Queclink
WIRELESS SOLUTIONS

GSM/GPRS/GPS Tracker **GT300**

@Track Air Interface Protocol

Application Notes: **TRACGT300AN001**

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0. Revision History

Revision	Date	Author	Description of change
V2.00	2009-09-07	Eagle LIU	Initial
V2.01	2009-10-30	Eagle LIU	1) Extend AT+GTMSA working mode 2) Add AT+GTTMA command 3) Add time zone information into +RESP:GTALL
V3.00	2010-01-05	Eagle LIU	1) Add Time and Date menu status, time zone information and daylight saving setting into +RESP:GTINF 2) Use UTC time in all send time 3) Support to disable local time adjustment by AT+GTTMA command 4) According to change of AT+GTTMA, add Time and Date menu status into +RESP:GTALL
V3.01	2010-01-14	Eagle LIU	1) Support to send the last known GPS location first when detected falling accident or SOS event is triggered. 2) Update +RESP:GTALL for AT+GTMSA and AT+GTSOS. 3) Add +RESP:GTLGL to report the last known GPS location with the current GSM tow data. 4) Modify AT+GTPHB command to support read action.
V3.02	2010-02-10	Eagle LIU	1) Support location by call function in AT+GTBEI 2) Add AT+GTBND command 3) Update +RESP:GTALL for above changes.
V3.03	2010-03-05	Eagle LIU	1) Change time zones of Brisbane and Melbourne to UTC+10 2) Add new command option to AT+GTRTO to support sending current location with Google Maps hyperlink
V3.04	2010-03-30	Eagle LIU	1) Remove descriptions of reserved parameters
V3.05	2010-05-21	Eagle LIU	1) Add AT+GTNMD command to support motion detection by sensor. 2) Add NMD settings in +RESP:GTALL.
V4.00	2010-06-08	Eagle LIU	1) Add reference to firmware update document.
V4.01	2010-09-16	Eagle LIU	1) Fill UTC time converted from the local time in the <*GPS UTC time*> field in position related reports when there is no successful GPS fix
V4.02	2011-04-20	Hendry PAN	1) Delete 'ta' field in +RESP:GTGEO and +RESP:GTLBC； 2) Set default value for <*movement speed*> and

			<movement distance> in AT+GTFRI;
			3) Change maximum value of *<time zone index>* to 77.

1. Overview

1.1. Scope of This Document

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

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

1.2. Terms and Abbreviation

Abbreviation	Description
APN	Access Point Network
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
SMS	Short Message Service
ASCII	American National Standard Code for Information Interchange
HDOP	Horizontal Dilution of Precision
ICCID	Integrated Circuit Card Identity
IP	Internet Protocol
UTC	Coordinated Universal Time
NMEA	The National Marine Electronics Association is a non-profit association of manufacturers, distributors, dealers, educational institutions, and others interested in peripheral marine electronics occupations. The NMEA 0183 standard defines an electrical interface and data protocol for communications between marine instrumentation.

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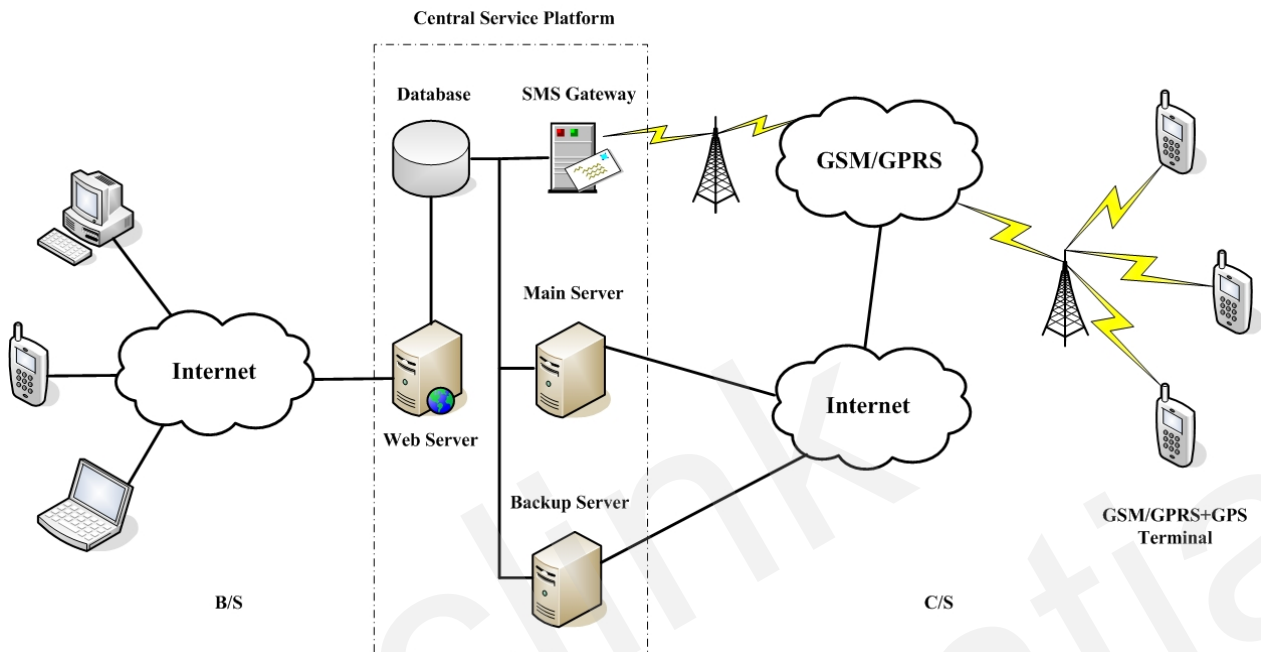
The backend server can be accessed by many terminals and should have the following abilities:

✧ The backend server should be able to access the Internet and listen to the connection originating from the terminal.

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

✧ The backend server should be able to receive and send SMS.

3. Message Description

3.1. Message Format

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

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

The entire message string ends with '\0'.
The characters 'XXX' identify the deferent message.
The "<parameter1>,<parameter2>,…" carry the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighbouring parameter characters. The parameter string may contain the ASCII characters:
'0'-'9', 'a'-'z', 'A'-'Z'.
Detailed descriptions of each message format are located in the specific message sections.

By sending Commands to the terminal, the backend server can either configure and query the parameters of the terminal or control the terminal to perform specific actions. When the terminal receives Commands over the air, it will reply with a corresponding Acknowledgement message. According to the configuration of the parameters, the terminal can send Report messages to the backend server. Please see the following figure:
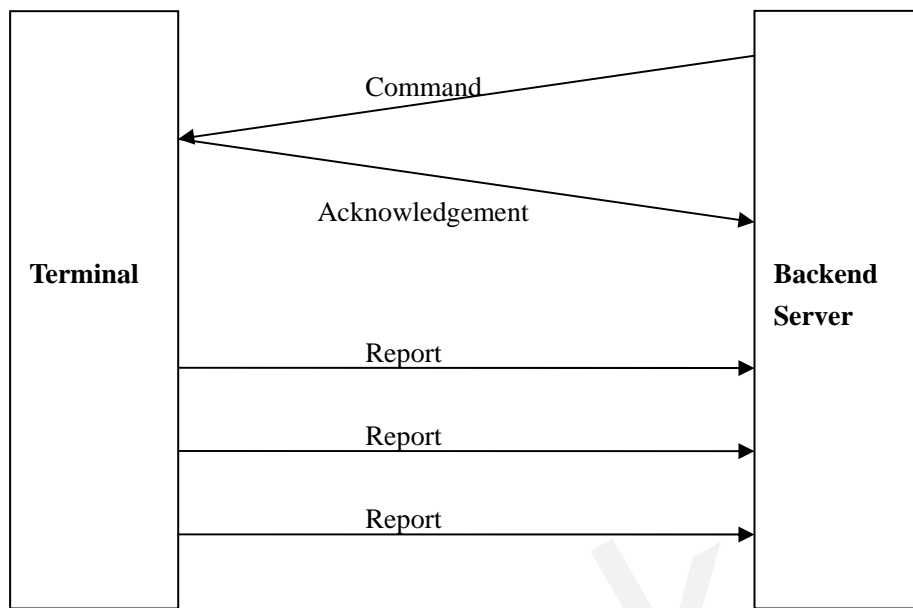
Figure **1**: @Tracker Protocol messages flow

Note: The Heart Beat Message (**GTHBD**, refer to chapter 3.4) is exceptional.

3.2. Command And Acknowledgement

3.2.1. Backend Server Register Information

The command **AT+GTSRI** is used to configure the GPRS parameters and server information of the terminal. It is also used to configure the report mode and connection mode between the backend server and the terminal. When the terminal is configured correctly, it should be able to report data to the backend server.

➢ **AT+GTSRI=**

Example:				
AT+GTSRI=gt300,0,cmnet,,,124.79.182.171,7001,+8613888888888,0000				
Parameter	**Length(byte)**	**Range/Format**		**Default value**
password	4~8	'0'-'9','a'-'z','A'-'Z'		gt300
report mode	1	0	TCP short connection + SMS	0
		1	TCP short connection	
		2	TCP long connection	
		3	UDP	
		4	SMS	
APN	<=40			
APN user name	<=20	'0'-'9','a'-'z','A'-'Z'		
APN user password	<=20	'0'-'9','a'-'z','A'-'Z'		
main server IP	<=15			
main server port	<=5			
main SMS gateway	<=20			
serial number	4	0000-FFFF		

✧ *<password>*: The valid character of password is '0'-9', 'a'-'z', 'A'-'Z'. The default value is "gt300".

✧ *<report mode>*: Defines the mode that the terminal uses to communicate with the platform, in hexadecimal format.

　　0: TCP short connection + SMS. In this mode, the terminal uses the TCP short connection as the default mode and uses SMS as the backup. If fail to send data via TCP short connection, send the same data via SMS again.

　　1: TCP short connection. In this mode, the terminal connects to the backend server via TCP protocol each time it needs to send data and shuts down the connection after the data transmission.

　　2: TCP long connection. In this mode, the terminal connects to the backend server via TCP protocol once power on, then keeps the connection alive and uses it all the time unless the connection is broken. Then it will try to connect to the backend server again and maintain the new connection. To maintain the connection, the terminal sends heart beat data to the backend server periodically and the backend server

responds to each of the heart beat data. In this way, both sides can confirm the connection is alive.

3: UDP mode. In this mode, the terminal sends data to the backend server via UDP protocol.

4: Force on SMS. All the data from the terminal are sent to the backend server via SMS message.

✧ *<APN>*: Access point name (APN).

✧ *<APN user name>*: the GPRS APN user name. If the parameter field is empty, the parameter will be cleared.

✧ *<APN user password>*: the GPRS APN password. If the parameter field is empty, the parameter will be cleared.

✧ *<main server IP>*: The IP address of the primary server. It is a dotted decimal notation IP address. Example as "192.117.16.7".

✧ *<main server port>*: The port of the primary server. The valid value is 0-65535.

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

✧ *<serial number>*: As the command reference, the exact serial number will be sent back to the backend server in acknowledgement message. It is in hexadecimal format. It should begin from 0000 and increases by 1 every time. It should roll back after "FFFF".

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

➢ **+ACK:GTSRI,**

Example:			
+ACK:GTSRI,135790246811220,0000,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

✧ *<unique ID>*: The terminal's IMEI.

