GSM/GPRS/GPS Tracker **GL100**

User Guide

TRACGL100UM002

Revision: 2.03

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Document Title	GL100 User manual
Version	2.03
Date	2010-11-24
Status	Release
Document Control ID	TRACGL100UM002

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Contents

0. Revision history

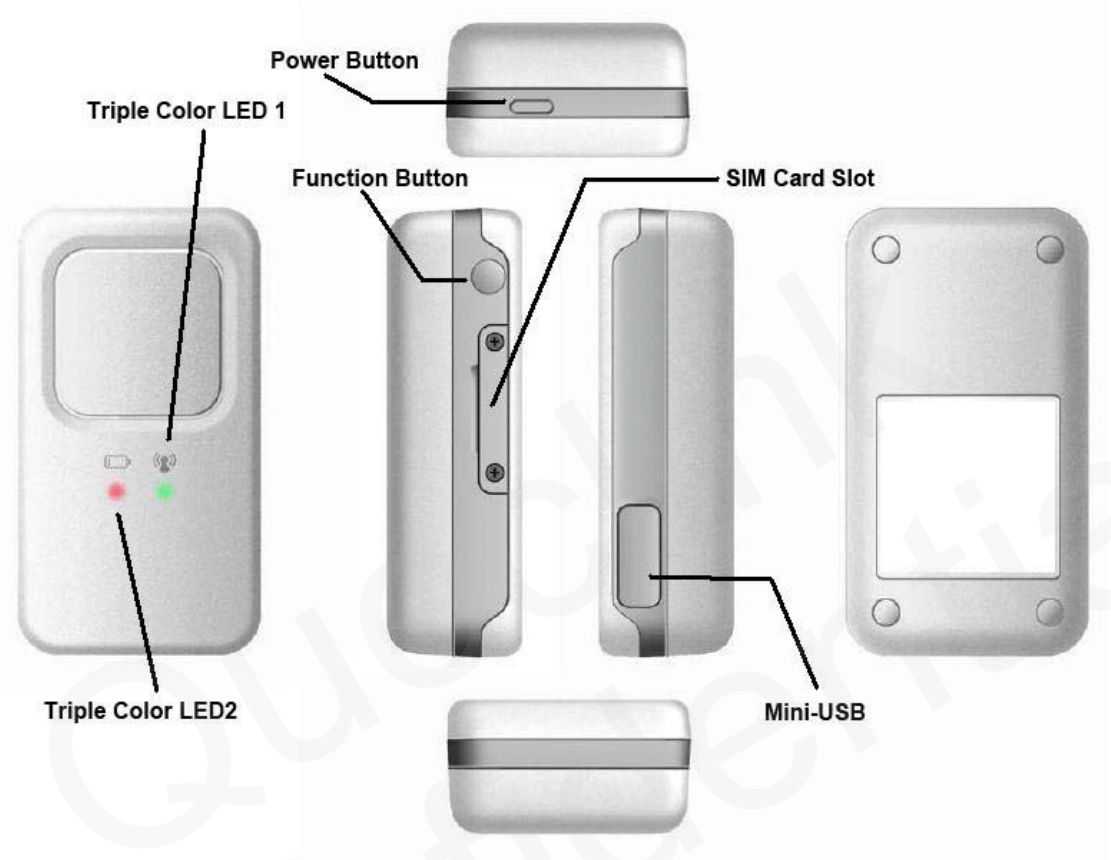
Revision	Date	Author	Description of change
2.01	2009-08-07	Moon XIE	Initial
2.02	2009-12-09	Ella HUANG	Update parameters of special function in chapter 4.4.5
2.03	2010-11-03	Ella HUANG	1. Add Chapter 4.4.8 and 4.4.9; 2. Update parameters of real time operation in chapter 4.4.7.

1. Introduction

GL100 is a powerful GPS locator which is designed for vehicle, pets and asserts tracking. With superior receiving sensitivity, fast TTFF and GSM frequencies 850/900/1800/1900. Its location can be real time or schedule tracked by backend server or specified terminals. Based on the embedded @Track protocol, GL100 can communicate with the backend server through GPRS/GSM network, and transfer reports of emergency, Geo-fencing, device status and scheduled GPS position etc… Service provider is easy to setup their tracking platform based on the functional @Track protocol.

