P51AE/P61
Interface Protocol

Revision: <u>V1.19</u>

Revision	Date	Author	Description
1.01	2020-1-7	Liu Ren li	Initial 1.Add MAC address of BLE sensor in report + RESP: GTINF and + RESP: GTTMP.
1.02	2020-1-19	Liu Ren li	1. Modify the GTTMP temperature range 2. Add GTBLE config and RESP:GTBLE report
1.03	2020-03-27	Liu Ren li	1.Fixed some error descriptions
1.04	2020-04-16	Liu Ren li	1.Fixed some error descriptions
1.05	2020-06-10	Liu Ren li	1.Add Corner Enable Bit in GTFRI
1.06	2020-06-15	Liu Ren li	1. Add Enable raw data report Mode in GTBLE. And Scan type format modification. 2. GTRTO 1B search the bluetooch The resulting report was modified by GTBLER to GTBLEO
1.07	2020-06-19	Liu Ren li	1.Improve GTBLE specifications.
1.08	2020-06-22	Liu Ren li	1.Fixed some description errors.
1.09	2020-07-22	Liu Ren li	1. GTCFG GEO interval change to Location update interval. 2. Add Gps info enable bit in AT+GTBLE config. And GTBLE,GTBLER report add gps info. 3. AT+GTBLE config UUID Support for wildcard Settings using the 'X' character.
1.11	2020-09-11	Liu Ren li	1. Modify GTBLE and GTBLER report formats 2. Modified GTBLE config to support MAC filtering
1.12	2020-10-09	Liu Ren li	1. GTBLE Sacn Max num changed from 8 to 20. 2. GTBLE report IBeacon numbers changed from 8 to 4. if IBeacon numbers More than 4, The report will be sent in several batches.
1.13	2021-04-07	Jiazhong Pei	Modified the function of corner enable.
1.14	2021-04-13	Jiazhong Pei	Modified the description of corner enable.

1.15	2021-06-29	Zhiyong Wang	The P61 protocol merged into the P51AE protocol.
1.16	2021-07-20	Zhiyong Wang	Add Satellite Numbers field to reports containing GPS information
1.17	2021-08-04	Jiazhong Pei	P51AE:Add Satellite Numbers field to reports containing GPS information
1.18	2021-08-23	Zhiyong Wang	P61: Removal +RESP:GTLBC
1.19	2021-9-1	Zhiyong Wang	P61: Add Network Mode to GTBSI

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 GPRS which is used for all communication between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms with an acknowledgement message. If necessary, the terminal also sends report messages to the backend server.

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

1.2.Terms and Abbreviations

Table 1: Terms and abbreviations

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

2. System Architecture
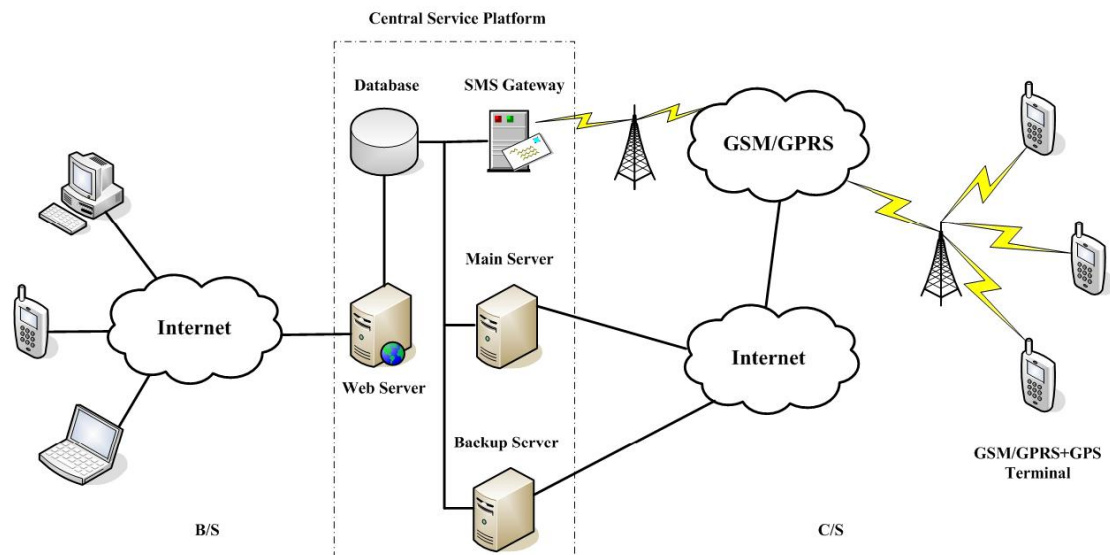
Figure 1: System architecture

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

Note: P61 does not support functions related to ignition.

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
AT+GTXXX=<parameter1>, <parameter2>…$	Command
+ACK: GTXXX, <parameter1>, <parameter2>…$	Acknowledgement
+RESP: GTXXX, <parameter1>, <parameter2>…$	Report
+BUFF: GTXXX, <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:
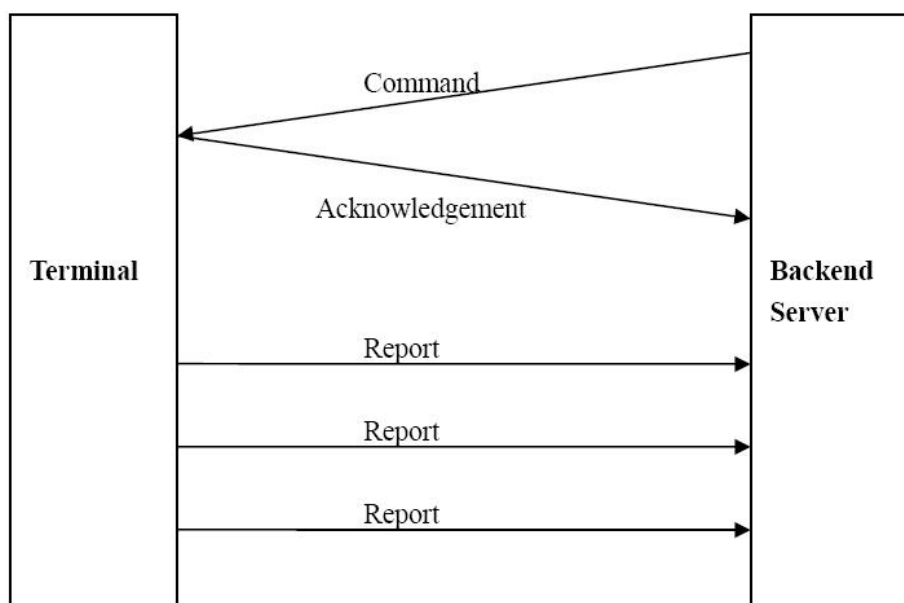
Figure 2: protocol messages flow Terminal Backend

When the device receives commands over the air, it supports several commands in one SMS or GPRS packet 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=**

Example:
AT+GTQSS=AIR11,cmnet,,,4,,1,116.226.44.17,9001,116.226.44.16,9002,+8613812341234,0,1, ,,0001$

Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
APN	<=40		
APN user name	<=20		
APN password	<=20		
Report mode	1	0 – 6	0
Reserved	0		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	0 – 255 min	1
Local port	<=5	0 – 65535	800
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. 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 < UDP Long Conn Duration > if no data transmission.

