

GL300A @Track Air Interface Protocol

GSM/GPRS/GPS Tracker

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0. Revision History

Revision	Date	Author	Description of Change
1.00	2017-03-03	Wokky Lin	1. Initial.
1.01	2017-08-01	Evan Tu	1. Added a new event message +RESP:GTSOA .
1.01	2017-09-07	Evan Tu	1. Added the new GPS antenna type "UNKNOWN" to <i><GPS Antenna Type></i> in +RESP:GTINF .
2.00	2018-01-16	Machal Zhao	1. Added the <i><GNSS Working Mode></i> parameter to the AT+GTCFG command.

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 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 1: Terms and Abbreviations

2. System Architecture

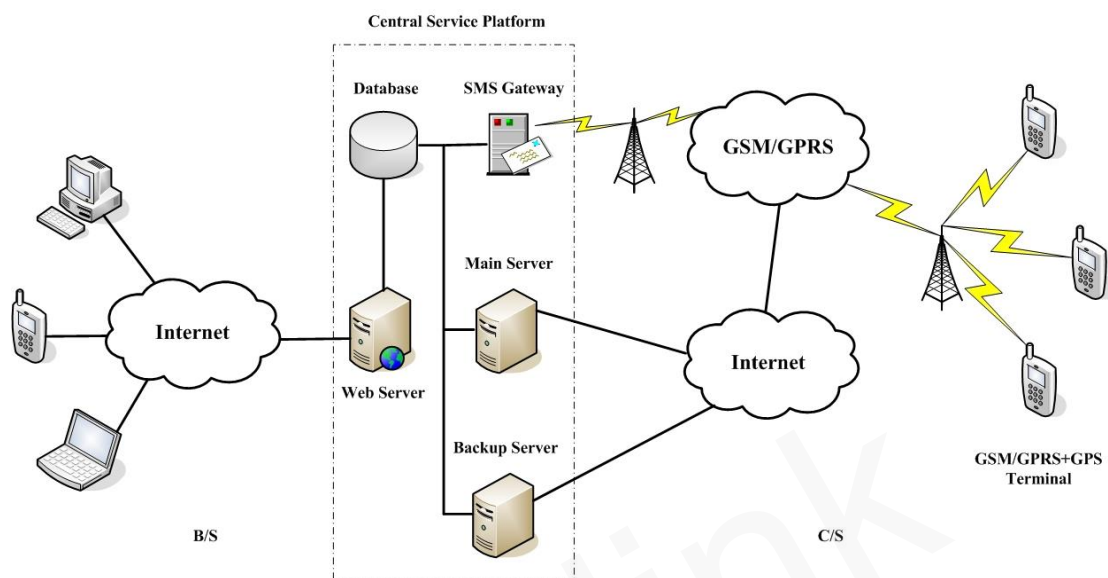


Figure 1: System Architecture

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 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:

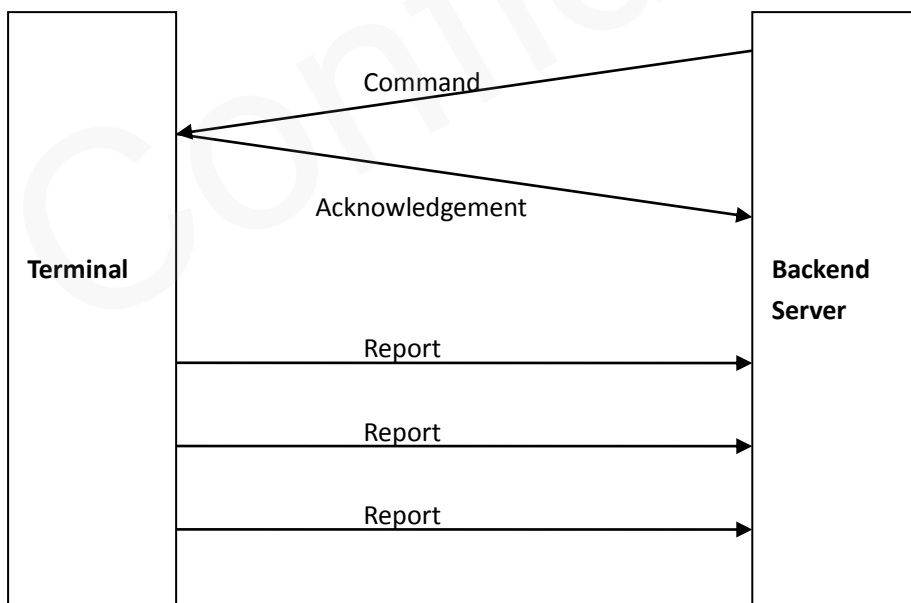


Figure 2: @Track Protocol Message Flow

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=gl300a,1,1,,,0000,2359,60,60,,,1F,0,,,,,,0007$AT+GTGEO=gl300a,0,3,101.412248,21.187891,1000,600,,,,,,0008$AT+GTSPD=gl300a,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,490100,135790246811220,,0007,20100310172830,11F0$
```

```
+ACK:GTGEO,490100,135790246811220,,0,0008,20100310172900,11F1$
```

```
+ACK:GTSPD,490100,135790246811220,,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 less than 160 bytes; otherwise the two commands **AT+GTBSI** and **AT+GTSRI** are used to configure those settings.

➤ **AT+GTQSS=**

Example:
AT+GTQSS=gl300a,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'	gl300a
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Report Mode	1	0 – 7	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 "gl300a".
- ✧ <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: Backup server connection supported TCP long-connection mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heartbeat data. The backend server should respond to the heartbeat data from the terminals. 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.
- ✧ *<Reserved>*: Not used at present. Please keep it empty.
- ✧ *<Buffer Enable>*: Enable/disable the Buffer function. Please refer to Chapter 0 for details of the Buffer function.
 - 0: Disable the Buffer function.
 - 1: Enable the Buffer function.
 - 2: High priority - Enable the buffer report function. In this mode, the device will send all the buffered messages before sending real time 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>*: A maximum of 20 characters including the optional national code starting with the "+" sign for sending SMS messages. Short code (for example, 10086) is also supported.
- ✧ *<Heartbeat Interval>*: The interval for the terminal sending heartbeat messages to the backend server. If it is set to 0, no heartbeat message 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,490100,135790246811220,,0001,20100310172830,11F0\$

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

- ✧ <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. “49” indicates GL300A New Version. The middle two characters represent the major version number and the last two characters represent 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>: It is the same as the serial number which is sent to the device along with the corresponding command. It is used to distinguish which command the ACK message is for.
- ✧ <Send Time>: The local time to send the ACK message.
- ✧ <Count Number>: The self-increasing 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 configure the GPRS parameters.

➤ **AT+GTBSI=**

Example:			
AT+GTBSI=gl300a,cmnet,,,,,,,,0002\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
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,490100,135790246811220,,0002,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.1.3 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 method of communication between the backend server and the terminal.

➤ **AT+GTSRI=**

Example:			
AT+GTSRI=gl300a,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'	gl300a
Report Mode	1	0 – 7	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 according to 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 parameter defines whether the device should establish TCP connection under certain conditions.
 - 0: Disable this 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> in **AT+GTQSS** is set to 3 (TCP long connection).

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

➤ **+ACK:GTSRI,**

Example:			
+ACK:GTSRI,490100,135790246811220,,0003,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2 Device Configuration

3.2.2.1 Global Configuration

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

➤ **AT+GTCFG=**

Example:
AT+GTCFG= gl300a,123456,,,,,,,,,,,,,,,,,,,,,0004\$
AT+GTCFG=gl300a,gl300a,gl300a,0,0,0,10,3F,0,,7EFF,1,1,0,300,1,1,20491231235959,0,0,,0,30,5,FFFF\$

Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
New Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	
Device Name	<=20	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	gl300a
ODO Enable	1	0 1	0
ODO Mileage	<=9	0.0 – 4294967.0Km	0.0
GPS On Need	1	0 1 2 3	1
GPS Fix Delay	<=2	5 – 60sec	5
Report Item Mask	<=4	0000 – 003F	001F
GSM Report	1	0 1 2 3 4	0
Cell Info Report Interval	<=5	1 – 86400sec	180
Event Mask	<=4	0000-FFFF	0FFF
Reserved	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
Reserved	0		
Battery Low Threshold	<=2	0 – 99	0
GPS Antenna Mode	1	0 1 2	0
GPS Antenna Timeout	<=4	0 – 1440min	30
Reserved	0		
GNSS Working Mode	1	0 - 4	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.
- ✧ <GPS On Need>: Whether to turn off GPS chip after retrieving GPS position information.
 - 0: Do not turn off GPS chip.
 - 1: Turn off GPS chip after retrieving GPS information every time.
 - 2: Do not turn off GPS chip in moving state.
 - 3: Keep GPS chip always off.