2. Product Overview

2.1. Appearance



2.2. Buttons/Mini USB Interface Description

Button /Mini USB Interface Description	
Power Key	● Turn on GL100 ● Turn off GL100 (If power key is enabled).
Function Key	● Geo-Fence mode (default) Press the key twice in 2 seconds to enable/disable Geo-Fence0 ● SOS mode Keep pressing the key for 3 seconds to enter the SOS mode ● Location Geo-Fence mode Press the key twice in 2 seconds to enable or disable Geo-Fence mode and use the current position as the centre of Geo-Fence

	0. ● Emergent SOS mode Keep pressing the key for 3 seconds, and GL100 report the current position according to the result of the latest GPS fixing and then start GPS fixing. After the GPS fixing finishes or timeout, the device will report the SOS message according the result of the GPS fixing. **Note:** Function key shall be enabled.
Mini USB interface	● Plug in the AC-DC power adapter to this interface for charging battery. ● Backend server developer or administrator can use the Data_Cable to configure GL100.

2.3. Two Triple-Color LEDs Description

There are two triple-color LEDs in GL100. Each LED shows red, green and blue to indicate different state of GL100. For better understanding, we call them **Red LED 1, Green LED 1, Blue LED 1** and **Red LED 2, Green LED 2, Blue LED 2**.

Light	Color	event	State
LED1	Red	The power key has been pressed	light
		The device receives a valid command	light
	Green	network searching	fast flash
		network has been registered	slow flash
		SIM pin locked	ever-light
	Blue	GPS is in fixing	fast flash
		GPS has fixed	ever-light for 2 seconds
LED2	Red	power is low	ever-light
		The device is in charging	slow flash
	Green	charging has completed	ever-light
		After inserting the charger	light for 8 seconds to indicate the battery status is checked
	Blue		Case 1: Geo-Fence mode/ Location Geo-Fence mode Blue led2 will be solid if the function key is pressed. After that if the user press the function key one more time in 2 seconds the blue LED2 will be off and he new Geo-Fence center will be set after successful GPS fix. Case 2: SOS mode/Emergent

			SOS mod The blue led2 will be solid when the function key is pressed. It will be off after the function key released. User should press the function key for at least 3 seconds to start SOS report.

3. Getting Started

3.1. Parts List

Name	Picture	Remark
GL100 Locater		The GSM/GPRS/GPS locator.
AC-DC Power Adapter (Standard accessory)		It is used to charge the internal battery of GL100.
GL100 Sheath (Standard accessory)		It is used to attach the GL100 to belt.
Screw Driver (Standard accessory)		It is used to twist off/ tighten the two screws on the side of GL100 when install SIM card.
Car Cigarette Charger (Optional accessory)		It is used to power the GL100 with the cigarette power output on the vehicle.
Car Kit Charger (Optional accessory)		It is used to power the GL100 with the battery output on the vehicle.

External Battery Kit (Optional accessory)		It is a set of accessories include an external battery, a power control unit and a pelican waterproof casing. It will greatly improve the working time of GL100 and also let the GL100 can be used for some special application like container tracking. Please refer to "GL100 External Battery Kit User Manual.pdf" for detail. Please notice the external battery kit only works on a special hardware version of GL100 which called GL100NB.
GL100 Data Cable (Optional accessory)		It the USB data cable which can be used for firmware upgrading and configuration.
GL100 Holder Without Magnet (Optional accessory)		It is used to hold the GL100, mount to somewhere with the screw.
GL100 Holder With Magnet (Optional accessory)		It is used to hold the GL100, attached to metal with the magnet on it.

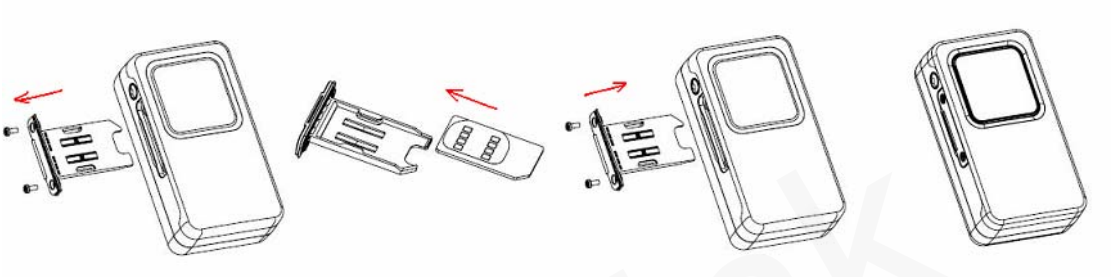
3.2. Battery Charging

- Please connect AC-DC power adapter with GL100.
- Insert the AC-DC power adapter into the power socket.
- During charging, the **Red LED 2** is blinking slowly. When the battery is full charged, the **Green LED 2** will be solid.
- You can also charge the battery by USB cable which connects GL100 with the PC.
- Charging time is about 5 hours.