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

✧ *<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.

✧ *<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 AT Plus is 720 pcs which is a FIFO queue, and the oldest message will be overwritten by the latest one if the buffer overflew.

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 it 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 Heartbeat 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.

✧ *<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**

Example: +ACK:GTQSS,110100, 358688000000158,,0001, 20110101101854,0001$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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	$	$

➢ *<Protocol version>*: The combination of the device type and the version number of the applied protocol. The first two characters 'XX' indicate the device type. '12' represents **PRIME AT PLUS**. The middle two characters are the main version number and the last two characters are the minimum version number. Both the main version and the minimum version are hex digital. For example, '020A' means version 2.10.

➢ [Note]
The protocol version in the firmware is the same as that of protocol documents which the firmware support. For example, the firmware should report 11010E for Prime AT Plus protocol V1.13, where 0E is the HEX number of 13 for the minor version.   The protocol version will be accordingly incremented as per the protocol document when changes have been made for new commands or just when changes to an existing command have been made that would require changing the way (GTFRI, for example) needs to be parsed.   But protocol version will not change for revising typing mistake or description clarification of the protocol.

➢ *<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=**

Example: **AT+GTBSI= AIR11,cmnet,,,,,,,0002$**			
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 (Only P61 supports it)	1	0-5	0
Serial number	4	0000 – FFFF	
Tail character	1	$	$

➢ <**Network Mode**>: Select network type.

　　0: Automatic

　　1: GSM Only

　　2: LTE Only

　　3: GSM & LTE Only

　　4: North America

　　　　The network bands are locked to 2, 4, 5, 12, 13 of CATM

　　5: Europe

　　　　The network bands are locked to 3, 8, 20 of CATM and 2G

　　Note: Only P61 supports it.

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

➢ **+ACK:GTBSI**

Example: **+ACK:GTBSI,110100, 358688000000158,,0002, 20110101101854,0002$**			
Parameter	Length (byte)	Range/Format	Default
Protocol 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=**

Example: AT+GTSRI= AIR11,4,,1,116.226.44.17,9001,116.226.44.16,9002,+8613812341234,0,1,,,,,0003$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Report mode	1	0 – 6	0
Reserved	0		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	0 – 255 min	1
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**

Example: +ACK:GTSRI,110100, 358688000000158,,0003, 20110101101854,0003$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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=**

Example:			
AT+GTCFG= AIR11,123456,AIR2012,,,1,5,003F,,,0FFF,0,1,1,300,1,,,,,,,0004$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
New password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	
Device name	0-10	'0' – '9', 'a' – 'z', 'A' – 'Z'	ATP4GA/P61
Power saving duration	3	0|10 -255 (× min)	0
Power saving interval	3	1 - 255 (× 30 mins)	4
GPS on need	3	0|1|2	1
GPS fix delay	2	2 – 20 mins	2
Report items mask	<=4	0000 – FFFF	003F
Report encryption key	2	00-FF	0
Power down delay	<=2	1-60 seconds	60
Event mask	4	0000-FFFF	0FFF
Reserevd	0		
LED mask	<=2	0-2D	1
Info report enable	1	0|1	0
Info report interval	<=5	30 – 86400 seconds	300
Reserevd	0		
Vibrate Mask	1	0-F	3
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.

➢ <Power saving duration>: The searching period of none GSM signal detected by device.

➢ <Power saving interval>: The time interval for the device to reboot when none GSM signal detected.

➢ *<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.

  2: Never close GPS chip only in ignition on state.

➢ *<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) : *<GTNMR for free fall>*
> **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.
> Note: P61 does not support this parameter.

➢ *<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):**+RESP: GTEPN** (P61 does not support it)
> **Bti3** (0008):**+RESP: GTEPF** (P61 does not support it)
> **Bit4** (0010): **Reserved**
> **Bit5** (0020):**+RESP: GTBPL**
> **Bit6** (0040):**+RESP: GTBTC**
> **Bit7** (0080):**+RESP: GTSTC**
> **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 deadly.

    1: Turn on GPS LED if necessary.

Bit1: **Reserved**

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:

    0: None function

    1: Turn off all LEDs except charging 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.

➢ *<Vibrate Mask>*: A Hex value to configure the working mode of vibrator.

    Bit0: Power on/off

        0: None function.

        1: Vibrate when the device powers on/off.

    Bit1: SOS Button

        0: None function

        1: Vibrate when press SOS button.

    Bit2: Reserved

    Bit3: Low battery

        0: None function

        1: Vibrate once when low battery.

Note: P61 does not support this parameter.

➢ *<Power saving duration>*: The searching period of none GSM signal detected by device.

➢ *<Power saving interval>*: The time interval for the device to reboot when none GSM signal detected.

➢ *<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 **GTGEO or GTBLE.**

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

➢ **+ACK:GTCFG**

Example:
+ACK:GTCFG,110100, 358688000000158,AIR2012,0004, 20110101101854,0004$

Parameter	Length (byte)	Range/Format	Default
Protocol 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	$	$

3.2.5. Non movement detection

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

➢ **AT+GTNMD=**

Example: AT+GTNMD= AIR11,2,20,3,2,1200,3,0,,,,,,,0005$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Mode	1	0-F	0
Non-movement duration	<=3	1 – 255(×15seconds)	2
Movement duration	<=2	1 – 10(×128ms)	2
Movement threshold	1	1-10	3
rest fix interval	<=5	10 – 86400 seconds	1200
rest send interval	2	1 -15	3
Battery level	1	0|1	0
Detection delay	5	0-86400 senconds	0
Reserved	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 FRI, Geo-Fence, BLE(GTBLE and GTBLER report) and WIFI when it detects non-movement. (**Note:** P61 does not support BLE)

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 FRI ,BLE(GTBLE and GTBLER report) and WIFI to *<rest fix interval>* and *<rest send interval>* when it detects non-movement. In the case, It just modify the fix interval and send interval of FRI but not suspend the report of FRI even if Bit0 is 1.(**Note:** P61 does not support BLE)

✧ *<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.

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

✧ *<Movement threshold>*: The threshold for the motion sensor to determine whether the device is in movement status. The less, the more likely to be treated as movement.

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

✧ *<rest send interval>*: the send interval for the report of FRI 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.

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**

Example:			
+ACK:GTNMD,110100, 358688000000158,,0005, 20110101101854,0005$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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	$	$

3.2.6. 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=**

Example:			
AT+GTTMA= AIR11,+,3,30,0, 20110101000000,,,,,0006$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
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**

Example:			
+ACK:GTTMA,110100, 358688000000158,,0006, 20110101101854,0006$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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=**

Example:			
AT+GTFRI= AIR11,1,1,,,0000,2359,300,2,150,3,001F,1000,1000,,,,,,,0007$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Mode	1	0|1|2|3|4|5|6|7	0
Discard no fix	1	0-1	0
Reserved	0		
RF off delay	<=4	0|2 -1440 minutes	10
Begin time	4	HHMM	0000
End time	4	HHMM	0000
Check interval1	<=5	5 – 86400 seconds	50
Send interval1	<=5	1 – 15/15000	1
Check interval2	<=5	5 – 86400 seconds	50
Send interval2	<=5	1 – 15/15000	1
Report mask	<=4	0000-FFFF	001F
Distance	<=5	50 – 65535 m	1000
Mileage	<=5	50 – 65535 m	1000
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Corner Enable	1	0 | 1	0
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✧ *<Mode>*:

0: Disable fixed report function.

