOT***. Reboot the device remotely.
  - 4: ***RESET***. Reset all parameters to factory default except the parameters of **AT+GTBSI**, **AT+GTSRI**, and **AT+GTTMA**.
  - 5: ***PWROFF***. Power off the device remotely.
  - 6: ***CID***. Request the device to report the ICCID of the installed SIM card.
  - 7: ***CSQ***. Request the device to report the current GSM signal level.
  - 8: ***VER***. Request the device to report version information including the device type, the firmware version and the hardware version.
  - 9: ***BAT***. Request the device to report power supply related information including the external power supply status, current voltage of the battery, the battery charging status and the working mode of LED.
  - A: ***TMZ***. Request the device to report the time zone setting.
  - B: ***INF***. Request the device to read the device information. The corresponding information will be reported via the message **+RESP:GTINF**.
  - C: Reserved.
  - D: ***DELBUF***. Delete all the buffered messages.
  - E: ***GSV***. Request the device to report the GNSS fix level.
  - F: ***GSM***. Request the device to report the cell information.
- <*Single configuration command*>: It is used to get a specified command's configuration via the message **+RESP:GTALS**. For example, to get the configuration of **AT+GTCFG**, use the command "AT+GTRTO=gl300,2,CFG,,,,,000F$".

  Note: This parameter is available only if <*Sub command*> is set to 2. If the parameter is set to default, the device will report all configurations via the message **+RESP:GTALL**.

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

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

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

➢ **+ACK:GTRTO,**

Example: **+ACK:GTRTO,301303,860599004785994,,GPS,0038,20190920102048,001D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	IMEI	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Sub Command	<=6	Sub Command String	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6.2 White List Call Configuration

The **AT+GTWLT** command is used to configure the white list of phone numbers.

➢ **AT+GTWLT=**

Example: **AT+GTWLT=gl300,1,1,2,13813888888,13913999999,,,,,000C$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0'-'9', 'a'-'z', 'A'-'Z'	gl300
Call filter	1	0|1|2	1
Mobile start	<=2	1-10	
Mobile end	<=2	1-10	
White list number	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	

- ✧ <*Call filter*>: A numeral to indicate whether to filter the incoming call according to <*White list number*> and <*Direct number list*> before the device tries to send an SMS with a Google Maps link to the incoming number.
  - 0: Do not return an SMS with a Google Maps link to the incoming number no matter what the parameter <*Location by call*> value is and no matter whether the incoming number is in the <*White list number*> or <*Direct number list*>.
  - 1: Do not filter the incoming call. The device will return an SMS with a Google Maps link to the incoming number as long as the parameter <*Location by call*> is set to 1.
  - 2: Filter the incoming call. If the incoming number isn't in <*White list number*> or <*Direct number list*>, the device won't return an SMS with a Google Maps link to the incoming number even if the parameter <*Location by call*> is set to 1.
- ✧ <*Mobile start*>: A numeral to indicate the first index of the whitelist call numbers to be input. For example, if it is **1**, the device will update the whitelist call number from the **1**st one. If it is empty, there should be no <*White list number*>.
- ✧ <*Mobile end*>: A numeral to indicate the last index of the whitelist call numbers to be input. For example, if it is **2**, the device will update the whitelist call number until the **2**nd one. If it is empty, there should be no <*White list number*>.
- ✧ <*White list number*>: A list of phone numbers. Two adjacent phone numbers are separated with "**,**". The number of the phone numbers in the list is determined by the parameters <*Mobile start*> and <*Mobile end*>. For example, if <*Mobile start*> is **1** and <*Mobile end*> is **2**, the <*White list number*> would include **2** phone numbers and the two numbers are separated with "**,**".

Note: If more phone numbers are needed, please adjust <*Mobile start*> and <*Mobile end*> for appropriate setup. If some phone numbers in <*White list number*> are empty, then the corresponding phone number will be deleted. For example, to delete the 4th, 5th and 6th numbers of the <*White list number*>, please set <*Mobile start*> to 4 and set <*Mobile end*> to 6 and keep those three phone numbers of <*White list number*> empty.

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

- ➢ **+ACK:GTWLT,**

Example: **+ACK:GTWLT,301303,860599004785994,,003B,20190920102059,0022$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

3.2.6.3 Configuration of SMS with Google Maps Link

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

➢ **AT+GTGLM=**

Example: **AT+GTGLM=gl300,1,1,2,13813888888,13913999999,,,,,000D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0'-'9', 'a'-'z', 'A'-'Z'	gl300
Google mode	1	0|1|2|3	0
Mobile start	1	1-3	
Mobile end	1	1-3	
Direct number list	<=20*3		
Hyperlink format	<=160		
Report Time Type	1	0|1	0
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	

✧ <*Google mode*>: A numeral to indicate whether to send an SMS with a Google Maps link to the number in <*Direct number list*> for SOS and GEO events.

- 0:Do not send an SMS with a Google Maps link to the number(s) specified by <*Direct number list*> for SOS and GEO events.
- 1:Send an SMS with a Google Maps link to the number(s) specified by <*Direct number list*> for SOS and GEO events and include the terminal name in the Google Maps hyperlink.
- 2: Send an SMS with a Google Maps link to the number(s) specified by <*Direct number list*> for SOS and GEO events and do not include the terminal name in the Google hyperlink.
- 3:Send an SMS with a map link in a specified format to the number(s) specified by <*Direct number list*> for SOS and GEO events and include the terminal name. The map link uses the format specified by <*Hyperlink format*>.

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

✧ <*Mobile end*>: A numeral to indicate the last index of the direct numbers to be input. For example, if it is **2**, the device will update the direct number list until the **2**nd one. If it is empty, there should be no <*Direct number list*>.

✧ <*Direct number list*>: A list of phone numbers. Two adjacent phone numbers are separated with "**,**". The number of the phone numbers in the list is determined by the parameters <*Mobile start*> and <*Mobile end*>. For example, if <*Mobile start*> is **1** and <*Mobile end*> is **2**, then <*Direct number list*> includes **2** phone numbers and the two numbers are separated by

with ",".

✧ <*Hyperlink format*>: It specifies the format Google Maps link uses when <*Google mode*> is 3. One or a few Keywords (as listed in the table below) can be added in the URL according to specific needs, so that the information of the corresponding Replaced Item(s) can be reported. Example:

http://maps.google.com/maps?f=q&hl=en&q=<longitude>,<latitude>&ie=UTF8&z=16&iwloc=addr&om=1&imei=<IMEI>&event=<event>&bat=<bat>&date=<date>&time=<time>

✧ <*Report time type*>: A numeral to indicate the time type for map report through SMS.

- 0: Use GNSS UTC time for map report through SMS.
- 1: Use RTC time for map report through SMS.

Replaced Item	Keyword
Longitude	<longitude>
Latitude	<latitude>
Altitude	<altitude>
IMEI	<IMEI>
Event type	<event>
Battery capacity	<bat>
Date (UTC/RTC)	<date>
Time (UTC/RTC)	<time>

<event>	Event Description
SOS	SOS report
IN-GEO-0/OUT-GEO-0	Enter or exit the corresponding Geo-Fence
LBC	Location by Call
PNL	The first location report message after the device powers on
RTL	Real-time location message
IGN	Ignition on report
IGF	Ignition off report
SPD(xxkm/h)	Speed alarm report
FRI	Fixed report information
BPL	Battery low report
NMR	Motion detection report
PFA	Power off report

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

➢ **+ACK:GTGLM,**

Example: **+ACK:GTGLM,301303,860599004785994,,003C,20190920102104,0023$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	

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

3.2.6.4 Data Transfer Between UART and Backend Server

The **AT+GTDAT** command is used to transfer data between UART and the backend server.

➢ **AT+GTDAT=**

Example: **AT+GTDAT=gl300,0,,data needs to be sent,0,,,,0016$** **AT+GTDAT=gl300,1,,config command to the CAN bus device,1,,,,0016$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Command type	1	0|1	0
Reserved	0		
Data	<=1280	ASCII code	
Need Ack	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✧ <*Command Type*>: A numeral to indicate the direction of data transfer.
- 0: The data should be transferred from UART to the backend server.
- 1: The data should be transferred from the backend server to UART.

✧ <*Data*>: The data to be transferred. It should be a printable ASCII string.

✧ <*Need Ack*>: A numeral to indicate whether the device should reply with the **+ACK** message to the backend server.
- 0: Do not send **+ACK:GTDAT** to the backend server.
- 1: Send **+ACK:GTDAT** to the backend server.

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

➢ **+ACK:GTDAT,**

Example: **+ACK:GTDAT,301303,860599004785994,,003A,20190920102056,0020$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	

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

3.2.6.5 Command String Storage

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

➢ **AT+GTCMD=**

Example: **AT+GTCMD=gl300,1,1,AT+GTRTO=gl300,0,,,,,,000B$,,,,,0005$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Mode	1	0-1	0
Stored CMD ID	3	0 – 31	
Command string	200	AT command	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✧ <*Mode*>: The working mode of storing command string.
- 0: Delete the stored command.
- 1: Add the stored command.

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

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

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

➢ **+ACK:GTCMD,**

Example: **+ACK:GTCMD,301303,860599004785994,,FFFF,20190920102112,0024$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	

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

3.2.6.6 User Defined Function

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

➢ **AT+GTUDF=**

Example: **AT+GTUDF=gl300,1,1,FFFFFFFF,30,,,FFFFFFFF,1,,,,,0005$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Mode	1	0-2	0
Group ID	2	0 – 31	
Input ID mask	16	0-FFFFFFFFFFFFFFFF	
Debounce time	5	0-86400(s)	0
Reserved			
Reserved			
Stocmd ID mask	<=8	0-FFFFFFFF	
Stocmd Ack	1	0|1	0
Reserved			
Reserved			
Reserved			
Reserved			
Serial number	4	0000 – FFFF	
Tail character	1	$	$

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

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

✧ <*Input ID Mask*>: Bitwise mask to indicate the input event(s) included in the group.

