

# **GT500MA&GT501 Interface Protocol**

**Revision: V1.27**

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1.02	2020-03-09	Xiao Hui Peng	1.Add GTBLE. Add the report of GTBLE 、GTBLER.
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			3.Modify the GPS info location in the gtble and gtbler reports. 4.Scan Max Num increased to 20 in Gtble config.
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1.16	2020-12-25	Xiao Hui Peng	1.Add optional description, for GTBLE and GTRFD.(The standard version does not have these two functions)
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1.18	2021-03-29	Xiao Hui Peng	1.Change the minimum value of check interval1 to 30 seconds in GTFRI.
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1.23	2021-08-19	Xiao Hui Peng	1.Change the format of the GTGSM report example.
1.24	2021-08-24	Xiao Hui Peng	1.Modify the format of GTPNA,GTPFA.
1.25	2021-08-30	Xiao Hui Peng	1.Modify the format of GTCID,GTVR,GTBAT,GTPDP.
1.26	2021-11-09	Xiao Hui Peng	1.Merge GTTMP command and report format, and merge GTBLE command format.
1.27	2022-02-22	Xiao Hui Peng	1.Perfect the description of still shutdown in GTNMD. 2.Perfect the description of GTLGT mode 1,2.

## **General Notes**

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# 1. Overview

## 1.1.Scope

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

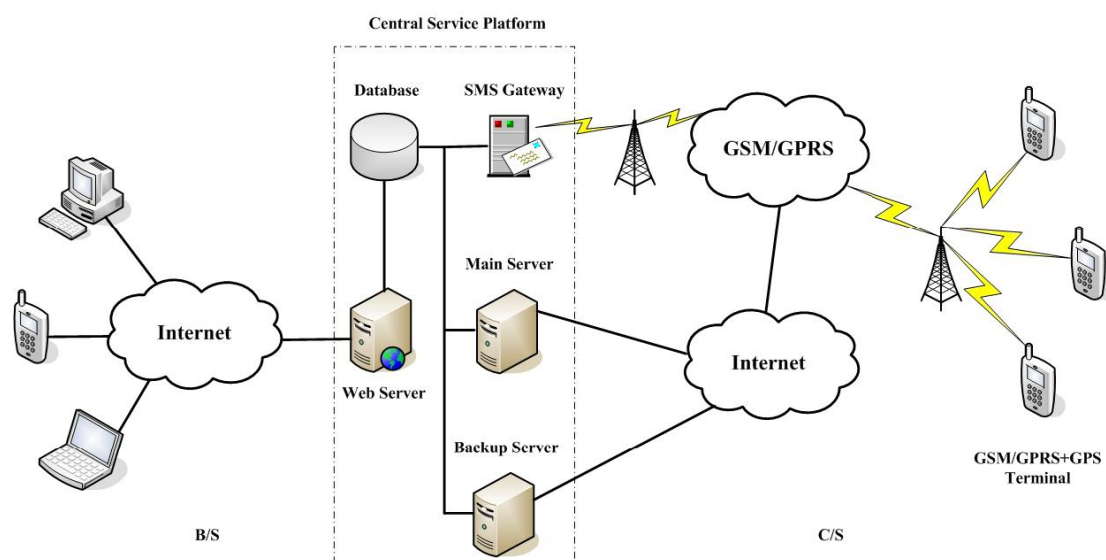
The purpose of this document is to describe how to build up the backend server based on the Interface Protocol.

## 1.2.Terms and Abbreviations

**Table 1: Terms and abbreviations**

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

## 2. System Architecture



**Figure 1: System architecture**

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

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



## 3. Message Description

### 3.1. Message Format

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

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

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

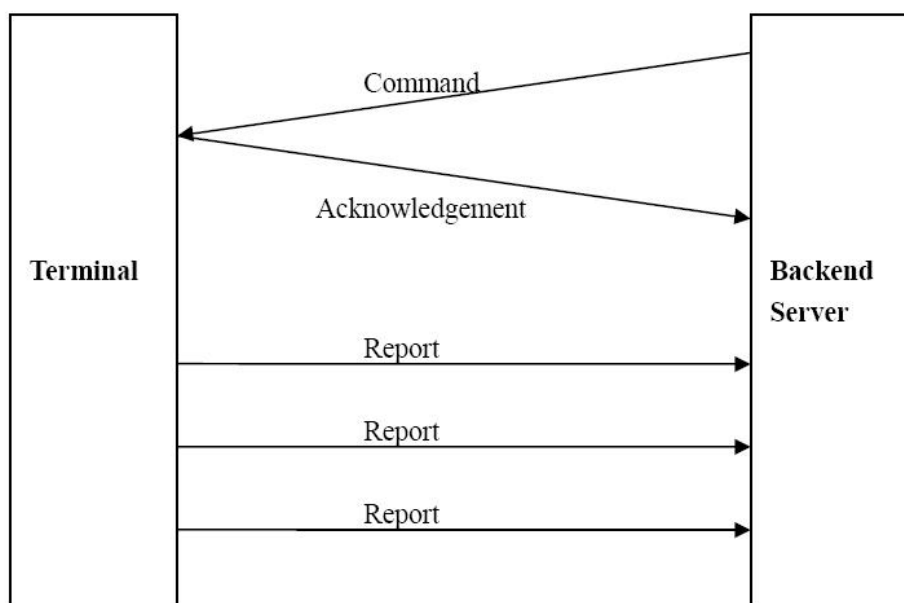
The characters 'XXX' identify the deferent message.

The "<parameter1>, <parameter2>,..." carry the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighboring parameter characters. The parameter string may contain the ASCII characters:

'0'-'9', 'a'-'z', 'A'-'Z'.

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

By sending Commands to the terminal, the backend server can either configure and query the parameters of the terminal or control the terminal to perform specific actions. When the terminal receives Commands over the air, it will reply with a corresponding Acknowledgement message. According to the configuration of the parameters, the terminal can send Report messages to the backend server. Please see the following figure:



**Figure 2: protocol messages flow Terminal Backend**

When the device receives commands over the air, it supports several commands in one SMS or Mobile Data Service without separate symbol between two close commands. But it is necessary to make sure the total size of the several commands is not longer than 160 if the commands are sent via SMS. Here is an example to send three commands in one SMS.

**AT+GTFRI=AIR11,1,1,,0000,2359,300,2,150,3,001F,,,,,,,,,0007\$**

**AT+GTGEO=AIR11,0,3,101.412248,21.187891,1000,2,,,,,,,,,0008\$ AT+GTSPD=AIR11,1,5,40,30,60,,,,,,,,,,,,,0009\$**

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

**+ACK: GTFRI, 110100, 358688000000158,, 0007, 20110101101854,0001\$**

**+ACK: GTGEO,110100, 358688000000158,,0,0008, 20110101101854,0002\$**

**+ACK: GTSPD,110100, 358688000000158,,0009, 20110101101854,0003\$**

## 3.2. Command and Acknowledgement

### 3.2.1.Quick Start Setting

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

➤ **AT+GTQSS=**

<b>Example:</b>			
<b>AT+GTQSS=AIR11,cmnet,,,4,0,1,116.226.44.17,9001,116.226.44.16,9002,+8613812341234,0,1,,0,0001\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
APN	<=40		
APN user name	<=20		
APN password	<=20		
Report mode	1	0 – 6	0
Reserved	0		
Buffer enable	1	0 1	1
Main server IP/domain Name	<=60		0.0.0.0
Main server port	<=5	0 – 65535	0
Backup server IP/domain Name	<=60		0.0.0.0
Backup server port	<=5	0 – 65535	0
SMS gateway	<=20		
Heartbeat interval	<=3	0 1 – 360 min	0
SACK enable	1	0 1	0
Connection Duration	<=3	1-255min	
Local port	<=5	0 – 65535	800
Network Mode	1	0 1 2 3	2
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ *<Password>*: The valid character of password is '0'-'9', 'a'-'z', 'A'-'Z'. The default value is "AIR11".
- ✧ *<APN>*: Access point name (APN).
- ✧ *<APN user name>*: the Mobile Data Service APN user name. If the parameter field is empty, the parameter will be cleared.
- ✧ *<APN password>*: the Mobile Data Service APN password. If the parameter field is empty, the parameter will be cleared.

- ✧ *<Report mode>*: Supports report modes as following:
  - 0: Stop reporting.**
  - 1: TCP short-connect preferred mode.** The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. And if it is failed 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-connect 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(20s). And if it is failed to establish a TCP connection with the backend server (including Main Server and Backup Server), it will be stored in the BUFFER (if BUFFER function is enabled, please refer to *<Buffer enable>*) or discarded (if the BUFFER function is disabled).
  - 3: TCP long-connect mode.** The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heart beat data. Please note that in this mode the backend server should respond to the heart beat data from the terminals.
  - 4: UDP mode.** The terminal will send data to the backend server by UDP protocol. It supports to receive protocol command via UDP. But it is recommended to make sure the IP address and UDP port of the device can be visited in the internet, and this is generally realized by heart beat package and the message +**RESP:GTPDP**.
  - 5: Force on SMS.** Only use the SMS for transmitting.
  - 6: UDP long-connect mode.** The terminal will send data to the backend server by UDP protocol. It supports to receive protocol command via UDP. The terminal will close the connection after *< Connection Duration >* if no data transmission.
- ✧ *<Buffer enable>*: Enable or disable BUFFER function. Please refer to **3.3.6** for the details about BUFFER function.
  - 0 Disable the BUFFER function.
  - 1 Enable the BUFFER function.
- ✧ *<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/domain name >*: The IP address or the domain name of the backup backend server.
- ✧ *<Backup server port>*: The port of the backup server.
- ✧ *<SMS gateway>*: Maximum 20 characters including the optional national code starting with “+” for SMS messages. Short code (for example: 10086) is also supported.
- ✧ *<Heartbeat interval>*: the interval for the terminal to send heartbeat package message to the backend server. If set to 0, no heartbeat package is sent.
  - 1.If no reply is received from the server and the heartbeat time is  $\geq 2\text{min}$ , a heartbeat report is sent to the server every two minutes.If  $<2\text{min}$ , reply a heartbeat report every minute.
  - 2.If the device receive the reply from server,the device will send message as per the interval of heartbeat interval.

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

0: the backend server does not reply SACK message after receiving a message from the device.

1: the backend server should reply SACK message after receiving a message from the device.

#### **[USER INSTRUCTION]**

Buffer, SACK and heartbeat all are the mechanism to enhance the robust of the connection between tracker and your backend server.

##### *1. Buffer provides the most primary level of message robust.*

Tracker will buffer all the messages while it detects no Mobile Data

Service connection available. And it will send out the buffered messages after the Mobile Data

Service connection resumed. The buffer size of ATW

is 720 pcs which is a FIFO queue, and the oldest message will be overwritten by the latest one if the buffer overflow.

Advantage: No resource needed from the backend server side. This is only take cared by the device itself.

Shortage: Cannot guarantee the message arrival to the backend server while Mobile Data

Service connection is available but server not reachable, such as server down, internet connect broken, etc.

##### *2. SACK provides the second level of message robust with a middle level overhead.*

The device will wait for the SACK message from server before it remove the current message from its message queue and send next message. If no SACK received, the device will try to resend the message to the server till it gets the SACK.

Advantage: It can guarantee the message arrival to backend server. It can work very well with UDP mode to provide a robust message connection.

Shortage:

a. Need server to send back a SACK message to each message from the device, which means extra communication cost.

b. The server availability detection is based on the message report from device. So it not works well for TCP/IP long connection mode while the message report interval is long while need to maintain the connection availability. For example, if the device is set to report position every 4 hours with TCP/IP long connection mode, the TCP/IP connection may not functional during this 4 hours period for many reasons.

##### *3. Heartbeat provides the highest level of message robust with high level overhead.*

The device will keep send heartbeat message to hand shake with the backend server as per the interval defined in the "Heartbeat Interval".

This is normally work with the TCP/IP long connection mode. The server should reply a heartbeat message to the device while it received one. If the device not received heartbeat message for 3 times, it will try to re-establish the TCP connection with server and re-send the messages.

Advantage: Heartbeat can maintain the highest connection availability for TCP/IP connection.

Shortage: Heavy overhead.

As a conclusion, these 3 mechanism can be enabled together without any conflict with each other. We recommended to enable buffer at least. SACK can work very well with UDP mode. And Heart beat is a MUST if you're using TCP/IP long connection, but not so efficient for UDP mode.