1: Enable the scheduled timing report.

2: Enable the scheduled distance report. Report each time the straight length that the device moved has exceeded the specified distance. It ignores the detail path the device has passed along. This function is invalid unless the GPS chip opens always. Unit: Meter.

3: Enable the scheduled mileage report. Report each time the path length that the device moved has exceeded the specified length. It calculates the length of the detail path the device has passed along. This function is invalid unless the GPS chip opens always. Unit: Meter.

4: Enable the scheduled time multi-points report.

5: Enable the scheduled stealth-mode report.

      6: Enable the storing and forwarding report. The reports will be stored in BUFFER. When the time interval arrives, all the reports will be sent to the backend server.

      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.

✧ *<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.

      In the stealth mode, every time the device enters non-movement status, it will shutdown the RF *<RF off delay>* minutes later. Its value range is 1-20 and the unit is minute. 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 interval1>*: The interval time to fix GPS when the device attached vehicle is ignition off, its value range is 10-86400 and the unit is second.

✧ *<Send interval1>*: The period to send the position information when the device attached vehicle is ignition off.

      NOTE: *< Send interval1>* is the times of *< Check interval1>*, so the actual *Send interval1* time is equal to *< Send interval1>* multiplied by *< Check interval1>*.

✧ *<Check interval2>*: The interval time to fix GPS when the device attached vehicle is ignition on, its value range is 10-86400 and the unit is second.

✧ *<Send interval2>*: The period to send the position information when the device attached vehicle is ignition on.

      NOTE: *< Send interval2>* is the times of *< Check interval2>*, so the actual *Send interval2* time is equal to *< Send interval2>* multiplied by *< Check interval2>*.

✧ *<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.

      <Corner Enable>:if Enable this bit.It enables you to report GTFRI when turning a corner,It

can make your GPS anchor point on the map smoother.

(1)If the location point is a corner point,the information will be stored.

(2)If the count of the point which has be stored is more than 15,the +RESP GTFRI which contain the information of these corner points will be sent.

(3)If the count of the point which has be stored is more than 0,and there is a +RESP GTFRI about other function will be sent,the +RESP GTFRI will contain the information of these corner points.

Note:If you want the function is well,other configuration are needed:

    (1)   The mode of AT+GTFRI is 1.

    (2)   Device is moving.

    (3)   Turn on GPS.

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**

Example:			
+ACK:GTFRI,110100, 358688000000158,,0007, 20110101101854,0007$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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=**

Example:
AT+GTGEO= AIR11,0,3,101.412248,21.187891,1000,2,,,,,,,,,0008$

Parameter	Length (byte)	Range/Format	Default
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: 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> and <Check interval2> in **GTFRI,**<GEO *Interval*> in **GTCFG.**

If < GEO Interval > is not equal to zero, then the < check Interval > multiplied by < GEO Interval > parameters.

✧ *<Periodic Report>*: Whether to open the continuous GTGEO report.

0: When enters or leaves the Geo-Fence,Send only one GTGEO report.

1: When enters or leaves the Geo-Fence,according to the < Check interval > send 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**

Example:
+ACK:GTGEO,110100, 358688000000158,,0,0008, 20110101101854,0008$

Parameter	Length (byte)	Range/Format	Default
Protocol 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=**

Example:			
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		
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**

Example:			
+ACK:GTSPD,110100, 358688000000158,,0009, 20110101101854,0009$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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	$	$

3.2.10. Function Key Setting

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

➢ **AT+GTFKS=**

Example:			
AT+GTFKS= AIR11,1, ,1,,,,,000A$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Power key enable	1	0|1	1
Full power up whilst charging	1	0|1	1
Function key mode	<=2	0 - 4	12	0
Extended Key mode	1	0-4	1
Reserved	0		
SOS report interval	2-4	30-1440	120
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✧ *<Power key enable>*: A numeric to indicate the working mode of the power key.

    0: Press power key will not power down the device.

    1: Press power key will power down the device.

✧ *< Full power up whilst charging >*: When device powers off

    0: Device doesn't power on when it detects charging in.

    1: Device powers on when it detects charging in.

✧ *<Function key mode>*: The working mode for the function key operation..

    0: Ignore the function key operation.

    1: Geo-Fence mode. Switch on/off the Geo-Fence ID 0 when the function key is long pressed. And after long press the function key, the terminal will report the message **+RESP: GTSWG** to inform to switch on or off Geo-Fence ID0 via this operation.

    2: Geo-Fence in current position. Switch on/off the Geo-Fence 0 when the function key is long pressed and use the current position as the centre of Geo-Fence 0 when switch on the Geo Fence 0 via the function key. After long press the function key, the terminal will report the message **+RESP: GTSWG** immediately. And if this operation is expected to switch on Geo-Fence ID 0, the terminal will start GPS fixing to get the current position as the centre of Geo-Fence ID 0. After GPS fixing finishes, it will report the message **+RESP: GTGCR** to inform the result of GPS fixing and whether Geo-Fence ID 0 was switched on successfully.

    NOTE：the last valid position will be used as the centre of GEO-Fence 0 if the GPS fixing failed.

    3: SOS mode. After long press for 3 seconds, 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 SOS message according the result of the GPS fixing.

4. **SOS-once mode.** After long press for 3 seconds, the device will report the current position according to the result of the latest GPS fixing

12.SOS-interval report mode. After long press for 3 seconds,then the device will fix the GPS and report +RESP:GTSOS every <SOS report interval> seconds ,the backend server could send command to stop the report. (Refer to "AT+GTRTO" command, set <Sub command> to "E").

✧ *< Extended Function Key mode >*:

    0: Ignore the extended function key operation.

    1: After long press the button 3 seconds, equipment out of sleep;after Loosen the button for 15 seconds, equipment into sleep.

    2: Input ID for GTDOG.

    3: Input ID for GTDIS.

    4: SOS mode.

✧ *< SOS report interval >*: The interval of reporting **+RESP:GTSOS**.   Unit: second.

Extended Function Key is corresponds to IO pin **KEY**(No.4), triggered by low or high level.

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

➢ **+ACK:GTFKS**

Example:
+ACK:GTFKS,110100, 358688000000158,,000A, 20110101101854,000A$

Parameter	Length (byte)	Range/Format	Default
Protocol 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	$	$

3.2.11. Real Time Operation

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

➢ **AT+GTRTO=**

Example: **AT+GTRTO= AIR11,12,,,,,1,10,10,10,,,,,000B$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Sub command	2	0-0x1C	
Reserved	0		
Reserved	0		
Reboot duration	0-5	0-43200 (Unit: minutes)	
Vibration duration	1-3	1-120 (Unit: seconds)	
Repo Mode	1	0-1	
Repo Mode duration	0-3	1-240 (Unit: hours)	
Repo Mode interval1	0-5	5-86400 (Unit:seconds)	
Repo Mode interval2	0-5	5-86400 (Unit:seconds)	
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:(**CBK):** Reserved.

E: (**SSR):** Stop SOS event report.

10: (**VBR):** Request the device to vibrate for *Vibration duration* seconds.

    Note: P61 does not support this parameter.

11: (**RLO)**Set RELAY_OUT pin low.

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: Reserved.