Note: Before the first time using GL100, please full charge the battery.

3.3. Install SIM Card

- Use a screw driver to twist off the two screws on the side of GL100.
- Then remove the screws and SIM cover.
- Insert the SIM card into the SIM cover according to the direction shown.
- Finally, put the SIM cover into the SIM slot and tighten screws.



3.4. Turn on/Turn off

- Turn on: Press the Power key at least 3 seconds and release it to turn on GL100. At the same time, **Red LED 1** will light on for 2~3 seconds. Then **Green LED 1** starts to blink quickly which means searching the GSM network. After the GSM network is registered, it turns to be slow blinking.
- Turn off: Press the Power key at least 3 seconds; **Red LED 1** will light on for 2~3 seconds and then turn off, it indicates that GL100 is turned off. Please note the end-user can not power off GL100 when the power key is disabled by protocol.

3.5. Operating on function key

- First please make sure the function key is enabled.
- When the function key is in Geo-Fence mode and the function key is enabled. To double press the function key in 2 seconds will enable/disable the Geo-Fence 0.

  Note: "*Check interval*", "*Central Point*" and "*Radius*" of Geo-Fence0 shall be preset.

- When the function key is in SOS mode, Press the function key for 3 seconds, then GL100 will report a +RESP:GTSOS message which includes the position information to the backend server.

4. GL100 Manager Setup Wizard

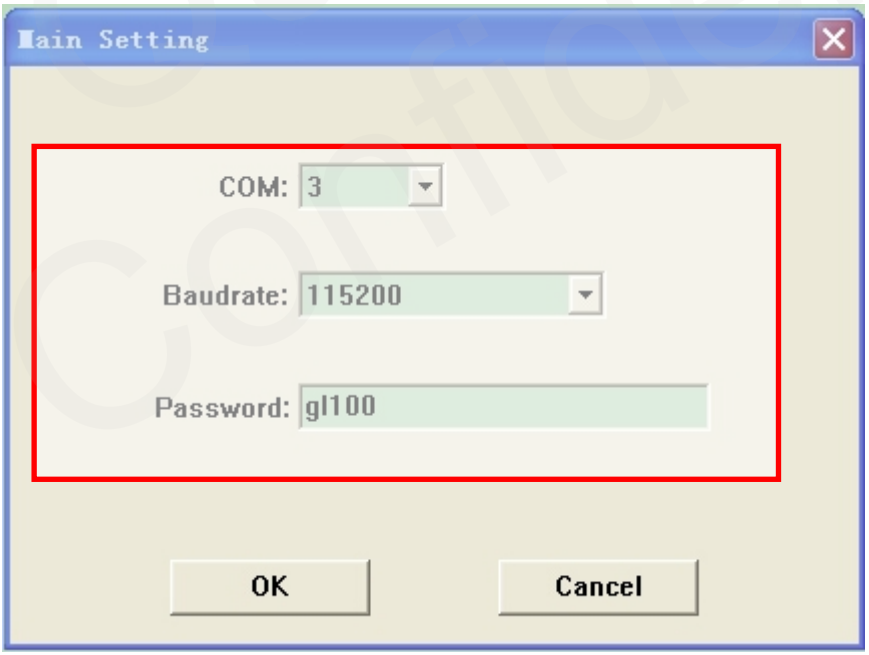
GL100 manager tool is PC software which can be used to configure GL100 through Data_Cable. It is easy for the backend server developers to configure GL100 with manager tool, which has friendly user interface. The correct command messages sent to GL100 will be displayed on the manage tool.(These messages can also be sent by SMS or GPRS).

The administrators can also use the manager tool to configure GL100 before selling. But it is strongly recommended to establish a backend server and implement the way to control GL100 by SMS or GPRS. Please refer to "*GL100 @Track Air Interface Protocol*" for detail.