- ✧ *<Connection Duration>*: Unit minutes.
- ✧ *<Local port>*: An integer, specifying the local sending and receiving port.
- ✧ *<Network Mode>*: selects the IoT technology.(0 is only CAT-M1;1 is only NB-IoT;2 is CAT-M1 (preferred) and NB-IoT;3 is CAT-M1 and NB-IoT (preferred).)
- ✧ *<Serial number>*: the serial number for the command. It will be invoked in the ACK message of the command.
- ✧ *<Tail character>*: a character to indicate the end of the command. And it should be “\$”.

The acknowledgement message of AT+GTQSS command:

➤ **+ACK:GTQSS**

<b>Example:</b>			
<b>+ACK:GTQSS,110100, 35868800000158,,0001, 20110101101854,0001\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

- *<Firmware Version>*: The six characters are Firmware version number in hexadecimal. For example, ‘423034’ means version B04.
- *<Unique ID>*: ID of the device, use the IMEI of the current SIM card inside the terminal.
- *<Device name>*: Please refer to the parameter *<Device name>* in the command **AT+GTCFG**.
- *<Serial number>*: The same serial number which is sent to the device with the corresponding command. The backend server could use it to distinguish which command the ACK message is for.
- *<Send time>*: The local time to send the ACK message.
- *<Count number>*: The self-increasing count number will be put into every acknowledgment message and report message. The count is beginning from 0000 and increases by 1 every time. It will roll back after “FFFF”.

### 3.2.2. Bearer Setting Information

The command **AT+GTBSI** is used to set the Mobile Data Service parameter.

➤ **AT+GTBSI=**

<b>Example:</b>			
<b>AT+GTBSI= AIR11,cmnet,,,,,,,,,0002\$</b>			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
APN	<=40		
APN user name	<=20		
APN password	<=20		
Reserved	0		
Reserved	0		
Reserved	0		
Network Mode	1	0 1 2 3	2
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

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

➤ **+ACK:GTBSI**

<b>Example:</b>			
<b>+ACK:GTBSI,110100, 358688000000158,,0002, 20110101101854,0002\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.3. Backend Server Register Information

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

➤ **AT+GTSRI=**

<b>Example:</b>			
<b>AT+GTSRI= AIR11,4,,1,116.226.44.17,9001,116.226.44.16,9002,+8613812341234,0,1,,,,,0003\$</b>			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Report mode	1	0 – 6	0
Reserved	0		
Buffer enable	1	0 1	1
Main server IP/domain Name	<=60		0.0.0.0
Main server port	<=5	0 – 65535	0
Backup server IP /domain Name	<=60		0.0.0.0
Backup server port	<=5	0 – 65535	0
SMS gateway	<=20		
Heartbeat interval	<=3	0 1 – 360 min	0
SACK enable	1	0 1	0
Connection Duration	<=3	1-255 min	
Local port	<=5	0 – 65535	800
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

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

➤ **+ACK: GTSRI**

<b>Example:</b>			
<b>+ACK:GTSRI,110100, 358688000000158,,0003, 20110101101854,0003\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$



### 3.2.4. Global Configuration

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

➤ AT+GTCFG=

<b>Example:</b>			
<b>AT+GTCFG= AIR11,123456,AIR2012,,,1,5,003F,,,0FFF,0,1,1,300,1,,,,,0004\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
New password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	NULL
Device name	10	'0' – '9', 'a' – 'z', 'A' – 'Z'	GT500MA
Reserved	0		
Reserved	0		
GPS on need	3	0 1	1
GPS fix delay	2	2 – 20 mins	2
Report items mask	<=4	0000 – FFFF	0x003F
Report encryption key	2	00-FF	00
Power down delay	<=2	1-60 seconds	60
Event mask	4	0000-FFFF	0EFF
Reserved	0		
LED mask	1	00-FF	01
Info report enable	1	0 1	0
Info report interval	<=5	30 – 86400 seconds	300
Reserved	0		
Reserved	0		
Location update Interval	<=5	0 – 86400 seconds	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

- <New password>: Set to change the current password. If user wants to keep the current password, set NULL as default.
- <Device name>: the name of the device, which appears in each uplink message.
- <GPS on need>: Whether to close GPS chip after retrieving GPS position information.
  - 0**: Never close GPS chip
  - 1**: Close GPS chip after retrieving GPS information every time.
- <GPS fix delay>: The longest positioning time. Unit: min.
- <Report items mask>: Bitwise report mask to configure the composition of the entire uplink message. Each bit represents a field in the uplink message. If some bit is set as 1, the corresponding field will be filled if it is included in the uplink message. Otherwise, the field

will be empty.

**Bit0** (0001) : *<speed>*

**Bit1** (0002) : *<azimuth>*

**Bit2** (0004) : *<altitude>*

**Bit3** (0008): GSM LAI and CI, including *<MCC>*, *<MNC>*, *<LAC>*, *<cell id>* and the *<reserved1>* parameter "00"

**Bit4** (0010) : *<send time>*

**Bit5** (0020) : *<Device name>*

**Bit6** (0040) : *<Google link old style>*

**Bit7** (0080) : Reserve.

**Bit8** (0100) : *<HDOP as GPS accuracy>*

**Bit9** (0200) : *<NMD GPS Info>* When the device detects non-movement, The speed from GPS is set to 0.0.

**Bit10** (0400) : *<UART Always On>*

**Bit11** (0800) : *<Report Encryption >*

**Bit12** (1000) : *<Same coordinate in NMD>* the same GPS coordinate will be reported when the device is still.

**Bit13** (2000) : *<temperature information>* the current temperature information.

**Bit14** (4000) : *<WiFi info>* For **+RESP:GTPNL**, **+RESP:GTGEO**, **+RESP:GTRTL**, **+RESP:GTBPL**, **+RESP:GTNMR**, **+RESP:GTSTT**, **+RESP:GTDOG**.

**Bit15** (8000) : *<Location Mode Mark>* For **+RESP:GTFRI**, **+RESP:GTPNL**, **+RESP:GTRTL**, **+RESP:GTBPL**, **+RESP:GTNMR**, **+RESP:GTSTT** .

- *<Power down delay>*: When the device is shut down by the RTO (0x5) command. The power delay time is the maximum time to complete data transmission. After which the terminal will be shut down completely. Unit: second.
- *<Event mask>*: A Hex value to configure which event reports can be sent to the backend server: Each bit corresponds to a report message. And if the bit is set as 1, the corresponding report message can be sent to the backend server. Otherwise, it can not be sent to the backend server. Here is the mapping between each bit and each report message.

**Bit0** (0001): **+RESP: GTPNA**

**Bit1** (0002): **+RESP: GTPFA**

**Bit2** (0004): **Reserved**

**Bit3** (0008): **Reserved**

**Bit4** (0010): **Reserved**

**Bit5** (0020): **+RESP: GTBPL**

**Bit6** (0040): **Reserved**

**Bit7** (0080): **Reserved**

**Bit8** (0100): **+RESP: GTSTT**

**Bit9** (0200): **Reserved**

**Bit10** (0400): **+RESP: GTPDP**

**Bit11** (0800): **+RESP: GTPNL**

**Bit12** (0800): **+RESP: GTHIS**

- *<LED mask>*: A Hex value to configure the working mode of LED.
  - Bit0:**
    - 0:** Each time configure GTFRI for the device, GPS LED will work for 30 seconds and then are turned off.
    - 1:** Turn on GPS LED if necessary.
  - Bit1:**
    - Reserve.
  - Bit2:**
    - 0:None function
    - 1:Power Led do fast flash when power is low.
  - Bit3:**
    - 0:** None function
    - 1:** GSM LED dark when no SIM is present.
  - Bit4:** Reserved.
  - Bit5:** Reserved.
  - Bit6:** Reserved.
  - Bit7:**
    - 0:** None function
    - 1:** Turn off all LED except power led.
- *<Info report enable>*: Enable/disable the device information report ( **+RESP:GTINF** ) function. The device information include 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, the last known time of GPS fix.
  - 0:** Disable the device information report function.
  - 1:** Enable the device information report function.
- *<Info report interval>*: The interval of reporting the device information.
- *<Report encryption key>*: If **Bit11** (0800) : *<Report Encryption >* is 1, the report encryption is using the exclusive or operation. The encryption will begin after IMEI:  
+RESP:GTINF,210102,354524043181354.....r.....u.....
- *<Location update Interval>*: The gps update interval for **GTBLE**,or the interval of checking Geo-fence for **GTGEO**.(For more information, please refer to gps info enable in GTBLE)

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

- **+ACK:GTCFG**

<b>Example:</b>			
<b>+ACK:GTCFG,110100,35868800000158,AIR2012,0004,20110101101854,0004\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	

Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.5. Non movement detection

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

➤ AT+GTNMD=

<b>Example:</b>			
<b>AT+GTNMD= AIR11,6,4,,,10,15,0,,,,,,0005\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Mode	1	0-F	0
Non-movement duration	<=3	1 – 255(×5seconds)	6
Reserved	0		
Reserved	0		
rest fix interval	<=5	10 – 86400 seconds	1200
rest send interval	2	1 -15	3
Battery level	1	0 1	0
Detection delay	3	0-180 senconds	0
Still shutdown	1	0  1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ *<mode>*: A hex numeric to determine how the function works. Each bit of the hex numeric indicate different behavior that device could do. If the corresponding bit is 1, the device will behave as the description. Otherwise, it won't behave as the description.

**Bit0(1)**: Suspend the report of WIFI,FRI,BLE and Geo-Fence when it detects non-movement.

**Bit1(2)**: Report the message +RESP:GTNMR to the backend server when it detects non-movement.

**Bit2(4)**: Report the message +RESP:GTNMR to the backend server when it detects movement.

**Bit3(8)**: Change the fix interval and send interval of GTFRI and GTBLE to *<rest fix interval>* and *<rest send interval>* when it detects non-movement.

✧ *<Non-movement duration>*: A time parameter to determine whether the device enters non-movement status, i.e. if the motion sensor detects that the device keeps in non-movement for a period of time defined by *<Non-movement duration>*, the device will be considered as in non-movement status.

✧ *<rest fix interval>*: the fix interval for the report of GTFRI and GTWIF when the device is in rest state if Bit3 of *<mode>* is 1.

- ✧ *<rest send interval>*: the send interval for the report of GTFRI and GTWIF when the device is in rest state if Bit3 of *<mode>* is 1.
- ✧ *<battery level>*: if Bit0 of *<mode>* is 1, report battery level or not.

**0:** Don't report battery level.

**1:** Suspend the report of FRI and Geo-Fence when it detects non-movement. Report the battery level (BAT) instead.

*<Detection delay>*: The delay of motion detection. The device will delay xxx seconds before it judge a movement after it detected any movement. If the movement keep going after the delay, device will judge it as a 'real' movement and enter motion mode. Otherwise device will ignore the movement and keep in sleep mode. This is to prevent device from being frequently waken by occasional vibration in order to save battery life. This parameter can be used along with motion threshold, where one can set a sensitive motion detection threshold as well as ignoring nonsense movements.

*<Still shutdown>*:When configured as fri mode1, and the static shutdown function is turned on, and fix interval  $\geq 600$ , fix interval\*send interval  $\geq 600$ (if mode (Bit3) in GTNMD is enable,use rest fix interval and rest send interval;If bit3 is not checked, bit0 is checked,shutdown hold time is 90min;or else,use check interval1 and send interval1 in GTFRI), the device can be shut down quickly, keep the shutdown time at fix interval.(Note:if the device is turned on by motion, it will be turned on in advance.)If rf off delay in GTFRI is 0, it will shut down quickly after being located,otherwise, the minimum value in gps fix delay or fix interval will be used for overtime shutdown.**(Gsensor must be turned on for this feature to work properly)**

NOTE:If it is found that it is still in motion, it will not shut down at that time, and it will continue to wait for the condition to reach shutdown according to the previous processing.);If rf off delay is not 0, after waiting to enter the standstill, shutdown after the rf off delay time.(NOTE:If the device is moving again, it will wait for it to stand still again, wait for rf off delay time and then shut down;If the detection time point is reached and the device is found to be in motion, restart it for a while and then continue the detection).When the send interval is reached, a GTFRI or GTBAT will be sent after a positioning is performed at boot.