17: Reserved.

18: Reserved.

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

1A : Reserved

1B : (**BLEO)**Search the Bluetooch.The corresponding information will be reported via the message **+RESP: GTBLEO**. See chapter 3.3.10 GTBLEO report.

1C : Module Fota Update; if use sub command 0x1c. See the list of related parameters**.**

* if use sub command 0x1c. See the list of related parameters.

Example:			
AT+GTRTO=AIR11,1c,220.248.15.178:20021,000,000,/fota,UpdPkg_LE910_B1_SA_1G_20.00.515_20.00.516.bin,,,,,,,,000B$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Sub command	2	0-0x15	
Ftp server			
Ftp use name			
Ftp password			
Ftp working directory			
Ftp upgrade package			
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✧ < 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.

✧ *< Vibration duration>*:

For VBR: duration of vibration. Unit: seconds.

✧ < 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.

✧ < Repo Mode interval1>:

For Repo Mode:

The interval time to fix GPS when the device enter Repo Mode.

For **WIFI:**

The interval time to report the WLAN information.

✧ < Repo Mode interval2>:

For Repo Mode:

The interval time to fix GPS when the device enter Repo Mode and attached vehicle is ignition on..

For **WIFI:**

The interval time to report the WLAN information and attached vehicle is ignition on.

✧ <Counter>:

For **WIFI:**

The number of times the device reports the WLAN information.

✧ <FTP server>:FTP server address

✧ <FTP user name>:account

✧ <FTP password>:password

✧ <FTP working directory>:Upgrade package path in the FTP server

✧ <FTP upgrade package>:Upgrade package name

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

➢ **+ACK:GTRTO**

Example:
+ACK:GTRTO,110100, 358688000000158,,GPS,000B, 20110101101854,000B$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF, 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	$	$

3.2.12. Google link SMS configuration

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

➢ **AT+GTGLM=**

Example: AT+GTGLM= AIR11,1,1,2,13813888888,13913999999,,,,,000D$			
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	1
Mobile end	1	1-3	1
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 SOS and GEO event.

> **0:** Do not send a SMS with Google link to the number is in the *<direct number list>* for SOS and GEO event.

> **1:** Send a SMS with Google link to the number is in the *<direct number list>* for SOS and 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**

Example:				
+ACK: GTGLM, 110100, 358688000000158,,000D, 20110101101854,0025$				
Parameter	Length (byte)	Range/Format	Default	
Protocol 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	$	$	

3.2.13. Auto unlock SIM-PIN

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

➢ **AT+GTPIN=**

Example:				
AT+GTPIN= AIR11,1,1234,1,,,,,000E$				
Parameter	**Length (byte)**	**Range/Format**	**Default**	
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**

Example:
+ACK:GTPIN,110100, 358688000000158,,000E, 20110101101854,0027$

Parameter	Length (byte)	Range/Format	Default
Protocol 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. 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 =**

Example:
AT+ GTDOG = AIR11,1,,0130,,1,1,,,,,0011$

Parameter	Length (byte)	Range/Format	Default
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Mode	1	0|1|2	0
Ignition frequency	<=3	10 – 120	60
Interval	<=2	1 -30 (unit: days)	30
Time	4	HHMM	0200
reserved	0		
Report before reboot	1	0|1	1
Input ID	1	0|1	0
Gsm Interval	<=3	0 | 5 – 255	0
Pdp Interval	<=3	0 | 4 – 255	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.

> **2:** reboot when ignition on.

✧ *<Ignition frequency>*: when the working mode is set to 2, if the time interval between two adjacent ignition is greater than the specified value, the device will automatically reboot upon ignition on.

✧ *<Interval>*: the interval to reboot the device in day.

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

✧ *<Report before reboot>*: whether to report the **+RESP: 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.

✧ *<Input ID>*: ID of the digital input port which is used to trigger the manually reboot.0 means don't use manual reboot. Only port 1 is supported.

✧ <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.

NOTE: this function is optional.

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

➢ **+ACK: GTDOG**

Example:			
+ACK: GTDOG,110100, 358688000000158,,0011, 20110101101854,0029$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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	$	$

3.2.15. Digital Output

Note: P61 does not support this function.

The **AT+GTOUT** command is used to output specified wave shape from the digital output port. Total three wave shapes are supported as below. If wave shape 1 is set, the output port will maintain the specified state until power off or restart.

EXAMPLE:

AT+ GTOUT = AIR11,1,,,,,,,,0012$

This command send to device. And return an +ACK. Then the output out :

Exp1

AT+ GTOUT = AIR11,0,5,10,,,,,0012$

This command send to device. And return an +ACK. Then the output out :
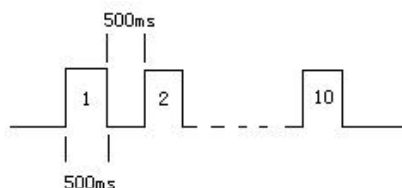
Exp 2

➢ **AT+ GTOUT =**

Example:			
AT+ GTOUT = AIR11,0,20,10,,,,,0012$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Output status	1	0|1	0
duration	<=3	0-255(x100ms)	0
Toggle times	<=3	0-255	0
reserved	0		
reserved	0		
reserved	0		
reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✦ *<output status>*: use only for need to set output high always.

      0: don't set pin high always

      1: set pin high always, discard other parameter

      3. Relay out.set RELAY_OUT pin low always.

✦ *<duration>*: when use the pin output pulse. Set the period of pulse. unit:100ms

✦ *< Toggle times>* set the number of pulse need to output

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

➢ **+ACK: GTOUT**

Example:			
+ACK: GTOUT,110100, 358688000000158,,0012, 20110101101854,0029$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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	$	$

3.2.16. WIFI Settings

Note: P61 does not support parameters: mode, Ap1 name, Ap1 password, Ap2 name, Ap2 password, Ap3 name, Ap3 password.

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

➢   **AT+ GTWIF =**

Example:			
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		
WLAN info report enable	1	0|1	
WLAN info report interval	<=5	30-86400 seconds	
Max AP Numbers	1	2-8	8
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.

✧ *<Ap password>*: Wireless access point password

✧ *<WLAN info report enable>*: Enable/disable the WLAN information report(**+RESP:GTWIF**) function.

✧ *<WLAN info report interval>*: The interval of reporting the WLAN information.

✧ <Max AP Numbers>:The max number of AP.

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

➢ **+ACK: GTWIF**

Example:			
+ACK: GTWIF,110100, 358688000000158,,0013, 20110101101854,0029$			
Parameter	Length (byte)	Range/Format	Default
Protocol 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. AGPS Setting

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

➢ **AT+ GTAGP =**

Example:			
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	20-240minutes	120
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**

Example:			
+ACK: GTAGP, 210110,012207000000015,,0020,20150725113330,0023$			
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	$	$

3.2.18. Digital Input Port Settings

Note: P61 does not support this function.

The **AT+GTDIS** command is used to set digit input function, and start check input pin state.

➢ **AT+ GTDIS =**

Example: **AT+ GTDIS = AIR11,0,20,10,,,,,0013$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	AIR11
Input ID	1	1	1
Enable	1	0|1	0
Debounce time	<=2	1-99(x1000ms)	1
reserved	0		
reserved	0		
reserved	0		
reserved	0		
Serial number	4	0000 – FFFF	
Tail character	1	$	$

✧ *<Input ID>*: The ID of the digital input. It is always 1. If the filed is empty, the device will ignore the following settings about the digital input 1, i.e. change nothing about the digital input 1.