✧ *<serial number>*: The *<serial number>* in the **AT+GTSRI** command.

✧ *<ack time>*: UTC time converted from the terminal local time when sending the message.

✧ *<count num>*: The self-increasing count number will be put into every acknowledgment message. The count is beginning from 0000 and increases by 1 every time. It will roll back after "FFFF".

✧ *<ver>*: The "HHHH" at the beginning is the hardware version. For example: **0102** means the hardware version is GT300V**0102**. The "SS" in the middle is the software version. For example: **07** means the software version is 0824B**07**GT300M128_TOSHIBA. The "PPPP" at the end is the @track protocol version. For example: **0202** means the protocol version is V**2.02**.

3.2.2. Base Equipment Information

The **AT+GTBEI** command is used to configure the base equipment information of the terminal, including the threshold of over-speed alarm, the interval to send information report(including ICCID, GSM signal level, battery level and the status of charger), the parameters of the secondary backend server and the visibility of SIM card contacts.

➢ **AT+GTBEI=**

Example:
AT+GTBEI=gt300,,,0,80,0,0,10,124.79.182.171,7003,,,0,0001

Parameter	Length(byte)	Range/Format	Default
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
reserved	<=8		
reserved	<=20		
location by call	1	0|1|2|3|4	0
speed alarm	<=3	0-999(km/h)	0
info. Report	<=4	0-1440(minute)	0
reserved	1	0|1	0
reserved	<=3	0|10~360(minute)	10
second server IP	<=15		
second server port	<=5		
reserved	<=20		empty
reserved	<=20		empty
SIM contact enable	1	0|1	0
serial number	4	0000-FFFF	

✧ *<reserved>*: The parameter field is reserved.

✧ *<location by call>*: Set the working mode of the location by call function.

> 0: Disable this function.
>
> 1: When there is an incoming call, the device will send its current location to the backend server by message +RESP:GTLBC.
>
> 2: Only if the number of the incoming call is within the local phone book, the device will send its current location to the incoming call via SMS with Google Maps hyperlink.
>
> 3: The device will send its current location to the incoming call number via SMS with Google Maps hyperlink.
>
> 4: The device will hang up the incoming call and send its current location to the incoming call number via SMS with Google Maps hyperlink.

✧ *<speed alarm>*: If this threshold is greater than zero, whenever GPS information is obtained, the terminal will compare its current speed with this limit. If the speed of the terminal is over this limit, an over speed alarm is sent out to the backend server.

✧ *<info. report>*: The interval to periodically report information including ICCID, GSM signal level, battery level, the status of charger, Time and Date menu status, offset of time zone and the daylight saving setting.

✧ *<second server IP>*: The IP address of the secondary backend server. Example as "192.117.16.7".

✧ *<second server port>*: The port of the secondary backend server. The valid value is 0-65535.

✧ *<SIM contact enable>*: 0 to disable the SIM contact menu of the terminal, 1 to enable the SIM contact menu.

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

➢ **+ACK:GTBEI,**

Example:			
+ACK:GTBEI,135790246811220,0001,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.3. Fixed Timing Report Information

The **AT**+**GTTRI** command is used to configure the parameters of scheduled fixed timing report.

➢ **AT**+**GTTRI=**

Example:			
AT+GTTRI=gt300,1000,2300,5,60,1,20,500,3,0002			
Parameter	**Length(byte)**	**Range/Format**	**Default**
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
begin time	4	0000-2359	0000
end time	4	0000-2359	0000
send interval	4	0-1440(minute)	0
fix interval	5	0-86400(second)	0
movement detect mode	1	0|1	
movement speed	<=3	1-999(km/h)	10
movement distance	<=4	1-9999(m)	100
movement send number	1	1-5	5
serial number	4	0000-FFFF	

✧ *<begin time>*: The start time of scheduled fix timing report. The valid format is "HHMM". The value range of "HH" is "00"-"23". The value range of "MM" is "00"-"59".

✧ *<end time>*: The end time of scheduled fix timing report. The valid format and range are same as *<begin time>*.

✧ *<send interval>*: The period in which the position information is reported. The value range is 0-1440 and the unit is minute.

✧ *<fix interval>*: The interval time to fix GPS, its value range is 0-86400 and the unit is second.

✧ *<movement detect mode>*: Enable or disable the movement detect function. Please refer to <u>chapter 4.3.2</u> for details.

✧ *<movement speed>*: The speed threshold of movement detect. The unit is km/h.

✧ *<movement distance>*: The distance threshold of movement detect. The unit is meter.

✧ *<movement send number>*: According to the speed threshold and distance threshold, if the terminal is considered staying at one position, the terminal will send out at most this number of reports before it moves again.

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

➢ **+ACK:GTTRI,**

Example: +ACK:GTTRI,135790246811220,0002,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.4. Geo-Fence Information

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

➢ **AT+GTGEO=**

Example: AT+GTGEO=gt300,3,121.412248,31.187891,1000,10,3,0003			
Parameter	**Length(byte)**	**Range/Format**	**Default**
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
geofence id	1	0-4	
longitude	20	xxx.xxxxxx(degree)	
latitude	20	xx.xxxxxx(degree)	
radius	10	0-6000000(meter)	
check interval	2	0-99(minute)	
geofence type	1	1-3	
serial number	4	0000-FFFF	

✧ *<geofence id>*: A numeric to identify the Geo-Fence. The valid values are 0, 1, 2, 3, 4.

✧ *<longitude>*: The longitude of a point which is defined as the center of the Geo-Fence circular region. The format is "(-)xxx.xxxxxx" and the value range is from "-180.000000" to "180.000000". The unit is degree. West longitude is defined as negative starting with minus "-" and east longitude is defined as positive without "+".

✧ *<latitude>*: The latitude of a point which is defined as the centre of the Geo-Fence circular region. The format is "(-)xx.xxxxxx" and the value range is from "-90.000000" to "90.000000". The unit is degree. South Latitude is defined as negative starting with minus "-" and north Latitude is defined as positive without "+".

✧ *<radius>*: The radius of the Geo-Fence circular region. The value range is (0-6000000) and the unit is meter.

✧ *<check interval>*: The interval of GPS checking for the Geo-Fence alarm.

✧ *<geofence type>*: A numeric which indicates when to report the notification to the backend server based on the following:

　　1: Reports when enters the Geo-Fence.

　　2: Reports when leaves the Geo-Fence.

　　3: Reports when enters or leaves the Geo-Fence.

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

➢ **+ACK:GTGEO,**

Example: +ACK:GTGEO,135790246811220,0,0003,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
geofence id	1	0-4	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.5. Real Time Operation

The **AT+GTRTO** command is used to retrieve information from the terminal.

➢ **AT+GTRTO=**

Example: AT+GTRTO=gt300,1,0004			
Parameter	**Length(byte)**	**Range/fomat**	**Default**
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
command option	1	0-9,A,B	
serial number	4	0000-FFFF	

✧ *<command option>*: Valid value is 0-9, A, B. For the definition, please refer to the following.

　　0: Get the latest time of successful GPS fixing.

　　1: Require the terminal to report the current position immediately

　　2: Get the current configuration of the terminal.

　　3: Reboot the terminal.

4: Reset all parameters to factory setting. Please note that the following parameters will not be reset: <report mode>, main server information (<main server IP>, <main server port>, <main SMS gateway>), GPRS information (<APN>, <APN user name>, <APN user password>, local phone book and volume settings).

5: Get the ICCID of the SIM card which is being used by the terminal.

6: Get the current GSM signal level of the terminal.

7: Get the software version.

8: Get the hardware version.

9: Get the battery level of the terminal.

A: Power off the terminal.

B: Request the device to send its current position with Google Maps hyperlink.

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

➢ **+ACK:GTRTO,**

Example: +ACK:GTRTO,135790246811220,RTL,0004,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
option abbr	<=8		
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

✧ <option abbr>: An abbreviation string corresponding to the <command option>:

"LGT":   <command option> = 0

"RTL":   <command option> = 1

"READ":   <command option> = 2

"REBOOT":   <command option> = 3

"RESET":   <command option> = 4

"CID":   <command option> = 5

"CSQ":   <command option> = 6

"SWV":   <command option> = 7

"HWV":   <command option> = 8

"CBC":   <command option> = 9

"PWROFF":   <command option> = A

"GGL":   <command option> = B

3.2.6.   Motion Sensor Alarm

The **AT+GTMSA** command is used to configure the motion sensor to detect falling down accident and make alarm.

➢ **AT+GTMSA=**

Example:			
AT+GTMSA=gt300,1,1,3,5,+8613888888888,,,0005			
Parameter	**Length(byte)**	**Range/Format**	**Default**
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
mode	1	0|1|2|3	0
send last position	1	0|1	1
sensitivity	<=2	1-10	5
alarm timeout	<=2	5-10 (second)	5
falling call	<=20		
reserved	2	Reserved	0
reserved	2	Reserved	0
serial number	4	0000-FFFF	

✧ <*mode*>: The working mode of the motion sensor as below
   0: Disable this function.
   1: Only make the falling call if falling accident is detected.
   2: Only send the current position to the backend server if falling accident is detected.
   3: If falling accident is detected, the terminal will make the falling call first.   After the falling call, the terminal will send the current position to the backend server.

✧ <*send last position*>: If set to 1 and the working mode is 2 or 3, sending the last known GPS position before making the falling call or sending the current position.   If set to 0, do not send the last known GPS position.

✧ <*sensitivity*>: Sensitivity of the sensor, total 10 levels.   The smaller, the more sensitive.

✧ <*alarm timeout*>: Time to cancel the alarm. When falling accident is detected, the end user is notified to confirm the alarm sending (visual notification, need display device support).   If the end user does not cancel the alarm within the given time, according to the working mode, the terminal will make the falling call or send the falling alarm to the backend server, or perform both actions.

✧ <*falling call*>: The phone number to call if falling accident is detected.   Maximum 20 characters including the optional national code starting with "+". Short code (for example: 10086) is also supported.

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

➢ **+ACK:GTMSA,**

Example:			
+ACK:GTMSA,135790246811220,0005,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.7. SOS Key Function

The **AT+GTSOS** command is used to configure the SOS key function.

➢ **AT+GTSOS=**

Example: AT+GTSOS=gt300,1,1,+8613888888888,0006			
Parameter	**Length(byte)**	**Range/Format**	**Default**
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
mode	1	0|1|2|3	3
send last position	1	0|1	1
SOS number	<=20		
serial number	4	0000-FFFF	

✧ *<mode>*: The working mode of the SOS key as below
- 0: Disable this function.
- 1: Only make the SOS call if SOS key is pressed for 3 seconds.
- 2: Only send the current position to the backend server if SOS key is pressed for 3 seconds.
- 3: If SOS key is pressed for 3 seconds, the terminal will make the SOS call first. After the SOS call, the terminal will send the current position to the backend server.

✧ *<send last position>*: If set to 1 and the working mode is 2 or 3, sending the last known GPS position before making the SOS call or sending the current position. If set to 0, do not send the last known GPS position.

✧ *< SOS number>*: The phone number to call.

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

➢ **+ACK:GTSOS,**

Example: +ACK:GTSOS,135790246811220,0006,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.8. Remote Phone Book Control

The **AT+GTPHB** is used to remotely edit the local phone book in the terminal.