About motion report(GTNMR):

1. If the motion state turns the device on, a motion report will be generated for the prompt.Do not send +RESP:GTPNA,to save energy.
2. If you use GTFRI mode1 combined with still shutdown,and the device is turned on again,it will not send +RESP:GTPNA, will not send the first motion report,and will not send +RESP:GTPFA.Only send a positioning report(GTFRI or GTBAT) when the final positioning time is up.
3. If the device is turned on for any other reason, GTPNA is enabled, GTNMD mode3 is enabled, +RESP:GTPNA and +RESP:GTNMR motion reports will be sent.

**NOTE:** *<rest send interval>* is the times of *<rest fix interval>*, so the actual rest send interval time is equal to *<rest send interval>* multiplied by *<rest fix interval>*.

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

➤ **+ACK:GTNMD**

<b>Example:</b>			
<b>+ACK:GTNMD,110100, 358688000000158,,0005, 20110101101854,0005\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.6. Time Adjustment

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

➤ **AT+GTTMA=**

<b>Example:</b>			
<b>AT+GTTMA= AIR11,+,3,30,0, 20110101000000,,,,,0006\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
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>: Indicate the positive or negative of the local time offset to UTC
- ✧ <Hour Offset>: UTC offset in hours
- ✧ <Minute Offset>: UTC offset in minutes
- ✧ <Daylight Saving>: Enable/disable daylight saving time.
  - 0**: Disable daylight saving
  - 1**: Enable daylight saving
- ✧ <UTC time>: The configuration UTC time.

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

➤ **+ACK:GTTMA**

<b>Example:</b>			
<b>+ACK:GTTMA,110100, 358688000000158,,0006, 20110101101854,0006\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$



### 3.2.7. Fixed Report Information

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

➤ **AT+GTFRI=**

<b>Example:</b>			
<b>AT+GTFRI= AIR11,1,1,,,0000,2359,300,2,150,3,001F,1000,1000,,,,,,0007\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Mode	1	0 1  7 9	0
Discard no fix	1	0-1	0
Reserved	0		
RF off delay	<=4	0  5-255 minutes	10
Begin time	4	HHMM	0000
End time	4	HHMM	0000
Check interval1	<=5	30 – 86400 seconds	50
Send interval1	<=5	1 – 15/15000	1
Reserved	0		
Reserved	0		
Report mask	<=4	0000-FFFF	001F
Distance	<=5	50 – 65535 m	1000
Mileage	<=5	50 – 65535 m	1000
Max AP Numbers	2	2-12	12
Location Mode	1	0-2	2
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Fri_alarm1	<=4	HHMM	0000
Fri_alarm2	<=4	HHMM	1200
Fri_alarm3	<=4	HHMM	1800
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

◇ *<Mode>*:

**0:** Disable fixed report function.

**1:** Enable the scheduled timing report.

**7:** Enable the scheduled sleep-wake mode report. The device will wake for *RF off delay* minutes and sleep for *Check interval\* Send interval* seconds. And that cycle repeats.(If the motion is turned on, the motion will be turned off when using mode 7 to shut down, so that the device can be turned on regularly using the alarm clock function.)

**9:** Enable the alarm mode report. The device usually in a shutdown state, and will boot

up to send a GTFRI report when the alarm clock time is up, then will turn off after RF off delay.

- ✧ *<Discard no fix >*:
  - 0**: to report last known GPS position if there is no GPS fix,
  - 1**: to send nothing if there is no GPS fix.
- ✧ *<RF off delay>*: In the storing and forwarding mode, every time the device forwards the reports, system will shutdown the RF after the time to RF off delay. Unit: minutes.(When mode == 7 or 9, it can be 0, can quickly shut down when the positioning is successful or the GPS fix delay time is up. When fri mode == 1, and still shutdown is turned on, rf off delay == 0, the device will be shut down when positioning or GPS positioning timeout; When rf off delay is not 0, after the device enters standstill, wait for rf off delay and then shut down)
 

In the stealth mode, every time the device enters non-movement status, it will shutdown the RF *<RF off delay>* minutes later. And the time should be shorter than *<Rest send interval>* in GTNMD time.
- ✧ *<Begin time>*: The start time of scheduled fixed report. The valid format is “HHMM”. The value range of “HH” is “00”-“23”. The value range of “MM” is “00”-“59”. It is noticed to use UTC time here.
- ✧ *<End time>*: The end time of scheduled fixed report. The valid format and range are same as *<Begin time>*.
- ✧ *<Check interval>*: The interval time to fix GPS, the unit is second.(When mode == 7, its value range is 1800-86400; When mode != 7, its value range is 3-86400)
- ✧ *<Send interval>*: The period to send the position information. (the range is from 1 to 15.)
 

**NOTE:** *< Send interval>* is the times of *< Check interval>*, so the actual *Send interval* time is equal to *< Send interval>* multiplied by *< Check interval>*.
- ✧ *<Report mask>*: Bitwise report mask to configure the composition of GPS position information for fixed report. If some bit is set as 1, the corresponding field will be filled in the position related message. Otherwise, the field will be empty.
  - Bit0 (0001) :** *<speed>*
  - Bit1 (0002) :** *<azimuth>*
  - Bit2 (0004) :** *<altitude>*
  - Bit3 (0008):** GSM LAI and CI, including *<MCC>*, *<MNC>*, *<LAC>*, *<cell id>* and the *<reserved1>* parameter “00”
  - Bit4 (0010) :** *<send time>*
- ✧ *<Distance>*: the specified distance to send the position information when *<mode>* is 2 and this is valid only in the case that GPS chip keep opened always. Unit: meter.
- ✧ *<Mileage>*: the specified path length to send the position information when *<mode>* is 3 and this is valid only in the case that GPS chip keep opened always. Unit: meter.
- ✧ *<Max AP Numbers>*: The max number of the wireless access point.
- ✧ *<Location Mode>*: ID of the report for **+RESP:GTFRI**. (Note: Only supports AT&T features)
  - 0: GPS, WiFi and LBS information are included in reports.
  - 1: Only WiFi and LBS information are included in reports.
  - 2: Only GPS and LBS information are included in reports.
- ✧ *<Fri\_alarm123>*: the specified time wakeup to send the position information when *<mode>* is 9 and can set 1-3 alarm clocks. The valid format is “HHMM”. The value range of “HH” is

“00”-“23”. The value range of “MM” is “00”-“59”.If the alarm clock is not set, the value is empty. In this mode,only the first report containing the percentage of electricity shows the percentage of electricity.

**Note:**

If <Location Mode> was set as 1,it only supports FRI mode 1,FRI mode 7.  
Only FRI mode 1 generates GTPNA report.

**Note:**

- **Check and send interval:** If <GPS on Need> was set as 1 or <GPS on Need> was set as 2 without ignition on, the terminal has two modes to operate the GPS module according to the value of <Check interval>:
- If the <Check interval> is more than 60 seconds, the terminal will close the GPS part every time after GPS fixing finishes in order to save power.

Due to the maximum length limitation of the report message, it must be assured that: <Send interval> / <Check Interval> <=15. If exceed that limitation, the command is discarded and the previous settings keep untouched.

If the terminal is in “Force on SMS Mode” (<Report mode> = 5) while the <Send interval> / <Check Interval> > 1, the terminal will report only the last position in the fixed timing report, because only one position could be filled in one single SMS message (160 bytes at most).

**Action time range:**

- <Begin time> <<End time>: reports in the time period (begin time, end time) every day.
- <Begin time> > <End time>: reports starting from <Begin time> and stopping at <End time> on the following day.
- <Begin time> =<End time>: reports on the whole day.

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

➤ **+ACK:GTFRI**

<b>Example:</b>			
<b>+ACK:GTFRI,110100,358688000000158,,0007,20110101101854,0007\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.8. Geo-Fence Information

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

➤ **AT+GTGEO=**

<b>Example:</b>			
<b>AT+GTGEO= AIR11,0,3,101.412248,21.187891,1000,2,,,,,,,,,0008\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
GEO ID	1	0-4	
Mode	1	0-3	0
Longitude	<=11	(-)xxx.xxxxxx	999.9
Latitude	<=10	(-)xx.xxxxxx	99.9
Radius	<=7	50 – 6000000m	1000
Check interval	<=2	1 - 24	2
Periodic Report	1	0-1	1
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 numeric to identify the Geo-Fence.
- ✧ <Mode>: A numeric which indicates when to report the notification to the backend server based on the following:
  - 0:** Disable the Geo-Fence on the specified GEO ID.
  - 1:** Reports when enters the Geo-Fence.
  - 2:** Reports when leaves the Geo-Fence.
  - 3:** Reports when enters or leaves the Geo-Fence.
- ✧ <Longitude>: The longitude of a point which is defined as the center of the Geo-Fence circular region. The format is “(-)xxx.xxxxxx” and the value range is from “-180.000000” to “180.000000”. The unit is degree. West longitude is defined as negative starting with minus “-” and east longitude is defined as positive without “+”.
 

**The default value is an invalid digital: 999.9 if there is no correct setting.**
- ✧ <Latitude>: The latitude of a point which is defined as the centre of the Geo-Fence circular region. The format is “(-)xx.xxxxxx” and the value range is from “-90.000000”

to“90.000000”.The unit is degree. South Latitude is defined as negative starting with minus “-” and north Latitude is defined as positive without “+”.

**The default value is an invalid digital: 99.9 if there is no correct setting.**

- ✧ <Radius>: The radius of the Geo-Fence circular region. The value range is (50-6000000) and the unit is meter.
- ✧ <Check interval>: The interval of GPS checking for the Geo-Fence alarm.
- ✧ **NOTE:** If <GEO Interval> is not equal to zero, the actual *Check interval* time is equal to <check interval> multiplied by < GEO Interval >. If <GEO Interval> is equal to zero, the actual *Check interval* time is equal to <check interval> multiplied by one of the parameters among the <rest fix interval> in **GTNMD**, <Check interval1> in **GTFRI**.
- ✧ <Periodic Report>: Whether to open the continuous **+RESP:GTGEO** report.
  - 0:** When enters or leaves the Geo-Fence, Send only one **+RESP:GTGEO** report.
  - 1:** When enters or leaves the Geo-Fence, according to the < Check interval > send **+RESP:GTGEO** periodic report.

**Note:**

<Mode> will be restored at first and it could be used later when switch on Geo-Fence 0 via Function Key), because the terminal doesn't know when to check Geo-Fence if the parameter <Check interval> is 0.

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

➤ **+ACK:GTGEO**

<b>Example:</b>			
<b>+ACK:GTGEO,110100,358688000000158,,0,0008,20110101101854,0008\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
GEO ID	1	0-4	
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.9. Speed Alarm

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

➤ AT+GTSPD=

<b>Example:</b>			
AT+GTSPD= AIR11,1,5,40,30,60,,,,,,,,,,,,,0009\$			
AT+GTSPD= AIR11,2,0,80,30,60,,,,,,,,,,,,,0009\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Mode	1	0-3	0
Min speed	<=3	0 – 400km/h	0
Max speed	<=3	0 – 400km/h	0
Duration	<=4	5 – 3600sec	60
Send interval	<=4	30 – 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		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ <Mode>: A numeric 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. GPS must be always on.

**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. GPS must be always on.

**3:** Enable speed alarm. One alert for each over max speed. GPS must be always on.

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

- ✧ *<Max speed>*: The upper limit of the speed range.
- ✧ *<Duration>*: According to the working mode, if the speed satisfies the specified speed range and maintains a period of time defined by *<Duration>*, the speed alarm will be triggered.
- ✧ *<Send interval>*: After the speed alarm is triggered, the speed alarm message is sent every interval time.

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

➤ **+ACK:GTSPD**

<b>Example:</b>			
<b>+ACK:GTSPD,110100,358688000000158,,0009,20110101101854,0009\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.10. Real Time Operation

The AT+GTRTO command is used to request real time operation report.

➤ AT+GTRTO=

<b>Example:</b>			
<b>AT+GTRTO=AIR11,0,,,,,,,,,,,,,000BS</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Sub command	<=2	0-0x1c	
Reserved/Ftp server	0		
Reserved/Ftp user name	0		
Reboot duration/Ftp password	0-5	0-43200 (Unit: minutes)	
Reserved/Ftp working directory	0		
Reserved/Ftp update package	0		
Reserved	0		
interval	0-5	5-86400 (Unit:seconds)	
Reserved	0		
Counter	<=3	1-999	
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ <Sub command>: A numeric to indicate the sub command to execute.
- 0 (**GPS**): Request GPS related information, including setting of <GPS on need>, <Report items mask>, <Report mask> of fixed report, GPS antenna type, GPS antenna status and the last known time of successful GPS fixing.
- 1 (**RTL**): Request the device to report its current position.
- 2 (**READ**): Request the device to report its entire configuration.
- 3 (**REBOOT**): Reboot the device remotely.
- 4 (**RESET**): Reset all parameters to factory default except parameter of AT+GTBSI, AT+GTSRI.
- 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**): Read the device information report function. The corresponding information will be reported via the message **+RESP: GTINF**.