Before using the manager tools please Find "PL2303_Prolific_DriverInstaller_v10518.zip" in develop suit and install the drive for PL2303.After that a new COM port can be found in the PC system, and then please follow the steps as below:

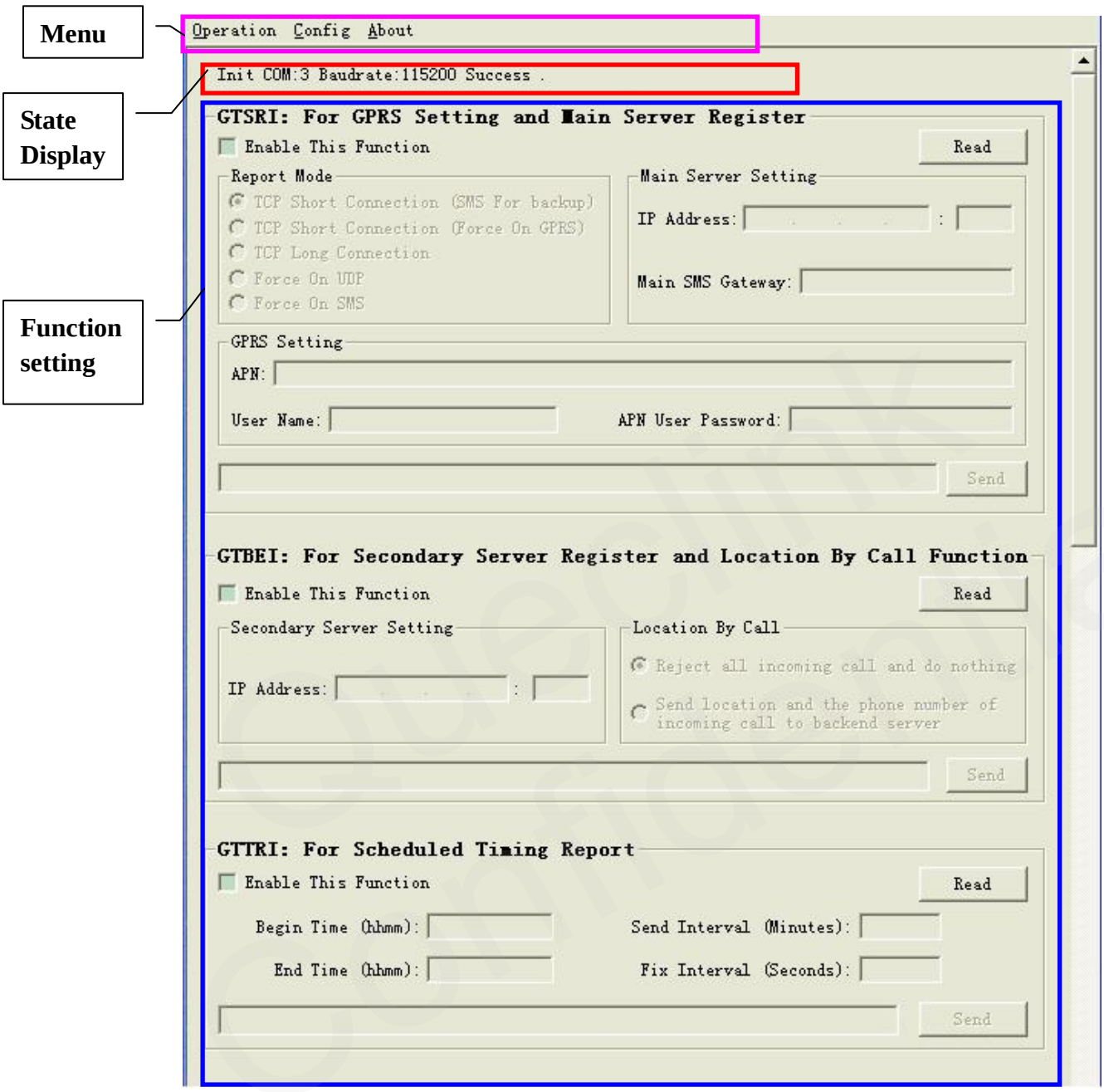
1. Power on GL100.
2. Connect GL100 to PC with Data_Cable.
3. Run "**GL100 Manager Tool Vx.xx.exe**".

4.1. Main setting



Select the COM port and baud rate, input the password "gl100", and the main window will display.

4.2. The main window



（1）Menu

[Operation]: Include two sub-menu items "*Send All*" and "*Read All*".

"*Send All*" is used to send the configuration message which is enabled in zone "*Function setting*"

"*Read All*" is used to read all the parameters from GL100 and display in zone "*Function setting*"

[Config]: Include "*Main Setting*", "*Save Config File*" and "*Load Config File*".