➢ **Write operation: AT+GTPHB=**

Example:
AT+GTPHB=gt300,1,1,0,Alice,+8613888888888,0007
AT+GTPHB=gt300,1,1,1,205F094E,+8613888888888,0007

Parameter	Length(byte)	Range/Format	Default
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
operation	1	1	
record index	<=2	1-20	3
DCS	1	0|1	
name	<=56		
phone number	<=20		
serial number	4	0000-FFFF	

✧ <operation>: 1 means write to the local phone book.

✧ <record index>: Index of the phone book entry to edit. Total 20 entries in the local phone book.

✧ <DCS>: Data coding scheme, indicates which coding scheme is used for the <name> field. 0 is ASCII, 1 is UCS2.

✧ <name>: The name of the contact to be edited. If DCS is set to 2, use little-endian ASCII string to represent the UCS2 code points of the name string. For example, if the UCS2 code points of the contact are U+5F20, U+4E09, puts '205F094E' in the <name> filed.

✧ <phone number>: The phone number of the contact to be edited.

➢ **Read operation: AT+GTPHB=**

Example:
AT+GTPHB=gt300,0,1,0007
AT+GTPHB=gt300,0,0,0007

Parameter	Length(byte)	Range/Format	Default
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
operation	1	0	
record index	<=2	0-20	
serial number	4	0000-FFFF	

✧ <operation>: 0 means read from the local phone book.

✧ <record index>: Index of the phone book entry to read. 0 means read all. If read all, the return message will only sent by GPRS.

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

➢ **+ACK:GTPHB,**

Example:
+ACK:GTPHB,135790246811220,0007,20090101000002,11F0,0102070202

Parameter	Length(byte)	Range/Format	Default
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.9. Remote Volume Control

The **AT+GTRVC** command is used to control the volume of voice call and ring tone of the terminal.

➢ **AT+GTRVC=**

Example: AT+GTRVC=gt300,3,5,3,4,2,0008			
Parameter	**Length(byte)**	**Range/Format**	**Default**
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
normal speech	1	1-7	
hands-free speech	1	1-7	
headset speech	1	1-7	
normal ring tone	1	1-7	
headset ring tone	1	1-7	
serial number	4	0000-FFFF	

✧ <normal speech>: The volume of the receiver during a voice call.

✧ <hands-free speech>: The volume of the speaker during a hands-free call.

✧ <headset speech>: The volume of the headset during a voice call.

✧ <normal ring tone>: The volume of normal ring tone.

✧ <headset ring tone>: The volume of ring tone via headset.

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

➢ **+ACK:GTRVC,**

Example: +ACK:GTRVC,135790246811220,0008,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.10. Time Adjustment

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

The backend server could use this command to hide the "Time and Date" menu if the end user is forbidden to adjust the local time.

➢ **AT+GTTMA=**

Example:
AT+GTTMA=gt300,1,8,0,20090917123500,0009

Parameter	Length(byte)	Range/Format	Default value
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
hide time menu	1	0|1	0
time zone index	<=2	1-77	
daylight saving	1	0|1	
UTC time	14	YYYYMMDDHHMMSS	
serial number	4	0000-FFFF	

✧ <password>: the valid character of password is '0'-9', 'a'-'z', 'A'-'Z'. The default value is "gt300".

✧ <hide time menu>: 0 to enable the Time and Date menu, 1 to disable the Time and Date menu.

✧ <time zone index>: the index of the time zone in the following table.

Index	City	Time Zone	Index	City	Time Zone
1	Abu Dhabi	4	41	London	0
2	Amsterdam	1	42	Los Angeles	-8
3	Apia	-11	43	Luxembourg	1
4	Athens	2	44	Madrid	1
5	Auckland	12	45	Manila	8
6	Anchorage	-9	46	Melbourne	10
7	Bangkok	7	47	Mexico City	-6
8	Beijing	8	48	Montreal	-5
9	Berlin	1	49	Moscow	3
10	Bogota	-5	50	New Delhi	5.5
11	Brasilia	-3	51	New York	-5
12	Brisbane	10	52	Norfolk Island	11.5
13	Brussels	1	53	Paris	1
14	Bucharest	2	54	Phoenix	-7
15	Budapest	1	55	Polynesia	-9.5
16	Buenos Aires	-3	56	Prague	1
17	Cairo	2	57	Praia	-1
18	Canberra	10	58	Rabat	0
19	Cape Town	2	59	Rome	1
20	Casablanca	0	60	San Francisco	-8
21	Central Atlantic	-2	61	Santiago	-4
22	Chicago	-6	62	Singapore	8
23	Copenhagen	1	63	Sofia	2
24	Dhaka	6	64	Solomon	11
25	Easter Island	-8.5	65	Stockholm	1
26	Geneva	1	66	Sydney	10
27	Guam	10	67	Taipei	8
28	Hong Kong	8	68	Tehran	3.5

29	Honolulu	-10	69	Tokyo	9
30	Islamabad	5	70	Tonga	12.75
31	Istanbul	2	71	Vancouver	-8
32	Jakarta	7	72	Vienna	1
33	Johannesburg	2	73	Vladivostok	10
34	Kabul	4.5	74	Warsaw	1
35	Kathmandu	5.75	75	Wellington	12
36	Kiev	2	76	Yangon	6.5
37	Kuala Lumpur	8	77	Zurich	1
38	Kwajalein	-12			
39	La Paz	-3.5			
40	Lisbon	0			

✦ *<daylight saving>*: 0 to disable the daylight saving, 1 to enable.
✦ *<UTC time>*: UTC time sent by the backend server to adjust the local time.
✦ *<serial number>*: As the command reference, the exact serial number will be sent back to the platform in ACK. It is in hexadecimal format. It should begin from 0000 and increases by 1 every time. It should roll back after "FFFF".

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

➢ **+ACK:GTTMA,**

Example:			
+ACK:GTTMA,135790246811220,0009,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.11. SIM Card Binding

The **AT+GTBND** command is used to make a binding between the device and the installed SIM card. If the bound SIM card is replaced by other card later, the device will send alarm to the backend server by message **+RESP:GTBND** with its current location via SMS.

➢ **AT+GTBND=**

Example:			
AT+GTBND=gt300,1,,,,,000A			
Parameter	**Length(byte)**	**Range/Format**	**Default value**
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300

mode	1	0|1|2	0
reserved	0		empty
reserved	0		empty
reserved	0		empty
reserved	0		empty
serial number	4	0000-FFFF	

✧ <mode>: The working mode of this command.

    0: Disable this function.

    1: Enable the binding check. If the device does not bind to any SIM card, make a binding with the current SIM card immediately.

    2: Make a binding with the current SIM card and enable the binding check no matter whether there is a previous binding or not.

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

➢ **+ACK:GTBND,**

Example:
+ACK:GTBND,135790246811220,000A,20090101000002,11F0,0102070202

Parameter	Length(byte)	Range/Format	Default
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.2.12. Non Movement Detection

The **AT+GTNMD** command is used to configure the motion sensor to detect the motion state of the device. If the device is detected to be at rest, the device could suspend the fixed timing report and the geo-fence function in order to saving the power. If the device is in motion again, the device will resume the fixed timing report and the geo-fence function.

➢ **AT+GTNMD=**

Example:
AT+GTNMD=gt300,3,4,1,2,0800,2000,0,,,,,000B

Parameter	Length(byte)	Range/Format	Default value
password	4~8	'0'-'9','a'-'z','A'-'Z'	gt300
mode	1	0|1|2|3	0
rest duration	<=3	1 – 255 (×15s)	4
motion duration	<=3	1 – 255 (×100ms)	1
TRI max	1	0 – 9	0
start	1	0000 – 2359	0000

end	1	0000 – 2359	0000
send mode	1	0|1|2	0
reserved	0		empty
reserved	0		empty
reserved	0		empty
reserved	0		empty
serial number	4	0000-FFFF	

✧ *<mode>*: The working mode of this command.

        0: Disable this function.

        1: If the device is at rest, suspend fixed timing report and geo-fence function.

        2: If the device is at rest, only send the **+RESP:GTNMR** message to the backend server.

        3: If the device is at rest, suspend fixed timing report, geo-fence function and send the **+RESP:GTNMR** message to the backend server.

✧ *<rest duration>*: If the device keeps still this time long, the device is then considered to be at rest.　The unit is 15 seconds and the default value is 4 i.e. 60 seconds.

✧ *<motion duration>*: If the device keeps moving this time long, the device is then considered to be in motion.　The unit is 100 milliseconds and the default value is 1.

✧ *<TRI max>*: This defines how many fixed timing reports are allowed to be sent to the backend server before the fixed timing report is suspended when rest is detected.

✧ *<start>*: The start time to begin checking the motion state of the device.

✧ *<end>*: The end time to stop checking the motion state of the device.

✧ *<send mode>*: This defines how to send the **+RESP:GTNMR** message to the backend server.

        0: Send it following the report mode set by **AT+GTSRI**.

        1: Always send it via GPRS.

        2: Always send it via SMS.

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

➢ **+ACK:GTNMD,**

Example:			
+ACK:GTNMD,135790246811220,000B,20090101000002,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
serial number	4	0000-FFFF	
ack time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.3. Report

3.3.1.   Position Related Information

The parameters of the five report messages **GTEST / GTSOS / GTRTL / GTMSA / GTBND / GTNMR** are the same.

Based on the setting of **AT+GTBEI**, the report message +**RESP:GTEST** is sent to alarm over speed when the speed of the terminal is over the threshold setting. (Refer to chapter 4.2.1)

If the SOS key is pressed for 3 seconds, the +**RESP:GTSOS** message will be reported to the backend server according to the SOS mode setting. (Refer to chapter 4.7)

When the terminal receives the **AT+GTRTO** command and the *<command option>* is 1, the terminal reports its current position by sending the message +**RESP:GTRTL** if successful acquisition. Or the last known position is sent. (Refer to chapter 4.5.2)

If falling accident is detected, the +**RESP:GTMSA** message will be sent to the backend server. (Refer to chapter 4.6)

If a bound SIM card is replaced by unbound SIM card, the +**RESP:GTBND** message will be sent to the backend server. (Refer to chapter 4.13)

If non movement is detected by motion sensor, according to the setting of **AT+GTNMD**, the +**RESP:GTNMR** message will be sent to the backend server.