C: (**GSM**): Request the device to report the GSM information. The corresponding information will be reported via the message **+RESP: GTGSM**.

D: Reserved.

E: Reserved.

F: Reserved.

10: Reserved.

11: Reserved.

12: (**REPO**): Request the device to enter or exit repo mode.

13: (**CLEARBUFF**): Request the device to clear buffer.

14: (**WIFI**): Request the device to report the WIFI information. The corresponding information will be reported via the message **+RESP: GTWIFR**.

15: Reserved.

16: Replace the battery with new one.

17: Reserved.

18: Reserved.

19 (**FOTAUPDATE**): Fota real-time update;

1A: Reserved.

1B: (**BLEO**) Search the Bluetooth. The corresponding information will be reported via the message **+RESP: GTBLEO**.

1C: Module fota upgrade.

✧ *<Reboot duration>*:

**For REBOOT:** The device powers off then will power on after reboot duration. The unit is minute. If the value is 0 or empty, the device will reboot immediately.

✧ *<interval1>*:

**For WIFI:**

The interval time to report the WLAN information.

**For Repo Mode:**

The interval time to fix GPS.

✧ *<Counter>*:

**For WIFI:**

The number of times the device reports the WLAN information.

✧ *<Repo Mode >*:

**For Repo Mode:**

**0:** Request the device to exit Repo Mode.

**1:** Request the device to enter Repo Mode.

✧ *<Repo Mode duration>*:

**For Repo Mode:**

The period of repo mode.

- ✧ Ftp server: The FTP address.
- ✧ Ftp user name: FTP account.
- ✧ Ftp password: FTP password.
- ✧ Ftp working directory: directory where the package is located.
- ✧ Ftp update package: Package name. (These are the ftp parameters for the module fota upgrade)

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

➤ **+ACK:GTRTO**

<b>Example:</b>			
<b>+ACK:GTRTO,110100,358688000000158,,GPS,000B,20110101101854,000BS</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Sub command	<=6	Sub command string	
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.11. Google link SMS configuration

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

➤ **AT+GTGLM=**

<b>Example:</b>			
<b>AT+GTGLM= AIR11,1,1,2,1381388888,1391399999,,,,,000D\$</b>			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Google mode	1	0 1	0
Mobile start	1	1-3	0
Mobile end	1	1-3	0
Direct number list	<=20*3		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ *<Google mode>*: A numeric to indicate whether to send a SMS with Google link to the number in *<direct number list>* for GEO event.
  - 0**: Do not send a SMS with Google link to the number is in the *<direct number list>* for GEO event.
  - 1**: Send a SMS with Google link to the number is in the *<direct number list>* for GEO event.
- ✧ *<Mobile start>*: A numeric to indicate the first index of the direct number to input. For example, if it is 1, it will update the white call list from the first one. If it is empty, it should not include *<direct number list>* later.
- ✧ *<Mobile end>*: A numeric to indicate the last index of the direct number to input. For example, if it is 2, it will update the direct list until the 2nd one. If it is empty, it should not include *<direct number list>* later.
- ✧ *<Direct number list>*: A phone number list. It could include several phone numbers. And two close phone numbers are separated with ",". The number of the phone number in the list is up to the parameter *<mobile start>* and *<mobile end>*. For example, if *<mobile start>* is 1 and *<mobile end>* is 2, the *<direct number list>* should include 2 phone numbers and the two numbers are separated by with ",".

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

➤ **+ACK:GTGLM**

<b>Example:</b>			
<b>+ACK: GTGLM, 110100, 358688000000158,,000D, 20110101101854,0025\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.12. Protocol watchdog(optional)

The **AT+GTDOG** command is used to reboot the device in a time based on manner or upon ignition.

This helps the device avoid working in an exception status for a long time. Besides these two automatically reboot method, the device also supports to use the digital input to trigger the reboot manually.

➤ **AT+GTDOG =**

<b>Example:</b>			
<b>AT+GTDOG=AIR11,0,60,30,0200,,1,0,30,50,,,0011\$</b>			
Parameter	Length (byte)	Range/Format	Default

Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Mode	1	0 1	0
reserved	0		
Interval	<=2	1 -30 (unit: days)	30
Time	4	HHMM	0200
reserved	0		
Report before reboot	1	0 1	1
reserved	0		
Gsm interval	<=3	0   5-255(unit:min)	0
Pdp interval	<=3	0   4-255(unit:min)	0
reserved	0		
reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ <Mode>: working mode.
  - 0**: disable this function
  - 1**: reboot periodically according to the <Interval> and <Time> setting.
- ✧ <Interval>: the interval to reboot the device in day.
- ✧ <Time>: at what time to perform the reboot operation when <Interval> is met.
- ✧ <Report before reboot>: whether to report the **+RESP: GTDOG** message before reboot.
  - 0**: no report
  - 1**: report.

If this is enabled, the device will make a real-time location before sending the messages in order to send it with the current location information.
- ✧ <Gsm interval>: This is the time to query for no network,the unit is minutes,when this time is reached, the device will reboot.
- ✧ <Pdp interval>: When ipinit failed more than three times and the duration is this time,the moudle will reboot,the unit is minutes.

Attention:When the Gsm interval and the Pdp interval are equal to 0, the corresponding function will not be turned on.

**NOTE: this function is optional.**

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

➤ **+ACK: GTDOG**

<b>Example:</b>			
<b>+ACK: GTDOG,110100, 358688000000158,,0011, 20110101101854,0029\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	

Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.13. WIFI Settings

The AT+GTWIF command is used to configure the WIFI parameter.

➤ AT+GTWIF =

<b>Example:</b>			
AT+GTWIF=AIR11,0,ap1,ap1-psw,ap2,ap2-psw,ap3,ap3-psw,,,,,0,120,,,0021\$			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
mode	1	0-3	0
Ap1 name	<=20		
Ap1 password	<=20		
Ap2 name	<=20		
Ap2 password	<=20		
Ap3 name	<=20		
Ap3 password	<=20		
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>:

- 0:** Mobile data mode only.
- 1:** Mobile data preferred mode.
- 2:** WIFI preferred mode.
- 3:** WIFI mode only mode.

✧ <Ap>: Wireless access point.

Notice: The Wireless access points must be different.

✧ <Ap password>: Wireless access point password

The acknowledgment message of the AT+GTWIF command:

➤ +ACK: GTWIF

<b>Example:</b>
+ACK: GTWIF,110100, 358688000000158,,0013, 20110101101854,0029\$

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.14. AGPS Setting

The AT+GTAGP command is used to set AGPS server information.

➤ AT+GTAGP =

<b>Example:</b>			
AT+GTAGP=AIR11,1,,,,,,,,,120,,,,,,,,,0020\$			
Parameter	Length (byte)	Range/Format	Default
Password	4-6	'0'-'9', 'a'-'z', 'A'-'Z'	AIR11
AGPS mode	1	0 1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Online update interval	<=3	20-240 min	240
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Sequence number	<=4	0-FFFF	
Tail character	1	\$	\$

✧ <AGPS mode>:

**0:** not use AGPS.

**1:** use AssistNow online AGPS.

✧ <Online update Interval>: Update local online data from AssistNow online server time interval.

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

➤ **+ACK: GTAGP**

<b>Example:</b>			
<b>+ACK: GTAGP, 210110,012207000000015,,0020,20150725113330,0023\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.15. 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=**

<b>Example:</b>			
<b>AT+GTPIN= AIR11,1,1234,1,,,,,000E\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
auto unlock PIN	1	0 1	1
PIN	4-8	'0' – '9'	
PIN checking	1	0 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ *<auto unlock PIN>*: A numeric to indicate whether to 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 for one time.
- ✧ *<PIN>*: The PIN code which is used when unlocks PIN automatically. If it is empty, the PIN code saved in the device will be cleared.
- ✧ *<PIN checking >*: A numeric to indicate whether to lock the device with SIM-PIN.
  - 0**: Do not lock the SIM-PIN.
  - 1**: Lock the SIM-PIN.

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

➤ **+ACK:GTPIN**

<b>Example:</b>			
<b>+ACK:GTPIN,110100,358688000000158,,000E,20110101101854,0027\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.16. Radio Frequency(Optional)

The **AT+GTRFD** command is used to configure 433 on and off, send interval, send frequency.

➤ **AT+GTRFD=**

<b>Example:</b>			
<b>AT+GTRFD=AIR11,1,10,1,,,,,,001DS</b>			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
RF433 Switch	1	0 1	0
Send Interval	1-2	2-10	2
Send Frequency	6	433.00-433.99	433.00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ *<RF433 Switch>*: Controls whether to turn the device on or off 433.

**0**: Turn off the device 433.

**1**: Turn on the device 433.

✧ *<Send Interval>*: Control device's 433 frequency send interval.



✧ <Send Frequency>: Control device 433 sends the frequency size.

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

➤ **+ACK:GTRFD**

<b>Example:</b>			
<b>+ACK:GTRFD,423031,353081090012876,,001D,20180101001437,0007\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.17. BLE Configuration(Optional)

The **AT+GTBLE** command is used to configurate parameters of the bluetooth.

The device will search for surrounding IBeacon signals and report the RSSI and UUID.

IBeacon broadcast message example(hex):

0201061aff4c000215e2c56db5dff48d2b060d0f5a71096e0000a0007c5

“e2c56db5dff48d2b060d0f5a71096e0” is UUID.

➤ **AT+GTBLE =**

<b>Example:</b>			
<b>AT+GTBLE=AIR11,1,60,8,0,6,0,0,0,,,,,,,,,,,,,,,,,,,,,,,,,,,,,001C\$</b>			
Parameter	Length (byte)	Range/Format	Default
Password	4-16	Except for NULL and comma in ASCII	AIR11
Mode	1	0   1   2	0
Scan interval	<=5	30 – 1000s	60
Scan max num	2	2-20	2
Scan type	4	0-3	0
Scan duration	<=2	6-15	15
Uuid/Mac Filter	1	0 1	0
Filter num start	<=2	0-15	0
Filter num end	<=2	0-15	0
Uuid/Mac 0	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 1	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 2	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 3	32/12	32/12	

Uuid/Mac 4	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 5	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 6	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 7	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 8	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 9	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 10	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 11	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 12	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 13	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 14	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
Uuid/Mac 15	32/12	'0' – '9', 'a' – 'f', 'A' – 'F'	
gps info enable	1	0 1	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	\$	\$

<Scan type mask>:

For GT500MA:

**bit 1(0001):** IBeacon

**bit 2(0002):** Eddystone-UID

**bit 3(0004):** Temp&Humi S1 (this bit Only valid in GTBLE mode 2;Only for GT500MA to get Temperature and Humidity).

For GT501:

**0:** All (**Note:Only supports mode 2**)

**1:** IBeacon

**2:** Eddystone-UID

**3:** IBeacon and Eddystone-UID

◇ <Mode>:

**0:** Disable report function;

**1:** Enable ble uuid report; (see GTBLE report)

**2:** Enable raw data report; (see GTBLER report)

NOTE: GTBLE and GTBLER reports are affected by the GTNMD configuration.

◇ < Scan interval >: The interval time to scan ,Unit: second.

◇ <Scan max num>: Max numbers in one scan.

◇ <Uuid filter>: Whether to enable filtering.A 12-bit MAC address, or a 32-bit UUID.

- ✧ <Filter num start>:The uuid list begin
- ✧ <Filter num end>:The uuid list end
- ✧ <Scan duration>:The scan time ,Unit: second.
- ✧ <Uuid0 ---Uuid15>:Filter send report UUID or MAC. UUID and MAC Support for wildcard Settings using the ‘X’ character, For example, .....XXX1234..... matches .....6781234.....(The length is 32).
- ✧ <gps info enable>:
  - 0**: disable gps info in GTBLE report.
  - 1**: enable gps info in GTBLE report. If enable this bit,The device will turn on the GPS according to the Location update interval When FRI mode 0. If not FRI mode 0, The report directly user the latest GPS data. (GTCFG Geo Interval has been changed to Location Update Interval).