✧ *<Enable>*: A numeric to check whether to enable the digital input.

● 0: Disable the digital input, i.e. ignore the status changing of the digital input.

● 1: Enable the digital input. If the status of the input change, the device will report the message **+RESP:GTDIS** to the backend server to inform the latest status.

✧ *<Debounce time>*: The time for debouncing.

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

➢ **+ACK: GTDIS**

Example: **+ACK: GTDIS,110100, 358688000000158,,0013, 20110101101854,0029$**			
Parameter	Length (byte)	Range/Format	Default
Protocol 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	$	$

3.2.19. Temperature detection

Note: P61 does not support this function.

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

➢ **AT+ GTTMP =**

Example:			
AT+GTTMP=AIR11,3,20,1,60,60,,,,,,,001B$			
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(×30s)	20
Detect duration	1-3	1 – 255(times Sampling Interval)	1
High temperature threshold	1-5	-30-75℃/-30-60℃	
Low temperature threshold	1-5	-30-75℃/-30-60℃	
Senser type	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: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>*.

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:℃ (Only supports integer)

✧ *< Low temperature threshold >*: Unit:℃ (Only supports integer)

✧ *< Sensor Type >*:

      0:DS18B20 temperature Sensor.

      NOTE:High temperature threshold or Low temperature threshold is : -30-75℃

      1:Wireless Bluetooth Sensor

      NOTE:High temperature threshold or Low temperature threshold is : -30-60℃

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

➢ **+ACK: GTTMP**

Example:			
+ACK:GTTMP,423037,355154081991594,ATP4GA,001B,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. BLE Configuration

Note: P61 does not support this function.

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):
0201061aff4c000215e2c56db5dffb48d2b060d0f5a71096e0000a0007c5
"e2c56db5dffb48d2b060d0f5a71096e0" is UUID.

➢ **AT+GTBLE =**

Example:			
AT+GTBLE=AIR11,1,60,,,,,,,,,,0011$			
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	1	2-20	8
Scan type masks	1	0001-0007	0007
Scan duration	<=2	6-15	6
Uuid/Mac filter	1	0|1	0
Filter num start	<=2	0-15	0
Filter num end	<=2	0-15	0
Uuid/Mac 0	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 1	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 2	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 3	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 4	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 5	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 6	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 7	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 8	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 9	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 10	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 11	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 12	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 13	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 14	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
Uuid/Mac 15	12|32	'0' – '9', 'a' – 'f', 'A' – 'F', 'X'	
gps info enable	1	0|1	0
reserved	0		
reserved	0		

Serial number	4	0000 – FFFF	
Tail character	1	$	$

❖ *<Mode>*:

　　0: Disable report function;

　　1: Enable ble uuid report; (see chapter 3.3.10 GTBLE report)

　　2: Enable raw data report; (see chapter 3.3.10 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.

❖ *<Scan type mask>*:

　　bit 1(0001):　IBeacon

　　bit 2(0002):　Eddystone-UID

　　bit 3(0004):　Temp&Humi S1 (this bit Only valid in GTBLE mode 2);

❖ *<Uuid filter>*: Whether to enable filtering

❖ <Uuid start>:The uuid list begins

❖ <Uudi end>:The uuid list end

❖ <Scan duration>:The scan time ,Unit: second

❖ *<Uuid0 ---Uuid15>*:Filter send report UUID or Mac Addr. 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).

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:GTSOS**: report after long press the function if the function key is enabled and the mode is SOS mode.

➢ **+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:GTDIS**: the status of digital input is detected being changed if the parameter *<Enable>* is set as 1 in the command **AT+GTDIS**

➢ **+RESP:GTDOG**: the protocol watchdog reboot message.

➢ **+RESP:GTREL**: report of **REPO MODE**

Example:

+RESP:GTFRI,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214013254,000C$
+RESP:GTREL,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214013254,000C$
+RESP:GTGEO,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,000D$
+RESP:GTSPD,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,000E$
+RESP:GTSOS,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,000F$
+RESP:GTRTL,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,0010$
+RESP:GTPNL,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,0011$
+RESP:GTNMR,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,0012$
+RESP:GTDIS,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,0013$
+RESP:GTDOG,110100,358688000000158,,0,0,1,5,1,4.3,92,70.0,121.354335,31.222073, 20110214013254,0460,0000,18d8,6141,00,80,20110214093254,0013$

Report Format:

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF X ∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Report ID	1	0-7	
Report type	2	0-3F	
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
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**
  FRI mode.   For example, 1 represent the scheduled timing mode.
- For **+RESP:GTGEO**
  ID of Geo-Fence in **+RESP:GTGEO**,

✧ *<Report type>*: type of the report for **+RESP:GTFRI**, **+RESP:GTGEO**, **+RESP:GTSPD**, **+RESP:GTNMR** and **+RESP:GTDIS**, 0 for other reports.
- 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.

2： free fall

- For **+RESP:GTDIS**

0: The current logical status of the input port is low.

1: The current logical status of the input is high.

✧ *<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.

✧ <Satellite Numbers>:The number of satellites in use after positioning.
Note: The supported device is P61.

✧ *<GPS accuracy>*: 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.

✧ *<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.
For **+RESP:GTNMR or +RESP:GTFRI**
If mode of GTFRI is 5 ,6 or 7 and if Check interval of GTFRI is greater than zero,this field is changed to the product of Check interval and Send interval.

✧ *<battery percentage>*: The current volume of the battery in percentage.

3.3.1.2. Location by Call Report
Note: P61 device does not support this function.

➢ **+RESP:GTLBC:**

+RESP=GTLBC:110100,358688000000158,,+8613800000000,5,1,4.3,92,70.0,121.354335,31.22

2073,20110214024537,0460,0000,18d8,6141,,,20110214024537,0013$			
Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Call number	20	Phone number	
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		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

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

3.3.1.3. Location as centre of Geo-Fence

If function key mode was set as 2 and long press function key to switch on Geo-Fence 0, the terminal will start GPS fixing to get the current position as the centre of Geo-Fence 0. And after GPS fixing finishes, the terminal will report the message +**RESP:GTGCR**.

➢ **+RESP:GTGCR:**

Example: **+RESP:GTGCR,110100,358688000000158,,3,50,2,5,2,0.4,296,-5.4,121.391055,31.164473,2011 0714104934,0460,0000,1878,0873,,,20110714104934,000C$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Geo mode	1	0|1|2|3	
Geo radius	<=7	50 – 6000000m	

Geo check interval	<=5	1 - 24	
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
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

✧ *<Geo mode>*: the new mode of Geo-Fence 0. Please refer to the parameter *<Mode>* in the command **AT+GTGEO**.

✧ *<Geo radius>*: the radius of Geo-Fence 0. Please refer to the parameter *<Radius>* in the command **AT+GTGEO**.

✧ *<Geo check interval>*: the check interval of Geo-Fence 0. Please refer to the parameter *<Check interval>* in the command **AT+GTGEO**.

✧ *<Longitude>*:The longitude of the current position. If it is successful to fix position this time, this longitude will be replace the longitude of the centre of Geo-Fence 0.