- ✧ *<GPS Fix Delay>*: This is the amount of time to wait after GPS fix succeeds. After GPS fix succeeds, the device will wait for the period of time specified by *<GPS Fix Delay>* and then acquire the GPS fix result. This is because the position obtained immediately after GPS fix succeeds may not be accurate. (E.g. If *<GPS Fix Delay>* is set to 7, the device will wait for 7 seconds after GPS 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 LAI and CI, including *<MCC>*, *<MNC>*, *<LAC>*, and *<CellID>*
 - Bit 4 (0010): *<Send Time>*
 - Bit 5 (0020): *<Device Name>*
- ✧ *<Event Mask>*: A Hex value to configure which event report messages 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.
 - 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): **+RESP:GTANT**
 - Bit 10 (0400): **+RESP:GTPDP**
 - Bit 11 (0800): **+RESP:GTPNL**
 - Bit 14 (4000): **+RESP:GTPFL**
 - Bit 15 (4000): **+RESP:GTSOA**
- ✧ *<GSM Report>*: If GPS 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 GPS position information.
 - 1: Allow the cell information report after failing to get GPS position information.
 - 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 GPS position information or not.

- 4: Report the message **+RESP:GTGSM** according to the *<Cell Info Report Interval>* after failing to get GPS position information.
- ✧ *<Cell Info Report Interval>*: The time interval for sending the message **+RESP:GTGSM** when *<GSM Report>* is set to 4. The value range is 1 – 86400. Unit: second.
- ✧ *<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, GPS 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 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**) function. The device information includes state of the device, ICCID, GSM signal strength, adapter connection status, battery voltage, charging status, Power and GPS LED working mode, *<GPS On Need>* setting, GPS antenna type, GPS antenna status, and the time of last known GPS fix.
 - 0: Disable the device information report function.
 - 1: Enable the device information report function.
- ✧ *<Info Report Interval>*: The interval for reporting the device information.
- ✧ *<Location by Call>*: It 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 GPS fixing and reports.
 - 0: Disable the Expiry function.
 - 1: Enable the Expiry function.
- ✧ *<Expiry Time>*: The time to stop all the GPS fixes and 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>*: It indicates whether to enable/disable AGPS. AGPS helps increase the chances of getting GPS position successfully and reduce the time needed to get a GPS position.
 - 0: Disable the AGPS function.
 - 1: Enable the AGPS function.
- ✧ *<Battery Low Threshold>*: The percentage value to judge whether internal battery is in low power state. If the remaining capacity (in percentage) of internal battery is less than the value set for 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.
- ✧ *<GPS Antenna Mode>*: A numeral to indicate how to select an internal GPS antenna. The internal GPS antenna will not work if the device connects with an external GPS antenna.
 - 0: Select the better-performing internal GPS antenna automatically.

- 1: Use the front internal GPS antenna.
 - 2: Use the back internal GPS antenna.
- ✧ <GPS Antenna Timeout>: The time in minutes before starting GPS antenna selection algorithm when the device fails to get a GPS position. This parameter works only when <GPS Antenna Mode> is 0. 0 means “The device will start GPS antenna selection algorithm for only one time (till it gets a better-performing antenna) after it is first fix and it will never start GPS antenna selection algorithm no matter how long it cannot get a GPS position”.
- ✧ <GNSS Working Mode>: The working mode of GNSS chip.
- 0: GPS, SBAS, QZSS and GLONASS positioning systems. In this mode, the device fixes position(s) with GPS and GLONASS systems
 - 1: GPS positioning system. In this mode, the device fixes position(s) only with GPS system.
 - 2: GLONASS positioning system. In this mode, the device fixes position(s) only with GLONASS system.
 - 3: BEIDOU positioning system. In this mode, the device fixes position(s) only with BEIDOU system.
 - 4: GPS and BEIDOU positioning systems. In this mode, the device fixes position(s) with GPS and BEIDOU systems.

Note: AGPS file must 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,490100,135790246811220,,0004,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{ 'A' - 'Z', '0' - '9' \}$	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
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=gl300a,,3,2,3,,,,,,,,,0005\$

Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
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	1 – 86400sec	300
Rest Send Interval	<=5	1 – 86400sec	300
Reserved	0		
Reserved	0		
URC Report	1	0 1	0
Enter Movement by Command	1	0 1	0
Reserved	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 won't 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 state. 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 state.
- ✧ *<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 state.
- ✧ *<Movement Threshold>*: The threshold for the motion sensor to measure 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 at rest and Bit 3 of *<Mode>* is 1.
- ✧ *<Rest Send Interval>*: The interval for sending the FRI report when the device is at rest and Bit 3 of *<Mode>* is 1.
- ✧ *<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 the device receives the subcommand **RTL** of the **AT+GTRTO** command.
 - 0: Do not change motion status after receiving the command.
 - 1: Force the device to enter movement state after the device receives the command.

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

➤ **+ACK:GTNMD,**

Example:			
+ACK:GTNMD,490100,135790246811220,,0005,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.3 Time Adjustment

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

➤ **AT+GTTMA=**

Example:			
AT+GTTMA=gl300a,-,3,30,0,20090917203500,,,,,0006\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
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,490100,135790246811220,,0007,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{ 'A' - 'Z', '0' - '9' \}$	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.4 Function Key Settings

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

➤ **AT+GTFKS=**

Example:			
AT+GTFKS=gl300a,3,,,,,3,5,ffff\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a

Power Key Mode	1	0-3	3
Full Power On	1	0 1	1
Reserved	0		
Reserved	0		
Reserved	0		
SOS Report Mode	1	1 2 3	3
Battery LED Light On Time	<=2	0-60sec	5
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Power Key Mode>: A numeral to indicate the working mode of the power key.
 - 0: Reserved
 - 1: Geo-Fence mode: Enable/disable the Geo-Fence 0 when the power key is long pressed. After the power key is long pressed, the terminal will report the message **+RESP:GTSWG** to indicate whether Geo-Fence 0 is enabled or disabled by the long press of the power key.
 - 2: Geo-Fence centering on the current position. Enable/disable the Geo-Fence 0 when the power key is long pressed and use the current position as the center of Geo-Fence 0 when the Geo Fence 0 is enabled using the power key. After the power key is long pressed, the terminal will report the message **+RESP:GTSWG** immediately. If the power key is long pressed to enable Geo-Fence 0, the terminal will start GPS fix to get the current position as the center of Geo-Fence 0. After GPS fix finishes, the terminal will report the message **+RESP:GTGCR** to indicate the result of GPS fix and the state of whether Geo-Fence 0 is enabled.
 - 3: SOS mode. After the power key is long pressed for 3 seconds, the device will report the current position according to the result of the latest GPS fix and then start GPS fix. After the GPS fix finishes or timeout expires, the device will report the SOS message according to the result of the GPS fix (whether it succeeds or fails).
- ✧ <Full Power On>: A numeral to indicate whether the terminal powers on completely after it is powered on by the charger inserted.
 - 0: The terminal does not power on completely. It will be charging, but not working.
 - 1: The terminal powers on completely. It will work normally just like it is powered on by long pressing the power key.
- ✧ <SOS Report Mode>: A numeral to indicate the mode of reporting GPS location information for the SOS event.
 - 1: Report only the last GPS location immediately after the SOS event is triggered.
 - 2: Try to report the current GPS location after the SOS event is triggered.
 - 3: Report the last GPS location immediately after the SOS event is triggered and then try to get the current GPS location to be reported.
- ✧ <Battery LED Light On Time>: The battery LED will be on for <Battery LED Light On Time> when the power key is short pressed to query battery level. '0' means "The battery LED light is always on".