➢   +**RESP:GTEST,**
➢   +**RESP:GTSOS,**
➢   +**RESP:GTRTL,**
➢   +**RESP:GTMSA,**
➢   +**RESP:GTBND,**
➢   +**RESP:GTNMR,**

Example:
+**RESP:GTEST,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000
000,0460,0000,18d8,6141,00,11F0,0102070202**

+**RESP:GTSOS,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000
000,0460,0000,18d8,6141,00,11F0,0102070202**

+**RESP:GTRTL,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000
000,0460,0000,18d8,6141,00,11F0,0102070202**

+**RESP:GTMSA,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,2009010100
0000,0460,0000,18d8,6141,00,11F0,0102070202**

+RESP:GTBND,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,2009010100
0000,0460,0000,18d8,6141,00,11F0,0102070202

+RESP:GTNMR,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,2009010100
0000,0460,0000,18d8,6141,00,11F0,0102070202

Parameter	Length(byte)	Range/Format	Default
unique ID	15	IMEI	
number	2	1	
reserved	1		0
reserved	1		0
GPS fix	1	0|1	
speed	<=5	(0.0-999.9)Km/h	
heading	<=3	0-359	
altitude	<=10	(xxxxx.x)m	
GPS accuracy	2	0-50	
longitude	<=20	xxx.xxxxxx	
latitude	<=20	xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
mcc	4	0XXX	
mnc	4	0XXX	
lac	4		
cellid	4		
reserved	2		00
count num	4		
ver	10	HHHHSSPPPP	

✧ <number>: The number of position in the report message. It is always "1" for the following five report messages:

+RESP:GTEST / +RESP:GTSOS / +RESP:GTRTL /
+RESP:GTMSA / +RESP:GTBND / +RESP:GTNMR

✧ <reserved>: This parameter field is reserved.
✧ <GPS fix>: 1: Successful GPS fixing; 0: Failure of GPS fixing.
✧ <speed>: Speed over ground. Accurate to one decimal.
✧ <heading>: azimuth in degrees.
✧ <altitude>: altitude of the terminal. Accurate to one decimal.
✧ <GPS accuracy>: The HDOP defined in NMEA0183. The range of value is 0-50. The smaller the value is the higher the accuracy.
✧ <GPS UTC time>: UTC time from GPS. If there is no successful GPS fix, use UTC time converted from the local time in this field.
✧ <mcc>: Mobile country code. It is 3 digits in length and ranges from 000-999.
✧ <mnc>: Mobile network code. It is 3 digits in length and ranges from 000-999.
✧ <lac>: Location area code in hex format.
✧ <cellid> : Cell ID in hex format.
✧ <reserved>: This parameter field is reserved, always 00.
✧ <count num>: Similar to the acknowledgement messages, all the report messages also include

this parameter field.

The message **+RESP:GTGEO** is used to notify when the terminal enters or exits the Geo-Fence. (Refer to chapter 4.4)

➢ **+RESP:GTGEO,**

Example:
+RESP:GTGEO,135790246811220,1,3,0,1,4.3,92,70.0,1,121.354335,31.222073,2009010100 0000,0460,0000,18d8,6141,00,11F0,0102070202

Parameter	Length(byte)	Range/Format	Default
unique ID	15	IMEI	
number	2	1	
geofence id	1	0-4	
geofence alert	1	0|1	
GPS fix	1	0|1	
speed	<=5	(0.0-999.9)Km/h	
heading	<=3	0-359	
altitude	<=10	(xxxxx.x)m	
GPS accuracy	2	0-50	
longitude	<=20	xxx.xxxxxx	
latitude	<=20	xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
mcc	4	0XXX	
mnc	4	00XX	
lac	4		
cellid	4		
ta	2		
count num	4		
ver	10	HHHHSSPPPP	

✧ *<number>*: The number of position in the report message. It is always "1" in the **+RESP:GTGEO** message.

✧ *<geofence id>*: Corresponding to the *<geofence id>* of command **AT+GTGEO**, it indicates which Geo-Fence alarm is reported.

✧ *<geofence alert>*: 0: The terminal leaves the Geo-Fence; 1: The terminal enters the Geo-Fence.

If the "fixed timing report" function is set successfully by the command **AT+GTTRI**, the terminal reports the **+RESP:GTTRI** message periodically.(Refer to chapter 4.3)

+RESP:GTTRI,

Example:
+RESP:GTTRI,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000 000,0460,0000,18d8,6141,00,11F0,0102070202

+RESP:GTTRI,135790246811220,2,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000 000,0460,0000,18d8,6141,00,1,-3.6,145,30.0,2,121.354442,31.221940,20090101000100,0460, 0000,18d8,6141,00,11F0,0102070202			
Parameter	Length(byte)	Range	Default
unique ID	15	IMEI	
number	2	0-15	
reserved1	3	0	0
reserved2	1	0	0
GPS fix	1	0|1	
speed	<=5	(0.0-999.9|-1)Km/h	
heading	<=4	0-359	
altitude	<=10	(xxxxx.x)m	
GPS accuracy	2	0-50	
longitude	<=20	xxx.xxxxxx	
latitude	<=20	xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
mcc	4	0XXX	
mnc	4	0XXX	
lac	4		
cellid	4		
reserved	2		00
count num	4		
ver	10	HHHHSSPPPP	

✧ <number>: The number each position log in the message. Every position log includes the boldfaced parameters (from <GPS fix> to <reserved>) in the above table.

This message is used to send the last known GPS location, **+RESP:GTLGL.** The GPS fix field is always 0 to mark it as dated. The GSM tower data is obtained when sending the message.

➢ **+RESP:GTLGL,**

Example: **+RESP:GTLGL,135790246811220,1,0,0,0,4.3,92,70.0,1,121.354335,31.222073,2009010100 0000,0460,0000,18d8,6141,00,11F0,0102070202**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
number	2	1	
MSA/SOS	1	0|1	
reserved	1		0
GPS fix	1	0	0
speed	<=5	(0.0-999.9)Km/h	
heading	<=3	0-359	
altitude	<=10	(xxxxx.x)m	
GPS accuracy	2	0-50	
longitude	<=20	xxx.xxxxxx	

latitude	<=20	xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
mcc	4	0XXX	
mnc	4	0XXX	
lac	4		
cellid	4		
reserved	2		00
count num	4		
ver	10	HHHHSSPPPP	

✧ *<MSA/SOS>* : 0 means this message is triggered by MSA function, 1 means triggered by SOS function.

✧ *<GPS fix>* : always 0 for **+RESP:GTLGL**

3.3.2. Report for Location by Call

If location by call is enabled, the device will send out its current location according to the working mode. (Refer to chapter 4.2.4)

If location by call is set to working mode 1, whenever there is a incoming call, the device will send +RESP:GTLBC to the backend server.

➢ **+RESP:GTLBC**

Example:
+RESP:GTLBC,135790246811220,13888888888,1,4.3,92,70.0,1,121.354335,31.222073,2009 0101000000,0460,0000,18d8,6141,00,11F0,0102070202

Parameter	Length(byte)	Range/Format	Default
unique ID	15	IMEI	
incoming call number	<=20		
GPS fix	1	0|1	
speed	<=5	(0.0-999.9)Km/h	
heading	<=3	0-359	
altitude	<=10	(xxxxx.x)m	
GPS accuracy	2	0-50	
longitude	<=20	xxx.xxxxxx	
latitude	<=20	xx.xxxxxx	
GPS UTC time	14	YYYYMMDDHHMMSS	
mcc	4	0XXX	
mnc	4	00XX	
lac	4		
cellid	4		
ta	2		
count num	4		

ver	10	HHHHSSPPPP	

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

3.3.3.   Report Google Maps hyperlink

According to the setting of locaiont by call and the command option of **AT+GTRTO**, the device can report its current location with Google Maps hyperlink.

If location by call is set to working mode 2 ~ 4, the device will sent its current position to the incoming call via SMS with Google Maps hyperlink.

If the command option of **AT+GTRTO** set to **B**, the device will send its current position to the originating phone number via SMS with Google Maps hyperlink.

➢ **Google Maps hyperlink**

Example:			
http://maps.google.com/maps?q=31.222073,121.354335			
F1 D2009/01/01T00:00:00 B74%			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Google Maps hyperlink header	30	http://maps.google.com/maps?q=	http://maps.google.com/maps?q=
latitude	<=20	xx.xxxxxx	
longitude	<=20	xxx.xxxxxx	
GPS fix	2	F1|F0	
GPS UTC time	20	DYYYY/MM/DDTHH:MM:SS	
battery level	<=5	B1~100%	

3.3.4.   Report for Querying

When the **AT+GTRTO** command is queried, the terminal will answer with the corresponding report messages. (Refer to chapter 4.5)

GTCID: Report the ICCID of the SIM card in the terminal.

GTHWV: Report the hardware version.

GTLGT: Report the last successful GPS fixing time.

GTCBC: Report the battery level (in percent).

➢ **+RESP:GTCID,**

➢ **+RESP: GTHWV,**

➢ **+RESP: GTLGT,**

> +**RESP:GTCBC,**

Example:
**+RESP:GTCID,135790246811220,898600810906F8048812,20090101000000,11F0,01020702
02**
+RESP:GTHWV,135790246811220,GT300HW0102,20090101000000,11F0,0102070202
+RESP:GTLGT,135790246811220,20090101100825,20090101000000,11F0,0102070202
+RESP:GTCBC,135790246811220,94,20090101000000,11F0,0102070202

Parameter	Length(byte)	Range/Format	Default
unique ID	15	IMEI	
content	<=30		
send time	14	YYYYMMDDHHMMSS	
count num	4		
ver	10	HHHHSSPPPP	

✧ <content> : the report content of the message.

✧ <send time>: UTC time converted from the terminal local time when sending the message.

GTCSQ: Report GSM signal level
GTSWV: Report software version

> +**RESP:GTCSQ,**
> +**RESP: GTSWV,**

Example:
+RESP:GTCSQ,135790246811220,16,0,20090101000000,11F0,0102070202
**+RESP:GTSWV,135790246811220,0824B07GT300M128_TOSHIBA,V03,20090101000000,
11F0,0102070202**

Parameter	Length(byte)	Range/Format	Default
unique ID	15	IMEI	
content1	<=30		
content2	<=30		
send time	14	YYYYMMDDHHMMSS	
count num	4		
ver	10	HHHHSSPPPP	

✧ <content1>: The first part of report content.

✧ <content2>: The second part of report content.

When the message is +**RESP:GTCSQ**, content1 indicates <rssi>, content2 indicates <ber>:

<rssi>   GSM signal strength

0:        <-113(dBm)

1:        -111(dBm)

2…30:   -109…-53(dBm)

31:       >-51(dBm)

99:       Unknown or none

<ber>   GSM signal quality. The range is 0-7, 99 for unknown or none.

When the message is **+RESP:GTSWV**, *<content1>* indicates software version, *<content2>* indicates sub software version.

+RESP:GTINF: periodically report the following information: ICCID, CSQ, battery level, charger connected, Time and Date menu status, offset of time zone and daylight saving setting.

➢ **+RESP:GTINF,**

Example: +RESP:GTINF,135790246811220,898600810906F8048812,16,0,91,0,+8.00,0,20090101000000,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
iccid	20		
rssi	<=2	0-31,99	
ber	2	0-7|99	
battery level	<=3	1-100	
charger connected	1	0|1	
hide time menu	1	0|1	
offset of time zone	<=6		
daylight saving	1	0|1	
send time	14	YYYYMMDDHHMMSS	
count num	4		
ver	10	HHHHSSPPPP	

✧ *<iccid>*: ICCID of SIM card.

✧ *<battery level>*: The battery level (in percent).

✧ *<charger connected>*: 0: the charger is connected. 1: the charger is not connected.

✧ *<offset of time zone>*: the offset of the time zone according to the current home city setting.