The acknowledgment message of the AT+GTBLE command:

➤ **+ACK:GTBLE**

<b>Example:</b>			
<b>+ACK:GTBLE,423032,355154089720672,GT500MA,0000,20200309062936,0001\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.18. Temperature Humidity Detection

The AT+GTTMP command is used to configure the parameters for temperature detection.

➤ **AT+GTTMP =**

<b>Example:</b>			
<b>AT+GTTMP=AIR11,3,20,1,60,60,,,,,,001B\$</b>			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	‘0’ – ‘9’, ‘a’ – ‘z’, ‘A’ – ‘Z’	AIR11
Temperature Mode	1	0-3	0
Sampling Interval	1-3	1 – 255(×30s)	20
Detect duration	1-3	1 – 255(times Sampling Interval)	1
High temperature	1-5	-30 – 60℃	

threshold			
Low temperature threshold	1-5	-30 – 60°C	
Sensor Type/Reserved	1	1	1
Humidity Mode/Reserved	1	0-3	0
High humidity threshold/Reserved	1-3	0%RH~100%RH	80
Low humidity threshold/Reserved	1-3	0%RH~100%RH	20
Keep tracing after Alert/Reserved	1	0  1	1
Reserved	0		
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

Note:1.Sensor Type only for GT500MA.

2.Humidity Mode,High humidity threshold,Low humidity threshold,Low humidity threshold only for GT501.

✧ <Temperature Mode>:

**0:** disable this function

**1:** Report the message **+RESP:GTTMP** to the backend server when the temperature is greater than <High temperature threshold>.

**2:** Report the message **+RESP:GTTMP** to the backend server when the temperature is less than <Low temperature threshold>.

**3.** Report the message **+RESP: GTTMP** to the backend server when both the temperature is greater than <High temperature threshold> and the temperature is less than <Low temperature threshold>.

✧ <Humidity Mode>: **(FOR GT501)**

**0:** disable this function

**1:** Report the message **+RESP:GTTMP** to the backend server when the humidity is greater than <High humidity threshold>.

**2:** Report the message **+RESP:GTTMP** to the backend server when the humidity is less than <Low humidity threshold>.

**3.** Report the message **+RESP: GTTMP** to the backend server when both the humidity is greater than <High humidity threshold> and the humidity is less than <Low humidity threshold>.

#### NOTE:

The device will report the current position according to the result of the latest GPS fixing.

✧ <Sampling interval>: The interval for the temperature sensor to take a sample.

✧ <Detect duration>: The period to analysis the sample set. When all the sample's temperature is greater than <High temperature threshold> or less than <Low temperature threshold>, report the

message **+RESP:GTTMP** to the backend server according to the value of *<Mode>*.

- ✧ *<High temperature threshold>*: Unit:°C (Only supports integer)
  - ✧ *<Low temperature threshold>*: Unit:°C (Only supports integer)
  - ✧ *<High humidity threshold>*: 0-100 (0%RH~100%RH)(Only supports integer) (**FOR GT501**)
  - ✧ *<Low humidity threshold>*: 0-100 (0%RH~100%RH)(Only supports integer)(**FOR GT501**)
  - ✧ *<Keep tracing after Alert>*: If enabled, when the device is turned off and an alarm is triggered at the same time, the device will be turned on through an alarm event.
- Note:the above are the sampling parameters and alarm startup parameters shared by temperature and humidity.(**FOR GT501**)
- ✧ *<Sensor Type>*:

1:Wireless Bluetooth Sensor.

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

➤ **+ACK: GTTMP**

<b>Example:</b>			
<b>+ACK:GTTMP,423037,355154081991594,ATP4GA,001B,20190226061504,0001\$</b>			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	14	MEID	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.19. Tilt Detection(Optional)

The **AT+GTTLT** command is used to configure the parameters for tilt detection.(**only GT500MA support**)

➤ **AT+ GTTLT=**

<b>Example:</b>			
<b>AT+GTTLT=AIR11,1,,,,,,001CS</b>			
Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Tilt Level	1	0-3	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

◇ <Tilt Level>: Different tilt angles can be configured. When set to 0, this function is turned off; 1 is about 30 degrees; 2 is about 45 degrees; 3 is about 60 degrees; (Relative to the initial position when the command is issued.)

Note: 1. When configuring commands, the current position of the device will be used as a reference point, and this state will be saved for future comparisons. This state will only be updated when reconfiguration. 2. This function can be used only when the motion is turned on. After the device is at rest, it will detect whether the corresponding level is rotated, relative to the state when the GTTTL command is configured; if it is reached, send a +RESP: GTTTL; otherwise, send a +RESP: GTTNT. 3. If it is reached, the device is turned off at this time, the device will be turned on, and a +RESP: GTTTL report will be reported when the device is turned on.

The acknowledgment message of the AT+ GTTTL command:

➤ +ACK: GTTTL

<b>Example:</b> +ACK:GTTTL,423037,355154081991594,ATP4GA,001C,20190226061504,0001\$			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	14	MEID	
Device name	10		
Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.2.20 Light Detection(Optional)

The AT+GTLGT command is used to configure the parameters for light detection.(only GT501 support)

➤ AT+ GTLGT =

**Example:**

AT+GTLGT= AIR11,2,1,10,6,3,1,,,,,0020\$

Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Mode	1	0-3	0
Sampling Interval	1-3	1 – 255(×500ms)	2
Detect duration	1-3	1 – 255(times Sampling Interval)	5
Bright threshold	1-4	1 – 1024	50
Dark threshold	1-4	1 – 1024	80
Keep tracing after Alert	1	0  1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ <Mode>:

**0:** disable this function

**1:** Report the message **+RESP:GTLGT** to the backend server when lightness is greater than the bright threshold (Device from dark place to light place. **The stronger the light, the smaller the light sensitivity value**).

**2:** Report the message **+RESP:GTLGT** to the backend server when lightness is less or equal than the dark threshold (Device from light place to dark place. **The weaker the light, the greater the light sensitivity value**).

**3.** Report the message **+RESP:GTLGT** to the backend server when both lightness less or equal than the dark threshold (Device from light place to dark place) and lightness greater than the bright threshold (Device from dark place to light place).

**NOTE:**

The device will report the current position according to the result of the latest GPS fixing and then start GPS fixing. After the GPS fixing finishes or timeout, the device will report the message **+RESP:GTLGT** according the result of the GPS fixing.

✧ <Sampling interval>: The interval for the light sensor to take a sample.

✧ <Detect duration>: The period to analysis the sample set. When all the sample's lightness is greater than the bright threshold or less than the dark threshold, report the message **+RESP:GTLGT** to the backend server according to the value of <Mode>.

✧ <Bright threshold>: The threshold for the light sensor to determine whether the device is from dark place to light place.

✧ <Dark threshold>: The threshold for the light sensor to determine whether the device is from light place to dark place.

✧ <Keep tracing after Alert>: When the device is shut down, this option needs to be selected if the **Light Alarm** is used to power on the device.

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

➤ **+ACK: GTLGT**

<b>Example:</b>			
<b>+ACK:GTLGT,110100, 358688000000158,,0005, 20110101101854,0005\$</b>			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF, X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
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 of AT+GTFRI
- **+RESP:GTGEO**: report of AT+GTGEO
- **+RESP:GTSPD**: report of AT+GTSPD
- **+RESP:GTRTL**: report of AT+GTRTO-RTL
- **+RESP:GTPNL**: The first location after the device powers on.
- **+RESP:GTNMR**: non movement is detected by motion sensor, according to the setting of AT+GTNMD
- **+RESP:GTDOG**: the protocol watchdog reboot message.
- **+RESP:GTREL**: report of REPO MODE.

#### Example:

<b>+RESP:GTFRI</b> ,110100,358688000000158,,0,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,0,0,80,20110214013254,000C\$
<b>+RESP:GTREL</b> ,110100,358688000000158,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,00,80,20110214013254,000C\$
<b>+RESP:GTGEO</b> ,110100,358688000000158,,0,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,0,0,80,20110214093254,000D\$
<b>+RESP:GTSPD</b> ,110100,358688000000158,,0,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,0,0,80,20110214093254,000E\$
<b>+RESP:GTRTL</b> ,110100,358688000000158,,0,0,10,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,0,0,80,20110214093254,0010\$
<b>+RESP:GTPNL</b> ,110100,358688000000158,,0,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,0,0,80,20110214093254,0011\$
<b>+RESP:GTNMR</b> ,110100,358688000000158,,0,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,0,0,80,20110214093254,0012\$
<b>+RESP:GTDOG</b> ,110100,358688000000158,,0,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,0,0,80,20110214093254,0013\$

- **+RESP:GTFRI**:report of AT+GTFRI (There are three modes including 0, 1 and 2, which are detailed as follows)

#### Report Format:(Location Mode :0 )

<b>+RESP:GTFRI</b> ,423130,353081090011035,GT500MA,0,1,1,1,27,2.2,275,83.9,121.390960,31.164458,20190522032204,7,7ca23e903e40,-59,,,,6c59400e80b7,-62,,,,24050f45fba1,-71,,,,9e305bbf2bc7,-76,,,,a4dcbefa5b00,-77,,,,20a68073b2e0,-82,,,,fcecda3becc7,-85,,,,460,01,1059,68C5,120,0,8,20190522032204,0003\$			
Parameter	Length (byte)	Range/Format	Default

Protocol version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-7	
Report type	2	0-14	
Number	<=2	0 – 15	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	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	
Max AP Numbers	<=2	0-12	
BSSID	12		
RSSI	<=4	dbm	
Reserved1			
Reserved2			
Reserved3			
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
Reserved	2	00	00
Location Mode	1	0-2	0
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ <BSSID>: Basic Service Set. The MAC address of the access point.
- ✧ <RSSI>: receive signal, unit dbm.
- ✧ <Max AP Numbers>:The max number of AP
- ✧ <Location Mode>:ID of the report for +RESP:GTFRI  
0: GPS, WiFi and LBS information are included in reports.
- ✧ <Satellite Numbers>:The number of satellites in use after positioning.

#### Report Format:(Location Mode :1 )

+RESP:GTFRI,423130,353081090011035,GT500MA,0,0,8,2ebb58160776,-50,,,,bc469920eba0,-56,,,,6c59400e80b7,-56,,,,24050f45fba1,-61,,,,a4dcbefa5b00,-64,,,,30493b015393,-65,,,,36493b015393,-65,,,,40490f8dec18,-85,,,,460,01,1059,68C6,00,1,80,20190520094936,0034\$			
Parameter	Length (byte)	Range/Format	Default

Protocol version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-7	
Report type	2	0-14	
Max AP Numbers	<=2	0-12	
BSSID	12		
RSSI	<=4	dbm	
Reserved1			
Reserved2			
Reserved3			
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXXX	
Reserved	2	00	00
Location Mode	1	0-2	1
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

**Report Format:(Location Mode :2 )**

+RESP:GTFRI,110100,358688000000158,GT500MA,0,0,1,1,1,4.3,92,70.0,121.354335,31.2220 73,20110214013254,0460,0000,18d8,6141,00,2,80,20110214013254,000C\$			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-7	
Report type	2	0-14	
Number	<=2	0 – 15	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	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	6	XXXXXX	
Reserved	2	00	00
Location Mode	1	0-2	2
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

◇ <Location Mode>:ID of the report for +RESP:GTFRI

**+RESP:GTGEO,GTPNL,GTNMR:**

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 1)**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-7	
Report type	2	0-14	
Number	<=2	0 – 15	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	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	
Max AP Numbers	<=2	0-12	
BSSID	12		
RSSI	<=4	dbm	
Reserved1			
Reserved2			
Reserved3			
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
Reserved	2	00	00
Location Mode	1	0-2	
battery percentage	3	0-100	

Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ <BSSID>: Basic Service Set. The MAC address of the access point.
- ✧ <RSSI>: receive signal, unit dbm.
- ✧ <Location Mode>:ID of the report for +RESP:GTFRI
  - 0: GPS, WiFi and LBS information are included in reports.