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

➤ **+ACK:GTFKS,**

Example:			
+ACK:GTFKS,490100,135790246811220,,000A,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.5 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=gl300a,1,1234,1,,,,,000E\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 - 6	'0'-'9', 'a'-'z', 'A'-'Z'	gl300a
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 SIM card with SIM PIN.

- 0: Do not lock the SIM card with the SIM PIN.

- 1: Lock the SIM card with the SIM PIN.

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

➤ **+ACK:GTPIN,**

Example: +ACK:GTPIN,490100,135790246811220,,000E,20101029085505,0027\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{ 'A' - 'Z', '0' - '9' \}$	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.6 Protocol Watchdog

The **AT+GTD0G** command is used to reboot the device in a time based manner. This helps the device avoid working in an abnormal state for a long time.

➤ **AT+GTD0G=**

Example: AT+GTD0G=gl300a,1,,1,0130,,1,,,,,0011\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
Mode	1	0 1	0
Reserved	0		
Interval	<=2	1-30	30
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0 1	1
Reserved	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.
- ✧ *<Interval>*: The interval for rebooting the device.
- ✧ *<Time>*: The time at which the reboot operation is performed when the *<Interval>* condition is met.
- ✧ *<Report Before Reboot>*: Whether to report the **+RESP:GTD0G** message before reboot. 0 means “Do not report the **+RESP:GTD0G** message before reboot”, and 1 means “Report the **+RESP:GTD0G** 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.
- ✧ *<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+GTD0G** command:

➤ **+ACK:GTD0G,**

Example:			
+ACK:GTD0G,490100,135790246811220,,0011,20101029085505,0028\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.7 Network Selection

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

➤ **AT+GTNTS=**

Example:			
AT+GTNTS=gl300a,1,20,2,46001,,,,,FFFF\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
Enable	1	0 1	0
RSSI Threshold	<=2	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 wait before changing the operator in case of no GSM network.

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

➤ **+ACK:GTNTS**

Example:			
+ACK:GTNTS,490100,135790246811220,,0011,20101029085505,0028\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.8 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 outside working hours. The command **AT+GTOWH** is used to define the working hours and the working mode to protect the privacy. If this function is enabled, the device will report empty latitude, empty longitude, empty LAC, empty Cell ID, empty MCC and empty MNC in all the report messages except **+RESP:GTSOS** and **+RESP:GTSOA**.

➤ AT+GTOWH=

Example:			
AT+GTOWH=gl300a,3,1F,0900,1200,1300,1800,,,,,1,,,,,,FFFF\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300a
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		
Reserved	0		
RF Sleep 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	\$	\$

- ✧ <Mode>: The working mode of this function.
 - 0: Disable this function.
 - 3: Automatic mode. In this mode, the device will automatically check the current time against the working hours range. If it is outside 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.
- ✧ <RF Sleep Mode>: It specifies whether to shut down radio when the device is outside working 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+GTDG** will not trigger GSM or PDP watchdog reboot.

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

➤ **+ACK:GTOWH,**

Example:			
+ACK:GTOWH,490100,135790246811220,,0012,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.2.9 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=gl300a,1,25,,5,10,10,,,,,,0016\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300a
Mode	1	0 1 2	0
Signal Threshold	<=2	0 – 31	25
Reserved	0		
Jamming Cell Number	<=2	0-99	5

Threshold			
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” state.
 - 2: Enable jamming detection function: If jamming is detected, the device will report the **+RESP:GTJDS** message upon entering into or quitting “jamming” state.
- ✧ <Signal Threshold>, <Jamming Cell Number Threshold>: The built-in jamming detection algorithm uses these two parameters to measure whether the device is currently being jammed. The smaller the parameter value, the more sensitive the detection would be.
- ✧ <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 state, 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,0A0200,135790246811220,,0016,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	‘0’ – ‘9’ ‘a’ – ‘z’ ‘A’ – ‘Z’ ‘-’ ‘_’	

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

3.2.3 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=gl300a,0,,,,,,,,,,,,,0007\$			
AT+GTFRI=gl300a,1,1,,,0000,2359,60,60,,,1F,,,,,,0007\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
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
Reserved	0		
Reserved	0		
Report Mask	<=4	0000 – 001F	001F
Distance	<=5	20 – 65535m	1000
Mileage	<=5	20 – 65535m	1000
Movement Detection Mode	1	0 1	0
Movement Speed	<=3	1 – 999 (km/h)	5
Movement Distance	<=4	1 – 9999 (m)	50
Movement Send Number	1	1 – 5	5
Corner	3	0 – 180	30
Append Mask	<=4	0000 – FFFF	0000
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ **<Mode>**: The working mode of the fixed report function.
 - 0: Disable the 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 distance specified by **<Distance>**. It ignores the specific path the device has passed along. This function is invalid unless the GPS 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 length specified by **<Mileage>**. It calculates the length of the specific path the device has passed along. This function is invalid unless the GPS is always on. Unit: meter.
 - 4: Optimum report. The device simultaneously checks both time interval and path length between two adjacent position reports. It will report device position if the calculated time interval between current time and the time of the last report is longer than **<Send Interval>**, and the length of path between the current position and the last position is greater than **<Mileage>**. In order for this function to work, **<GPS On Need>** must be 0 (Do not turn off GPS chip) or 2 (Do not turn off GPS chip in 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 position reports. It will report the device position if the calculated time interval between current time and the time of last report is longer than **<Send Interval>**, or the length of path between the current position and the last position is greater than **<Mileage>**.
- ✧ **<Discard No Fix>**: 0 means "Report last known GPS position if there is no GPS fix", and 1 means "Do not send position information" if there is no GPS fix.
- ✧ **<Begin Time>**: The start time of scheduled report. The valid format is "HHMM". The value ranges of "HH" and "MM" are "00" – "23" and "00" – "59" respectively. 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 GPS fix. Its value range is 1-86400. Unit: second.
- ✧ **<Send Interval>**: The period to send the position information. The value range is 1–86400. Unit: second.
- ✧ **<Report Mask>**: Bitwise mask to configure the composition of GPS 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 corresponding field will be empty.
 - Bit 0 (0001): **<Speed>**
 - Bit 1 (0002): **<Azimuth>**
 - Bit 2 (0004): **<Altitude>**
 - Bit 3 (0008): GSM LAI and CI, including **<MCC>**, **<MNC>**, **<LAC>**, and **<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 GPS 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 GPS 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 GPS fix result, is lower than *<Movement Speed>* and the distance between the current GPS point and the last moving GPS 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. Unit: km/h.
- ✧ *<Movement Distance>*: The distance threshold for movement detection. Unit: meter.
- ✧ *<Movement Send Number>*: If the terminal is considered to be staying at one position according to the speed threshold and distance threshold, the terminal 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 the 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)	Reserved
Bit 1 (0002)	Temperature
Bit 2 (0004)	Relative Humidity
Bit 3 (0008)	Ambient Light Sensor Value
Bit 4 (0010)	Device Removed Light Level
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

Note:**Check Interval**

If *<GPS On Need>* is set to 1 or *<GPS On Need>* is set to 2, the terminal has two modes of operating the GPS module depending on the value of *<Check Interval>*:

- Mode 1: If the *<Check Interval>* is more than 60 seconds, the terminal will turn off the GPS chip every time after GPS fix finishes in order to save power.
- Mode 2: If the *<Check Interval>* is less than 60 seconds, the terminal will never turn off the GPS 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 terminal is in “Forced SMS Mode” (*<Report Mode>* = 5) while the *<Send Interval>* / *<Check Interval>* is greater than 1, the terminal 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 reporting works in the time period of (Begin time, End time) every day.
- *<Begin Time>* > *<End Time>*: The reporting starts from *<Begin Time>* and stops at *<End Time>* the following day.
- *<Begin Time>* = *<End Time>*: The reporting works for the whole day.

Scheduled Report Mode

For the modes of fixed distance report, fixed mileage report and optimum report, *<GPS On Need>* must be 0 (Do not turn off GPS chip) or 2 (Do not turn off GPS chip in movement state) for the function. For the mode of fixed time report, it doesn't matter whether GPS works always.

Corner Report

Make sure *<GPS 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,490100,135790246811220,,0007,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	\$	\$
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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 could be sent to the backend server according to the *<Mode>* setting.