GTALL: Read all of the parameters

➢ **+RESP:GTALL,**

Example: +RESP:GTALL,135790246811220,0,0,10,cmnet,,,124.79.182.171,7001,124.79.182.171,7003, +8613888888888,0,80,0,,1,1000,2300,5,60,1,20,500,3,Geo0,,,,,3,Geo1,,,,,3,Geo2,,,,,3,Geo3,121 .412248,31.187891,1000,10,3,Geo4,,,,,3,1,1,3,5,+8613888888888,0,0,1,1,+8613888888888,3,5, 3,4,2,1,8,+8.00,0,0,3,4,1,2,0800,2000,0,20090101000000,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
configuration content	<=450	*<unique ID>,* *<report mode>,<reserved>,<reserved>,* *<APN>,* *<APN user name>,<APN user password>,* *<main server ip>,<main server port>,* *<second server ip>,<second server port>,* *<main sms gateway>,* *<location by call>,* *<speed alarm>,<info report>,* *<reserved>,<SIM contact menu enable>,* *<begin time>,<end time>,*	

		<send interval>,<fix interval>, *<movement detect mode>,* *<movement speed>,<movement distance>,* *<movement send number>,* Geo0,*<longitude0>,<latitude0>,<radius0>,* *<check interval0>,<geofence type0>,* Geo1,*<longitude1>,<latitude1>,<radius1>,* *<check interval1>,<geofence type1>,* Geo2,*<longitude2>,<latitude2>,<radius2>,* *<check interval2>,<geofence type2>,* Geo3,*<longitude3>,<latitude3>,<radius3>,* *<check interval3>,<geofence type3>,* Geo4,*<longitude4>,<latitude4>,<radius4>,* *<check interval4>,<geofence type4>,* *<msa enable>,<send last position>,* *<msa sensitivity>,<msa timeout>,* *<falling call>,* *<reserved>,<reserved>,* *<SOS mode>,<send last position>,* *<SOS number>,* *<normal speech volume>,* *<hands-free speech volume>,* *<headset speech volume>,* *<normal ring tone volume>,* *<headset ring tone volume>,* *<hide time menu>,* *<home city index>,<time zone offset>,* *<daylight saving>,* *<check binding enable>,* *<NMD working mode>,* *<rest duration>,<motion duration>,* *<TRI max>,<start>,<end>,<send mode>*	
send time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

If use **AT+GTPHB** to read the local phone book, the device will report to the backend server by message +**RESP:GTPHB**.

➢ **+RESP:GTPHB,**

Example: +RESP:GTPHB,135790246811220,1,0,Alice,+8613888888888,20090101000000,11F0,0102070202 +RESP:GTPHB,135790246811220,1,1,205F094E,+8613888888888,20090101000000,11F0,0102070202 +RESP:GTPHB,135790246811220,1,0,Alice,+8613888888888,2,1,205F094E,+8613888888888,3,,,,4,,,,5,,,,6,,,,7,,,,8,,,,9,,,,10,,,,11,,,,12,,,,13,,,,14,,,,15,,,,16,,,,17,,,,18,,,,19,,,,20,,,,20090101000000,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
unique ID	15	IMEI	
record index	<=2	1-20	
DCS	1	0|1	
name	<=56		

phone number	<=20		
send time	14	YYYYMMDDHHMMSS	
count num	4		
ver	10	HHHHSSPPPP	

✧ *<record index>* - *<phone number>*: each phone book entry contains *<record index>*, *<DCS>*, *<name>* and *<phone number>*.

3.3.5. Report to Indicate

GTPNA: Power on report

GTPFA: Power off report

GTPLA: Power low report

GTBTC: Start charging report

GTSTC: Charge complete report.

➢ **+RESP:GTPNA,**

➢ **+RESP:GTPFA,**

➢ **+RESP:GTPLA,**

➢ **+RESP:GTBTC,**

➢ **+RESP:GTSTC,**

Example:
+RESP:GTPNA,135790246811220,20090101000000,11F0,0102070202
+RESP:GTPFA,135790246811220,20090101000000,11F0,0102070202
+RESP:GTPLA,135790246811220,20090101000000,11F0,0102070202
+RESP:GTBTC,135790246811220,20090101000000,11F0,0102070202
+RESP:GTSTC,135790246811220,20090101000000,11F0,0102070202

Parameter	Length(byte)	Range/Format	Default
unique ID	15	IMEI	
send time	14	YYYYMMDDHHMMSS	
count num	4	0000-FFFF	
ver	10	HHHHSSPPPP	

3.4. Heart Beat Data

The heart beat data is sent from the terminal to the backend server in order to maintain the long-connection of TCP.

➢ **AT+GTHBD=**

Example:			
AT+GTHBD=HeartBeat,135790246811220,20090101000000,11F0,0102070202			
Parameter	**Length(byte)**	**Range/Format**	**Default**
content	9	HeartBeat	
unique ID	15	IMEI	
send time	14	YYYYMMDDHHMMSS	
count num	4		
ver	10	HHHHSSPPPP	

✧ <*content*>: string "HeartBeat".

The backend server SHOULD respond with:

➢ **+RESP:GTHBD,**

Example:			
+RESP:GTHBD,GPRS ACTIVE,HeartBeat,135790246811220,20090101000000,11F0			
Parameter	**Length(byte)**	**Range/Format**	**Default**
content1	11	GPRS ACTIVE	
content2	9	HeartBeat	
unique ID	15	IMEI	
send time	14	YYYYMMDDHHMMSS	
count num	4		

✧ <*content1*>: string "GPRS ACTIVE".

✧ <*content2*>: string "HeartBeat".

4. Develop User Guide

4.1. Register

4.1.1. Connection Mode

The @Tracker Air Interface supports SMS and GPRS data communication via the GSM network and can be configured to use one or the other exclusively or automatically switch between the two by the parameter <*report mode*> of **AT+GTSRI**.

If GPRS is enabled via the appropriate report mode setting, then the GPRS connection parameters are used to establish GPRS sessions. The @Track Protocol supports both TCP and UDP transport protocols.

The following lists the detail settings of <*report mode*>.

✧ TCP Short Connection + SMS

In this mode, the terminal uses the TCP short connection as the default mode and uses SMS as the backup. When there is data need to be sent, the terminal will establish a short connection to the backend server via TCP protocol and send the data.   If fail to send the data, it will then send the same data via SMS again.

✧ TCP Short Connection

In this mode, the terminal connects to the backend server via TCP protocol each time it needs to send data and shuts down the connection after the data transmission.

✧ TCP Long Connection

In this mode, the terminal connects to the backend server via TCP protocol after it powers on, then keeps the connection alive and uses it all the time unless the connection is broken.   If the connection is broken, the terminal will try to connect to the backend server again and maintain the new connection.

To maintain the connection, the terminal sends heart beat data to the backend server periodically and the backend server responds to each of the heart beat data.   In this way, both sides can confirm the connection is alive.

This is the only mode that the backend server could send commands to the terminal via TCP connection.   In other words, the backend server can send commands to the terminal either via SMS or via TCP connection in the TCP long connection mode.

✧ UDP Mode

In this mode, the terminal sends data to the backend server via UDP protocol.

✧ Force on SMS

In this mode, the terminal will communicate exclusively via SMS.

The following lists the details and examples of these connection modes.

➤ **TCP Short Connection + SMS Mode**

✧ Set *<report mode>* as 0 using the **AT+GTSRI** command.
✧ In this mode, the terminal will establish a socket with the backend server for every message.
✧ The terminal will use the secondary backend server for backup in case sending data to the main server fails.
✧ The terminal will use the SMS server as backup in case failing to send data to both main server and backup server via TCP.

Example:

Configure the terminal with the command as follows:

AT+GTSRI=gt300,**0**,cmnet,,,124.79.182.171,7001,+8613888888888,0000

Please note that the boldfaced "**0**" means "TCP short connection + SMS mode".

The backend server sends the acknowledgement message to confirm:

+ACK:GTSRI,135790246811220,0000,20090112104725,000A,0102070202

➤ **TCP Short Connection Mode**

✧ Set *<report mode>* as 1 using the **AT+GTSRI** command.
✧ In this mode, the terminal will establish a socket with the backend server for every message.
✧ The terminal will use the secondary backend server for backup in case sending data to the main server fails.

Example:

Configure the terminal with the command as follows:

AT+GTSRI=gt300,**1**,cmnet,,,124.79.182.171,7001,+8613888888888,0000

Please note that the boldfaced "**1**" means "TCP short connection mode".

The backend server sends the acknowledgement message to confirm:

+ACK:GTSRI,135790246811220,0000,20090112104725,000A,0102070202

➤ **TCP Long Connection Mode**

✧ Set *<report mode>* as 2 by the **AT+GTSRI** command.
✧ The terminal will connect to the backend server by TCP protocol after power on, maintaining the connection and will never disconnect. If the connection is dropped by the network, the terminal will try to connect again.

✦ The terminal checks the connection status by heartbeat data. (For heartbeat, please refer to chapter 3.4). The terminal will send the **AT+GTHBD** special command to the backend server every specified period of time. The backend server will reply with the message **+RESP:GTHBD**. If the terminal cannot receive this message from the backend server, the connection will be considered as dropped.

✦ In this mode, the terminal does not attempt to connect to the secondary server or SMS gateway even though the main server cannot be accessed successfully.

Example:

The following command is used:

AT+GTSRI=gt300,**2**,cmnet,,,124.79.182.171,7001,+8613888888888,0000

Please note that the boldfaced "**2**" means "TCP long connection mode".

After the terminal receives the configuration command successfully, it will give the following acknowledgement message:

+ACK:GTSRI,135790246811220,0000,20090112104725,000A,0102070202

➢ **UDP Mode**

✦ Set *<report mode>* as 3 by the **AT+GTSRI** command.

✦ The terminal sends all messages via UDP protocol.

Example:

The following is an example for configuration:

AT+GTSRI=gt300,**3**,cmnet,,,124.79.182.171,7001,+8613888888888,0000

Please note that the boldfaced "**3**" means "**UDP** mode"

The configuration is done when the backend server receives the following message:

+ACK:GTSRI,135790246811220,0000,20090112104725,000a,0102070202

➢ **Force on SMS Mode**

✦ Set the *<report mode>* as 4 using the **AT+GTSRI** command.

✦ All of the messages are sent by SMS in this mode except when the "Fixed timing report" is in "emergency mode" in which case the report message will be sent by TCP.

✦ Due to the limited length of SMS, the report messages **+RESP:GTALL** will be sent via TCP short connection..

Example:

Configure the terminal with the command:

AT+GTSRI=gt300,**4**,cmnet,,,124.79.182.171,7001,+8613888888888,0000

Please note that the boldfaced "**4**" means "Force on SMS Mode".

The configuration is done when the backend server receives the following message:

+ACK:GTSRI,135790246811220,0000,20090112104725,000A,0102070202

4.1.2. Server Setting

If GPRS is enabled via the appropriate report mode settings, the GPRS connection parameters are used to establish GPRS sessions. The @Track Protocol supports UDP and TCP transport protocols. UDP is a connectionless protocol that generally requires less overhead than TCP, but TCP has a number of advantages that may make it the preferred choice of transport protocol for smaller deployments.

In all cases, the GPRS APN is provided by the network provider and determines how the terminal connects to the GPRS network and is authenticated.

The GPRS destination address includes both the IP Address and Port Number of the application server.

The @Track Protocol does not use DNS in the GPRS Destination Address translation. The @Track Protocol operates exclusively with the IP Addresses and Port Numbers.

> **Set the IP Address and Port Number of Main Server**

✧ Set the IP address and port number of the main server with the **AT+GTSRI** command.

✧ The main server will be the first choice of data sending, except in "Force on SMS mode"

Example:

Configure the terminal with the command:

AT+GTSRI=gt300,0,cmnet,,,**124.79.182.171**,**7001**,+8613888888888,0000

In the above command, "**124.79.182.171**" is the IP address and "**7001**" is the port number.