#### +RESP:GTGEO,GTPNL,GTNMR:

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 0)**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-4	
Report type	1	0-7	
Number	<=2	0 – 15	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	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	6	XXXXXX	
CSQ RSSI	2	0 – 31 99	
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

#### ➤ +RESP:GTSPD:

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF	

		$X \in \{'A'-'Z', '0'-'9'\}$	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-4	
Report type	1	0-7	
Number	$\leq 2$	0 – 15	
Satellite Numbers	$\leq 2$	0 - 26	
GPS accuracy	$\leq 4$	0 1 – 50	
Speed	$\leq 5$	0.0 – 999.9km/h	
Azimuth	$\leq 3$	0 – 359	
Altitude	$\leq 8$	(-)xxxxx.x m	
Longitude	$\leq 11$	(-)xxx.xxxxxx	
Latitude	$\leq 10$	(-)xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

➤ **+RESP:GTDG:**

**Report Format:**(If the *<WiFi info>* in the *<Report Items Mask>* of the GTCFG command was set as 1)

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF $X \in \{'A'-'Z', '0'-'9'\}$	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-4	
Report type	1	0-7	
Number	$\leq 2$	0 – 15	
Satellite Numbers	$\leq 2$	0 - 26	
GPS accuracy	$\leq 4$	0 1 – 50	
Speed	$\leq 5$	0.0 – 999.9km/h	
Azimuth	$\leq 3$	0 – 359	
Altitude	$\leq 8$	(-)xxxxx.x m	
Longitude	$\leq 11$	(-)xxx.xxxxxx	
Latitude	$\leq 10$	(-)xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	

BSSID	12		
RSSI	<=4	dbm	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

◇ <BSSID>,<RSSI>:Wifi information from 0 to max wifi number.(There may be several sets of data)

➤ **+RESP:GTDOG:**

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 0)**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-4	
Report type	1	0-7	
Number	<=2	0 – 15	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	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	6	XXXXXX	
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

➤ **+RESP:GTRTL:**

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 1)**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-4	
Report type	1	0-7	
Number	<=2	0 – 15	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	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	
Max AP Numbers	<=2	0-12	
BSSID	12		
RSSI	<=4	dbm	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
CSQ RSSI	2	0 – 31 99	
Reserved	0		
Location Mode	1	0-2	
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

◇ <BSSID>,<RSSI>:Wifi information from 0 to max wifi number.(There may be several sets of data)

➤ **+RESP:GTRTL:**

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 0)**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF	



		$X \in \{ 'A'-'Z', '0'-'9' \}$	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-4	
Report type	1	0-7	
Number	$\leq 2$	0 – 15	
Satellite Numbers	$\leq 2$	0 - 26	
GPS accuracy	$\leq 4$	0 1 – 50	
Speed	$\leq 5$	0.0 – 999.9km/h	
Azimuth	$\leq 3$	0 – 359	
Altitude	$\leq 8$	(-)xxxxx.x m	
Longitude	$\leq 11$	(-)xxx.xxxxxx	
Latitude	$\leq 10$	(-)xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
CSQ RSSI	2	0 – 31 99	
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ *<Report ID>*: ID of the report for **+RESP:GTFRI** and **+RESP:GTGEO**, 0 for other reports.

- For **+RESP:GTFRI**
  - 1: stealth mode.
  - 0: other mode.
- For **+RESP:GTGEO**
  - ID of Geo-Fence in **+RESP:GTGEO**,

✧ *<Report type>*: type of the report for all report

- For **+RESP:GTFRI**
  - Bit0(1)**: 0, it detects non-movement; 1, it detects movement.
  - Bit1(2)**: 0, devices is not charging; 1, devices is charging.
  - Bit2(4)**: 0, no external power supply; 1, it detects external power supply.
  - Bit3(8)**: 0, no use; 1, device enters flight mode.
  - Bit4(10)**: 0, no use; 1, device exits flight mode.
- For **+RESP:GTGEO**
  - 0**: exit the corresponding Geo-Fence.
  - 1**: enter the corresponding Geo-Fence.
- For **+RESP:GTSPD**
  - 1**: Inside the speed range.
  - 2**: Outside the speed range.

- 3. Over max speed.
  - For **+RESP:GTNMR**
    - 0**: The state of the device changed from motion to rest.
    - 1**: The state of the device changed from rest to motion.
  - For **+RESP:GTPNL,+RESP:GTDG**
    - Bit0(1)**: 0, it detects non-movement; 1, it detects movement.
    - Bit1(2)**: 0, devices is not charging; 1, devices is charging.
    - Bit2(4)**: 0, no external power supply; 1, it detects external power supply.
- ✧ **<DeviceMove>** Detects non-movement or movement.
  - 0: detects non-movement
  - 1: detects movement
- ✧ **<Number>**: Number of points in one report message. According to the setting of fixed report, there could be up to 15 points in one **+RESP:GTFRI** report. For other reports, this is always 1. If there is more than 1 point in the report, information from **<GPS accuracy>** to **<Reserved>** is repeated for each point.
- ✧ **<GPS accuracy>**:
  - If **<HDOP as GPS accuracy>** is set as 1, GPS accuracy represents HDOP. The HDOP defined in NMEA0183. The range of value is 1– 50. The smaller the value, the higher the precision. Different from NMEA0183, 0 here means no fix, while GPS accuracy between 0 and 1 is set to 1.
  - If **<HDOP as GPS accuracy>** is set as 0, GPS accuracy is related with SNR. The higher SNR value, the smaller the value. The range of value is 1– 50, 0 here means no fix.
- ✧ **<Speed>**: The speed 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”. The unit is degree. West longitude is defined as negative starting with minus “-” and east longitude is defined as positive without “+”.
- ✧ **<Latitude>**: The latitude of the current position. The format is “(-)xx.xxxxxx” and the value range is from “-90.000000” to “90.000000”. The unit is degree. South Latitude is defined as negative starting with minus “-” and north Latitude is defined as positive without “+”.
- ✧ **<GPS UTC time>**: UTC time from GPS.
- ✧ **<MCC>**: Mobile country code. It is 3 digits in length and ranges from 000 to 999.
- ✧ **<MNC>**: Mobile network code. It is 3 digits in length and ranges from 000 to 999.
- ✧ **<LAC>**: Location area code.
- ✧ **<Cell ID>**: Cell ID.

### 3.3.1.2. History report

- **+RESP:GTHIS**: If the **BUFFER** is full, the main data of **+RESP:GTFRI** that be discarded can be stored in another queue. When all buffered messages have been sent, these data will be sent to the backend server as **+RESP:GTHIS**.

### Example:

```
+RESP:GTHIS,110100,358688000000158,,1,1,5,0,4.3,92,70.0,121.354335,31.222073,
20130214013254,460,00,1848,c141,,0,20130214033254,000C$
```

**Report Format:**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Reserved	0		
Report type	1		
Number	<=2	0 – 15	
GPS accuracy	<=4	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	XXX	
MNC	4	XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
Reserved	0		
Location Mode	1	0-2	
Send time	14	YYYYMMDDHHMMSS	
History Count number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ <Report type>: If it is successful to fix position the time,the information is report type. If it is not successful to fix position the time,the information is null.

**3.3.2. Device Information Report****➤ +RESP:GTINF:**

Parameter	Length (byte)	Range/Format	Default
<b>Example:</b> +RESP:GTINF,110100,358688000000158,,0,41,898600810906F8048812,18,99,0,33.23,1,4.19,1,1,1,0, 0,20110714104934,100,,,,,0,20110714104934,0014\$			
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	

Unique ID	15	IMEI	
Device name	10		
State	2	41 42	
ICCID	20		
CSQ RSSI	<=2	0 – 31 99	
CSQ RSRQ	<=2	0 – 7 99	
Reserved	0		
BLE sensor MAC address/Reserved	12	AC233FA10F0D	
Temperature	5	-30-60°C	
Humidity	5	0%-100%	
Reserved	0		
Reserved	0		
Reserved	0		
GPS on need	1	0 1 2	
GPS antenna type	1	0	
GPS antenna state	1	0 1	
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	\$	\$

- ✧ <State>: The current motion state of the device.
  - 41:** The device is motionless without ignition on.
  - 42:** The device is moving without ignition on.
- ✧ <ICCID>: The ICCID of the installed SIM card.
- ✧ <CSQ RSSI>: The signal strength level.
- ✧ <CSQ RSRQ>: The quality of the signal. This field is always set to 99, which is normal.
- ✧ <BLE sensor MAC address>:only for GT500MA(use BLE).
- ✧ <Temperature>: The temperature of the Device.
- ✧ <Humidity>:Humidity 0%-100%.This field is only valid for Wireless Bluetooth Sensor.
- ✧ <GPS on need>: The setting of <GPS on need> in AT+GTCFG.
- ✧ <GPS antenna type>: A numeric to indicate which GPS antenna is working now.
  - 0:** inside GPS antenna
- ✧ <GPS antenna state>: the status of the working GPS antenna.
  - 0:** The antenna is working
- ✧ <Last GPS fix UTC time>:The UTC time of the latest successful GPS fixing.

### 3.3.3. WLAN Information Report

➤ +RESP:GTWIFR: AT+GTRTO-WIFI.

Example:			
+RESP:GTWIFR,423132,353081090011035,ATP4GA,12,6c59400e80b7,-58,,,,24050f45fba1,-60,,,,2ebb58160776,-60,,,,2ebb58b74e23,-65,,,,7ca23e903e40,-66,,,,36493b015393,-72,,,,30493b015393,-72,,,,608334a82894,-73,,,,fecda3becc7,-77,,,,fceda3becc7,-79,,,,a4dcbefa5b00,-81,,,,40490f8dee18,-81,,,,,42,20190615113018,001BS			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
AP numbers	1	0-4	
BSSID	12		
RSSI	<=4	dbm	
Reserved1	0		
Reserved2	0		
Reserved3	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ <BSSID>: Basic Service Set. The MAC address of the access point.<RSSI>: receive signal, unit dBm

### 3.3.8. BT Information Report

➤ +RESP:GTBLE: report the beacon information.

Example:			
+RESP:GTBLE,423039,353081090341580,GT500MA,,,,8,,9e9ad2eb19cf4ac1b6d00b29c0b51cd6,0000,0000,6167f732e69e,-54,,f4f61b9db50b4763852174d281c425a3,0000,0000,5cf97fed9271,-54,,0587a20caedb2c2d20c0000000000000,,51935be6e234,-54,,36e6370b9e8c840c8541000000000000,,4b685459b678,-54,,07b0b8af13426817e0cf000000000000,,5abc896cf8e1,-54,,4abc64bcb7bd4822af7a83c77d035ef4,00			

Parameter	Length (byte)	Range/Format	Default
<b>00,0000,79d6c07ea8a2,-54,,fbf6443861a444edb01be27f112512d3,0000,0000,5d98318023f5,-54,,93e639280aa65e333aff000000000000,,,675a16680e5d,-54,,,,,100,20200101002352,0057\$</b>			
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
IBeacon numbers	1	0-4	
<b>Reserved1</b>	<b>0</b>		
<b>UUID</b>	<b>32</b>		
<b>Major</b>	<b>4</b>		
<b>Minor</b>	<b>4</b>		
<b>Mac Addr</b>	<b>12</b>	'A'-'Z','0'-'9'	
<b>RSSI</b>	<b>&lt;=4</b>	<b>dbm</b>	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ <IBeacon numbers >: Number of IBEACONs searched.
- ✧ <UUID >:The UUID field in IBEACON broadcast
- ✧ <Major >:Ble ibeacon info(if device type is Eddystone,this is Reserved)
- ✧ <Minor >:Ble ibeacon info(if device type is Eddystone,this is Reserved)
- ✧ <Mac Addr>:Ble mac addr
- ✧ <RSSI>: receive signal, unit dbm.
- ✧ <Longitude>: longitude
- ✧ <Latitude>: latitude
- ✧ <GPS UTC time>:last Gps utc time

➤ **+RESP:GTBLEO**: report the becaon information(For GTRTO(0x1B))

**Example:**

**+RESP:GTBLEO,423039,353081090341580,GT500MA,,,,8,,7c7e13f68cb04c52baedd0ff22df8c3c,0000,0000,656986c63240,-56,,0587a20caedbcca2d20c0000000000**

00,,,51935be6e234,-56,,f48c7ec0ab4d45b2a3b541b6ed553b84,0000,0000,717f4df1a80e,-56,,4b5b57b6f85e22430f06000000000000,,,752b0b1c92c5,-57,,7d66bd8c517e73727da2000000000000,,,449ca54b2e1c,-57,,fc1b04e6ec84057e287a0000000000000,,,6db58b318efa,-57,,07b0b8af13426817e0cf000000000000,,,5abc896cf8e1,-57,,36e6370b9e8c840c8541000000000000,,,4b685459b678,-57,,,,,100,20200101002806,005ES			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
IBeacon numbers	1	0-4	
<b>Reserved1</b>	<b>0</b>		
<b>UUID</b>	<b>32</b>		
<b>Major</b>	<b>4</b>		
<b>Minor</b>	<b>4</b>		
<b>Mac Addr</b>	<b>12</b>	'A'-'Z','0'-'9'	
<b>RSSI</b>	<b>&lt;=4</b>	<b>dbm</b>	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ <IBeacon numbers >: Number of IBEACONs searched.
- ✧ <UUID >:The UUID field in IBEACON broadcast
- ✧ <Major >:Ble ibeacon info(if device type is Eddystone,this is Reserved)
- ✧ <Minor >:Ble ibeacon info(if device type is Eddystone,this is Reserved)
- ✧ <Ble mac addr>:Ble mac addr
- ✧ <RSSI >: Receive signal, unit dBm.
- ✧ <Longitude>: longitude
- ✧ <Latitude>: latitude
- ✧ <GPS UTC time>:last Gps utc time

➤ **+RESP:GTBLER:** report ble raw data report.