✧ *<Latitude>*: The latitude of the current position. If it is successful to fix position this time, this latitude will be replaced the latitude of the centre of Geo-Fence 0.

3.3.1.4. 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,,,,1,1,4.3,92,70.0,121.354335,31.222073,
20130214013254,460,00,1848,c141,,,20130214033254,000C$

Report Format:

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

Unique ID	15	IMEI	
Device name	10		
Reserved	0		
Reserved	0		
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		
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
History Count number	4	0000 – FFFF	
Tail character	1	$	$

3.3.2. Device Information Report

➢ **+RESP:GTINF:**

Example:
+RESP:GTINF,110100,358688000000158,,41,898600810906F8048812,18,99,0,33.23,1,4.19,1,1 ,1,0, 0,20110714104934,100,,,,,20110714104934,0014$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
State	2	21|22|41|42	
ICCID	20		
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
External power supply	1	0|1	
BLE sensor MAC	12	AC233FA10F0D	

address			
Temperature	5		
Humidity	5	0%-100%	
Reserved	0		
Battery voltage	<=4	0.0 – 4.50V	
Charging	1	0|1	
LED on	2	0-2D	
GPS on need	1	0|1|2	
GPS antenna type	1	0|1	
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.

    21: The device attached vehicle is ignition on and motionless.

    22: The device attached vehicle is ignition on and moving.

    41: The device is motionless without ignition on.

    42: The device is moving without ignition on.

❖ *<ICCID>*: The ICCID of the installed SIM card.

❖ *<CSQ RSSI>*: The GSM signal strength level.

❖ *<CSQ BER>*: The quality of the GSM signal. This field is always set to 99, which is normal.

❖ *<External power supply>*: Whether the external power supply is connected.

    0: Not connected

    1: Connected

❖ *<BLE sensor MAC address>*:MAC Address of Bluetooth Temperature and Humidity Sensor. This field is only valid when the sensor type in GTTMP is wireless bluetooth sesnor and it is reserved when the device is not found.

❖ *<Temperature>*: The temperature of the Device.

❖ *<Humidity>*:Humidity 0%-100%.This field is only valid when the *<Sensor Type>* in GTTMP is Wireless Bluetooth Sensor.

❖ *<Battery voltage>*: The voltage of the battery.

❖ *<Charging>*: Whether the battery is charging when the external power supply is connected.

    0: Not charging

    1: Charging

❖ *<LED on>*: The setting of <LED on> in **AT+GTCFG**.

❖ *<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

    1: outside 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:GTWIF:** report the WLAN AP infomation.

➢ **+RESP:GTWIFR: AT+GTRTO-WIFI** .

Example:

+RESP:GTWIF,423037,355154081991594,,3,a4dcbefa5b00,-62,,,,30493b015393,-63,,,,36493b015393,-63,,,,,,,,19,20190315023038,0016$

+RESP:GTWIFR,423037,355154081991594,,4,a4dcbefa5b00,-62,,,,36493b015393,-63,,,,30493b015393,-63,,,,cc34292988ae,-84,,,,,,,,18,20190315023343,0037$

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		
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.

3.3.4. Report for Querying

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

➢ **+RESP:GTGPS:** The report for real time operation GPS

Example:
+RESP:GTGPS,110100,358688000000158,,1,5,0,001F,001F,0,20110714104934,2011071410493 4,0015$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF 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|1	
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	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

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

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

Example:
+RESP:GTALL,423035,353081090312243,,BSI,,,,,,,,,SRI,3,,1,220.248.15.178,63191,220.248.15 .178,63191,,0,0,0,800,,,CFG,AIR11,,0,4,1,2,003F,0,60,00EF,,1,1,300,1,3,0,5,3,,NMD,8,2,2,3,300 ,1,0,0,,,,,,TMZ,+0000,0,,,FRI,1,0,,10,0000,0000,60,1,60,1,001F,1000,1000,,,,,,1,GEO,0,0,999.90 0000000,99.900000,1000,2,1,,,,,,,,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,,,,,,,,S PD,0,0,0,60,300,,,,,,,,,,,,,,FKS,1,1,0,1,,120,,GLM,0,,,,,,,,,,,,PIN,1,1234,0,DOG,0,60,30,0200,,1,0 ,0,0,,,TMP,0,20,1,0,0,0,,,,,,,WIF,0,,,,,,,,,,0,60,8,,,,GON,,1,0,0,,999,,,AGP,0,,,,,,,120,,BLE,1,60,8, 0,6,1,0,15,,,,,,,,,,,,,,,,0011223344556677889abcde1c30213,,,,20200101024814,007E$

Parameter	Length (byte)	Range/Format	Default
Protocol 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		
SRI	3	SRI	SRI
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|10 – 360 minutes	
SACK enable	1	0|1	
Connection Duration	<=3	1-255min	
Local_port	<=5	0 – 65535	
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
New password	4 -6	'0' – '9', 'a' – 'z', 'A' – 'Z'	
Device name	10		
Power saving duration	3	0|10 -255 (× min)	
Power saving interval	3	1-255 (× 30 mins)	
GPS on need	1	0|1|2	
GPS fix delay	<=2	2– 20 mins	
Report items mask	<=4	0000 – FFFF	
Report encryption key	2	00-FF	
Reserved	0		
Event mask	4	0000 – FFFF	
Reserved	0		
LED on	2	0-2D	
Info report enable	1	0|1	
Info report interval	<=5	30 – 86400 seconds	
MT call mode	1	0|1	
Reserved	0		
GEO Interval	<=5	0 – 86400 seconds	
Reserved	0		
Reserved	0		

Reserved	0		
NMD	3	NMD	NMD
Mode	1	0 – F	
Non-movement duration	<=3	0 – 255(x15 seconds)	
Movement duration	<=2	0 – 10(x100 ms)	
Movement threshold	1	1-10	3
Rest fix interval	5	10 – 86400 seconds	
Rest send interval	5	1 - 24	
Battery level	1	0|1	
Detection delay	<=5	0-86400 senconds	
AGPS suspend while non-movement	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TMZ	3	TMZ	TMZ
Time zone	5	-|+HHMM	
Daylight saving	1	0|1	
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0|1	
Invalid position for no fix and AGPS Disable	1	0-3	
Reserved	0		
RF_off_delay	<=4	4-1440 minutes	
Begin time	4	HHMM	
End time	4	HHMM	
Check interval1	<=5	5 – 86400seconds	
Send interval1	<=5	1 – 15/15000	
Check interval2	<=5	5 – 86400seconds	
Send interval2	<=5	1 – 15/15000	
Report mask	<=4	0000 – FFFF	
Distance	<=5	300 – 65535 meters	
Mileage	<=5	300 – 65535 meters	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Corner Enable	1	0|1	

GEO	3	GEO	GEO
GEO ID0	1		0
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Periodic Report	1	0 | 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID1	1		1
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Periodic Report	1	0 | 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID2	1		2
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Periodic Report	1	0 | 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