The configuration is done when the backend server receives the following message:

+ACK:GTSRI,135790246811220,0000,20090112104725,000A,0102070202

> **Set the Phone Number of Main SMS Gateway**

✧ Set the phone number of main SMS gate with the **AT+GTSRI** command.

✧ All data are sent to the main SMS gateway in "Force on SMS mode"

✧ SMS gate will be the backup for data sending when in "TCP short connection + SMS mode".

Example:

Configure the terminal with the command:

AT+GTSRI=gt300,4,cmnet,,,124.79.182.171,7001,**+8613888888888**,0000

In the above command, "**+8613888888888**" is the phone number of the SMS gateway. Short code such as "**10086**" is also supported.

The configuration is done when the backend server receives the following message:
+ACK:GTSRI,135790246811220,0000,20090112104725,000A,0102070202

> **Set the IP Address and Port of Secondary Server**

✧ Set the IP address and port of the secondary server with the command **AT+GTBEI**.

✧ In "TCP short connection mode" and "TCP short connection + SMS mode", if the main server cannot be accessed the terminal will try to send data to the secondary server.

Example:

Configure the terminal with the command:

AT+GTBEI=gt300,,,0,80,0,0,10,**124.79.182.171**,**7003**,,,0,0001

In the above command, "**124.79.182.171**" is the IP address of the secondary server and "**7003**" is the port of the secondary server.

The configuration is done when the backend server receives the following message:
+ACK:GTBEI,135790246811220,0001,20090112104725,000A,0102070202

4.1.3. Set APN Parameters

Set APN parameters *<apn>*, *<apn user name>*, *<apn user password>* with the **AT+GTSRI** command.

Example:

Configure the terminal with the command:

AT+GTSRI=gt300,0,**cmnet**,,,124.79.182.171,7001,+8613888888888,0000

In the above command, "**cmnet**" is the APN of GPRS network, where the *<apn user name>* and *<apn user password>* parameters are empty for the APN "cmnet". The end-user can get the APN information from the network provider.

The configuration is done when the backend server receives the following message:
+ACK:GTSRI,135790246811220,0000,20090112104725,000A,0102070202

4.2. Basic Equipment Information

The backend server can use the **AT**+**GTBEI** command to configure several overall configuration of the equipment, including 'over speed alarm', 'report information periodically' and 'SIM contact menu visibility'.

4.2.1 Over Speed Alarm

The backend server can set a speed threshold for the terminal. The terminal will report its position and speed to the backend server when its moving speed is over this threshold. The setting of over speed alarm is done by the **AT**+**GTBEI** command.

Please note that the terminal will check the speed every time after a successful GPS fixing.

Example:

Enable "over speed alarm":

AT+GTBEI=gt300,,,0,**80**,0,0,10,124.79.182.171,7003,,,0,0001

This command will enable "over speed alarm" and the speed threshold is 80km/h.

The acknowledgement from the terminal:

+ACK:GTBEI,135790246811220,0001,20090112104725,000A,0102070202

The over speed alarm is reported from the terminal:

+RESP:**GTEST**,135790246811220,1,0,0,1,**85.3**,92,70.0,1,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,11F0,0102070202

To disable over speed alarm, just set the speed threshold to "0":

AT+GTBEI=gt300,,,0,**0**,0,0,10,124.79.182.171,7003,,,0,0001

4.2.2 Report Information Periodically

The backend server can configure the terminal to report information periodically by **AT+GTBEI** command. The parameter *<info report>* is used to configure the reporting period, and the unit is minute.

Example:

The following is an example of this function:

AT+GTBEI=gt300,,,0,80,**2**,0,10,124.79.182.171,7003,,,0,0001

This command configures the terminal to periodically report information every 2 minutes.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTBEI,135790246811220,0001,20090112104725,000A,0102070202

The terminal then periodically reports the information (ICCID, GSM signal level, battery level, the status of charger, Time and Date menu status, offset of time zone and the daylight saving setting) by message **+RESP:GTINF**. The following is an example of a report message:

+RESP:GTINF,135790246811220,**898600120907F6015733**,**16**,**0**,**91**,**0**,**1**,**+8.00**,**0**,20090101000000,11F0,0102070202

898600120907F6015733: *<ICCID>*

16: *<rssi>*

0: *<ber>*

91: *<battery level>*

0: *<charger connected>*

1: *<hide time menu>*

+8.00: *<offset of time zone>*

0: *<daylight saving>*

4.2.3 Remote SIM Contact Control

The backend server can use command **AT+GTBEI** to control the visibility of the SIM contact menu of the terminal.   If the menu is disabled, the end user can not access the information of the SIM contacts via the GUI menu of the terminal.   But the terminal can still use the SIM contacts information to match the incoming call and incoming message when proper.

Example 1:
To enable the SIM contact menu, configure the terminal with the following command:
AT+GTBEI=gt300,,,0,80,2,0,10,124.79.182.171,7003,,,**1**,0001

Example 2:
To disable the SIM contact menu, configure the terminal with the following command:
AT+GTBEI=gt300,,,0,80,2,0,10,124.79.182.171,7003,,,**0**,0001

The configuration is done when the backend server receives the following message:
+ACK:GTBEI,135790246811220,0001,20090112104725,000A,0102070202

4.2.4 Location by Call

The device supports to report its location by a phone call. The location by call function has total four working modes. According to the working mode, the device will use different reporting format and different destination to send its current position.

Example 1:

The working mode 1: under this working mode, the device will report its current location to the backend server by message +**RESP:GTLBC** when there is an incoming call. The report message will be sent according to the setting of *<report mode>*.

AT+GTBEI=gt300,,,**1**,80,2,0,10,124.79.182.171,7003,,,1,0001

In the message +**RESP:GTLBC** will include the phone number of the incoming call to let the backend server process the response accordingly.

+RESP:**GTLBC**,135790246811220,**13888888888**,1,4.3,92,70.0,1,121.354335,31.222073,200901
01000000,0460,0000,18d8,6141,00,11F0,0102070202

Example 2:

The working mode 2: under this working mode, when there is an incoming call, the device will first try to find it in the local phone book. If there is a match, the device then reports its current location to the incoming call number via SMS with a Google Maps hyperlink. No match found, no report.

AT+GTBEI=gt300,,,**2**,80,2,0,10,124.79.182.171,7003,,,1,0001

In the response SMS message, besides a Google Maps hyperlink to the current position, it also report whether it is a successful fix, the UTC time from the GPS chip and the current battery level.

http://maps.google.com/maps?q=31.222073,121.354335
F1 D2009/01/01T00:00:00 B74%

http://maps.google.com/maps?q=31.222073,121.354335 is the hyperlink to the current location in Google Maps.

F1 indicates it is a successful fix while **F0** will be fail-to-fix.

D2009/01/01T00:00:00 is the UTC time when obtaining the position information.

B74% indicates that the battery level is 74%.

Example 3:

The working mode 3: under this working mode, when there is an incoming call, the device will not check the source of the incoming call. It will send its current location to each incoming call number via SMS with a Google Maps hyperlink.

AT+GTBEI=gt300,,,**3**,80,2,0,10,124.79.182.171,7003,,,1,0001

The response is same as working mode 2.

http://maps.google.com/maps?q=31.222073,121.354335
F1 D2009/01/01T00:00:00 B74%

Example 4:

The working mode 4: under this working mode, when there is an incoming call, the device will fist hang up the incoming call. Then it will send its current location to each incoming call number via SMS with a Google Maps hyperlink. This mode is mostly used in an emergency situation while you do not want the device notifies that there is an incoming call. Beware, under this mode the users of the device will never know there is an incoming call nor can they pick it up.

AT+GTBEI=gt300,,,**4**,80,2,0,10,124.79.182.171,7003,,,1,0001

The response is same as working mode 2.

http://maps.google.com/maps?q=31.222073,121.354335
F1 D2009/01/01T00:00:00 B74%

4.3. Fixed Timing Report

4.3.1. Basic Setting

"Fixed timing report" is a basic function of the @Track Protocol. The backend server can configure the *<start time>* and *<end time>* to schedule periodical position reports. In the pre-defined period of time, the terminal will start up GPS every *<fix interval>* time and report the recorded position log to the backend server every *<send interval>* time.

Example:
The following is an example of "fixed timing report":
AT+GTTRI=gt300,**1000**,**2300**,**5**,**60**,1,20,500,3,0002
<start time> = 1000
<end time> = 2300
<send interval> = 5
<fix interval> = 60

➢ **Fix and send interval**

The terminal has two modes to operate the GPS module according to the value of *<fix interval>*:
✧ "Normal mode": If the *<fix interval>* is more than 60 seconds, the terminal will close the GPS part every time after GPS fixing finishes in order to save power.
✧ "Emergency mode": If the *<fix interval>* is less than 60 seconds, the terminal will never close the GPS part. In this mode, the *<send interval>* will be ignored, the terminal reports every *<fix interval>* time, and the minimum value of *<fix interval>* is forced to 30 seconds.

Due to the maximum length limitation of the report message, it must be assured that: *<send interval>* / *<fix 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>* = 4) while the *<send interval>* / *<fix 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).

If either *<send interval>* or *<fix Interval>* is 0, the fixed timing report will be disabled.

➢ **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.

Examples:

AT+GTTRI=gt300,**1000,2300**,**8**,**120**,1,20,500,3,0002

✧ Reports from 10:00 to 23:00 every day.

✧ Power on GPS every 120 seconds and power off after GPS fixing finishes.

✧ Send fixed timing report every 8 minutes.

✧ Please note in this example each fixed timing report message will include 4 (8*60/120) position records.

AT+GTTRI=gt300,1000,2300,5,**30**,1,20,500,3,0002

The terminal will enter "emergency mode" as the *<fix interval>* is less than 60 seconds, and the GPS part will never be closed. The terminal will report the real time position every 30 seconds.

AT+GTTRI=gt300,**1000,1000**,5,60,1,20,500,3,0002

The terminal will report on the whole day as the *<begin time>* is equal to the *<end time>*.

AT+GTTRI=gt300,1000,2300,**0**,60,1,20,500,3,0002

The fixed timing report is disabled as the *<send interval>* is "0".

4.3.2. Movement Detect

The "Movement Detect" function is used to temporarily disable the fixed timing report when the terminal stays in the same place without moving for a long time in order to save the communication cost and power consumption.

Examples:

An example is given as following:

AT+GTTRI=gt300,1000,2300,5,60,**1**,**20**,**500**,**3**,0002

<movement detect mode> = 1;

<movement speed> = 20;

<movement distance> = 500;

<movement number> = 3.

The parameter *<movement detect mode>* is used to enable/disable the movement detect function.

The terminal will check the movement status according to *<movement speed>* and *<movement distance>*:

✧ If the distance between current position and previous is longer than *<movement distance>* (in meter), the terminal will be considered as moving.

✧ If the speed is faster than *<movement speed>* (in km/h), the terminal will be considered as moving.

The method to report is described as following:

If the terminal is regarded as staying at one position, the terminal will then report its position only 'max send' times.   After that, it discards all the position information until the terminal is regarded as moving again.

When this feature is enabled, the speed would be set to -1 for those points regarded as staying at the same position.