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

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

ID	Mask Bit	Item
1	**Bit 0**	Power on finished
2	**Bit 1**	Ignition on
3	**Bit 2**	Ignition off
4	**Bit 3**	Attached to the GPRS network
5	**Bit 4**	Not attached to the GPRS network
6	**Bit 5**	The GSM network is registered.
7	**Bit 6**	The GSM network is not registered.
8	**Bit 7**	Network roaming
9	**Bit 8**	Network non-roaming
10	**Bit 9**	SIM card is locked.
11	**Bit 10**	GNSS is on.
12	**Bit 11**	GNSS is off.
13	**Bit 12**	The device is stationary.
14	**Bit 13**	The device is moving.
15	**Bit 14**	External charge inserted
16	**Bit 15**	No external charge
17	**Bit 16**	The device is charging.
18	**Bit 17**	The device is not charging.
19	**Bit 18**	External battery inserted
20	**Bit 19**	No external battery
21	**Bit 20**	Digital input 1 is low.
22	**Bit 21**	Digital input 1 is high.
23	**Bit 22**	SIM card is inserted.
24	**Bit 23**	SIM card is not inserted.
25	**Bit 24**	Reserved
26	**Bit 25**	Reserved
27	**Bit 26**	Inside the Geo 0
28	**Bit 27**	Outside the Geo 0
29	**Bit 28**	Inside the Geo 1
30	**Bit 29**	Outside the Geo 1
31	**Bit 30**	Inside the Geo 2
32	**Bit 31**	Outside the Geo 2
33	**Bit 32**	Inside the Geo 3
34	**Bit 33**	Outside the Geo 3
35	**Bit 34**	Inside the Geo 4
36	**Bit 35**	Outside the Geo 4
37	**Bit 36**	Inside the speed range
38	**Bit 37**	Outside the speed range
39	**Bit 38**	Messages need to be sent.
40	**Bit 39**	No messages need to be sent.

41	**Bit 40**	SOS event
42	**Bit 41**	Battery low event
43	**Bit 42**	Outside-working-hours event
44	**Bit 43**	Inside-working-hours event

- <*Debounce time*>: The debounce time for input events before the specified stored commands are executed.
- <*Stocmd ID mask*>: Bitwise mask of the stored commands which will be executed after the state of the group becomes TRUE (i.e. all input events included in the group happen.).
- <*Stocmd Ack*>: A numeral to indicate whether to return an acknowledgement message after a stored command is executed.
  - 0: Do not send an acknowledgement message when a stored command is executed.
  - 1: Send an acknowledgement message when a stored command is executed.

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

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

➢ **+ACK:GTUDF,**

Example: **+ACK:GTUDF,301303,860599004785994,,FFFF,20190920102118,0025$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6.7 Over-the-air Configuration Update

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

➢ **AT+GTUPC=**

Example: **AT+GTUPC=gl300,0,10,0,0,168,http://www.queclink.com/configure.ini,0,,,,0001$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0'-'9', 'a'-'z', 'A'-'Z'	gl300
Max. download retry	1	0 – 3	0
Download timeout	<=2	5 – 30 min	10
Download protocol	1	0	0

Report enable	1	0|1	0
Update interval	1	0 – 8760	0
Download URL	<=100	URL	
Mode	1	0|1	0
Reserved	0		
Extended Status Report	1	0|1	0
Identifier Number	8	00000000-FFFFFFFF	0
Reserved	0		
Update Status Mask	1	0 - F	3
Serial number	4	0000-FFFF	
Tail character	1	$	$

- <*Password*>: The valid characters for the password include '0'-9', 'a'-'z', and 'A'-'Z'. The default value is "gl300".
- <*Max. download retry*>: It specifies the maximum number of retry attempts to download the configuration file upon download failure.
- <*Download timeout*>: It specifies the expiration timeout for one single download. If the download expires, it is considered to be failure.
- <*Download protocol*>: The protocol used to download the file. Only HTTP is supported now. It is set to 0.
- <*Report enable*>: A numeral to determine whether to report the message **+RESP:GTUPC** to indicate the configuration is updated over the air.
  - 0: Do not report the message **+RESP:GTUPC**.
  - 1: Report the message **+RESP:GTUPC**.
- <*Update interval*>: The time interval in hours for updating the configuration over the air.
- <*Download URL*>: It specifies the URL to download the configuration file. If the URL ends with "/" which means it is just a path without any file, the unit will add <imei>.ini as the default configuration file name at the end of the URL.
- <*Mode*>: A numeral to indicate the working mode of downloading configuration over the air.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Extended Status Report*>: A numeral to indicate the message to be reported for the configuration update status when <*Enable Report*> is 1.
  - 0: Report the message **+RESP:GTUPC**.
  - 1: Report the message **+RESP:GTEUC** to include more information.
- <*Identifier Number*>: A numeral to identify the configuration update request. It will be included in the message **+RESP:GTEUC** to indicate the request it is related to.
- <*Update Status Mask*>: Bitwise mask to configure the Status which the device could update the Configuration.
  - Bit 0 for <*ignition off*>.
  - Bit 1 for <*ignition on*>.

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

➢ **+ACK:GTUPC,**

Example: **+ACK:GTUPC,301302,860599004785994,,003E,20190920102128,0027$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6.8 Settings for Preserving Device's Specified Logic States

The command **AT+GTPDS** is used to preserve specified logic states of the terminal. The function works according to the <*Mode*> setting, and the logic state(s) to be saved can be selected according to the value of <*Mask*>.

➢ **AT+GTPDS=**

Example: **AT+GTPDS=gl300,1,1F,,,,,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300
Mode	1	0|1|2	1
Mask	8	00000000-FFFFFFFF	69
Reserved			
Reserved			
Reserved			
Reserved			$
Reserved			
Reserved			
Serial number	4	0000 – FFFF	
Tail character	1	$	

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

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

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

Each bit represents a state.

- Bit 0: State of GEO
- Bit 1: Device reset type. The device will not send **+RESP:GTPFA/+RESP:GTPFL** or **+RESP:GTPNA/+RESP:GTPNL** messages when rebooted by **RTO** or **DOG**.
- Bit 2: Reserved
- Bit 3: Information of last known position
- Bit 4: Current device status, including ignition status and motion status
- Bit 5: State of external power
- Bit 6: State of charge
- Bit 7: State of digital inputs
- Bit 20: State in **+RESP:GTLSW** from EBK
- Bit 21: State in **+RESP:GTTSW** from EBK
- Bit 22: State in **+RESP:GTOMS** from EBK

Note: For details of the **+RESP:GTLSW**, **+RESP:GTTSW**, and **+RESP:GTOMS** messages, please refer to the *GL300 External Battery Kit User Manual* document [1].

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

➢ **+ACK:GTPDS,**

Example: **+ACK:GTPDS,301302,860599004785994,,003F,20190920102132,0028$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6.9 Remote Control of Vibration Motor

The **AT+GTRVC** command is used to switch ON/OFF the onboard vibration module remotely by using command sent from a remote server or via SMS Message.

➢ **AT+GTRVC=**

Example: **AT+GTRVC=gl300,1,1000,200,3,1,,,0001$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Mode	1	0-1	0
ON duration	<=5	0-60000	1000
OFF duration	<=5	0-60000	1000

Repeats	<=2	0-10	1
Acknowledgment	1	0-1	1
Reserved			
Reserved			
Serial number	4	0000 – FFFF	
Tail character	1	$	$

- <*Mode*>: A numeral to indicate the working mode of controlling the motor vibration.
  - 0: Disable motor vibration.
  - 1: Enable motor vibration.
- <*ON duration*>: The Vibration Module is set as inactive as default. The Module becomes active after receiving the **AT+GTRVC** command to set up ON Duration and is switched OFF then. It can be set to a value in the range of 0 - 60000ms. The maximum value is 1 minute.
- <*OFF duration*>: The length of pause between two Vibrations. In case of repeats, it is the time in between. It can be set to a value in the range of 0 - 60000ms. The maximum value is 1 minute.
- <*Repeats*>: 1 repeat cycle is composed of two time periods: ON Duration and OFF Duration. The value can be adjusted between 0-10 repeats. The default value is 1. If the parameter is set to 0, the device will ignore the settings of <*OFF duration*> and <*ON duration*>, and keep vibrating.
- <*Acknowledgement*>: This parameter determines whether to send an acknowledgement report to the remote server or SMS command sender or not.
  - 0: Do not send an acknowledgement report.
  - 1: Send an Acknowledgement report.

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

- **+ACK:GTRVC,**

Example: **+ACK:GTRVC,301303,860599004785994,,0040,20190920102136,0029$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.2.6.10 GNSS-Assisted Motion Measurement

The command **AT+GTGAM** is used for assisting in measuring motion with GNSS if the sensor

detects stationary state while the GNSS is always on.

➢ **AT+GTGAM=**

Example: **AT+GTGAM=gl300,1,1,10,10,10,5,,,,,0006$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300
Mode	1	0|1	1
Speed mode	1	0|1	1
Motion speed threshold	<=2	5-50km/h	25
Motion cumulative time	<=3	10-100s	10
Motionless cumulative time	<=3	10-250s	60
GNSS fix failure timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

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

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

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

✧ <*Motion cumulative time*>: If the average speed is higher than <*Motion speed threshold*> for <*Motion cumulative time*>, the device is considered to be in moving state.