➤ AT+GTGEO=

Example:			
AT+GTGEO=gl300a,0,3,101.412248,21.187891,1000,600,,,,,,,,,0008\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
GEO ID	1	0 – 4	
Mode	1	0 – 3	0
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0 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>*: A numeral to identify the Geo-Fence.
- ✧ *<Mode>*: A numeral to indicate when to report the notification to the backend server.
 - 0: Disable the Geo-Fence for a specific 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 format is “(-)xxx.xxxxxx” and the value range is from “-180.000000”

to "180.000000". Unit: degree. 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 format is "(-)xx.xxxxxx" and the value range is from "-90.000000" to "90.000000". Unit: degree. 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). Unit: meter.
- ✧ <Check Interval>: The interval of GPS checking position information against the Geo-Fence alarm.
- ✧ <State Mode>: A numeral to indicate the mode of reporting GEO state.
 - 0: Report a GEO state when getting the GEO state for the first time.
 - 1: Do not report a GEO state 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 0, <Mode> will be invalid when Geo-Fence 0 is enabled via Power Key).

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

➤ **+ACK:GTGEO,**

Example:			
+ACK:GTGEO,490100,135790246811220,,0,0008,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
GEO ID	1	0 – 4	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.2 Speed Alarm

The **AT+GTSPD** command is used to configure speed alarm of the device. According to the <Mode> setting, the device will report speed alarm when its speed is outside or inside a predefined range.

➤ **AT+GTSPD=**

Example:			
AT+GTSPD=gl300a,1,5,40,30,60,,,,,,,,,,,,,0009\$			
AT+GTSPD=gl300a,2,0,80,30,60,,,,,,,,,,,,,0009\$			
Parameter	Length (byte)	Range/Format	Default

Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
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 GPS is not always on. The speed alarm will be reported immediately if the speed of the terminal detected is outside the allowed speed range when GPS is not always on.

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

➤ **+ACK:GTSPD,****Example:****+ACK:GTSPD,490100,135790246811220,,0009,20100310172830,11F0\$**

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

3.2.4.3 Temperature Alarm

The **AT+GTTEM** command is used to configure temperature alarm for the device. According to the *<Mode>* setting, the device will report temperature alarm when its temperature is outside or inside a predefined range.

➤ **AT+GTTEM=****Example:****AT+GTTEM=gl300a,1,-05,10,15,30,,,,,,000E\$**

Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300a
Mode	1	0 1 2 3	0
Min Temperature	<=3	-20°C–60°C	0
Max Temperature	<=3	-20°C–60°C	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 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 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 temperature range specified by *<Min Temperature>* and *<Max Temperature>* for the period of time specified by *<Duration>*, 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, 490100,135790246811220,,000E,20150214093254, 000E\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.4.4 Device Removal Alarm

The **AT+GTDRM** command is used to configure the device removal alarm function on the light sensor. The two parameters *<Mode>* and *<Sensitivity Threshold>* combine to determine whether the device removal alarm event will be triggered.

➤ **AT+GTDRM=**

Example:			
AT+GTDRM=gl300a,1,3,1,300,1,2,,,,0004\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300a
Mode	1	0 1	0
Sensitivity Threshold	1	1 – 9	3
Duration	<= 4	1 – 1200 (unit: 3sec)	1

Send Interval	<= 3	0 5 – 300 sec	0
End Report	1	0 1	0
Report Mode	1	1 2 3	2
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Mode>: A numeral to indicate the working mode of the device removal alarm function.
 - 0: Disable this function.
 - 1: Enable the device removal alarm: The device will send the **+RESP:GTDRM** message when the light intensity detected is higher than <Sensitivity Threshold>.
- ✧ <Sensitivity Threshold>: The level of sensitivity to detect light intensity. The smaller the parameter value, the more sensitive the detection would be.
- ✧ <Duration>: If the <Mode> is not 0 and the light intensity is higher than <Sensitivity Threshold> for a period of time specified by <Duration>, the light sensor alarm event will be triggered (Unit: 3sec).
- ✧ <Send Interval>: The time interval for sending the device removed alarm report when the device enters into device removal alarm report status. 0 means “The device removal alarm will only be reported once”.
- ✧ <End Report>: The device reports the **+RESP:GTDRM** message when it quits the device removal alarm report status. 1 means “Enable the parameter”, and 0 means “Disable the parameter”.
- ✧ <Report Mode>: A numeral to configure how to report **+RESP:GTDRM** when the device is removed.
 - 1: Report the last position fix.
 - 2: Report the current position.
 - 3: Report the last position immediately, and then turn on GPS to get the current position and report the current position information.

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

➤ **+ACK:GTDRM,**

Example:			
+ACK:GTDRM, 490100,135790246811220,,000E,20150214093254, 000E\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {‘A’ – ‘Z’, ‘0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=20	‘0’ – ‘9’ ‘a’ – ‘z’ ‘A’ – ‘Z’ ‘-’ ‘_’	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	\$	\$
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3.2.5 Other Settings

3.2.5.1 Real Time Operation

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

➤ **AT+GTRTO=**

Example: AT+GTRTO=gl300a,0,,,,,000B\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
Sub Command	<=2	00– FF	
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: **GPS**. Request GPS related information, including settings of *<GPS On Need>*, *<Report Item Mask>*, *<Report Mask>* of fixed report, GPS antenna type, GPS antenna status and the time of last known successful GPS 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 except the parameters of **AT+GTBSI**, **AT+GTSRI**, and **AT+GTTMA** to factory default.
 - 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: **Reserved**.
 - E: **GSV**. Request the device to report the GPS fix level.
 - F: **GSM**. Request the device to report the cell information.
 - 10: **Reserved**.
 - 11: **BAK**. Write all the protocol settings to the backup block.
 - 12: **Reserved**.
 - 13: **GPSANT**. Start to select GPS antenna.
- ✧ **<Single Configuration Command>**: It is used to get a specified command's configuration of the terminal via the message **+RESP:GTALS**. For example, to get the configuration of **AT+GTCFG**, use the command "AT+GTRTO=gI300a,2,CFG,,,,,000F\$".
- Note:** This parameter is available only if **<Sub Command>** is set to 2. If the parameter is set to default, the terminal 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,490100,135790246811220,,GPS,000B,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Sub Command	<=6	Sub Command String	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5.2 White List Call Configuration

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

➤ **AT+GTWLT=**

Example:			
AT+GTWLT=gl300a,1,1,2,13813888888,13913999999,,,,,000C\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 - 6	'0'-'9', 'a'-'z', 'A'-'Z'	gl300a
Call Filter	1	0 1 2	1
Mobile Start	1	1-10	
Mobile End	1	1-10	
White List of Numbers	<=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 an incoming call according to **<White List of Numbers>** 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 of Numbers>** 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 is not in **<White List of Numbers>** or **<Direct Number List>**, the device will not 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 **1st** one. If it is empty, there should be no **<White List of Numbers>**.
- ✧ **<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 **2nd** one. If it is empty, there should be no **<White List of Numbers>**.
- ✧ **<White List of Numbers>**: 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 **<White List of Numbers>** would include **2** phone numbers and the two numbers are separated with **“,”**.

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

➤ **+ACK:GTWLT,**

Example:			
+ACK:GTWLT,490100,135790246811220,,000C,20101029085505,0025\$			
Parameter	Length (byte)	Range/Format	Default

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

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

3.2.5.3 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=gl300a,1,1,2,13813888888,13913999999,,,,,000D\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 - 6	'0'-'9', 'a'-'z', 'A'-'Z'	gl300a
Google Mode	1	0 1 2	0
Mobile Start	1	1-3	
Mobile End	1	1-3	
Direct Number List	<=20*3		
Reserved	0		
Reserved	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(s) defined in <Direct Number List> for SOS and GEO events.

- 0: Do not send an SMS with a Google Maps link to the number(s) defined in the <Direct Number List> for SOS and GEO events.
- 1: Send an SMS with a Google Maps link to the number(s) defined in the <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) defined in the <Direct Number List> for SOS and GEO events and do not include the terminal name in the Google hyperlink.

✧ <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 **1st** 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 **2nd** 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**, the *<Direct Number List>* would include **2** phone numbers and the two numbers are separated by with “,”.