4.4. Geo-Fence Alarm Setting

Up to 5 Geo-Fence regions can be defined on the terminal. Each Geo-Fence region is defined as a circular region defined by a center point and radius. The terminal will report the status when it enters or leaves one of the Geo-Fence areas.

Geo-Fence checking will only be trigged after successful GPS fixing. The <check interval> indicates how often the terminal will check the GPS position. Prior to the first successful GPS fixing after power on, the terminal will consider itself outside of all Geo-Fence regions. This means that if the terminal powers on in one of the Geo-Fence regions, it will report an entering status to the backend server. Otherwise it will not report until the Geo-Fence status changes.

The terminal will report a leaving status to the backend server if necessary when it leaves the Geo-Fence regions. The terminal will report an entering status to the backend server if necessary when it enters the Geo-Fence regions.

Example:
AT+GTGEO=gt300,**1**,121.412248,31.187891,1000,10,**2**,0003
"**1**" means Geo-Fence 1. "**2**" means to report an alarm message only when leaving Geo-Fence 1.

The terminal sends the following acknowledgement message:
+ACK:GTGEO,135790246811220,0003,20090202170812,000A,0102070202

The report message:
+RESP:GTGEO,135790246811220,1,**1,0**,1,4.3,92,70.0,1,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,11F0,0102070202
The "**1**" indicates Geo-Fence 1; "**0**" means leave. The report message indicates that the terminal has left Geo-Fence 1 and its current position is (121.354335, 31.222073).

4.5. Real Time Operation

4.5.1. Get the Latest Successful GPS Fixing Time

If the terminal has finished a successful GPS fixing, it will record its latest corresponding UTC time. The backend server can get the UTC time by using the **AT+GTRTO** command.

If the GPS fixing fails after the terminal is powered on, the backend server will get the default GPS time.

Example:

AT+GTRTO=gt300,**0**,0004

"**0**" means to get the latest successful GPS fixing time.

The terminal sends the following acknowledgement message:

+ACK:GTRTO,135790246811220,**LGT**,0004,20090202170812,000A,0102070202

The terminal then reports the latest successful GPS fixing time to backend server as following:

+RESP:**GTLGT**,135790246811220,**20090202091014**,20090202170812,000A,0102070202

4.5.2. Real Time Locate

Example:

If the backend server wants to get the real time location of the terminal, it can send the following command to the terminal:

AT+GTRTO=gt300,**1**,0004

"**1**" means to get the real time location of the terminal.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**RTL**,0004,20090202172647,000A,0102070202

The terminal will then report the real time position to backend server with the following commands:

+RESP:**GTRTL**,135790246811220,1,0,0,1,0.0,189,32.0,6,121.354647,31.222080,200902270713 27,0460,0000,18d8,3072,00,000f, 0102070202

4.5.3. Get All Configuration

Example:

If the backend server wants to get all configurations of the terminal, send the following command

to the terminal:

AT+GTRTO=gt300,**2**,0004

In the above command, "**2**" will get all configurations of the terminal.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**READ**,0004,20090202172647,000A,0102070202

The terminal will then report all parameters as following:

+RESP:**GTALL**,135790246811220,0,0,10,cmnet,,,124.79.182.171,7001,124.79.182.171,7003,+8
613888888888,80,0,+8613888888888,1,1000,2300,5,60,1,20,500,3,Geo0,,,,,3,Geo1,,,,,3,Geo2,,,,,
3,Geo3,121.412248,31.187891,1000,10,3,Geo4,,,,,3,1,3,5,+8613888888888,0,0,1,+861388888888
8,3,5,3,4,2,1,8,+8.00,0,20090101000000,11F0,0102070202

Please note that "+RESP:**GTALL**" will NOT be sent through SMS.

4.5.4. Reboot the Terminal

Example:

If the backend server is required to reboot the terminal, send the following command to the terminal:

AT+GTRTO=gt300,**3**,0004

"**3**" means to reboot the terminal.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**REBOOT**,0004,20090202172647,000A,0102070202

After that the terminal will reboot.

4.5.5. Reset to Factory Setting

When the terminal receives the instruction, all configurations will be reset to the factory setting except *<main server ip>*, *<main server port>*, *<apn>*, *<apn user name>*, *<apn user password>*, *<report mode>*, *<main sms gateway>*, local phone book and volume settings.

Example:

Reset the configurations to factory setting with the command:

AT+GTRTO=gt300,**4**,0004

"**4**" means to reset configurations to factory setting.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,RESET,0004,20090202172647,000A,0102070202

Note: The backend server can query the parameters of the terminal by using the **AT+GTRTO** command.

4.5.6.   Get the ICCID of SIM Card

Example:

If the backend server wants to get the ICCID of the SIM card inserted in terminal, send the following command to terminal:

AT+GTRTO=gt300,**5**,0004

"**5**" means this command is used to get the ICCID of the SIM card inserted in the terminal.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**CID**,0004,20090202172647,000A,0102070202

The terminal will then report the ICCID with the following message:

+RESP:**GTCID**,135790246811220,**898600120907F6015733**,20090203094907,000A,0102070202

4.5.7.   Get GSM Signal Level

Example:

If the backend server is to retrieve the GSM signal level of the terminal, send the following command to the terminal:

AT+GTRTO=gt300,**6**,0004

"**6**" means this command is used to get the GSM signal level of the terminal.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**CSQ**,0004,20090202172647,000A,0102070202

The terminal will then report the GSM signal level as following:

+RESP:**GTCSQ**,135790246811220,**19,0**,20090203094910,000A,0102070202

The GSM receive level is 19 and the receive quality is 0.

4.5.8.   Get Software Version

Example:

If the backend server is to retrieve the software version of the terminal, send the following command to terminal:

AT+GTRTO=gt300,**7**,0004

"**7**" means this command is used to get the firmware version.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**SWV**,0004,20090202172647,000A,0102070202

The terminal will report the firmware version as following:

+RESP:**GTSWV**,135790246811220,**0824B07GT300M128_TOSHIBA**,**V01**,20090203094913,00 0A,0102070202

"**0824B07GT300M128_TOSHIBA**" is the software release version, where "**07**" is the major version. "**V01**" is the minor version.

4.5.9.　Get Hardware Version

Example:

If the backend server is to retrieve the hardware version of the terminal, send the following command to terminal:

AT+GTRTO=gt300,**8**,0004

"**8**" means this command is used to get the hardware version.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**HWV**,0004,20090202172647,000A,0102070202

The terminal will report the hardware version with the following message:

+RESP:**GTHWV**,135790246811220,**GT300HW0103**,20090203094914,000A,0102070202

"**GT300HW0103**" means the current hardware version is GT300 V1.03.

4.5.10.　Get the Battery Level

Example:

If the backend server is to retrieve the battery level of the terminal, send the following command to terminal:

AT+GTRTO=gt300,**9**,0004

"**9**" means this command is used to read the battery level.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**CBC**,0004,20090210071841,000A,0102070202

The terminal will then report the battery level with following message:

+RESP:**GTCBC**,135790246811220,**94**,20090101000000,000A,0102070202

In the above message, "**94**" refers to the battery level with 94% charge left.

4.5.11. Power off the Terminal

Example:

If the backend server needs to remotely control the terminal to power off, the following command can be sent to the terminal:

AT+GTRTO=gt300,**A**,0004

In the above command, "**A**" means to power off the terminal.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**PWROFF**,0004,20090202172647,000A,0102070202

The terminal will then send the +**RESP:GTPFA** message and power off.

4.5.12. Report Google Maps Hyperlink

Example:

If someone wants to locate the device on Google Maps, he can send the following command to the terminal via SMS:

AT+GTRTO=gt300,**B**,0004

In the above command, "**B**" means to report location with Google Maps hyperlink. This function only works when the command is sent via SMS. If sent via GPRS, the device will ignore the command.

The command is accepted by the terminal when the backend server receives the following message:

+ACK:GTRTO,135790246811220,**GGL**,0004,20090202172647,000A,0102070202

The terminal will then report its current location with Google Maps hyperlink via SMS to the originating phone number.

In the response SMS message, besides a Google Maps hyperlink to the current position, it also report whether it is a successful fix, the UTC time from the GPS chip and the current battery level.

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

F1 D2009/01/01T00:00:00 B74%

http://maps.google.com/maps?q=31.222073,121.354335 is the hyperlink to the current location in Google Maps.

F1 indicates it is a successful fix while **F0** will be fail-to-fix.

D2009/01/01T00:00:00 is the UTC time when obtaining the position information.

B74% indicates that the battery level is 74%.

4.6. Motion Sensor Alarm

The terminal is integrated with a motion sensor to detect falling event. By command **AT+GTMSA**, the sensitivity of the sensor could be adjusted from level 1 to level 10, the less the more sensitive. When a falling event is detected, there is first a notification displayed on the screen of the terminal with option to cancel the alarm if misinform. If the end user confirms the alarm or does not cancel the alarm within *<alarm timeout>* seconds, according to the working mode, the terminal will auto dial the number set by *<falling call>* or send the current position to the backend server via +**RESP:GTMSA** message, or perform both actions.

When working on mode 3, sending position after falling call, if the falling accident occurs during a phone call, the terminal will send the position information only. There would be no phone call to the *<falling call>* number.

If the 'send last position' set to 1 and the working mode is 2 or 3, the device will send the last known GPS position to the backend server before making the falling call or sending the current position.

Example1:
An example is given as following to make the falling call:
AT+GTMSA=gt300,**1**,,**3**,**5**,+**8613888888888**,,,0005
By this command, the motion sensor alarm is enabled. The sensitivity is set to **3** and the timeout to cancel the alarm is set to **5** seconds. If a falling event is detected, the terminal will call the number +**8613888888888**.

Sending last position before making the falling call:
AT+GTMSA=gt300,**3**,**1**,**3**,**5**,+**8613888888888**,,,0005
By this command, the device will send the last known position before making the falling.

The command is accepted by the terminal when the backend server receives the following message:
+ACK:GTMSA,135790246811220,0005,20090101000002,11F0,0102070202

The terminal will then report the falling alarm as following:
+RESP:**GTMSA**,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,11F0,0102070202

The last known position:
+RESP:GTLGL,135790246811220,1,**0**,**0**,**0**,4.3,92,70.0,1,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,11F0,0102070202

4.7. SOS Key Function

Command **AT**+**GTSOS** is used to configure the function of the SOS key. The SOS key has 3 working modes if it is pressed and held for 3 seconds.

✧ By setting the parameter *<mode>* = 1, the terminal only makes the SOS call.
✧ By setting the parameter *<mode>* = 2, the terminal only sends its current position to the backend server by message +**RESP:GTSOS**.
✧ By setting the parameter *<mode>* = 3, the terminal makes the SOS call first and then sends the current position to the backend server by message +**RESP:GTSOS**.

If the 'send last position' set to 1 and the working mode is 2 or 3, the device will send the last known GPS position to the backend server before making the SOS call or sending the current position.

Example 1:
To disable the SOS key function, configure the terminal with the following command:
AT+GTSOS=gt300,**0**,,+8613888888888,0006
This will disable the function of SOS key. User can still access SOS number via GUI menu.

Example 2:
To set the SOS key to only make the SOS phone call, configure the terminal with the following command:
AT+GTSOS=gt300,**1**,,+8613888888888,0006

Example 3:
To set the SOS key to send position only, configure the terminal with the following command:
AT+GTSOS=gt300,**2**,,+8613888888888,0006
In this mode, the terminal will vibrate once to notify the user the function is triggered.