✧ <*Motionless cumulative time*>: If the average speed is lower than <*Motion speed threshold*> for <*Motionless cumulative time*>, the device is considered to be in stationary state.

✧ <*GNSS fix failure timeout*>: If the GNSS takes more than <*GNSS fix failure timeout*> before it gets a fix, the motion sensor will update motion status again.

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

➢ **+ACK:GTGAM,**

Example: **+ACK:GTGAM,301303,860599004785994,,0041,20190920102140,002A$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	

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

3.2.6.11 SMS Sending

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

➢ **AT+GTSMS=**

Example: **AT+GTSMS=gl300,,,0,"http://www.queclink.com",13888888888,,,FFFF$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300
Reserved	0		
Reserved	0		
SMS Message Format	1	0	0
SMS Text	<=160		
Target Number	<=20		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*SMS Message Format*>: It defines the format of the SMS content.
- 0: ASCII Format.

✧ <*SMS Text*>: A string which is enclosed with double quotes. This string will be sent to the <*Target Number*> via SMS. This field cannot be empty and the parameter value cannot be a string which represents a command of this protocol.

✧ <*Target Number*>: The phone number that the SMS text will be sent to. This field cannot be empty.

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

➢ **+ACK:GTSMS,**

Example: **+ACK:GTSMS,301303,860599004785994,,0044,20190920102155,002B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

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

3.2.6.12 Configuration File Version

The command **AT+GTFVR** is used to record configuration information from the configuration file (generated by Manage Tool) to be downloaded by the device during update via **AT+GTUPC**.

➢ **AT+GTFVR=**

Example: **AT+GTFVR=gl300,1,0000,,,,,,,,,,0010$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
Configuration Version	4	0000 – 9999	
Command Mask	<=32	00000000000000000000 00000000000 – FFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF	
GEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Stocmd ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Group ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Digital Signature	32	'0'-'9' 'a'-'z' 'A'-'Z'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Generation Time	14	YYYYMMDDHHMMSS	
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Configuration Name*>: The name of the configuration file.

✧ <*Configuration Version*>: The version number of the configuration file. The first two

characters indicate the major version number, and the last two characters indicate the minor version number.

✧ <*Command Mask*>: A hex value to indicate which AT command is included in this configuration file. Each bit corresponds to an AT command.

Mask Bit	Item
Bit 0	BSI
Bit 1	SRI
Bit 2	QSS
Bit 3	CFG
Bit 4	DIS
Bit 5	TMA
Bit 6	FRI
Bit 7	GEO
Bit 8	SPD
Bit 9	Reserved
Bit 10	OWH
Bit 11	DOG
Bit 12	WLT
Bit 13	PDS
Bit 14	CMD
Bit 15	UDF
Bit 16	Reserved
Bit 17	Reserved
Bit 18	Reserved
Bit 19	Reserved
Bit 20	FVR
Bit 21	Reserved
Bit 22	Reserved
Bit 23	Reserved
Bit 24	Reserved
Bit 25	HBM
Bit 26	Reserved

Bit 27	Reserved
Bit 28	Reserved
Bit 29	Reserved
Bit 30	Reserved
Bit 31	Reserved
Bit 32	Reserved
Bit 33	Reserved
Bit34	Reserved
Bit 35	Reserved
Bit 36	Reserved
Bit 37	Reserved
Bit 38	RMD
Bit 39	Reserved
Bit 40	JDC
Bit 41	Reserved
Bit 42	Reserved
Bit 43	Reserved
⋮	Reserved
Bit 50	Reserved
Bit 51	Reserved
⋮	Reserved
Bit 54	PIN
Bit 55	GAM
Bit 56	Reserved
Bit 57	Reserved
Bit 58	Reserved
Bit 59	Reserved
Bit 60	Reserved
Bit 61	Reserved
Bit 62	Reserved

Bit 63	Reserved
Bit 64	Reserved
Bit 74	Reserved
Bit 75	Reserved
Bit 76	Reserved
⋮	Reserved
Bit 87	NTS
Bit 88	GLM
Bit 89	NMD
Bit 90	FKS
Bit 91	TEM

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

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

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

Bit	Stored cmd ID
Bit 0	1

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

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

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

Bit 18	19
Bit 19	20
⋮	⋮
Bit 31	31

- ✧ <*Digital Signature*>: The parameter is used to confirm the validity of subsequent commands.
- ✧ <*Generation Time*>: The time when the configuration file is generated.

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

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

- ➢ **+ACK:GTFVR,**

Example: **+ACK:GTFVR,301303,860599004785994,,FFFF,20190923020137,0333$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

3.3 Report

3.3.1 Position Related Report

3.3.1.1 General Position Report

- ➢ **+RESP:GTFRI**: Report message for **AT+GTFRI**
- ➢ **+RESP:GTGEO**: Report message for **AT+GTGEO**
- ➢ **+RESP:GTSPD**: Report message for **AT+GTSPD**
- ➢ **+RESP:GTSOS**: Report message after long pressing the function key if the function key is enabled and the mode is SOS mode.
- ➢ **+RESP:GTRTL:** Report message of **AT+GTRTO-RTL**
- ➢ **+RESP:GTPNL**: The first location report message after the device powers on
- ➢ **+RESP:GTNMR**: Non-movement is detected by motion sensor according to the settings of **AT+GTNMD.**
- ➢ **+RESP:GTDIS**: Status change of digital input is detected if the parameter <*Enable*> is set to 1 in the command **AT+GTDIS**
- ➢ **+RESP:GTDOG**: The protocol watchdog reboot message
- ➢ **+RESP:GTIGL**: The location message for ignition on and ignition off
- ➢ **+RESP:GTPFL**: The first location message after the device powers off

- **+RESP:GTHBM**: If harsh behavior is detected, this message will be sent to the backend server.

Example:

+RESP:GTFRI,301303,860599004785994,,1,0,1,1,0.2,0,-43.4,117.129316,31.840015,20190923022045,0460,0000,550B,B969,,100,0001,20190923022046,034A$

+RESP:GTGEO,301303,860599004785994,,0,1,1,1,0.0,0,-43.4,117.129316,31.840015,20190923022307,0460,0000,550B,B969,,100,0001,20190923022308,034C$

+RESP:GTSPD,301303,860599004785994,,0,1,1,1,0.0,0,-43.4,117.129316,31.840015,20190923022536,0460,0000,550B,B969,,100,0001,20190923022537,0351$

+RESP:GTSOS,301303,860599004785994,,0,0,1,1,0.0,0,-43.4,117.129316,31.840015,20190923022637,0460,0000,550B,B969,,100,0001,20190923022638,0356$

+RESP:GTRTL,301303,860599004785994,,0,0,1,1,0.0,0,-43.4,117.129316,31.840015,20190923022706,0460,0000,550B,B969,,100,0001,20190923022707,0358$

+RESP:GTPNL,301303,860599004785994,,0,0,1,1,0.0,0,105.6,117.129219,31.840399,20190923022756,0460,0000,550B,B969,,100,0001,20190923022757,035E$

+RESP:GTNMR,301303,860599004785994,,0,1,1,1,0.6,0,59.5,117.129119,31.839435,20190923022937,0460,0000,550B,B969,,100,0001,20190923022938,0362$

+RESP:GTDIS,301303,860599004785994,,1,1,1,1,0.0,0,95.5,117.129276,31.839124,20190923023108,0460,0000,550B,B969,,100,0001,20190923023109,036C$

+RESP:GTDOG,301303,860599004785994,,0,0,1,2,23.4,353,49.5,117.129287,31.838997,20190923023456,0460,0000,550B,B969,,100,0001,20190923023457,0382$

+RESP:GTIGL,301303,860599004785994,,0,0,1,1,0.9,353,81.7,117.129306,31.839022,20190923023640,0460,0000,550B,B969,,100,0003,20190923023641,0392$

+RESP:GTPFL,301303,860599004785994,,0,0,1,1,1.0,353,93.0,117.129283,31.838800,20190923023722,0460,0000,550B,B969,,100,0001,20190923023722,0399$

+RESP:GTHBM,301303,860599004785994,,1,0,1,1,0.0,2,76.2,117.129441,31.839031,20190923024426,0460,0000,550B,B969,,100,0001,20190923024426,03AC$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	''0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Report ID / Append Mask	1	0 – 19	

Report Type	<=2	0 - 2	
Number	<=2	1 – 15	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Battery Percentage	3	0-100	
I/O Status (Optional)	<=4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Report ID / Append Mask*>: The ID of Geo-Fence in **+RESP:GTGEO**, the ID of input in **+RESP:GTDIS**, or the ID of speed level in **+RESP:GTHBM**. For **+RESP:GTFRI** and **+RESP:GTSOS**, please see below for details. For other reports, report ID is 0.

- For **+RESP:GTGEO**, it indicates the ID of the Geo-Fence.
- For **+RESP:GTDIS**, it is always 1.
- For **+RESP:GTFRI**

  0: If the parameter <*Append mask*> in the command **AT+GTFRI** is 0, there is no appended field in the report.

  <*Append mask*>: If the parameter <*Append mask*> in the command **AT+GTFRI** is not 0, the parameter <*Append mask*> and all enabled appended fields will be present in sequence before <*Send time*>.
- For **+RESP:GTSOS**

  0: Triggered through other ways.

  1: Triggered by input ID 1.
- For **+RESP:GTHBM**, the speed level at which the harsh behavior is detected in the message **+RESP:GTHBM**. “3” indicates high speed, “2” indicates medium speed and “1” indicates low speed.