GEO ID3	1		3
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Periodic Report	1	0 | 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID4	1		4
Mode	1	0 – 3	
Longitude	<=11	(+/-)xxx.xxxxxx	
Latitude	<=10	(+/-)xx.xxxxxx	
Radius	<=7	50 – 6000000 meters	
Check interval	<=5	1 - 24	
Periodic Report	1	0 | 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SPD	3	SPD	SPD
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		
FKS	3	FKS	FKS
Power key enable	1	0|1	
Full power up whilst charging	1	0|1	
Function key mode	1	0-4	
Extended Function key mode	1	0-4	
SOS number	20		
Flight mode duration	0		
Reserved	0		
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		
Reserved	0		
PIN	3	PIN	PIN
auto unlock PIN	1	0|1	1
Reserved	0		
PIN checking	1	0|1	
DIS	3	DIS	DIS
Input ID	1	1	
Enable	1	0|1	
Debounce time	<2	1-99(x1000ms)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG

Mode	1	0|1|2	
Ignition frequency	<=3	10 – 120	
Interval	<=2	1 -30 (unit: days)	
Time	4	HHMM	
Reserved	0		
Report before reboot	1	0|1	
Input ID	1	0|1	
Gsm Interval	<=3	0|15　– 255	
Pdp Interval	<=3	0|4　– 255	
Reserved	0		
Reserved	0		
TMP	3	TMP	TMP
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 threshold	1-5	-30 – 75℃	
Low temperature threshold	1-5	-30 – 75℃	
Senser type	1	0|1	0
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
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		
WLAN info report enable	1	0|1	
WLAN info report interval	<=5	30-86400 seconds	
Max AP number	1	2-8	

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		
Online update interval	<=3	20-240minutes	
Reserved	0		
BLE	3	BLE	BLE
Mode	1	0|1	0
Scan interval	<=5	30 – 1000s	60
Scan max num	1	2-20	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
Uuid0	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid1	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid2	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid3	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid4	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid5	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid6	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid7	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid8	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid9	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid10	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid11	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	

Uuid12	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid13	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid14	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Uuid15	32	'0' – '9', 'a' – 'f', 'A' – 'F','X'	
Gps info enable	1	0|1	
reserved	0		
reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Serial number	4	0000 – FFFF	
Tail character	1	$	$

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

Example:			
+RESP:GTCID,110100, 358688000000158,,898600810906F8048812,20110214093254,0016$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol 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, 358688000000158,,18,99,20110214093254,0017$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF X∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
CSQ RSSI	<=2	0 – 31| 99	
CSQ BER	<=2	0 – 7| 99	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

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

Example:

+RESP:GTVER,110100, 358688000000158,,TRACKER,010B,0020,20110214093254,0018$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol 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

Example:			
+RESP:GTBAT,110100, 358688000000158,,0,,100,4.20,0,1,20110214093254,0019$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
External power supply	1	0|1	
Reserved	0	0000 – FFFF	
battery percentage	3	0-100	
Battery voltage	<=4	0.0 – 4.50V	
Charging	1	0|1	
LED on	2	0-2D	
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

Example:

+RESP:GTTMZ,110100, 358688000000158,+0000,0,20110214093254,001A$

Parameter	Length (byte)	Range/Format	Default
Protocol 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	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

3.3.5. Event Report

Note: P61 device does not support +RESP:GTEPN and +RESP:GTEPF.

The following event reports are triggered when certain event occurs.

+RESP:GTPNA: Power on report

+RESP:GTPFA: Power off report

+RESP:GTEPN: The report for connecting external power supply

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

+RESP:GTBPL: Battery low report

+RESP:GTBTC: Start charging report

+RESP:GTSTC: Stop charging report.

+RESP:GTSTT: Device motion state indication

+RESP:GTPDP: GPRS PDP connect report

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

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

➢ **+RESP:GTPNA:**

Example:
+RESP:GTPNA,110100, 358688000000158,,20110214093254,001B$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF 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:**

Example:
+RESP:GTPFA,110100, 358688000000158,,20110214093254,001C$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF	

		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:GTEPN:**

Example:
+RESP:GTEPN,110100,358688000000158,,5,0,4.3,92,70.0,121.354335,31.222073,2011021401
3254,0460,0000,18d8,6141,,20110214093254,001D$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF X∈ {'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
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		
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 "+".

➢ **+RESP:GTEPF:**

Example:

+RESP:GTEPF,110100,358688000000158,,5,0,4.3,92,70.0,121.354335,31.222073,2011021401 3254,0460,0000,18d8,6141,,20110214093254,001E$

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

➢ **+RESP:GTBPL:**

Example:

+RESP:GTBPL,110100,358688000000158,,3.53,5,0,4.3,92,70.0,121.354335,31.222073,201102 14013254,0460,0000,18d8,6141,,20110214093254,001F$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Battery voltage	<=4	0.0 – 4.50V	
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		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

> **+RESP:GTBTC:**

Example: +RESP:GTBTC,110100,358688000000158,,,5,0,4.3,92,70.0,121.354335,31.222073,2011021401 3254,0460,0000,18d8,6141,,20110214093254,0020$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
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		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

> **+RESP:GTSTC:**

Example: +RESP:GTSTC,110100,358688000000158,,,5,0,4.3,92,70.0,121.354335,31.222073,201102140 13254,0460,0000,18d8,6141,,20110214093254,0021$			
Parameter	**Length**	**Range/Format**	**Default**

	(byte)		
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Reserved	0		
Satellite Numbers	<=2	0 – 26	
GPS accuracy	<=2	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		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

➢ **+RESP:GTSTT:**

Example:
+RESP:GTSTT,110100,358688000000158,,41,5,0,4.3,92,70.0,121.354335,31.222073,20110214 **013254,0460,0000,18d8,6141,,20110214093254,0022$**

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
State	2	21|22|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		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

> **+RESP:GTPDP:**

Example:			
+RESP:GTPDP,110100,358688000000158,,20110214093254,011D$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF 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:GTSWG:**

Example:			
+RESP:GTSWG,110100,358688000000158,,1,5,0,2.1,0,27.1,121.390717,31.164424,201109010 73917,0460,0000,1878,0873,,20110901154653,0015$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
Geo active	1	0|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	
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		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

✦ *<Geo active>*: A numeric to indicate to activate or deactivate Geo-Fence 0 by the long press of the function key.

        0: deactivate Geo-Fence 0

        1: activate Geo-Fence 0

➢ **+RESP:GTGSM:**

Example:
+RESP:GTGSM,423037,355154081991594,ATP4GA,RTO,0460,0000,1878,0873,99,,20190226102538,002E$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF 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		
Serving rssi	2	0 – 31|99	
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

➢ **+RESP:GTFUS**:

Example:
+RESP:GTFUS,423036,460012101511271,L200,1,20180101004549,0004$

Parameter	Length (byte)	Range/Format	Default
Firmware Version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
IMEI	15	450050209516643	
Device name	10		
Fota Update Status	1	0-2	
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**:

Example:			
+RESP:GTMFS,423137,356611070694082,P51MA,,3,20190101233110,03E6$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Firmware Version	6	XX0000 – XXFFFF X∈ {'A'-'Z','0'-'9'}	
IMEI	15	356611070694082	
Device name	10	P51MA	
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

3.3.6.Buffer Report

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

✧ No GSM signal.

✧ Failed to activate GPRS context for the TCP or UDP connection.

✧ Failed to establish the TCP connection with the backend server.

These messages will be sent to the backend server 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**

✧ 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.

Example:

The following is an example of the buffered message:

+BUFF:GTFRI,110100,358688000000158,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20110214 013254,0460,0000,18d8,6141,00,,20110214093254,0024$

3.3.7.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 to1, Prime AT Plus 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 chapter3.2.13) 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**, Prime AT Plus will send a SMS with Google Maps hyperlink to the direct phone numbers after the message **+RESP:GTSOS** and **+RESP:GTGEO**.