"*Main setting*" is used to configure the COM port and password. Please refer to chapter 4.1.

"*Save Config File*" is used to save all parameters to an ini file.

"*Load Config File*" is used to load all parameters from an ini file which was created through menu item "*Save Config File*"

[About]: Select "*About This Tool*". Then the following pop up window will display.

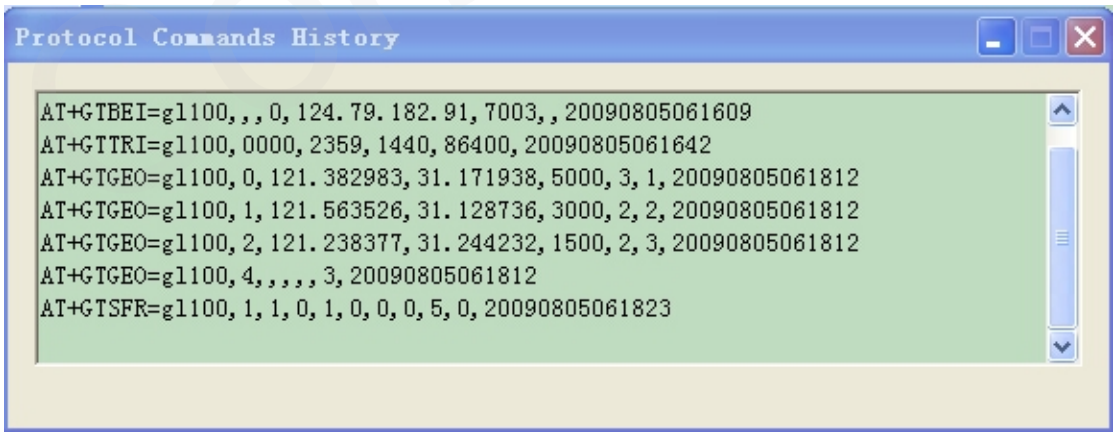
(2) State Display

Display the state of operation, including the serial port state, baud rate state, and the operation result.

(3) Function setting

Set and view the parameters of the functions.

4.3. Protocol Commands History



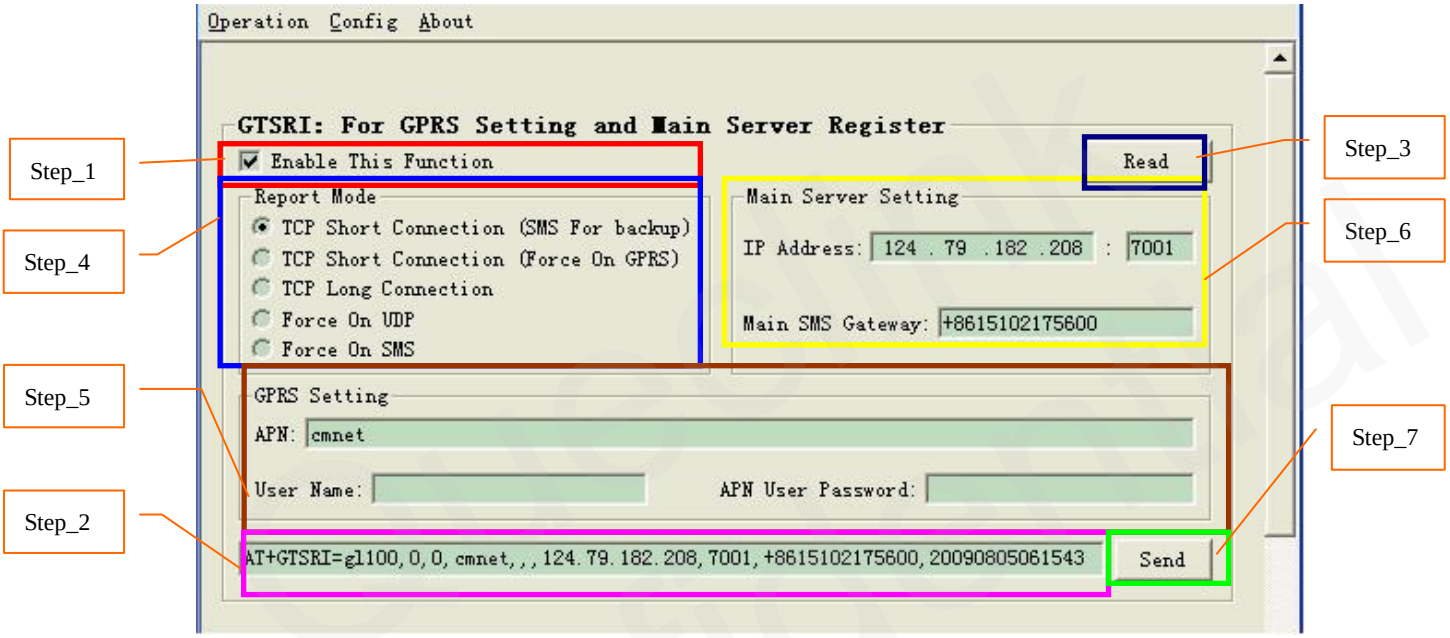
The Protocol Commands History Dialog shows all the commands which have been sent to GL100 from the Manager Tool.