For other reports, it is always 0.

✧ <*Report Type*>: The report type of **+RESP:GTFRI**, **+RESP:GTGEO**, **+RESP:GTSPD**, **+RESP:GTNMR**, **+RESP:GTDIS**, **+RESP:GTIGL**, **+RESP:GTDOG** and **+RESP:GTHBM**. For other reports, it is 0.

- For **+RESP:GTFRI**

  0: This message is a common scheduled position report.

1: If <*Wrap Corner Point*> is 0 , this message indicates a turning point. If <*Wrap Corner Point*> is 1, the number of collected GNSS points reaches 15 and other report condition(fix time, distance, mileage report)no met or GNSS points collection stops.

- For **+RESP:GTGEO**
  0: Exit the corresponding Geo-Fence.
  1: Enter the corresponding Geo-Fence.
- For **+RESP:GTSPD**
  0: Outside the speed range.
  1: Inside the speed range.
- For **+RESP:GTNMR**
  The motion trigger and the report type in hex format. 4 high bits means motion trigger and 4 low bits indicate "enter movement or non-movement".
  Motion trigger has four meanings as follows.
  0x00: The state of the device changes from motion to rest.
  0x01: Motion triggered by sensor detection. It is the default value.
  0x11: Motion triggered by **RTO** sub command **RTL**.
  0x21: Motion triggered by the command **AT+GTLSW** from EBK.
- In the **+RESP:GTDIS** report message generated by the digital input
  0: The current logic status of the input port is low level.
  1: The current logic status of the input port is high level.
- In the ignition on and ignition off message **+RESP:GTIGL**
  0: The engine is ignition on.
  1: The engine is ignition off.
- For **+RESP:GTDOG**
  0: Reboot periodically according to the <*Interval*> and <*Time*> settings or upon ignition on or by <*Input ID*>
  1: Reboot when GPRS network registration is unsuccessful
  2: Reboot when there is no GSM signal
- For **+RESP:GTHBM**
  0: Harsh braking behavior
  1: Harsh acceleration behavior

✧ <*Number*>: The number of points in one report message. According to the setting of fixed report, there could be up to 15 points in one **+RESP:GTFRI** report. For other reports, this value is always 1. If there is more than 1 point in the report, information from <*GNSS Accuracy*> to <*Odo Mileage*> is repeated for each point.

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

✧ <*Speed*>: The speed obtained from GNSS.

✧ <*Azimuth*>: The azimuth from GNSS.

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

✧ <*Longitude*>: The longitude of the current position. The unit is degree, and accuracy is 6

decimal places. West longitude is defined as negative starting with the minus sign "-" and east longitude is defined as positive without "+".

- <*Latitude*>: The latitude of the current position. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "-" and north latitude is defined as positive without "+".
- <*GNSS UTC Time*>: UTC time obtained from GNSS.
- <*MCC*>: Mobile country code. It is 3 digits in length and ranges from 000 to 999.
- <*MNC*>: Mobile network code. It is 3 digits in length and ranges from 000 to 999.
- <*LAC*>: Location area code in hex format.
- <*Cell ID*>: Cell ID in hex format.
- <*Odo Mileage*>: The total mileage in the position defined by <*Latitude*> and <*Longitude*>. If <*ODO Enable*> in the command **AT+GTCFG** is set to 0, the field will be empty.
- <*Battery Percentage*>: The current volume of the battery in percentage.
- <*I/O Status*>: A hexadecimal value to indicate the I/O status. If Bit 0 of the parameter <*Report ID / Append Mask*> in the report is 1, this field will be present in the report message **+RESP:GTFRI**. If Bit 0 of the parameter <*Report ID / Append Mask*> is 0, there is no <*I/O Status*> field. Below is the detailed information of <*I/O Status*>.

Bit	I/O Status
Bit 0 (0001)	Input 0 status
Bit 1 (0002)	Ignition on/off status
Bit 2 (0004)	Reserved
Bit 3 (0008)	Reserved
Bit 4 (0010)	Reserved
Bit 5 (0020)	Reserved
Bit 6 (0040)	Reserved
Bit 7 (0080)	Reserved
Bit 8 (0100)	Reserved
Bit 9 (0200)	Reserved
Bit 10 (0400)	Reserved
Bit 11 (0800)	Reserved
Bit 12 (1000)	Reserved
Bit 13 (2000)	Reserved
Bit 14 (4000)	Reserved
Bit 15 (8000)	Reserved

3.3.1.2 Location by Call Report

- **+RESP:GTLBC:**

Example: **+RESP:GTLBC,301303,860599004785994,,15156017224,1,0.0,2,148.8,117.129322,31.839245,20190923055152,0460,0000,550B,B969,,,20190923055152,0441$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	''0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Call Number	<=20	(Call Number)	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Call number*>: The phone number of the incoming call which initiates this report.

3.3.1.3 Location as the Center of Geo-Fence

If the <*Function key mode*> is set to 2 and the function key is long pressed to enable Geo-Fence 0, the terminal will start GNSS fixing to get the current position as the center of Geo-Fence 0. After GNSS fix finishes, the terminal will report the message **+RESP:GTGCR**.

➢ **+RESP:GTGCR:**

Example: **+RESP:GTGCR,301303,860599004785994,,3,500,30,1,0.0,2,148.8,117.129322,31.839245,20190923060244,0460,0000,550B,B969,,,20190923060244,044D$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	IMEI	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Geo Mode	1	0 - 3	
Geo Radius	<=7	50 - 6000000(m)	
Geo Check Interval	<=5	0|30 - 86400(sec)	
GNSS Accuracy	<=2	0 - 50	
Speed	<=5	0.0 - 999.9(km/h)	

Azimuth	<=3	0 – 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Geo mode*>: The mode of Geo-Fence 0. Please refer to the parameter <*Mode*> in the command **AT+GTGEO**.
- <*Geo radius*>: The radius of Geo-Fence 0. Please refer to the parameter <*Radius*> in the command **AT+GTGEO**.
- <*Geo check interval*>: The check interval of Geo-Fence 0. Please refer to the parameter <*Check interval*> in the command **AT+GTGEO**.
- <*Longitude*>: The longitude of the current position. If the current position fix succeeds, this longitude will be used to replace the longitude of the center of Geo-Fence 0.
- <*Latitude*>: The latitude of the current position. If the current position fix succeeds, this latitude will be used to replace the latitude of the center of Geo-Fence 0.

3.3.2 Device Information Report

- **+RESP:GTINF,**

Example: **+RESP:GTINF,301303,860599004785994,,41,898600c01244f9823536,31,0,1,0.0,,4.13,0,1,0,0,0,20190923060703,98,,34.2,,,20190923060704,0450$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	''0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Motion Status	2	21|22|41|42	
ICCID	20		
CSQ RSSI	<=2	0 - 31|99	
CSQ BER	<=2	0 - 7|99	
External Power Supply	1	0|1	

Mileage	<=9	0.0 - 4294967.0(km)	
Reserved	0		
Battery Voltage	<=4	0.0 - 4.50(V)	
Charging	1	0|1	
LED On	1	0 - 2	
GNSS On Need	1	0 - 3	
GNSS Antenna Type	1	0	
GNSS Antenna State	1	0	
Last GNSS Fix UTC Time	14	YYYYMMDDHHMMSS	
Battery Percentage	3	0 - 100	
Reserved	0		
Temperature	<=5	(-)XX.X(℃)	
Lock State	1	0|1	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Motion status*>: The current motion status of the device.
  - 21: The device attached vehicle is ignition on and motionless.
  - 22: The device attached vehicle is ignition on and moving.
  - 41: The device is motionless without ignition on.
  - 42: The device is moving without ignition on.
- <*ICCID*>: The ICCID of the installed SIM card.
- <*CSQ RSSI*>: The GSM signal strength level.
- <*CSQ BER*>: The quality of the GSM signal.
- <*External power supply*>: Whether the external power supply is connected.
  - 0: Not connected.
  - 1: Connected.
- <*Mileage*>: The total mileage is based on <*ODO Initial mileage*> in **AT+GTCFG**.
- <*Battery voltage*>: The voltage of the battery.
- <*Charging*>: Whether the battery is charging when the external power supply is connected.
  - 0: Not charging.
  - 1: Charging.
- <*LED on*>: Please refer to <*LED on*> in **AT+GTCFG**.
- <*GNSS on need*>: Please refer to <*GNSS on need*> in **AT+GTCFG**.
- <*GNSS antenna type*>: A numeral to indicate which GNSS antenna is working now.
  - 0: Internal GNSS antenna
- <*GNSS antenna state*>: The status of the GNSS antenna.
  - 0: The antenna is working.
- <*Last GNSS fix UTC time*>: The UTC time of the latest successful GNSS fix.
- <*Temperature*>: The temperature of the device.
- <*Lock state*>: The state of the external battery kit. Please see the parameter <*State*> in the

message **+RESP:GTLSW** (refer to the *GL300 External Battery Kit User Manual* document [1]).

3.3.3 Report for Querying

The following reports are for real time querying via the command **AT+GTRTO**.

➢ **+RESP:GTGPS:** The report for real time operation of the subcommand **GNSS**.

Example: **+RESP:GTGPS,301303,860599004785994,,0,5,0,001F,001F,0,20190923063126,20190923063127,0460$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
GNSS On Need	1	0 - 3	
GNSS Fix Delay	<=2	5 - 60(sec)	
GNSS Antenna Type	1	0	
Report Item Mask	4	(HEX)	
FRI Report Mask	4	(HEX)	
GNSS Antenna State	1	0	
Last GNSS Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*FRI report mask*>: Please refer to <*Report mask*> in **AT+GTFRI**.