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

➤ **+ACK:GTGLM,**

Example:			
+ACK:GTGLM,490100,135790246811220,,000D,20101029085505,0025\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {‘A’-‘Z’, ‘0’-‘9’}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5.4 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=gl300a,0,,data needs to be sent,0,,,0016\$			
AT+GTDAT=gl300a,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’	gl300a
Command Type	1	0 1	0
Reserved	0		
Data	<=200	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: Data transfer from UART to the backend server.
 - 1: Data transfer 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,490100,135790246811220,,0011,20101029085505,0028\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, $X \in \{ 'A' - 'Z', '0' - '9' \}$	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5.5 Command String Storage

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

➤ **AT+GTCMD=**

Example:			
AT+GTCMD=gl300a,1,1,AT+GTRTO=gl300a,0,,,,,000B\$,,,,,0005\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
Mode	1	0 – 1	0
Stored CMD ID		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 a 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,490100,135790246811220,,0005,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5.6 User Defined Function

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

➤ **AT+GTUDF=**

Example:			
AT+GTUDF=gl300a,0,1,F,30,,,F,1,,,,,0005\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
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-FFFFFFF	
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 of input event(s) and stored command(s).
 - 1: Enable the group of input event(s) and stored command(s).
 - 2: Delete the group of input event(s) and stored command(s).
- ✧ <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	Reserved
3	Bit 2	Reserved
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	GPS is on.
12	Bit 11	GPS is off.
13	Bit 12	The device is stationary.
14	Bit 13	The device is moving.
15	Bit 14	External charge inserted
16	Bit 15	No external charge
17	Bit 16	The device is charging.
18	Bit 17	The device is not charging.

19	Bit 18	Reserved
20	Bit 19	Reserved
21	Bit 20	Reserved
22	Bit 21	Reserved
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.). The maximum number of the stored commands can be configured is five.
- ✧ <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.

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

➤ **+ACK:GTUDF,**

Example:

+ACK:GTUDF,490100,135790246811220,,0005,20100310172830,11F0\$

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

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

3.2.5.7 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=gl300a,0,10,0,0,168,http://www.queclink.com/configure.ini,0,,,,0001\$			
Parameter	Length (byte)	Range/Format	Default value
Password	4 - 6	'0'-'9', 'a'-'z', 'A'-'Z'	gl300a
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		
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 "gl300a".
- ✧ <Max Download Retry>: It specifies the maximum number of retries to download the configuration file upon download failure.
- ✧ <Download Timeout>: It specifies the expiration timeout for a single download. If the download expires, it is considered to be failure.
- ✧ <Download Protocol>: The protocol used to download the file. Only HTTP is supported now. It is set to 0.
- ✧ <Report Enable>: A numeral to determine whether to report the message **+RESP:GTUPC** in the process of the over-the-air configuration update.

- 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.

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

➤ **+ACK:GTUPC,**

Example:			
+ACK:GTUPC,490100,135790246811220,,0005,20100310172830,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.2.5.8 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 states to be saved can be selected according to the value of *<Mask>*.

➤ **AT+GTPDS=**

Example:			
AT+GTPDS=gl300a,1,1F,,,,,,FFFF\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gl300a
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 the **AT+GTPDS** command.
 - 0: Disable this function.
 - 1: Preserve specified logic state of the device according to the value of **<Mask>**.
 - 2: Reset all the specified logic states listed in **<Mask>** after receiving the command, and then preserve specified logic state(s) 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 state, including motion status
 - Bit 5: State of external power
 - Bit 6: Charging status
 - Bit 7: Reserved
 - Bit 20: Reserved
 - Bit 21: Reserved
 - Bit 22: Reserved

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

➤ **+ACK:GTPDS,**

Example:			
+ACK:GTPDS,490101,135790246811220,,000D,20150214093254,FFFF\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A' – 'Z', '0' – '9'}	gl300a
Unique ID	15	IMEI	0
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_' '?'	1000
Serial Number	4	0000 – FFFF	1000
Send Time	14	YYYYMMDDHHMMSS	1
Count Number	4	0000 – FFFF	1
Tail Character	1	\$	\$

3.2.5.9 GPS-Assisted Motion Measurement

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

➤ **AT+GTGAM=**

Example:			
AT+GTGAM=gl300a,1,1,10,10,10,5,,,,,0006\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
Mode	1	0 1	1
Speed Mode	1	0 1	1
Motion Speed Threshold	<=2	5-50km/h	25
Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GPS Fix Failure Timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Mode>: The working mode of the GPS-assisted motion measurement function.
 - 0: Disable this function.
 - 1: Enable this function.
- ✧ <Speed Mode>: Enable/disable the use of GPS speed to assist with motion measurement based on motion sensor status.
 - 0: Disable this feature.
 - 1: Enable this feature.
- ✧ <Motion Speed Threshold>: The speed threshold which is combined with GPS speed to measure the status of movement.
- ✧ <Motion Cumulative Time>: If the average speed 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.
- ✧ <GPS Fix Failure Timeout>: If the GPS takes more than <GPS Fix Failure Timeout> before it gets a fix, the device will update the motion status from the motion sensor.

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

➤ **+ACK:GTGAM,**

Example:

+ACK:GTGAM,490100,135790246811220,,0011,20101029085505,0028\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

3.3 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 power key when the power key is enabled and the *<Power Key Mode>* is 3 (SOS mode)
- **+RESP:GTRTL**: Report message for **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:GTDG**: The protocol watchdog reboot message
- **+RESP:GTPFL**: The first location message after the device powers off

Example:

```
+RESP:GTFRI,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,100,20150214093254,11F0$
```

```
+RESP:GTFRI,490100,135790246811220,,0,0,2,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,1,4.3,92,70.0,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,0.0,100,20150214093254,11F0$
```

```
+RESP:GTGEO,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,100,20150214093254,11F0$
```

```
+RESP:GTSPD,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,100,20150214093254,11F0$
```

+RESP:GTSOS,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,100,20150214093254,11F0\$

+RESP:GTRTL,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,100,20150214093254,11F0\$

+RESP:GTPNL,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,00,,20150214093254,11F0\$

+RESP:GTNMR,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,100,20150214093254,11F0\$

+RESP:GTDOG,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,100,20150214093254,11F0\$

+RESP:GTPFL,490100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,10.0,50,20150214093254,11F0\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9' '-' '_'}	
Unique ID	15	IMEI	
Device Name	20		
Report ID / Append Mask	<=2	0 – 30	
Report Type	<=2	0 1 2	
Number	<=2	1 – 15	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)xxxxx.x m	
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Battery Percentage	3	0-100	
Temperature (Optional)	<=5	(-)XX.X°C	
Relative Humidity (Optional)	<=3	0–100 %RH	
Ambient Light Sensor Value	<=6	0 – 100000Lux	

(Optional)			
Device Removal Light Level (Optional)	2	0 – 10	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ *<Report ID / Append Mask>*: The ID of Geo-Fence in **+RESP:GTGEO**. Report ID is 0 for other reports.
 - For **+RESP:GTGEO**, it indicates the ID of the Geo-Fence.
 - 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 other reports, it is always 0.
- ✧ *<Report Type>*: The report type of **+RESP:GTFRI**, **+RESP:GTGEO**, **+RESP:GTSPD** and **+RESP:GTNMR**. For other reports, it is 0.
 - For **+RESP:GTFRI**
 - 0: This message is a common scheduled position report.
 - 1: This message indicates a turning point.
 - 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 indicate motion trigger and 4 low bits indicate “enter movement state or non-movement state”.
 - Motion trigger defines the factor which triggers the message. It has three 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 the sub command **RTL** of **AT+GTRTO**.
 - For **+RESP:GTDOG**
 - 0: Reboot periodically according to the *<Interval>* and *<Time>* settings.
 - 1: Reboot when GPRS network registration is unsuccessful.
 - 2: Reboot when there is no GSM signal.
- ✧ *<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 message. For other reports, this value is always 1. If there is more than 1 point in the report, information from *<GPS Accuracy>* to *<ODO Mileage>* is repeated for each point.