<b>Example:</b>			
<b>+RESP:GTBLER,423039,353081090341580,Bolt4G,,,,6167f732e69e,1aff4c0002159e9ad2eb19cf4ac1b6d00b29c0b51cd600000000bf,717f4df1a80e,1aff4c000215f48c7ec0ab4d45b2a3b541b6ed553b840000000bf,,,,,100,20200101003036,0069\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Longitude	<=11	(-)xxx.xxxxxx	
Latitude	<=10	(-)xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
Ble mac addr1	12	{'A'-'Z','0'-'9'}	
Raw data1	<62		
Ble mac addr2	12	{'A'-'Z','0'-'9'}	
Raw data2	<62		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

- ✧ <Raw data>: Ble scan of raw data
- ✧ <Ble mac addr>:Ble mac addr
- ✧ <Longitude>: longitude
- ✧ <Latitude>: latitude
- ✧ <GPS UTC time>:last Gps utc time

### 3.3.5. Report for Querying

These are the report of real time querying by command AT+GTRTO.

- +RESP:GTGPS: The report for real time operation GPS

<b>Example:</b>			
<b>+RESP:GTGPS,110100,358688000000158,,0,1,5,0,001F,001F,0,20110714104934,0,100,20110714104934,0015\$</b>			
Parameter	Length (byte)	Range/Format	Default



Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
GPS on need	1	0 1 2	
GPS fix delay	2	2 – 20 mins	
GPS antenna type	1	0	
Report items mask	<=4	0000 – FFFF	
FRI report mask	<=4	0000 – FFFF	
GPS antenna state	1	0 1	
Last GPS fix UTC time	14	YYYYMMDDHHMMSS	
Reserved	0		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ <FRI report mask>: The setting of <Report mask> in **AT+GTFRI**.

### 3.3.6. Temperature Report

➤ **+RESP:GTTMP: For detection temperature.**

<b>Example:</b>			
<b>+RESP:GTTMP,110100,358688000000158,,2,AC233FA10F0D,60,1,1,4.3,92,70.0,121.354335,3 1.222073, 20110214013254,0460,0000,18d8,6141,00,,80,20110214093254,000FS</b>			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
State	1	0-2	
BLE sensor MAC address/Reserved	12	AC233FA10F0D	
Temperature	<=5	-30-60℃	
Number	1	1	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	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	6	XXXXXX	
Reserved	2	00	00
Humidity	5	0%-100%	
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ <State>:

GT500MA:**1:** Temperature is greater than < *High temperature threshold* >.

**2:** Temperature is less than < *Low temperature threshold* >.

GT501:

Two-digit hexadecimal number, using bit representation.

**Bit0:** Temperature is greater than < *High temperature threshold* >.

**Bit1:** Temperature is less than < *Low temperature threshold* >.

**Bit2:** Humidity is greater than < *High humidity threshold* >.

**Bit3:** Humidity is less than < *Low humidity threshold* >.

✧ <BLE sensor MAC address>: Record the Bluetooth information associated with temperature and humidity query, only for GT500MA.

✧ <Temperature>: Temperature. Unit: °C

✧ <Humidity>: Humidity. (RH%)

### 3.3.7. Tilt Report(Optional)

➤ +RESP:GTTLT: (Already tilted) .

<b>Example:</b>			
+RESP:GTTLT,110100,358688000000158,,,,,,,,,20110214093254,000F\$			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00

Reserved	2	00	00
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

➤ **+RESP:GTTNT: (No tilt) .**

<b>Example:</b> <b>+RESP:GTTNT,110100,35868800000158,,,,,,,,,20110214093254,000F\$</b>			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXXFFF $X \in \{'A'\-'Z', '0'\-'9'\}$	
Unique ID	15	IMEI	
Device name	10		
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Reserved	2	00	00
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.3.8. Lightness Information Report(Optional)

➤ **+RESP:GTLGT:**

<b>Example:</b> <b>+RESP:GTLGT,110100,35868800000158,,2,0,81,1,1,4,3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,000F\$</b>			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXXFFF $X \in \{'A'\-'Z', '0'\-'9'\}$	
Unique ID	15	IMEI	
Device name	10		
Alarm Flag	1	0 1	
State	1	0-2	
Lightness	<=4	0-1024	
Number	1	1	
GPS accuracy	<=4	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	6	XXXXXX	
Reserved	2	00	00
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

◇ <Alarm Flag>:

If the light alarm turns the device on,it's 1.or else,it's 0.

◇ <State>:

**0:** Report after the GPS fixing finished of timeout.

**1:** Lightness is greater than the bright threshold (Device from dark place to light place).

**2:** Lightness is less than the dark threshold (Device from light place to dark place).

<Lightness>: The lightness level.

➤ **+RESP:GTALL:** The report to get all configuration

**Example:**

```
@#^*+RESP:GTALL,423038,356813100065396,GT500MA,BSI,,,,,2,SRI,0,,1,0.0.0.0,0.0.0.0.0,0,0,0,0,0,0,,,CFG,AIR11,GT500MA,0,4,1,2,003F,0,60,0EFF,,01,0,300,,,0,,,NMD,0,6,,,1200,3,0,0,0,,,,,TMZ,+0000,0,,,FRI,0,0,,10,0000,0000,50,1,50,1,001F,1000,1000,12,2,,,,,,GEO,0,0,999.900000,99.900000,1000,2,1,,,,,,1,0,999.900000,99.900000,1000,2,1,,,,,,2,0,999.900000,99.900000,1000,2,1,,,,,,3,0,999.900000,99.900000,1000,2,1,,,,,,4,0,999.900000,99.900000,1000,2,1,,,,,SPD,0,0,0,60,300,,,,,,WLT,1,,,,,,GLM,0,,,,,,PIN,1,1234,0,DOG,0,60,30,0200,,1,0,0,0,,,TMP,0,20,1,0,0,1,,,,,,WIF,0,,,,,,0,0,0,,,GON,,1,0,0,,999,,,AGP,0,,,,,240,,BLE,0,60,8,7,6,0,0,0,,,,,,0,,,RFD,0,2,433.00,,,,,,TLT,1,,,,,,SSR,1,78.129.173.42,21001,30,140003,,,20201212001220,0003$
```

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
BSI	3	BSI	BSI
APN	<=40		
APN user name	<=20		

APN password	<=20		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>SRI</b>	<b>3</b>	<b>SRI</b>	<b>SRI</b>
Report mode	1	0-5	
Reserved	0		
Buffer enable	1	0 1	
Main server IP/ domain name	<=60		
Main server port	<=5	0 – 65535	
Backup server IP/ domain name	<=60		
Backup server port	<=5	0 – 65535	
SMS gateway	<=20		
Heartbeat interval	<=3	0 1 – 360 minutes	
SACK enable	1	0 1	
Reserved	0		
Reserved	0		
Reserved	0		
<b>CFG</b>	<b>3</b>	<b>CFG</b>	<b>CFG</b>
New password	4 -6	'0' – '9', 'a' – 'z', 'A' – 'Z'	
Device name	10		
Reserved	0		
Reserved	0		
GPS on need	1	0 1	
GPS fix delay	<=2	2– 20 mins	
Report items mask	<=4	0000 – FFFF	
Reserved	0		
Reserved	0		
Event mask	4	0000 – FFFF	
Reserved	0		
Reserved	0		
Info report enable	1	0 1	
Info report interval	<=5	30 – 86400 seconds	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>NMD</b>	<b>3</b>	<b>NMD</b>	<b>NMD</b>

Mode	1	0 – F	
Non-movement duration	<=3	0 – 255(x5 seconds)	
Reserved	0		
Rest fix interval	5	10 – 3600 seconds	
Rest send interval	5	1 - 24	
Battery level	1	0 1	0
Detection delay	5	0-86400 senconds	0
Still shutdown	1	0  1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>TMZ</b>	<b>3</b>	<b>TMZ</b>	<b>TMZ</b>
Time zone	5	- +HHMM	
Daylight saving	1	0 1	
Reserved	0		
Reserved	0		
<b>FRI</b>	<b>3</b>	<b>FRI</b>	<b>FRI</b>
Mode	1	0 1	
Invalid position for no fix and AGPS Disable	1	0-3	
Reserved	0		
Reserved	0		
Begin time	4	HHMM	
End time	4	HHMM	
Check interval1	<=5	10 – 3600 seconds	
Send interval1	<=5	1 - 24	
Reserved	0		
Reserved	0		
Report mask	<=4	0000 – FFFF	
Distance	<=5	300 – 65535 meters	
Mileage	<=5	300 – 65535 meters	
Max AP Numbers	2	2-12	12
Location Mode	1	0-2	2
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>GEO</b>	<b>3</b>	<b>GEO</b>	<b>GEO</b>
<b>GEO ID0</b>	1		0
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	

Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>GEO ID1</b>	1		1
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>GEO ID2</b>	1		2
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>GEO ID3</b>	1		3
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	

Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>GEO ID4</b>	1		4
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
<b>SPD</b>	3	<b>SPD</b>	<b>SPD</b>
Mode	1	0 1 2	
Min speed	<=3	0 – 400 km/h	
Max speed	<=3	0 – 400 km/h	
Duration	<=4	30 – 3600 seconds	
Send interval	<=4	30 – 3600 seconds	
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		
WLT	3	WLT	WLT
call filter	1	0 1 2	
white number list	<=20*10		
GLM	3	GLM	GLM
Google mode	1	0 1	
Direct number	20		
Direct number	20		
Direct number	20		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
auto unlock PIN	1	0 1	
PIN	4-8	'0' - '9'	
PIN checking	1	0 1	
DOG	3	DOG	DOG
Mode	1	0 1	
reserved	0		
Interval	<=2	1 -30 (unit: days)	
Time	4	HHMM	
reserved	0		
Report before reboot	1	0 1	
reserved	0		
Gsm interval	<=3	0   30-255(unit:min)	
Pdp interval	<=3	0   30-255(unit:min)	
reserved	0		
reserved	0		
TMP	3	TMP	TMP
Mode	1	0-3	
Sampling Interval	<=3	1 - 255(×30s)	
Detect duration	<=3	1 - 255(times Sampling Interval)	
High temperature threshold	<=5	-30 - 75℃	
Low temperature threshold	<=5	-30 - 75℃	
WIF	3	WIF	WIF
Mode	1	0 1 2 3	

Ap1 name	<=20		
Ap1 password	<=20		
Ap2 name	<=20		
Ap2 password	<=20		
Ap3 name	<=20		
Ap3 password	<=20		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GON	3	GON	GON
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
AGP	3	AGP	AGP
AGPS mode	1	0 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Online update interval	<=3	300-1440minutes	
Reserved	0		
BLE	3	BLE	BLE
Mode			
Scan interval	<=5	30 – 1000s	60
Scan max num	1	2-8	8
Scan type	1	0-2	0
Scan duration	<=2	6-15	6
Uuid filter	1	0 1	0
Uuid start	<=2	0-15	0

Uuid end	<=2	0-15	0
RFD	3	RFD	RFD
RF433 Switch	1	0 1	
Send Interval	1-2	2-10	
Send Frequency	6	433.00-433.99	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$
TLT	3	TLT	TLT
Tilt Level	1	0-3	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		
SSR	3	SSR	SSR
Mode	1	0-1	1
Ssr Server IP/domain Name	<=60		78.129.173.42
Ssr Server port	<=5	0-65535	21001
Ssr report interval	<=2	15-60 (Unit: days)	30
Ssr report info mask	<=6	0-1FFFFFF	140003
Reserved	0		
Reserved	0		

➤ **+RESP:GTCID:** The report for real time operation CID

**Example:**

**+RESP:GTCID,110100,**

**35868800000158,,0,898600810906F8048812,0,20110214093254,0016\$**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
ICCID	20		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

➤ **+RESP:GTCSQ**: The report for real time operation CSQ

**Example:**

**+RESP:GTCSQ,110100,35868800000158,,0,18,99,0,20110214093254,0017\$**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
CSQ RSSI	<=2	0 – 31  99	
CSQ RSRQ	<=2	0 – 7  99	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

➤ **+RESP:GTVR**: The report for real time operation VER

**Example:**

**+RESP:GTVR,110100,**

**35868800000158,,0,TRACKER,010B,0020,0,20110214093254,0018\$**

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Device type	10	'0' – '9', 'a' – 'z', 'A' – 'Z'	TRACKER
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 represents the type of the device.