➢ **+RESP:GTALL:** The report for real time operation of the subcommand **READ**.

Example: **+RESP:GTALL,300600,860599000000448,,BSI,,,,,,,SRI,2,,1,116.228.146.250,8161,192.0.0.0,0,+8618600126107,5,1,0,1,,,CFG,gl300,gl300,1,0.8,0,5,003F,0,,0FFF,0,1,1,300,1,0,20491231235959,1,0,,NMD,0,2,3,2,300,300,2,3,0,1,,,,TMA,+0000,0,,,,,FRI,3,0,,,0000,0000,30,30,180,180,001F,1000,100,0,5,50,5,0,0000,GEO,0,0,,,50,0,0,,,,,,,,1,0,,,50,0,0,,,,,,,2,0,,,50,0,0,,,,,,,3,0,,,50,0,0,,,,,,,4,0,,,50,0,0,,,,,,,,SPD,0,0,0,60,300,,,,,,,,,,,,,,,FKS,1,1,3,0,0,2,,WLT,1,,,,,,,,,,,,,,GLM,0,,,,,,,PIN,1,1234,0,,,,,DIS,1,0,5,,,,,,DOG,0,60,30,0200,,1,0,0,60,60,,NTS,0,30,10,,,,10,,OWH,0,1f,0900,1200,1300,1800,,,0,,,,,,,,,TEM,0,0,0,60,300,,,,,,UPC,0,10,0,0,168,http://www.queclink.com/configure.ini,,,,,JDC,0,25,,5,10,10,,,,,,,PDS,1,69,,,,,,,20150923034509,02AE$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
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 - 7|9	0
Reserved	0		
Buffer Enable	1	0 - 2	1
Main Server IP / Domain Name	<=60	(ASCII)	
Main Server Port	<=5	0 - 65535	0
Backup Server IP	<=15	(ASCII)	192.0.0.0
Backup Server Port	<=5	0 - 65535	0
SMS Gateway	<=20	(Call Number)	
Heartbeat Interval	<=3	0|5 - 360(min)	0
SACK Enable	1	0|1	0
SMS ACK Enable	1	0|1	0
Quick Link Enable	1	0|1	0
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
New Password	4 – 6	'0' - '9', 'a' - 'z', 'A' - 'Z'	gl300
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	GL300
ODO Enable	1	0|1	0
ODO Mileage	<=9	0.0 - 4294967.0(km)	0
GNSS On Need	1	0 - 3	1
GNSS Fix Delay	<=2	5 - 60(sec)	5
Report Item Mask	4	(HEX)	1F
GSM Report	1	0 - 3	0
Reserved	0		
Event Mask	4	(HEX)	FFF
EBK Mode	1	0|1	0
LED On	1	0 - 2	1
Info Report Enable	1	0|1	1
Info Report Interval	<=5	30 - 86400(sec)	300
Location By Call	1	0|1	1
Expiry Enable	1	0|1	0
Expiry Time	14	YYYYMMDDHHMMSS	20491231235959
AGPS Mode	1	0|1	0

Sleep Enable	1	0|1	0
Battery Low Threshold	<=2	0 - 99	0
GNSS Working Mode	1	0 - 2	0
NMD	3	NMD	NMD
Mode	1	(HEX)	
Non-movement Duration	<=3	1 - 255(*15sec)	2
Movement Duration	<=2	1 - 50(*100ms)	3
Movement Threshold	1	2 - 9	2
Rest Fix Interval	5	5 -86400(sec)	300
Rest Send Interval	5	5 -86400(sec)	300
EBK Rest Threshold	1	2 - 9	2
EBK Motion Threshold	1	2 - 9	3
URC Report	1	0|1	0
Enter Movement By Command	1	0|1	0
Movement Debounce	1	0|1	0
Reserved	0		
Reserved	0		
TMA	3	TMA	TMA
Time Zone	5	+/- HHMM	
Daylight Saving	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 - 6	0
Discard No Fix	1	0|1	1
Reserved	0		
Reserved	0		
Begin Time	4	HHMM	0000
End Time	4	HHMM	0000
Check Interval	<=5	1 - 86400(sec)	180
Send Interval	<=5	1 - 86400(sec)	180
Ignition Check Interval	<=5	1 - 86400(sec)	180
Ignition Send Interval	<=5	1 - 86400(sec)	180
Report Mask	4	(HEX)	1F
Distance	<=5	20 - 65535(m)	1000
Mileage	<=5	20 - 65535(m)	1000
Movement Detection Mode	1	0|1	0

Movement Speed	<=3	1 - 999(km/h)	5
Movement Distance	<=4	1 - 999(km/h)	50
Movement Send Number	1	1 - 5	5
Corner	3	0 - 180	0
Append Mask	4	(HEX)	0
Wrap Corner Point	1	0|1	0
GEO	3	GEO	GEO
GEO ID	<=2	0 - 19	
Mode	1	0 - 3	0
Longitude	<=11	-180 - 180	0.00000
Latitude	<=10	-90 - 90	0.00000
Radius	<=7	50 - 6000000(m)	50
Check Interval	<=5	0|30 - 86400(sec)	0
State Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SPD	3	SPD	SPD
Mode	1	0 - 2	0
Min Speed	<=3	0 - 400(km/h)	0
Max Speed	<=3	0 - 400(km/h)	0
Duration	<=4	15 - 3600(sec)	60
Send Interval	<=4	0|5 - 3600(sec)	300
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
FKS	3	FKS	FKS
Power Key Mode	1	0 - 2	1
Full Power Up	1	0|1	1
Function Key Mode	1	0 - 3	3
Power Key Indicator	1	0|1	0
Function Key Indicator	1	0 - 2	0
SOS Report Mode	1	1 - 3	3
Reserved	0		
WLT	3	WLT	WLT
Call Filter	1	0 - 2	1
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
White List Number	<=20	(Call Number)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GLM	3	GLM	GLM
Google Mode	1	0 - 3	0
Direct Number	<=20	(Call Number)	
Direct Number	<=20	(Call Number)	
Direct Number	<=20	(Call Number)	
Hyperlink Format	<=160	(ASCII)	
Report Time Type	1	0|1	0
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
Auto-unlock PIN	1	0|1	1
PIN	4 - 8	'0' - '9'	
PIN Check	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

DIS	3	DIS	DIS
Input ID	1	1	1
Mode	1	0 - 3	0
Debounce Time	<=4	1 - 800(*10ms)	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0 - 2	0
Ignition Frequency	<=3	10 - 120(min)	60
Interval	<=2	1 - 30(d)	30
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0|1	1
Input ID	1	0|1	0
Unit	1	0|1	0
GSM Interval	<=4	0|5 - 1440(min)	60
PDP Interval	<=4	0|5 - 1440(min)	60
Reserved	0		
NTS	3	NTS	NTS
Enable	1	0|1	0
RSSI Threshold	<=2	0 - 35	30
Interval	<=3	0 - 300(min)	10
Oper1	<=10	(ASCII)	
Oper2	<=10	(ASCII)	
Oper3	<=10	(ASCII)	
GSM Interval	<=3	0 - 300(min)	10
Reserved	0		
OWH	3	OWH	OWH
Mode	1	0 - 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
RF Sleep Mode	1	0|1	0
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TEM	3	TEM	TEM
Mode	1	0 - 3	0
Min Temperature	<=3	-20 - 60(℃)	0
Max Temperature	<=3	-20 - 60(℃)	0
Duration	<=4	0 - 3600(sec)	60
Send Interval	<=4	0|5 - 3600(sec)	300
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UPC	3	UPC	UPC
Max Download Retry	1	0 - 3	0
Download Timeout	<=2	5 - 30(min)	10
Download Protocol	1	0	0
Report Enable	1	0|1	0
Update Interval	<=4	0 - 8760(h)	0
Download URL	<=100	(URL)	
Mode	1	0|1	0
Reserved	0		
Extended Status Report	1	0|1	
Identifier Number	8	(HEX)	
Reserved	0		
Update Status Mask	1	(HEX)	
JDC	3	JDC	JDC
Mode	1	0 - 2	0
Signal Threshold	<=2	0 - 31	25
Reserved	0		
Jamming Cell Number Threshold	<=2	0 - 99	5
Enter Jamming Timer Threshold	<=3	0 - 300(sec)	10
Quit Jamming Timer Threshold	<=4	0 - 300(sec)	10

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PDS	3	PDS	PDS
Mode	1	0 - 2	1
Mask	<=8	(HEX)	69
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
CMD	3	CMD	CMD
Mode	1	0|1	0
Stored CMD ID	<=2	0 - 31	
Command String	<=200	(String)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UDF	3	UDF	UDF
Mode	1	0 - 2	0
Group ID	<=2	0 - 31	
Input ID Mask	<=16	(HEX)	
Debounce Time	<=5	0 - 86400(sec)	0
Reserved	0		
Reserved	0		
Stocmd ID Mask	8	(HEX)	
Stocmd Ack	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GAM	3	GAM	GAM
Mode	1	0|1	1
Speed Mode	1	0|1	1
Motion Speed Threshold	<=2	5 - 50(km/h)	25
Motion Cumulative	<=3	10 - 100(sec)	10