- ✧ <GPS Accuracy>: A numeral to indicate the GPS fix status and HDOP of the GPS position. 0 means the current GPS fix fails and the last known GPS position is used. A non-zero value (1 - 50) indicates the current GPS fix is successful and represents the HDOP of the current GPS position.
- ✧ <Speed>: The speed obtained from GPS.
- ✧ <Azimuth>: The azimuth from GPS.
- ✧ <Altitude>: The height above sea level from GPS.
- ✧ <Longitude>: The longitude of the current position. The format is “(-)xxx.xxxxxx” and the value range is from “-180.000000” to “180.000000”. Unit: degree. 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 format is “(-)xx.xxxxxx” and the value range is from “-90.000000” to “90.000000”. Unit: degree. South latitude is defined as negative starting with the minus sign “-” and north latitude is defined as positive without “+”.
- ✧ <GPS UTC time>: UTC time obtained from GPS.
- ✧ <MCC>: Mobile country code. It is 3 digits in length and ranges from 000 – 999.
- ✧ <MNC>: Mobile network code. It is 3 digits in length and ranges from 000 – 999.
- ✧ <LAC>: Location area code in hex format.
- ✧ <Cell ID>: Cell ID in hex format.
- ✧ <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.
- ✧ <Temperature>: If Bit 1 of the parameter <Report ID / Append Mask> in the **+RESP:GTFRI** report is 1, this field will be present in the report message **+RESP:GTFRI**. If Bit 1 of the parameter <Report ID / Append Mask> is 0, there is no <Temperature> field.
- ✧ <Relative Humidity>: The field is controlled by Bit 2 of <Report ID / Append Mask>. It is the ambient relative humidity.
- ✧ <Ambient Light Sensor Value>: The field is controlled by Bit 3 of <Report ID / Append Mask>. It represents the ambient light sensor value.
- ✧ <Device Removal Light Level>: The field is controlled by Bit 4 of <Report ID / Append Mask>. It represents the level of device removal light sensitivity.

3.3.1.2 Location by Call Report

➤ **+RESP:GTLBC,**

Example:			
+RESP:GTLBC,490100,135790246811220,,+8613800000000,1,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	

Device Name	20		
Call Number	<=20	phone number	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Longitude	<=11	±XXX.XXXXXX	
Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
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 <Power Key Mode> is set to 2 and the power key is long pressed to enable Geo-Fence 0, the terminal will start GPS fixing to get the current position as the center of Geo-Fence 0. After GPS fix finishes, the terminal will report the message **+RESP:GTGCR**.

➤ **+RESP:GTGCR,**

Example:			
+RESP:GTGCR,490100,135790246811220,,3,50,180,2,0.4,296,-5.4,121.391055,31.164473,20140714104934,0460,0000,1878,0873,0.0,,20140714104934,000C\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Geo Mode	1	0 1 2 3	
Geo Radius	<=7	50 – 6000000m	
Geo Check Interval	<=5	0 30 – 86400sec	
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	

Altitude	<=8	±XXXXX.X m	
Longitude	<=11	±XXX.XXXXXX	
Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
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 for 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 value 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 value will be used to replace the latitude of the center of Geo-Fence 0.

3.3.1.4 Device Removal Alarm Report

The device will send the **+RESP:GTDRM** message when the light intensity detected is higher than <Sensitivity Threshold>. If <End Report> is set to 1, the device reports the **+RESP:GTDRM** message when it quits the device removal alarm report status.

➤ **+RESP:GTDRM,**

Example:			
+RESP:GTDRM,400100,135790246811220,GL500,1,9,,,0,0.2,0,55.3,117.201406,31.833033,20160115020539,0460,0000,5678,2079,,,,,20160115100600,02B9\$			
Parameter	Length (byte)	Range	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Alarm Type	1	0 1	
Light Level	2	0 – 10	
Battery Percentage	3	0 – 100	

Reserved			
GPS Accuracy	<=2	0 1 – 50	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Longitude	<=11	±XXX.XXXXXX	
Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
CSQ RSSI	<=2	0 – 31 99	
CSQ BER	<=2	0 – 7 99	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Alarm Type>: The type of the device removal alarm.
 - 0: The alarm is triggered by light intensity detected which is lower than predefined sensitivity threshold.
 - 1: The alarm is triggered by light intensity detected which is higher than predefined sensitivity threshold.
- ✧ <Light Level>: The current light level read from the light sensor.
- ✧ <Battery Percentage>: The current volume of the battery in percentage.

3.3.2 Device Information Report

➤ +RESP:GTINF,

Example:

+RESP:GTINF,490100,860599000700286,,41,89860035121285196404,21,0,1,0,0,,4.11,0,1,0,0,0,20150224013314,96,,35.3,,,20150224093316,0A60\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Motion Status	2	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 – 4294967.0Km	
Reserved	0		
Battery Voltage	<=4	0.0 – 4.50V	
Charging	1	0 1	
LED On	1	0 1 2	
GPS On Need	1	0 1 2 3	
GPS Antenna Type	1	0 1 3	
GPS Antenna State	1	0	
Last GPS Fix UTC time	14	YYYYMMDDHHMMSS	
Battery Percentage	3	0-100	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Motion Status>: The current motion status of the device.
 - 41: The device is stationary.
 - 42: The device is moving.
- ✧ <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**.
- ✧ <GPS On Need>: Please refer to <GPS On Need> in **AT+GTCFG**.
- ✧ <GPS Antenna Type>: A numeral to indicate which GPS antenna is working currently.
 - 0: Internal GPS antenna.
 - 1: External GPS antenna.
 - 3: Unknown GPS antenna.
- ✧ <GPS Antenna State>: The status of the GPS antenna.
 - 0: The antenna is working.
- ✧ <Last GPS Fix UTC Time>: The UTC time of the latest successful GPS fix.

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 **GPS**.

Example:			
+RESP:GTGPS,490100,135790246811220,,0,1F,1F,0,0,20150214013254,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
GPS On Need	1	0 1 2 3	
GPS Fix Delay	3	5 – 60sec	
GPS Antenna Type	1	0 1 3	
Report Item Mask	<=4	0000 – FFFF	
FRI Report Mask	<=4	0000 – FFFF	
GPS Antenna State	1	0	
Last GPS fix UTC time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
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,490100,860599000000448,,BSI,,,,,,,,SRI,2,,1,116.228.146.250,8161,192.0.0.0,0,+8618600126107,5,1,0,1,,,CFG,gl300a,gl300a,1,0.8,0,5,003F,0,,OFFF,1,1,300,1,0,20491231235959,1,0,,0,30,5,NMD,0,2,3,2,300,300,,,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	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
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	0
Reserved	0		
Buffer Enable	1	0 1	1
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	0
Backup Server IP	<=15		192.0.0.0
Backup Server Port	<=5	0 – 65535	0
SMS Gateway	<=20		
Heartbeat Interval	<=3	0 10 – 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		
CFG	3	CFG	CFG
New Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl300a
Device Name	20		GL300A
ODO Enable	1	0 1	0
ODO Mileage	<=9	0.0 – 4294967.0Km	0
GPS On Need	1	0 1 2 3	1
GPS Fix Delay	3	5 – 60sec	5
Report Item Mask	<=4	0000 – 003F	1F
GSM Report	1	0 1 2 3 4	0
Cell Info Report Interval	<=5	1 – 86400sec	180
Event Mask	4	0000-FFFF	FFF
Reserved	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
Reserved	0		
Battery Low Threshold	<=2	0-99	0
GPS Antenna Mode	1	0 1 2	0
GPS Antenna Timeout	<=4	0 – 1440min	30
Reserved	0		
GNSS Working Mode	1	0 - 4	0
NMD	3	NMD	NMD
Mode	1	0-F	
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	1 – 86400sec	300
Rest Send Interval	<=5	1 – 86400sec	300
Reserved	0		
Reserved	0		
URC Report	1	0 1	0
Enter Movement by Command	1	0 1	0
Reserved	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 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
Reserved	0		
Reserved	0		
Report Mask	<=4	0000 – 001F	1F
Distance	<=5	20 – 65535m	1000