- ✧ *<Firmware version>*: The firmware version. The first two characters point out the main version and the last two characters point out the subsidiary version. For example: 010A means the version 1.10
  - ✧ *<Hardware version>*: The hardware version. The first two characters point out the main version and the last two characters point out the subsidiary version. For example: 010A means the version 1.10
- **+RESP:GTBAT**: The report for real time operation BAT

<b>Example:</b>			
<b>+RESP:GTBAT,110100,358688000000158,,0,0,,100,4.20,0,1,100,20110214093254,0019\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Reserved	0		
Reserved	0		
battery percentage	3	0-100	
Reserved	0		
Charging	1	0 1	
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

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

- **+RESP:GTTMZ**: The report for real time operation TMZ

<b>Example:</b>			
<b>+RESP:GTTMZ,210102,354524044821636,,0,+0000,0,0,20170101000033,0005\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Time zone offset	5	±HHMM	
Daylight saving	1	0 1	
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

### 3.3.4. Event Report

The following event reports are triggered when certain event occurs.

- +RESP:GTPNA: Power on report
- +RESP:GTPFA: Power off report
- +RESP:GTBPL: Battery low report
- +RESP:GTSTT: Device motion state indication
- +RESP:GTPDP: Mobile Data Service PDP connect report
- +RESP:GTGSM: The report for the information of the service cell and the neighbor cells.
- +RESP:GTFUS: FOTA Update Status Report .
- +RESP:GTMFS:Module Update Status Report.

In +RESP:GTBPL, +RESP:GTSTT event reports, the last known GPS information are involved.

#### ➤ +RESP:GTPNA:

<b>Example:</b>			
<b>+RESP:GTPNA,423038,35868800000158,GT500MA,20210101040019,0001\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

#### ➤ +RESP:GTPFA:

<b>Example:</b>			
<b>+RESP:GTPFA,423038,35868800000158,GT500MA,20210101040026,0002\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
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”. The unit is degree. West longitude is

defined as negative starting with minus “-” 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”. The unit is degree. South Latitude is defined as negative starting with minus “-” and north Latitude is defined as positive without “+”.

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 1)**

➤ **+RESP:GTBPL:**

<b>Example:</b>			
<b>+RESP:GTBPL,110100,358688000000158,,,5,0,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,,0,100,20110214093254,0022\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Reserved	0		
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	0 1 – 50	
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	
BSSID	12		
RSSI	<=4	dbm	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
Reserved	0		
Location Mode	1	0-2	
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

- ◇ <BSSID>,<RSSI>:Wifi information from 0 to max wifi number.(There may be several sets of data)

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 0)**

➤ **+RESP:GTBPL:**

<b>Example:</b>			
<b>+RESP:GTBPL,110100,35868800000158,,,5,0,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,,0,100,20110214093254,0022\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Reserved	0		
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	0 1 – 50	
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	6	XXXXXX	
Reserved	0		
Location Mode	1	0-2	
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 1)**

<b>Example:</b>			
<b>+RESP:GTSTT,110100,35868800000158,,41,5,0,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,,0,100,20110214093254,0022\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	



Unique ID	15	IMEI	
Device name	10		
State	2	41 42	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	0 1 - 50	
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	
BSSID	12		
RSSI	<=4	dbm	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	6	XXXXXX	
Reserved	0		
Location Mode	1	0-2	
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 - FFFF	
Tail character	1	\$	\$

◇ <BSSID>,<RSSI>:Wifi information from 0 to max wifi number.(There may be several sets of data)

**Report Format:(If the <WiFi info> in the <Report Items Mask> of the GTCFG command was set as 0)**

➤ **+RESP:GTSTT:**

<b>Example:</b>			
<b>+RESP:GTSTT,110100,358688000000158,,41,5,0,4.3,92,70.0,121.354335,31.222073,20110214013254,0460,0000,18d8,6141,,0,100,20110214093254,0022\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 - XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
State	2	41 42	
Satellite Numbers	<=2	0 - 26	
GPS accuracy	<=4	0 1 - 50	
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	6	XXXXXX	
Reserved	0		
Location Mode	1	0-2	
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

➤ **+RESP:GTPDP:**

<b>Example:</b>			
<b>+RESP:GTPDP,110100,358688000000158,,0,0,20110214093254,011D\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

➤ **+RESP:GTGSM:**

<b>Example:</b>			
<b>+RESP:GTGSM,423033,866884045644150,GT501,RTO,,,,0,,20210101040026,0004\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Fix type	3	RTO	
mcc	4	0XXX	
mnc	4	0XXX	

lac	4		
cellid	4		
CSQ RSSI	<=2	0 – 31 99	
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

➤ **+RESP:GTFUS:**

<b>Example:</b>			
<b>+RESP:GTFUS,423036,460012101511271,GT500MA,1,0,0,20180101004549,0004\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
IMSI	15	450050209516643	
Device name	10	GT500MA	
Fota Update Status	1	0-2	
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ <Fota Update Status>: FOTA upgrades the state of success and failure

**0:** Low battery, no download allowed

**1:** Upgrade failure.

**2:** Upgrade success.

**4:** No updateable version

➤ **+RESP:GTMFS:**

<b>Example:</b>			
<b>+RESP:GTMFS,423137,356611070694082,GT500MA,,3,20190101233110,03E6\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
IMEI	15	356611070694082	
Device name	10	GT500MA	
Module Version	10		
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

✧ <Module Version>:

- \* If the module upgrade is successful, the module version number after the upgrade is displayed.
- \* If the module upgrade fails, it is empty.

### 3.3.5. Buffer Report

If BUFFER function is enabled, the terminal will save the message into the BUFFER in the following circumstances.

- ✧ No GSM or WCDMA signal.
- ✧ Failed to activate Mobile Data Service context for the TCP or UDP connection.
- ✧ Failed to establish the TCP connection with the backend server.

These messages will be sent to the backend server after the message can be sent to the backend server. The device can save up to 720 messages if the length of each buffered message is not greater than 160.

- ✧ Only **+RESP** messages can be buffered except **+RESP:GTALL**
- ✧ **+ACK** messages can be buffered
- ✧ In the buffer report, the original header string “+RESP” is replaced by “+BUFF” while keeps the other content untouched including the original sending time and count number.
- ✧ In the buffer report, the original header string “+ACK” is replaced by “+BCK” while keeps the other content untouched including the original sending time and count number.

**Example:**

The following is an example of the buffered message:

```
+BUFF:GTFRI,110100,35868800000158,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,201102
14013254,0460,0000,18d8,6141,0,0,100,20110214093254,0024$
+BCK:GTFRI,423038,869912030076182,GT301MA,0007,20190417055553,000A$
```

### 3.3.6. Report Google Maps hyperlink

According to the setting of the command **AT+GTGLM** and the configuration of MT call mode, the device can send a SMS with Google Maps hyperlink to a mobile phone.

If MT call mode is set to 1, ATW will sent its current position to the incoming call via SMS with Google Maps hyperlink if the incoming call is a direct number (Please refer to *<direct number list>* in the chapter 3.2.13) or a white call (Please refer to *<white number list>* in the chapter 3.2.12).

If the *<Google link mode>* was set as 1 in the command **AT+GTGLM**, ATW will send a SMS with Google Maps hyperlink to the direct phone numbers after the message **+RESP:GTGEO**.

➤ **Google Maps hyperlink**

Parameter	Length (byte)	Range/Format	Default
SMS header	<=30		
Google Maps hyperlink	<=77		
Device name	<10	GT500MA	
GPS fix	2	F1 F0	

GPS UTC time	20	YYYY/MM/DD HH:MM:SS	
battery level	<=5	B1-100%	

- ✧ <SMS header>: A string that includes the terminal name set in the command **AT+GTGLM** and GPS fix type ( "**IN GEO-i**", "**OUT GEO-i**", "**LBC**").
- ✧ <Google Maps hyperlink>: A string of a Google map hyperlink.

### 3.3.7. Exception Report

Anytime, there will be an exception report sent to the backend server if an error occurs, such as wrong password is set, or invalid symbol is found in the parameters.

#### EXPT:

<b>Example:</b>			
<b>EXPT:WRONG PASSWORD,GTQSS,password,AIR10\$</b>			
Parameter	Length (byte)	Range/Format	Default
Exception type	20		
Command	20		
Parameter	20		
Exception info	14		
Tail character	1	\$	\$

- ✧ <Exception type>:the string will indicate what kind of exception is happened,which include **INVALID COMMAND, WRONG PASSWORD, DATA OVERFLOW , WRONG SYMBOL**
- ✧ <Command>: the corresponding command which error occurs.
- ✧ <Parameter >: the wrong setting parameters.
- ✧ <Exception type >: the wrong setting parameter value

### 3.4.Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server if communicating via Mobile Data Service. The heartbeat package is sent to the backend server at the interval defined by <Heartbeat interval> in AT+GTQSS or AT+GTSRI command.

➤ **+ACK:GTHBD:**

<b>Example:</b> <b>+ACK:GTHBD,110100,358688000000158,,20110214093254,0025\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	\$	\$

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

➤ **+SACK:GTHBD:**

<b>Example:</b> <b>+SACK:GTHBD,110100,0026\$</b>			
Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXXFFF 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 heart beat package from the device as the <Count number> in the server acknowledgement of the heartbeat.

**NOTE: please pay more attention here.**

**1 the Heartbeat function should be used only in TCP long connection and UDP mode.**

### 3.5. Sever Acknowledgement

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

➤ **+SACK:**

<b>Example:</b> <b>+SACK:0027\$</b>			
<b>Parameter</b>	<b>Length (byte)</b>	<b>Range/Format</b>	<b>Default</b>
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.



## 3.6. LED Description

Light	Event	State
GPS LED(Blue)	GPS turned off OR GPS is not positioned	Dark
	Power key was pressed and prepare to power on OR GPS positioning	Solid
GSM LED(Green)	Network has been registered	Slow flash
	Power off	Dark
	Power key was pressed and prepare to power on	Solid
Power LED(Red)	Power on and normal	Dark
	Power key was pressed and prepare to on or prepare to power off	Solid
	Low battery status and configuration enabled	Fast flashing

## Appendix: Message Index

### ◇ **Command and ACK**

AT+GTQSS

+ACK:GTQSS

AT+GTBSI

+ACK:GTBSI

AT+GTSRI

+ACK:GTSRI

AT+GTCFG

+ACK:GTCFG

AT+GTTMA

+ACK:GTTMA

AT+GTFRI

+ACK:GTFRI

AT+GTGEO

+ACK:GTGEO

AT+GTSPD

+ACK:GTSPD

AT+GTRTO

+ACK:GTRTO

AT+GTGLM

+ACK:GTGLM

AT+GTDOG

+ACK:GTDOG

AT+GTWIF

+ACK:GTWIF

### ◇ **Position Related Report**

+RESP:GTFRI

+RESP:GTGEO

+RESP:GTSPD

+RESP:GTRTL

+RESP:GTPNL

+RESP:GTNMR

+RESP:GTDOG

+RESP:GTHIS

+RESP:GTWIFR

### ◇ **Device Information Report**

+RESP:GTINF

✧ **Report for Querying**

+RESP:GTGPS

+RESP:GTALL

+RESP:GTCID

+RESP:GTCSQ

+RESP:GTVER

+RESP:GTBAT

+RESP:GTTMZ

✧ **Event Report**

+RESP:GTPNA

+RESP:GTPFA

+RESP:GTBPL

+RESP:GTSTT

+RESP:GTPDP

+RESP:GTWIFR

EXPT

✧ **Heartbeat**

+ACK:GTHBD

+SACK:GTHBD

✧ **Server Acknowledgement**

+SACK