Time			
Motionless Cumulative Time	<=3	10 - 250(sec)	60
GNSS Fix Failure Timeout	<=4	5 - 1800(sec)	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
RMD	3	RMD	RMD
Mode	1	0 - 2	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Home Operator Start	1	0 - 10	
Home Operator End	1	0 - 10	
Home Operator List	<=6*10	(ASCII)	
Reserved	0		
Reserved	0		
Roaming Operator Start	1	0 - 100	
Roaming Operator End	1	0 - 100	
Roaming Operator List	<=6*100	(ASCII)	
Reserved	0		
Reserved	0		
Blacklist Operator Start	1	1 - 20	
Blacklist Operator End	1	1 - 20	
Black List Operator	<=6*20	(ASCII)	
Reserved	0		
Reserved	0		
Known Roaming Event Mask	<=6	(HEX)	7FFF
Reserved	0		
Reserved	0		
Unknown Roaming Event mask	<=6	(HEX)	7FFF
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
Mode	1	0 | 1	0
Behavior Duration	1	3 - 5(sec)	3
Reserved	0		
High Speed	<=3	100 - 400(km/h)	100
ΔVhb	<=3	0 - 100(km/h)	0
ΔVha	<=3	0 - 100(km/h)	0
Reserved	0		
Medium Speed	<=3	20 - 100(km/h)	60
ΔVmb	<=3	0 - 100(km/h)	0
ΔVma	<=3	0 - 100(km/h)	0
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 - 100(km/h)	0
ΔVla	<=3	0 - 100(km/h)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FVR	3	FVR	FVR
Configuration Name	<=40	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Configuration Version	4	0000 - 9999	
Command Mask	32	(HEX)	
GEO ID Mask	16	(HEX)	
Stocmd ID Mask	16	(HEX)	
Group ID Mask	16	(HEX)	
Digital Signature	32	'0' - '9', 'a' - 'z', 'A' - 'Z'	
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Generation Time	14	YYYYMMDDHHMMSS	
Send time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

Note: Regardless of the <*Report mode*> setting, **+RESP:GTALL** is only reported through GPRS. If the current report mode is forced SMS mode, **+RESP:GTALL** will be reported via TCP short connection.

➢ **+RESP:GTALM:** The report for real time operation of the subcommand **READ**.

After the device receives the command **AT+GTRTO** to read all the configurations, it will send all configurations to the backend server via the message **+RESP:GTALL**. This message is only sent via GPRS even if the report mode is forced SMS mode. If the message's length is too long, then it will be sub-packaged into several **+RESP:GTALM** messages.

Example:

+RESP:GTALM,301303,860599004781431,gl300,3,1,BSI,cmnet,,,,,,SRI,3,,2,60.174.225.171,10086,192.0.0.0,0,,10,1,0,0,,,CFG,gl300,gl300,1,119.9,2,5,003F,0,,7FFF,0,1,1,300,1,0,20491231235959,0,0,0,0,NMD,7,2,3,2,300,300,2,3,0,0,0,,,TMA,+0800,0,,,,,FRI,1,0,,,0000,0000,5,75,180,180,001F,1500,2500,0,5,50,5,1,0001,0,GEO,0,0,,,50,0,0,,,,,,,1,0,,,50,0,0,,,,,,,2,0,,,50,0,0,,,,,,,3,0,,,50,0,0,,,,,,,4,0,,,50,0,0,,,,,,,5,0,,,50,0,0,,,,,,,6,0,,,50,0,0,,,,,,,7,0,,,50,0,0,,,,,,,8,0,,,50,0,0,,,,,,,9,0,,,50,0,0,,,,,,,10,0,,,50,0,0,,,,,,,11,0,,,50,0,0,,,,,,,12,0,,,50,0,0,,,,,,,13,0,,,50,0,0,,,,,,,14,0,,,50,0,0,,,,,,,15,0,,,50,0,0,,,,,,,16,0,,,50,0,0,,,,,,,17,0,,,50,0,0,,,,,,,18,0,,,50,0,0,,,,,,,19,0,,,50,0,0,,,,,,,SPD,0,0,0,60,300,,,,,,,,,,,,,,,FKS,1,1,3,0,0,3,,WLT,1,,,,,,,,,,,,,GLM,0,,,,,0,,,PIN,1,,0,,,,DIS,1,0,5,,,,,DOG,0,60,30,0200,,1,0,0,60,60,,NTS,0,30,10,,,,10,,OWH,0,1F,0900,1200,1300,1800,,,0,0,,,,,,,TEM,0,0,0,60,300,,,,,,UPC,0,10,0,0,0,,0,,0,00000000,,3,JDC,0,25,,5,10,10,,,,,,PDS,1,69,,,,,,CMD,0,0,,,,,,0,1,,,,,,0,2,,,,,,0,3,,,,,,0,4,,,,,,0,5,,,,,,0,6,,,,,,0,7,,,,,,0,8,,,,,,0,9,,,,,,0,10,,,,,,0,11,,,,,,0,12,,,,,,0,13,,,,,,0,14,,,,,,0,15,,,,,,0,16,,,,,,0,17,,,,,,0,18,,,,,,0,19,,,,,,0,20,,,,,,0,21,,,,,,0,22,,,,,,0,23,,,,,,0,24,,,,,,0,25,,,,,,20191030115017,040E$

+RESP:GTALM,301303,860599004781431,gl300,3,2,CMD,0,26,,,,,,0,27,,,,,,0,28,,,,,,0,29,,,,,,0,30,,,,,,0,31,,,,,,UDF,0,0,0000000000000000,0,,,00000000,0,,,,,0,1,0000000000000000,0,,,00000000,0,,,,,0,2,0000000000000000,0,,,00000000,0,,,,,0,3,0000000000000000,0,,,00000000,0,,,,,0,4,0000000000000000,0,,,00000000,0,,,,,0,5,0000000000000000,0,,,00000000,0,,,,,0,6,0000000000000000,0,,,00000000,0,,,,,0,7,0000000000000000,0,,,00000000,0,,,,,0,8,0000000000000000,0,,,00000000,0,,,,,0,9,0000000000000000,0,,,00000000,0,,,,,0,10,0000000000000000,0,,,00000000,0,,,,,0,11,0000000000000000,0,,,00000000,0,,,,,0,12,0000000000000000,0,,,00000000,0,,,,,0,13,0000000000000000,0,,,00000000,0,,,,,0,14,0000000000000000,0,,,00000000,0,,,,,0,15,0000000000000000,0,,,00000000,0,,,,,0,16,0000000000000000,0,,,00000000,0,,,,,0,17,0000000000000000,0,,,00000000,0,,,,,0,18,0000000000000000,0,,,00000000,0,,,,,0,19,0000000000000000,0,,,00000000,0,,,,,0,20,0000000000000000,0,,,00000000,0,,,,,0,21,0000000000000000,0,,,00000000,0,,,,,0,22,0000000000000000,0,,,00000000,0,,,,,0,23,0000000000000000,0,,,00000000,0,,,,,0,24,0000000000000000,0,,,00000000,0,,,,,0,25,0000000000000000,0,,,00000000,0,,,,,0,26,0000000000000000,0,,,00000000,0,,,,,0,27,0000000000000000,0,,,00000

000,0,,,,,20191030115017,040F$ +RESP:GTALM,301303,860599004781431,gl300,3,3,UDF,0,28,0000000000000000,0,,,00000000,0,,,,,0,29,0000000000000000,0,,,00000000,0,,,,,0,30,0000000000000000,0,,,00000000,0,,,,,0,31,0000000000000000,0,,,00000000,0,,,,,GAM,1,1,25,10,60,60,,,,,RMD,0,,7FFF,,,7FFF,,,,,,,,,,HBM,0,3,,100,0,0,,60,0,0,,,0,0,,,,,,,,,,FVR,,0000,00000000000000000000000000000000,0000000000000000,0000000000000000,0000000000000000,,,,,,,20191030115018,0410$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Total Packets	<=2	1 - 16	
Current Packet	<=2	1 - 16	
Configurations	< 1400		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- *<Total packets>*: The total number of **+RESP:GTALM**.
- *<Current packet>*: The sequence number of the current packet.
- *<Configurations>*: The current configurations of the device.

Note: The length of every **+RESP:GTALM** message (including header and tail) should be less than or equal to(<=) 1400 characters.

- **+RESP:GTCID:** The report for real time operation of the subcommand **CID**.

Example: **+RESP:GTCID,301303,860599004785994,,898600c01244f9823536,20190923065129,0473$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	''0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
ICCID	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- **+RESP:GTCSQ:** The report for real time operation of the subcommand **CSQ**.

Example: **+RESP:GTCSQ,301303,860599004785994,,31,0,20190923065344,0477$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	

Unique ID	15	(IMEI)	
Device Name	<=20	''0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
CSQ RSSI	<=2	0 - 31|99	
CSQ BER	<=2	0 - 7|99	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTVER:** The report for real time operation of the subcommand **VER**.

Example: **+RESP:GTVER,301303,860599004785994,,GL300,0D0B,0201,20190923065542,047B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Device Type	<=10	'0' - '9', 'a' - 'z', 'A' - 'Z'	GL300
Firmware Version	4	(HEX)	
Hardware Version	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Device Type*>: A string which represents the type of the device.

✧ <*Firmware Version*>: The firmware version of the device. The first two characters represent the major version and the last two characters represent the minor version. For example, 010A means the version 1.10.

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

➢ **+RESP:GTBAT:** The report for real time operation of the subcommand **BAT**.

Example: **+RESP:GTBAT,301303,860599004785994,,1,,96,4.1,0,1,20190923065923,047F$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
External Power Supply	1	0|1	
Reserved	0		
Battery Percentage	<=3	0 - 100	
Battery Voltage	<=4	0.0 - 4.50(V)	
Charging	1	0|1	

LED On	1	0 - 2	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTTMZ:** The report for real time operation of the subcommand **TMZ**.