➢ **Google Maps hyperlink**

Example 1 (old style): **SOS:** **http://maps.google.com/maps?q=-27.491107,153.095529   NAME F1 UTC 2012/05/28** **07:26:51 B97** **Example 2:** **SOS:** **http://maps.google.com/maps?q=31.222073,121.354335+%28NAME%20F1%20UTC%202 011/10/01%2009:05:32%20B33%%29**

Parameter	Length (byte)	Range/Format	Default
SMS header	<=30		
Google Maps hyperlink	<=77		
Device name	<10	NAME	
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 (**"SOS"**, **"IN GEO-i"**, **"OUT GEO-i"**, **"LBC"**).

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

3.3.8. 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:

Example:			
EXPT:WRONG PASSWORD,GTQSS,password,AIR10$			
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,whicn 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

3.3.9. Temperature Report

Note: P61 device does not support this function.

➢ **+RESP:GTTMP:**

Example:
+RESP:GTTMP,110100,358688000000158,,2,,60,1,5,1,4.3,92,70.0,121.354335,31.222073,
20110214013254,0460,0000,18d8,6141,00,80,20110214093254,000F$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
State	1	0-2	
BLE sensor MAC address	12	AC233FA10F0D	
Temperature	<=5	-30-75℃/-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
battery percentage	3	0-100	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

✧ *<State>*:
      1: Temperature is greater than *< High temperature threshold >*.
      2: Temperature is less than *< Low temperature threshold >*.
✧ *<BLE sensor MAC address>*:MAC Address of Bluetooth Temperature and Humidity Sensor. This field is only valid when the sensor type in GTTMP is wireless bluetooth sesnor and it is reserved when the device is not found.

✧   *<Temperature>*: Temperature. Unit:℃

3.3.10. BT Information Report

Note: P61 device does not support this function.

➢ **+RESP:GTBLE:** report the beacon infomation.

Example:			
+RESP:GTBLE,423134,353081090312243,ATABLE1234,,,,2,,36e6370b9e8c840c85410000000 00000,,,47d78f373991,-56,,e2c56db5dffb48d2b060d0f5a71096e0,0000,0000,ac233f527ab4,-87, ,,,,100,20200101001238,002E$			
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	
Reserved *	0		
UUID	32		
Major	4		
Minor	4		
Mac Addr	12	'A'-'Z','0'-'9'	
RSSI *	<=4	dbm	
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	$	$

*if Ibeacon number more than 1. report field [Reserved ` RSSI] is cycle.

✧ *<IBeacon numbers >*：Number of IBEACONs searched.

✧ *<RSSI >*：Receive signal, unit dBm.

✧ *<UUID >*:The UUID field in IBEACON broadcast

✧ <Major >:Ble ibeacon info for Major.(if device type is Eddystone,this is Reserved)

✧ <Minor >:Ble ibeacon info for Minor.(if device type is Eddystone,this is Reserved)

✧ <Mac Addr>:Ble mac addr

✧ <Longitude>: longitude

✧ <Latitude>: latitude
✧ <GPS UTC time>:last Gps utc time

➢ **+RESP:GTBLEO:** report the becaon information

Example:
+RESP:GTBLEO,423134,353081090312243,ATABLE1234,,,,8,,4abc64bcb7bd4822af7a83c77 d035ef4,0000,0000,76376e1e5c36,-52,,30313233343536373839303132333400,0000,0000,5ce5d b75cade,-53,,,,,100,20200101002412,003C$

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	
Reserved1	0		
UUID	32		
Major	4		
Minor	4		
Ble mac addr	12		
RSSI	<=4	dbm	
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)
✧ *<RSSI >*：Receive signal, unit dBm.
✧ <Ble mac addr>:Ble mac addr
✧ <Longitude>: longitude
✧ <Latitude>: latitude
✧ <GPS UTC time>:last Gps utc time

> ➢ **+RESP:GTBLER:** report ble raw data report.

Example:
+RESP:GTBLER,423134,353081090312243,ATABLE1234,,,,ac233fa10f0d,0201060303e1ff10
16e1ffa1016418bd3d800d0fa13f23ac,5d316baf4ed4,1aff4c0002159e9ad2eb19cf4ac1b6d00b29
c0b51cd600000000bf,,,,100,20200101003021,0042$

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 addr	12	{'A'-'Z','0'-'9'}	
Raw data1	<62	{'A'-'Z','0'-'9'}	
Ble mac addr	12	{'A'-'Z','0'-'9'}	
Raw data2	<62	{'A'-'Z','0'-'9'}	
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

3.4.Heartbeat

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

➢ **+ACK:GTHBD:**

Example: +ACK:GTHBD,110100, 358688000000158,,20110214093254,0025$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF 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:**

Example: +SACK:GTHBD,110100,0026$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF X∈{'A'-'Z','0'-'9'}	
Count number	4	0000 – FFFF	
Tail character	1	$	$

✧ *<Count number>*: The backend server uses the *<Count number>* extracted from the 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:**

Example:			
+SACK:0027$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Count number	4	0000 – FFFF	
Tail character	1	$	$

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

4. LED Indication

P61:

Light	Event	State
GSM LED	Network has been registered	Slow flash
	Power off	Dark
	Power key was pressed and prepare to power on	Solid
Power LED	Power on and normal	Dark
	Fully charged	Solid
	In charging	Slow flash
	Power key was pressed and prepare to power off	Solid
	Power key was pressed and prepare to power on	Solid

OTHERS:

GSM LED	Network has been registered	Slow flash
	Power off	Dark
	Power key was pressed and prepare to power on	Solid
Power LED	Power on and normal	Dark
	Fully charged	Solid
	In charging	Slow flash
	Power key was pressed and prepare to power off	Solid
	Power key was pressed and prepare to power on	Solid
WIFI LED	WIFI on	Slow flash
	Power key was pressed and prepare to power on	Solid
GPS LED	GPS signal valid	Fast flash
	GPS turned off, GPS signal invalid	Dark

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+GTFKS
+ACK:GTFKS
AT+GTRTO
+ACK:GTRTO
AT+GTGLM
+ACK:GTGLM
AT+GTPIN
+ACK:GTPIN
AT+GTDOG
+ACK:GTDOG
AT+GTOUT
+ACK:GTOUT
AT+GTDIS
+ACK:GTDIS
AT+GTTMP
+ACK:GTTMP
AT+GTWIF
+ACK:GTWIF

❖ **Position Related Report**
+RESP:GTFRI
+RESP:GTGEO

+RESP:GTSPD
+RESP:GTSOS
+RESP:GTRTL
+RESP:GTLBC
+RESP:GTPNL
+RESP:GTNMR
+RESP:GTGCR
+RESP:GTDOG
+RESP:GTHIS
+RESP:GTWIF

✧ **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:GTEPN
+RESP:GTEPF
+RESP:GTBTC
+RESP:GTSTC
+RESP:GTBPL
+RESP:GTSTT
+RESP:GTPDP
+RESP:GTSWG
+RESP:GTWIF
EXCP

✧ **Heartbeat**

+ACK:GTHBD
+SACK:GTHBD

✧ **Server Acknowledgement**

+SACK