Mileage	<=5	20 – 65535m	1000
Movement Detection Mode	1	0 1	0
Movement Speed	<=3	1-999(km/h)	5
Movement Distance	<=4	1-9999(m)	50
Movement Send Number	1	1-5	5
Corner	3	0 - 180	30
Append Mask	<=4	0 – 1F	0
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	0
Longitude	<=11	±xxx.xxxxxx	0.00000
Latitude	<=10	±xx.xxxxxx	0.00000
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		
GEO ID1	1	1	1
Mode	1	0 – 3	0
Longitude	<=11	±xxx.xxxxxx	0.00000
Latitude	<=10	±xx.xxxxxx	0.00000
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		
GEO ID2	1	2	2
Mode	1	0 – 3	0
Longitude	<=11	±xxx.xxxxxx	0.00000
Latitude	<=10	±xx.xxxxxx	0.00000
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		
GEO ID3	1	3	3
Mode	1	0 – 3	0
Longitude	<=11	±xxx.xxxxxx	0.00000
Latitude	<=10	±xx.xxxxxx	0.00000
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		
GEO ID4	1	4	4
Mode	1	0 – 3	0
Longitude	<=11	±xxx.xxxxxx	0.00000
Latitude	<=10	±xx.xxxxxx	0.00000
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		
SPD	3	SPD	SPD
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	30 – 3600sec	300

Direct Number	20		
Direct Number	20		
Reserved	0		
Reserved	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		
DOG	3	DOG	DOG
Mode	1	0 1	0
Reserved	0		
Interval	<=2	1-30 days	30
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0 1	1
Reserved	0		
Unit	1	0 1	0
GSM Interval	4	0 5-1440	60
PDP Interval	4	0 5-1440	60
Reserved	0		
NTS	3	NTS	NTS
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		
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

Quit Jamming Timer	<=4	0-3600sec	10
Threshold			
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PDS	3	PDS	PDS
Mode	1	0 1 2	1
Mask	8	00000000-FFFFFFFF	69
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
CMD	3	CMD	CMD
Mode	1	0-1	0
Stored CMD ID	3	0 – 31	
Command String	200		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UDF	3	UDF	UDF
Mode	1	0-2	0
Group ID	<=2	0 – 31	
Input ID Mask	<=16	0-FFFFFFFFFFFFFFFF	
Debounce Time	<=5	0-86400(s)	0
Reserved	0		
Reserved	0		
Stocmd ID Mask	<=8	0-FFFFFFF	
Stocmd Ack	1	0 1	0
Reserved	0		
Reserved	0		
Reserved			
Reserved			
GAM	3	GAM	GAM
Mode	1	0 1	1
Speed Mode	1	0 1	1
Motion Speed Threshold	<=2	5-50km/h	25

Motion Cumulative Time	<=3	10-100s	10
Motionless Cumulative Time	<=3	10-250s	60
GPS Fix Failure Timeout	<=4	5-1800s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DRM	3	DRM	DRM
Mode	1	1	0
Sensitivity Threshold	<= 2	1 – 9	3
Duration	<= 4	1 – 1200 (unit: 3sec)	1
Send Interval	<= 4	0 5 – 300 sec	0
End Report	1	0 1	0
Report Mode	1	1 2 3	2
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
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,300601,135790246811220,,2,1,BSI,cmnet,,,,,,,,SRI,3,,1,220.178.67.210,8161,22
1.178.67.210,8163,18654138983,5,0,0,0,,,CFG,gl300a,gl300a,0,0,0,1,5,001F,0,,OFFF,,1,1,300,
1,0,20491231235959,0,0,,0,30,5,NMD,0,2,3,2,300,300,,,0,0,,,,TMA,+0000,0,,,,FRI,0,1,,,0000,
0000,180,180,180,180,001F,1000,1000,0,5,50,5,0,0000,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,1,1,3,0,0,3,,
WLT,1,,,,,,,,,GLM,0,,,,,,,,PIN,1,1,0,,,,DIS,1,0,0,,,,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,0,10,0,0,0,0,,,J
DC,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,,,,,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,,,,,0,4,000
    
```



```
000000000000,0,,,00000000,0,,,,,0,5,0000000000000000,0,,,00000000,0,,,,,0,6,0000000000
000000,0,,,00000000,0,,,,,0,7,0000000000000000,0,,,00000000,0,,,,,0,8,0000000000000000,0
,,,00000000,0,,,,,20160919054739,000A$
+RESP:GTALM,300601,135790246811220,,2,2,0,9,0000000000000000,0,,,00000000,0,,,,,0,10,
0000000000000000,0,,,00000000,0,,,,,0,11,0000000000000000,0,,,00000000,0,,,,,0,12,00000
0000000000,0,,,00000000,0,,,,,0,13,0000000000000000,0,,,00000000,0,,,,,0,14,0000000000
000000,0,,,00000000,0,,,,,0,15,0000000000000000,0,,,00000000,0,,,,,0,16,0000000000000000
0,0,,,00000000,0,,,,,0,17,0000000000000000,0,,,00000000,0,,,,,0,18,0000000000000000,0,,,0
0000000,0,,,,,0,19,0000000000000000,0,,,00000000,0,,,,,0,20,0000000000000000,0,,,0000000
00,0,,,,,0,21,0000000000000000,0,,,00000000,0,,,,,0,22,0000000000000000,0,,,00000000,0,,,,
,0,23,0000000000000000,0,,,00000000,0,,,,,0,24,0000000000000000,0,,,00000000,0,,,,,0,25,0
0000000000000000,0,,,00000000,0,,,,,0,26,0000000000000000,0,,,00000000,0,,,,,0,27,0000000
0000000000,0,,,00000000,0,,,,,0,28,0000000000000000,0,,,00000000,0,,,,,0,29,000000000000
00000,0,,,00000000,0,,,,,0,30,0000000000000000,0,,,00000000,0,,,,,0,31,0000000000000000,
0,,,00000000,0,,,,,20160919054739,000B$
```

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Total Packets	<=2	1 – 16	
Current Packet	<=2	1 – 16	
Configurations	< 1400		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

Note: The length of every +RESP:GTALM message (including header and tail) should be <= 1400 characters.

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

Example:

```
+RESP:GTCID,490100,135790246811220,,898600810906F8048812,20150214093254,11F0$
```

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
ICCID	20		

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

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

Example:			
+RESP:GTCSQ,490100,135790246811220,,16,0,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
CSQ RSSI	<=2	0 – 31 99	
CSQ BER	<=2	0 – 7 99	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

Example:			
+RESP:GTVER,490100,135790246811220,,GL300A,0100,0101,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Device Type	10	'0' – '9', 'a' – 'z', 'A' – 'Z'	GL300A
Firmware Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
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,490100,135790246811220,,0,,100,4.20,0,1,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
External power supply	1	0 1	
Reserved	0		
Battery Percentage	3	0-100	
Battery Voltage	<=4	0.0 – 4.50V	
Charging	1	0 1	
LED On	1	0 1 2	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

Example:			
+RESP:GTTMZ,490100,135790246811220,-0330,0,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0 1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTALS,**

The report for real time query of the configuration of a single command. The following takes **TMA** as an example:

Example:			
+RESP:GTALS,490100,135790246811220,GL300A,TMA,+0800,1,,,,,20150219083156,10FB\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
TMA	3	TMA	TMA

Time Zone	5	- +HHMM	
Daylight Saving	1	0 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTGSV**: The report for GPS level.

Example:
+RESP:GTGSV,490100,359464036001111,,03,17,11,30,24,31,30,32,28,32,29,12,0,14,17,16,18,20,0,22,24,24,0,25,0,20150305101643,000F\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
GPS Level	2	00-FF	
Jamming Indicator	3	0-255	
SV Count	2	0-12	
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	0000 – FFFF	
Tail Character	1	\$	\$

✧ **<GPS Level>**: 4 high bits indicate jamming status, and 4 low bits indicates GPS 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: Can not 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 GPS finds.
- ✧ <SV ID>: Satellite ID.
- ✧ <SV Power>: Satellite power.

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:GTANT: GPS antenna status indication

+RESP:GTPDP: GPRS PDP connection report

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

+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:GTSOA: The SIM card cover is opened.

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

➤ **+RESP:GTPNA,**

Example:			
+RESP:GTPNA,490100,135790246811220,,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Send Time	14	YYYYMMDDHHMMSS	

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

➤ **+RESP:GTPFA,**

Example:			
+RESP:GTPFA,490100,135790246811220,,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTEPN,**

Example:			
+RESP:GTEPN,490100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

◇ *<Last Longitude>*: The longitude of the last position. The format is “(-)xxx.xxxxxx” and the value range is from “-180.000000” to “180.000000”. Unit: degree. 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 format is “(-)xx.xxxxxx” and the value range is from “-90.000000” to “90.000000”. Unit: degree. South latitude is defined as negative starting with the minus sign “-” and north latitude is defined as positive without “+”.

➤ **+RESP:GTEPF,**

Example:
+RESP:GTEPF,490100,135790246811220,0,,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,20150214093254,11F0\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTBPL,**

Example:
+RESP:GTBPL,490100,135790246811220,,3.53,0,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,20150214093254,11F0\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Battery Voltage	<=4	0.0 – 4.50V	

GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTBTC,****Example:**

+RESP:GTBTC,490100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,20150214093254,11F0\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z', '0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTSTC,**

Example:			
+RESP:GTSTC,490100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Reserved	0		
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTSTT,**

Example:			
+RESP:GTSTT,490100,135790246811220,,41,0,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
State	2	41 42	
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	

MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTANT,**

Example:			
+RESP:GTANT,490100,135790246811220,,0,0,0,4,3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20100214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
GPS Antenna Type	1	0 1 3	
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTPDP,**

Example:			
+RESP:GTPDP,490100,135790246811220,,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	

Device Name	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ +RESP:GTSWG,

Example:

+RESP:GTSWG,490100,135790246811220,,1,0,2.1,0,27.1,121.390717,31.164424,2010090107
3917,0460,0000,1878,0873,0.0,20150901154653,0015\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Geo Active	1	0 1	
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ <Geo Active>: A numeral to indicate whether Geo-Fence 0 is active or inactive.

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

➤ +RESP:GTGSM,

Example:

+RESP:GTGSM,300105,860599000702001,GSM,0460,0000,5678,2d7e,40,,0460,0000,5678,20
79,31,,0460,0000,5665,206e,29,,0460,0000,5665,47a2,26,,0460,0000,5665,47a0,25,,0460,00
00,5678,5d7b,24,,0460,0000,5665,47a1,24,00,20150210151320,01CC\$

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

Unique ID	15	IMEI	
Fix Type	3	SOS RTL LBC FRI GSM	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4		
CellID1	4		
Rxlevel1	2	0-63	
Reserved1	0		
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
CellID2	4		
Rxlevel2	2	0-63	
Reserved2	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		
CellID3	4		
Rxlevel3	2	0-63	
Reserved3	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
CellID4	4		
Rxlevel4	2	0-63	
Reserved4	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
CellID5	4		
Rxlevel5	2	0-63	
Reserved5	0		
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4		
CellID6	4		
Rxlevel6	2	0-63	
Reserved6	0		
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
CellID	4		

Rxlevel	2	0-63	
Reserved	2		00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Fix type>: A string to indicate what kind of GPS fix this cell information is for.
 - "SOS": This cell information is for SOS request.
 - "RTL": This cell information is for RTL request.
 - "LBC": This cell information is for LBC request.
 - "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*.
- ✧ <Cell IDi>: 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.

Note:

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

➤ **+RESP:GTTEM,**

Example:			
+RESP:GTTEM,490100,860599000000448,,3,33,0,5.8,0,33.4,117.201191,31.832502,20130109061410,0460,0000,5678,2079,0.0,20150109061517,0091\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Alarm Type	1	1 2 3	

Temperature	<=5	(-)XX.X°C	
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

- ✧ <Last Longitude>: The longitude of the last position. The format is “(-)xxx.xxxxxx” and the value range is from “-180.000000” to “180.000000”. Unit: degree. 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 format is “(-)xx.xxxxxx” and the value range is from “-90.000000” to “90.000000”. Unit: degree. 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 lower 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 higher temperature limit defined by <Max Temperature>.
- ✧ <Temperature>: The current temperature of the device.

➤ **+RESP:GTUPC,**

Example:

+RESP:GTUPC,490100,135790246811220,,1,http://www.queclink.com/configure.ini,,20150201000000,11F0\$

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

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

➤ **+RESP:GTJDS,**

Example:

+RESP:GTJDS,490100,860599001163195,GL300A,1,0,0.0,197,-7.6,117.201554,31.833136,2017060623137,0460,0000,5678,2D80,00,20170606104459,0CAB\$

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

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

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

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

➤ **+RESP:GTSOA,**

Example:
+RESP:GTSOA,490100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20150214013254,0460,0000,18d8,6141,0.0,20150214093254,11F0\$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
ODO Mileage	9	0.0 – 4294967.0Km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

➤ **+RESP:GTDAT,**

Example:
+RESP:GTDAT,490100,135790246811220,,config command to the CAN bus device,20150217112247,032D\$

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

		$X \in \{'A'-'Z', '0'-'9'\}$	
Unique ID	15	IMEI	
Device Name	20		
Data	≤ 200	ASCII Code	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

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 real time messages if *<Buffer Mode>* in **AT+GTSRI** is set to 1.
- ✧ The buffered messages will be sent before real time messages if *<Buffer Mode>* in **AT+GTSRI** is set to 2. The SOS message has the highest priority and is sent before the buffered messages.

Example:

The following is an example of the buffered message:

```
+BUFF:GTFRI,490100,135790246811220,,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 command **AT+GTGLM** and *<Location by Call>* settings, the device can send an SMS with a Google Maps hyperlink to a mobile phone number.

If *<Location by Call>* is set to 1, the device will send 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 the Chapter 0) or a whitelist number (Please refer to *<White List of Numbers>* in the Chapter 0).

If the *<Google Mode>* in the command **AT+GTGLM** is set to 1, the device will send an SMS with a Google Maps hyperlink to the phone numbers defined in *<Direct Number List>* after the messages **+RESP:GTSOS** and **+RESP:GTGEO**.

➤ Google Maps Hyperlink

Example:			
GL300A 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		
GPS Fix	2	F1 F0	
GPS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Battery Level	<=5	B1-100%	

- ✧ *<SMS Header>*: A string that includes the terminal name and GPS fix type (such as "SOS", "IN GEO-i", "OUT GEO-i", or "LBC").
- ✧ *<Google Maps Hyperlink>*: A string which represents a Google Maps 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,490100,135790246811220,,20150214093254,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

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

➤ **+SACK:GTHBD,**

Example:			
+SACK:GTHBD,490100,11F0\$			
Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Count Number	4	0000 – FFFF	
Tail Character	1	\$	\$

✧ *<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	0000 – FFFF	
Tail Character	1	\$	\$

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

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+GTDOG

+ACK:GTDOG

AT+GTDAT

+ACK:GTDAT

AT+GTNTS

+ACK:GTNTS

AT+GTOWH

+ACK:GTOWH

AT+GTTEM

+ACK:GTTEM

AT+GTCMD

+ACK:GTCMD

AT+GTUDF

+ACK:GTUDF

AT+GTUPC

+ACK:GTUPC

AT+GTJDC

+ACK:GTJDC

AT+GTPDS

+ACK:GTPDS

AT+GTGAM

+ACK:GTGAM

AT+GTDRM

+ACK:GTDRM

✧ **Position Related Report**

+RESP:GTFRI

+RESP:GTGEO

+RESP:GTSPD

+RESP:GTSOS

+RESP:GTRTL

+RESP:GTLBC

+RESP:GTPNL

+RESP:GTNMR

+RESP:GTGCR

+RESP:GTDOG

+RESP:GTDRM

✧ **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

✧ **Event Report**

+RESP:GTPNA

+RESP:GTPFA

+RESP:GTEPN

+RESP:GTEPF

+RESP:GTBTC

+RESP:GTSTC

+RESP:GTBPL

+RESP:GTSTT

+RESP:GTANT

+RESP:GTPDP

+RESP:GTSWG

+RESP:GTGSM

+RESP:GTTEM

+RESP:GTUPC

+RESP:GTJDR

+RESP:GTJDS

+RESP:GTSOA

✧ **Executive Command Report**

+RESP:GTDAT

✧ **Heartbeat**

+ACK:GTHBD

+SACK:GTHBD

✧ **Server Acknowledgement**

+SACK

*Queclink
Grace Wang Checked
2018.04.08*