Example: **+RESP:GTTMZ,301303,860599004785994,,+0000,0,20190923085029,04CB$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Time Zone Offset	5	+/- HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTALS:** The report for real time query of the configuration of a single command. The following takes **FRI** as an example:

Example: **+RESP:GTALS,301303,860599004785994,,FRI,1,0,,,0000,0000,180,180,180,180,001F,1000,1000,0,5,50,1,0,0001,20190923110538,0523$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Sub AT Command	3	'0' - '9', 'A' - 'Z'	
Mode	1	0 - 6	
Discard No Fix	1	0|1	
Reserved	0		
Reserved	0		
Begin Time	4	HHMM	
End Time	4	HHMM	
Check Interval	<=5	1 - 86400(sec)	
Send Interval	<=5	1 - 86400(sec)	
Ignition Check Interval	<=5	1 - 86400(sec)	
Ignition Send Interval	<=5	1 - 86400(sec)	
Report Mask	4	(HEX)	
Distance	<=5	20 - 65535(m)	
Mileage	<=5	20 - 65535(m)	
Movement Detection Mode	1	0|1	

Movement Speed	<=3	1 - 999(km/h)	
Movement Distance	<=4	1 - 9999(m)	
Movement Send Number	1	1 - 5	
Corner	<=3	0 - 180	
Append Mask	<=4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	

➢ **+RESP:GTGSV:** The report for GNSS level.

Example: **+RESP:GTGSV,301303,860599004785994,,03,15,11,10,35,12,42,14,45,15,21,18,32,20,33,21,21,24,44,25,30,31,32,32,45,20190923111831,0531$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
GNSS Level	2	(HEX)	
Jamming Indicator	<=3	0 - 255	
SV Count	<=2	0 - 16	
SV ID	<=2	0 - 50	
SV Power	<=2	0 - 55	
SV ID	<=2	0 - 50	
SV Power	<=2	0 - 55	
…			
SV ID	<=2	0 - 50	
SV Power	<=2	0 - 55	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*GNSS level*>: 4 high bits indicate jamming status, and 4 low bits indicates GNSS level.

4 High Bits:

- 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 Low Bits:

- 0: Cannot fix
- 1: Hard to fix
- 2: A little hard to fix
- 3: Easy to fix

✧ <*Jamming indicator*>: Scaled from 0 to 255 (0 = no CW jamming, 255=strong CW jamming).

- ✧ <*SV count*>: The count of satellites the GNSS finds.
- ✧ <*SV ID*>: Satellite ID.
- ✧ <*SV power*>: Satellite power.

➢ **+RESP:GTUSW:** The report for real time operation of the subcommand **UART SWITCH** and auto-enabling UART port after timeout.

Example: **+RESP:GTUSW, 301303,860599001112515,,0,20180524081800,0034$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
UART Status	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- ✧ <*UART status*>: It indicates the status of the UART port.
  - 0: The UART port is disabled.
  - 1: The UART port is enabled.

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:GTEPN: The report for connecting external power supply

+RESP:GTEPF: The report for disconnecting external power supply

+RESP:GTBPL: Battery low report

+RESP:GTBTC: Start-charging report

+RESP:GTSTC: Stop-charging report

+RESP:GTSTT: Device motion status indication

+RESP:GTPDP: GPRS PDP connection report

+RESP:GTSWG: Switch on or off Geo-Fence 0 via function key

+RESP:GTIGN: Ignition on report

+RESP:GTIGF: Ignition off report

+RESP:GTGSM: The report for the information of the serving cell and the neighbor cells.

+RESP:GTTEM: Temperature alarm report

+RESP:GTUPC: To indicate to the backend server that the configuration of the device is updated over the air

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

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

+RESP:GTJDS message when jamming is detected.
+RESP:GTRMD: The report for entering or leaving GSM roaming state.
+RESP:GTEUC: Extended status report of configuration update.

In **+RESP:GTEPN**, **+RESP:GTEPF**, **+RESP:GTBTC**, **+RESP:GTSTC**, **+RESP:GTBPL**, **+RESP:GTSTT**, and **+RESP:GTSWG** event reports, the last known GNSS information and the current GSM network information are included.

- **+RESP:GTPNA,**

Example: **+RESP:GTPNA,301303,860599004785994,,20190924021149,0778$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- **+RESP:GTPFA,**

Example: **+RESP:GTPFA,301303,860599004785994,,20190924021139,0777$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- **+RESP:GTEPN,**

Example: **+RESP:GTEPN,301303,860599004785994,,0,0.0,353,66.7,117.129139,31.840015,20190924021533,0460,0000,550B,B969,,20190924021534,0786$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	

Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- <*Last longitude*>: The longitude of the last position. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the minus sign "-" and east longitude is defined as positive without "+".
- <*Last latitude*>: The latitude of the last position. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "-" and north latitude is defined as positive without "+".

➢ **+RESP:GTEPF,**

Example: **+RESP:GTEPF,301303,860599004785994,,0,0.0,353,44.3,117.129206,31.839421,20190924021525,0460,0000,550B,B969,,20190924021530,0783$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTBPL,**

Example: **+RESP:GTBPL,301303,860599004785994,,3.53,0,4.3,92,70.0,117.129206,31.839421,20190924021525,0460,0000,550B,B969,,20190924021530,0783$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Battery Voltage	<=4	0.0 - 4.50(V)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTBTC,**

Example: **+RESP:GTBTC,301303,860599004785994,,0,0.0,353,66.7,117.129139,31.840015,20190924021533,0460,0000,550B,B969,,20190924021536,0787$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTSTC,**

Example: **+RESP:GTSTC,301303,860599004785994,,,0,0.0,353,44.3,117.129206,31.839421,20190924021525,0460,0000,550B,B969,,20190924021530,0784$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Reserved	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTSTT,**

Example: **+RESP:GTSTT,301303,860599004785994,,42,0,0.0,12,80.8,117.129585,31.839512,20190925012823,0460,0001,5504,5E27,,20190925013029,0B76$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Motion Status	2	21|22|41|42	

GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTPDP,**

Example: **+RESP:GTPDP,301303,860599004785994,,20190924023836,0798$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTSWG,**

Example: **+RESP:GTSWG,301303,860599004785994,,0,0,0.0,2,148.8,117.129322,31.839245,20190923060229,0460,0000,550B,B969,,20190923060230,044B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Geo Active	1	0|1	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	

GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Geo active*>: A numeral to indicate whether Geo-Fence 0 is active or inactive after the function key is long pressed.

- 0: Geo-Fence 0 is inactive.
- 1: Geo-Fence 0 is active.

➢ **+RESP:GTIGN,**

Example: **+RESP:GTIGN,301303,860599004785994,,0,0,0.7,353,38.5,117.129226,31.838440,20190923023639,0460,0000,550B,B969,,20190923023640,0390$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Duration Of Ignition Off	<=6	0 - 999999(sec)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Duration Of Ignition Off*>: Duration since last time the ignition is turned off. If it is greater than 999999 seconds, it will be reported as 999999 seconds.

➢ **+RESP:GTIGF,**

Example: **+RESP:GTIGF,301303,860599004785994,,10,0,0.9,353,81.7,117.129306,31.839022,20190923023640,0460,0000,550B,B969,,20190923023650,0393$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Duration Of Ignition On	<=6	0 - 999999(sec)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ *<Duration of ignition on>*: Duration since last time the ignition is turned on. If it is greater than 999999 seconds, it will be reported as 999999 seconds.

➢ **+RESP:GTGSM,**

Example: **+RESP:GTGSM,301303,860599004785994,GSM,0460,0000,550b,b96a,42,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0460,0000,550b,b969,31,00,20190924024454,079E$**			
Parameter	**Length (byte)**	**Range**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Fix Type	3	SOS|RTL|LBC|FRI|GSM	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
CellID1	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Rxlevel1	<=2	0 - 63	
Reserved1	0		

MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
CellID2	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Rxlevel2	<=2	0-63	
Reserved2	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
CellID3	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Rxlevel3	<=2	0 - 63	
Reserved3	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
CellID4	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Rxlevel4	<=2	0 - 63	
Reserved4	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
CellID5	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Rxlevel5	<=2	0 - 63	
Reserved5	0		
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
CellID6	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Rxlevel6	<=2	0 - 63	
Reserved6	0		
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
CellID	4	'0' - '9', 'a' - 'f', 'A' - 'F'	
Rxlevel	<=2	0 - 63	
Reserved	2		00
Send Time	14	YYYYMMDDHHMMSS	
Count Num	4		
Tail Character	1	$	$

✧ <*Fix type*>: A string to indicate what kind of GNSS fix this cell information is for.

- "SOS": This cell information is for SOS request.

- "RTL": This cell information is for RTL request.
- "LBC": This cell information is for LBC request.
- "FRI": This cell information is for FRI request.

✧ <*MCCi*>: MCC of the neighbor cell *i* (*i* is the index of the neighbor cell).
✧ <*MNCi*>: MNC of the neighbor cell *i*.
✧ <*LACi*>: LAC (in hex format) of the neighbor cell *i*.
✧ <*CellIDi*>: Cell ID (in hex format) of the neighbor cell *i*.
✧ <*Rxleveli*>: The signal strength of the neighbor cell *i*. This parameter is a 6-bit value coded in 1 dB steps:
0: -110 dBm
1 to 62: -109 to -48 dBm
63: -47 dBm
✧ <*Reservedi*>: The reserved field for the neighbor cell *i*.
✧ <*MCC*>: MCC of the serving cell.
✧ <*MNC*>: MNC of the serving cell.
✧ <*LAC*>: LAC (in hex format) of the service cell.
✧ <*CellID*>: Cell ID (in hex format) of the serving cell.
✧ <*Rxlevel*>: The signal strength of the serving cell.