Example 4:
To set the SOS key to make the SOS phone call and send its position, configure the terminal with the following command:
AT+GTSOS=gt300,**3**,,+8613888888888,0006

Example5:
To set the SOS key to send the last position before making the SOS phone call and send its current position, configure the terminal with the following command:
AT+GTSOS=gt300,**3**,**1**,+8613888888888,0006

The configuration is done when the backend server receives the following message:
+ACK:GTSOS,135790246811220,0006,20090112104725,000A,0102070202

The terminal sends its position information to the backend server by message +**RESP:GTSOS.**

+**RESP:GTSOS**,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,11F0,0102070202

The last known position:
+RESP:GTLGL,135790246811220,1,**1**,0,**0**,4.3,92,70.0,1,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,11F0,0102070202

4.8. Remote Phone Book Control

The backend server can use command **AT+GTPHB** to control the phone book in the terminal local memory.   There are up to 20 entries in the local phone book.   Each entry includes the contact name and the phone number.   To edit a contact, specify its index in the phone book by <*record index*>.

To support multi-language in the contact name field, two data coding schemes are supported: ASCII (set <*DCS*> to 0) and UCS2 (set <*DCS*> to 1).   If using UCS2, put the UCS2 code points in little-endian ordering to the <*name*> field.   For example, the UCS2 code points of "张三" is "5F204E09", then the <*name*> field should be "205F094E".

The name of the contact is up to 28 characters in ASCII and 14 characters in UCS2.

This command has two working mode, one is to edit the local phone book; the other is to read the local phone book.

Example 1:
To set the 1st phone book entry, use the following command:
AT+GTPHB=gt300,**1**,**1**,**0**,**Alice**,+**8613888888888**,0007
By this command, the name of the 1st contact is set to "**Alice**" and phone number to "+**8613888888888**".   The DCS of the name is ASCII.

Or
AT+GTPHB=gt300,**1**,**1**,**1**,**205F094E**,+**8613888888888**,0007
By this command, the name of the 1st contact is set to "张三" and phone number to "+**8613888888888**".   The DCS of the name is UCS2.

Example2:
To read the 1st phone book entry, use the following command:
AT+GTPHB=gt300,**0**,**1**,0007

The device reports by message:
+**RESP:GTPHB**,135790246811220,**1**,**0**,**Alice**,+**8613888888888**,20090101000000,11F0,0102070202

Or
+**RESP:GTPHB**,135790246811220,**1**,**1**,**205F094E**,+**8613888888888**,20090101000000,11F0,0102070202

Example3:
To read all 20 the phone book entries, use the following command:
AT+GTPHB=gt300,**0**,**0**,0007

The device reports by message:

+RESP:GTPHB,135790246811220,**1,0**,**Alice**,**+8613888888888**,**2**,**1**,**205F094E**,+8613888888888,
3,,,,4,,,,5,,,,6,,,,7,,,,8,,,,9,,,,10,,,,11,,,,12,,,,13,,,,14,,,,15,,,,16,,,,17,,,,18,,,,19,,,,20,,,,20090101000000
,11F0,0102070202

The acknowledgement from the terminal:

+ACK:GTPHB,135790246811220,0007,20090101000002,11F0,0102070202

4.9. Remote Volume Control

The backend server can use command **AT+GTRVC** to control the volume of the voice call and ring tone.   It can control the volume of normal phone call, hands-free call and call via headset. It can control the volume of normal ring tone and ring tone via headset.

Example:

To control the volume of the voice call and melody playback, configure the terminal with the following command:

AT+GTRVC=gt300,**3**,**5**,**3**,**4**,**2**,0008

By this command, the volume of the normal phone call is set to "**3**" ; The volume of the hands-fre call is set to "**5**", and the volume of the phone call via headset is set to "**3**".   The volume of normal ring tone is set to "**4**" and ring tone via headset to "**2**" for the headset.

The configuration is done when the backend server receives the following message:

+ACK:GTRVC,135790246811220,0008,20090112104725,000A,0102070202

4.10. Time Adjustment

The backend server can use command **AT+GTTMA** to adjust the local time of the device remotely. According to the local saved city-time zone table, the backend server uses a city index of the table to set the time zone of the device. At the same time, the backend server could provide a referenced UTC time as the basis to adjust the device local time.

This command will also trigger the device to adjust the local time according to GPS time. After a successful GPS fix, the device will update the local time with the GPS UTC time again.

Upon this command, the device can also set the daylight saving.

If the end user is not allowed to change the local time of the terminal, the backend user can use this command to hide the Time and Date menu.   Thus the end user has no way to change the local time anymore.

Example:
To adjust the device local time, send the following command:
AT+GTTMA=gt300,,**8,0,20090917123500,0009**
By this command, the current home city is set to "**Beijing**"; the current UTC time is set to "**20090917123500**" and according to the time zone of "**Beijing**", the current local time would then be "**320090917203500**".   The daylight saving is disabled.

To forbid the end user change the local time, send the following command:
AT+GTTMA=gt300,**1,,,,0009**
By this command, the Time and Date menu is hidden to avoid setting the time locally.

The configuration is done when the backend server receives the following message:
+ACK:GTTMA,135790246811220,0009,20090112104725,000A,0102070202

4.11. Power Management

4.11.1 Power Low Alarm

When the battery level of the terminal is low, it will report a power low alarm to the backend server.

Example:
+RESP:**GTPLA**,135790246811220,20080111223344,000A,0102070202

4.11.2 Power Low Alarm

When the charge status of the terminal status is changed, it will report a message to the backend server.

Example1:
When the terminal switches from normal mode to charge mode, it will report a +**RESP:GTBTC** message to the backend server as following:
+RESP:**GTBTC**,135790246811220,20030101120615,000A,0102070202

Example2:
When the charge is completed, the terminal will send a +**RESP:GTSTC** message to the backend server as following:
+RESP:**GTSTC**,135790246811220,20030101120615,000A,0102070202

4.11.3 Power Low Alarm

When the terminal powers on or powers off, the terminal will report a message to the backend server.

Example1:
When the terminal powers on, it will report a +**RESP:GTPNA** message to the backend server as following:
+RESP:**GTPNA**,135790246811220,20030101120615,000A,0102070202

Example2:
When the terminal powers off, it will send a +**RESP:GTPFA** message to the backend server as following:
+RESP:**GTPFA**,135790246811220,20030101120615,000A,0102070202

4.12. Buffer Report Function

If the GSM network is not available, the terminal will record the messages required to be sent to the backend server. These messages will be sent to the backend server when the GSM network is available again. The terminal can record up to 720 messages.

✦ Only +RESP messages are buffered. +RESP:GTHBD and +RESP:GTALL are not buffered
✦ The string "**#BUF#**" will be added to the beginning of all of the buffered messages.
✦ Buffered messages can only be sent by TCP or UDP protocol. They cannot be sent by SMS.
✦ The buffered messages will be sent after the other normal messages.

Example:

The following is an example of the buffered message:

#BUF#+RESP:GTTRI,135790246811220,1,0,0,1,6.7,148,37.0,50,121.354647,31.221713,20090119020919,0460,0000,18d8,3072,000B,0102070202

4.13. SIM Card Binding

The backend server could use the command **AT+GTBND** to make a binding between the device and the installed SIM card.   Thus if an un-authorized SIM card is swapped in, the device will automatically report its current position via SMS to the backend server.   From the report SMS, the backend thus can trace the phone number of the un-authorized SIM card and track the device.

Example 1:

To enable the binding check:

AT+GTBND=gt300,**1**,,,,,000A

This will enable the binding check.   If there is not a binding, the device makes a binding with the current installed SIM card immediately.   Later, every time the device powers on, it will check if the bound SIM card has been swapped.   If swapped, the device will report its current position via SMS by message +**RESP:GTBND** to the backend server.

The response message:

+RESP:**GTBND**,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,11F0,0102070202

Example 2:

To accept a new SIM card:

AT+GTBND=gt300,**2**,,,,,000A

If for any reason, the device needs to install a new SIM card, the backend server can send this command to the device.   The device will make a new binding with the current installed SIM card and keep the binding check enable.

Example 3:

To disable the binding check:

AT+GTBND=gt300,**0**,,,,,000A

This will disable the binding check.   The built binding will be saved.

4.14. Non Movement Detection

In order to saving the power, when the device is standstill in one place, there is no need to send the same redundant locations to the backend server many times. So the backend server could use the command **AT+GTNMD** to make the device suspend its fixed timing report and geo-fence checking when the device is detected to be at rest by the motion sensor. When the device moves again, it will automatically resume the suspended function.

According to the setting, the device may send +**RESP:GTNMR** message to the backend server when rest is detected.

Example 1:
To suspend the fixed timing report and geo-fence checking without sending the +**RESP:GTNMR** message:
AT+GTNMD=gt300**,1,**4,1,2,0800,2000,0**,,,,,**000B

Example 2:
To send only the +**RESP:GTNMR** message:
AT+GTNMD=gt300**,2,**4,1,2,0800,2000,0**,,,,,**000B

The response message when the device is detected to be at rest:
+RESP:**GTNMR**,135790246811220,1,0,0,1,4.3,92,70.0,1,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,11F0,0102070202

Example 3:
To both suspend the related report and send the +**RESP:GTNMR** message:
AT+GTNMD=gt300**,3,**4,1,2,0800,2000,0**,,,,,**000B

5. Firmware Update

A technology known as firmware over-the-air software updating is supported and integrated into @Tracker air interface protocol.   This enables to update the firmware of GT300 remotely without having to require the end users to bring their device to the service centre.   Thus the service provider of GT300 could conveniently push new features or bug fix to the end users and promote the customer experience.

Refer to GT300 @Track Air Interface Firmware Update document for detail information.

Appendix: Commands Index

✧ **Command and ACK**

AT+GTSRI

+ACK:GTSRI

AT+GTBEI

+ACK:GTBEI

AT+GTTRI

+ACK:GTTRI

AT+GTGEO

+ACK:GTGEO

AT+GTRTO

+ACK:GTRTO

AT+GTMSA

+ACK:GTMSA

AT+GTSOS

+ACK:GTSOS

AT+GTPHB

+ACK:GTPHB

AT+GTRVC

+ACK:GTRVC

AT+GTTMA

+ACK:GTTMA

AT+GTBND

+ACK:GTBND

AT+GTNMD

+ACK:GTNMD

✧ **Position Related Information**

+RESP:GTEST

+RESP:GTSOS

+RESP:GTRTL

+RESP:GTMSA

+RESP:GTBND

+RESP:GTNMR

+RESP:GTGEO

+RESP:GTTRI

+RESP:GTLGL

✧ **Report for Location By Call**

+RESP:GTLBC

Google Maps Hyperlink

✧ **Report for Querying**

+RESP:GTCID
+RESP:GTHWV
+RESP:GTLGT
+RESP:GTCBC
+RESP:GTCSQ
+RESP:GTSWV
+RESP:GTINF
+RESP:GTALL
+RESP:GTPHB

✧ **Report to Indicate**

+RESP:GTPNA
+RESP:GTPFA
+RESP:GTPLA
+RESP:GTBTC
+RESP:GTSTC

✧ **Heart Beat Data**

AT+GTHBD
+RESP:GTHBD