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

➢ **+RESP:GTRMD,**

Example: **+RESP:GTRMD,301303,860599004785994,,1,0,0.0,353,71.6,117.129355,31.838444,20190924031359,0460,0000,550B,B969,20190924031400,07DC$**			
Parameter	**Length (byte)**	**Range**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Roaming State	1	0 - 3	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	(HEX)	
Tail Character	1	$	$

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

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

➢ **+RESP:GTTEM,**

Example: **+RESP:GTTEM,301303,860599004785994,,1,43.3,0,0.0,353,66.7,117.129139,31.840015,20190924025442,0460,0000,550B,B969,,20190924025443,07A8$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Alarm Type	1	1 - 3	
Temperature	<=5	(-)XX.X(℃)	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Last Longitude	<=11	-180 - 180	
Last Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Odo Mileage	<=9	0.0 - 4294967.0(km)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Last longitude*>: The longitude of the last position. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the minus sign "-" and east longitude is defined as positive without "+".

✧ <*Last latitude*>: The latitude of the last position. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "-" and north latitude is defined as positive without "+".

✧ <*Alarm type*>: The type of temperature alarm.

- 1: The current temperature is lower than the low temperature limit defined by

<*Min. temperature*>.

- 2: The current temperature is within the temperature threshold range specified by <*Min. temperature*> and <*Max. temperature*>.
- 3: The current temperature is higher than the high temperature limit defined by <*Max. temperature*>.

✧ <*Temperature*>: The current temperature of the device.

➢ **+RESP:GTUPC,**

Example: **+RESP:GTUPC,301303,860599004785994,,0,200,http://qlinkhf.f3322.org:10049/GL300N/deltabin/reset_at.ini,20190924032400,07E7$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Command ID	<=3	0 - 999	
Result	3	100 - 103|200 - 202|300 - 302|304 - 306	
Download URL	<=100	(URL)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

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

- 100: The update command is starting.
- 101: The update command is confirmed by the device.
- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.
- 303: Reserved
- 304: <*Command Mask*>, <*GEO ID Mask*>, <*Stocmd ID Mask*>, <*Group ID Mask*> or <*PEO ID Mask*> check fails.
- 305: The update process is interrupted by abnormal reboot.
- 306: The update process is interrupted by md5 verification error.

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

name.

➢ **+RESP:GTJDR,**

Example: **+RESP:GTJDR,301303,860599004785994,,0,2.0,353,103.9,117.129373,31.839203,20190924033114,,,,,00,20190924033225,07F4$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
GNSS Accuracy	1	0	0, Last known
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

➢ **+RESP:GTJDS,**

Example: **+RESP:GTJDS,301303,860599004785994,,1,0,2.0,353,103.9,117.129373,31.839203,20190924033114,0460,0000,550B,B969,00,20190924033556,07FE$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	

Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Jamming Status	1	1|2	
GNSS Accuracy	1	0	0, Last known
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4	(HEX)	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

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

➢ **+RESP:GTDAT,**

Example: **+RESP:GTDAT,301303,860599004785994,,,20190924060646,0865$**			
Parameter	**Length (byte)**	**Range**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Data	<=1280	(ASCII)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Data*>: The data to be transferred when the command **AT+GTDAT** is executed. It should be a printable ASCII string.

➢ **+RESP:GTEUC,**

Example: **+RESP:GTEUC,301303,860599004785994,,0,200,http://qlinkhf.f3322.org:10049/GL300N/deltabin/reset_at.ini,00000000,,,,,20190924061201,086C$**			
Parameter	**Length(byte)**	**Range / Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Command ID	<=3	0 - 999	
Result	3	100 - 103|200 - 202|300 - 302|304 - 306	
Download URL	<=100	(URL)	
Identifier Number	8	(HEX)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the response code is 301. It indicates wrong format of command ID when the response code is 302. It is empty when the response code is 304 or 305.

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

- 100: The update command is starting.
- 101: The update command is confirmed by the device.
- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.
- 303: Reserved
- 304: <*Command Mask*> or <*GEO ID Mask*> check fails.
- 305: The update process is interrupted by abnormal reboot.
- 306: The update process is interrupted by md5 verification error.

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

✧ <*Identifier Number*>: Please refer to the parameter <*Identifier Number*> in the command

AT+GTUPC.

3.3.5 Buffer Report

If the Buffer function is enabled, the terminal will save the messages into the Buffer in the following circumstances.

- ✧ No GSM signal.
- ✧ Failure to activate GPRS context for the TCP or UDP connection.
- ✧ Failure to establish the TCP connection with the backend server.

The buffered messages will be sent to the backend server after the messages can be sent to the backend server (i.e. when the network connection is available). The buffered reports are saved to the built-in non-volatile memory in case the device is reset. The device can save 10,000 messages at most.

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

Example:

The following is an example of the buffered message:

+BUFF:GTFRI,301303,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,100,20150214093254,11F0$

3.3.6 Report with Google Maps Hyperlink

According to the setting of the command **AT+GTGLM** and the configuration of location by call function, the device can send an SMS with a Google Maps hyperlink to a mobile phone number.

If <*Location by call*> is set to 1, GL300 will sent its current position to the incoming call number via an SMS with a Google Maps hyperlink if the incoming call is a direct number (Please refer to <*Direct number list*> in Chapter 3.2.6.3) or a whitelist number (Please refer to <*White list number*> in Chapter 3.2.6.2).

If the <*Google link mode*> is set to 1 in the command **AT+GTGLM**, GL300 will send an SMS with a Google Maps hyperlink to the direct phone numbers after the messages **+RESP:GTSOS** and **+RESP:GTGEO**.

➢ **Google Maps Hyperlink**

Example: **GL300 SOS:** **http://maps.google.com/maps?q=31.222073,121.354335+%28GL300%29** **F1 D2015/01/01T00:00:00 B74%**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
SMS Header	<=30		
Google Maps Hyperlink	<=77		
GNSS Fix	2	F1|F0	
GNSS UTC/RTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Battery Level	<=5	B1-100%	

✧ <*SMS header*>: A string that includes the terminal name and GNSS fix type ("**SOS**", "**IN GEO-i**", "**OUT GEO-i**", "**LBC**").

✧ <*Google Maps hyperlink*>: A string which represents a Google map hyperlink.

3.4 Heartbeat

Heartbeat is used to maintain the connection between the device and the backend server in GPRS communication. The heartbeat package is sent to the backend server at the interval defined by <*Heartbeat interval*> in the **AT+GTQSS** or **AT+GTSRI** command.

➢ **+ACK:GTHBD,**

Example: **+ACK:GTHBD,301303,860599004785994,,20190923020845,033E$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	''0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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

➢ **+SACK:GTHBD,**

Example: **+SACK:GTHBD, 301303,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Count Number	4	(HEX)	

Tail Character	1	$	$

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

3.5 Sever Acknowledgement

If server acknowledgement is enabled by the **AT+GTQSS** or **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	(HEX)	
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.

Appendix: Message Index

✧ **Command and ACK**

AT+GTQSS
+ACK:GTQSS
AT+GTBSI
+ACK:GTBSI
AT+GTSRI
+ACK:GTSRI
AT+GTCFG
+ACK:GTCFG
AT+GTNMD
+ACK:GTNMD
AT+GTTMA
+ACK:GTTMA
AT+GTFRI
+ACK:GTFRI
AT+GTGEO
+ACK:GTGEO
AT+GTSPD
+ACK:GTSPD
AT+GTFKS
+ACK:GTFKS
AT+GTRTO
+ACK:GTRTO
AT+GTWLT
+ACK:GTWLT
AT+GTGLM
+ACK:GTGLM
AT+GTPIN
+ACK:GTPIN
AT+GTDIS
+ACK:GTDIS
AT+GTDOG
+ACK:GTDOG
AT+GTDAT
+ACK:GTDAT
AT+GTNTS
+ACK:GTNTS
AT+GTOWH
+ACK:GTOWH
AT+GTTEM
+ACK:GTTEM
AT+GTCMD

+ACK:GTCMD
AT+GTUPC
+ACK:GTUPC
AT+GTJDC
+ACK:GTJDC
AT+GTPDS
+ACK:GTPDS
AT+GTRVC
+ACK:GTRVC
AT+GTGAM
+ACK:GTGAM
AT+GTRMD
+ACK:GTRMD
AT+GTHBM
+ACK:GTHBM

✧ **Position Related Report**

+RESP:GTFRI
+RESP:GTGEO
+RESP:GTSPD
+RESP:GTSOS
+RESP:GTRTL
+RESP:GTLBC
+RESP:GTPNL
+RESP:GTNMR
+RESP:GTGCR
+RESP:GTDOG
+RESP:GTIGL
+RESP:GTHBM

✧ **Device Information Report**

+RESP:GTINF

✧ **Report for Querying**

+RESP:GTGPS
+RESP:GTALL
+RESP:GTCID
+RESP:GTCSQ
+RESP:GTVER
+RESP:GTBAT
+RESP:GTTMZ
+RESP:GTALS
+RESP:GTALM
+RESP:GTUSW

✧ **Event Report**

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTEPN
+RESP:GTEPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTPDP
+RESP:GTSWG
+RESP:GTIGN
+RESP:GTIGF
+RESP:GTGSM
+RESP:GTTEM
+RESP:GTUPC
+RESP:GTJDR
+RESP:GTJDS
+RESP:GTRMD
+RESP:GTEUC

✧ **Executive Command Report**

+RESP:GTDAT

✧ **Heartbeat**

+ACK:GTHBD
+SACK:GTHBD

✧ **Server Acknowledgement**

+SACK