4.4. An example to configure GL100

The manager tool is developed based on the @Track Air Interface Protocol. Please refer to "*GL100 @Track Air Interface Protocol*" for detail.

Following is a general procedure to configure GL100 with manager tool.

4.4.1. Set the parameters of main backend server



Step_1: Select "*Enable This Function*", after that the parameters of GTSRI can be changed and the "*Send*" button is enabled.

Step_2: When "*Enable This Function*" is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also be sent to GL100 through SMS or GPRS.

Step_3: It is recommended to read the parameters from GL100 and edit based on them.

Step_4: Set Report Mode. Please refer to "*GL100 @Track Air Interface Protocol*" for the meaning of each choice.

Step_5: Set GPRS parameters. Please contact your SIM card provider to get the correct APN information.

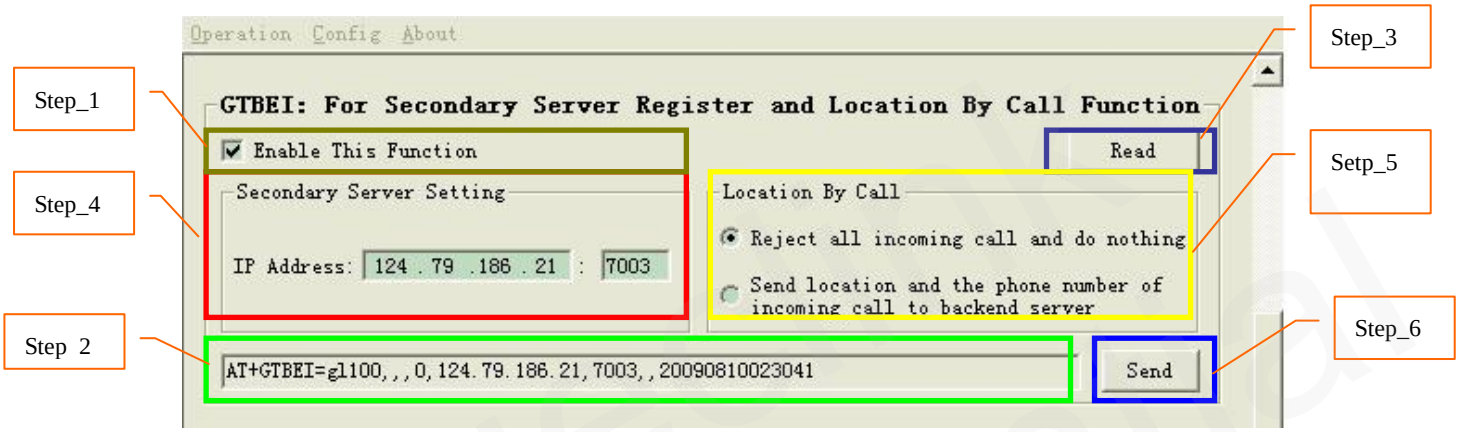
Step_6: Set the parameters of main backend server.

In the "*IP Address*" text box, input the internet IP address and port number of main backend server. The valid value of port number is 0-65535.

In the "*Main SMS Gateway*" text box, input the phone number of main SMS gateway which is used to receive the message from GL100 by SMS. The international format like "+8615201772961" and short code like "10086" are both supported.

Step_7: Click the "*Send*" button; download the parameters of GTSRI to GL100.

4.4.2. Set the parameters of secondary backend server



Step_1: Select "*Enable This Function*", after that the parameters of GTBEI can be changed and the "*Send*" button is enabled.

Step_2: When "*Enable This Function*" is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also be sent to GL100 through SMS or GPRS.

Step_3: It is recommended to read the parameters from GL100 and edit based on them.

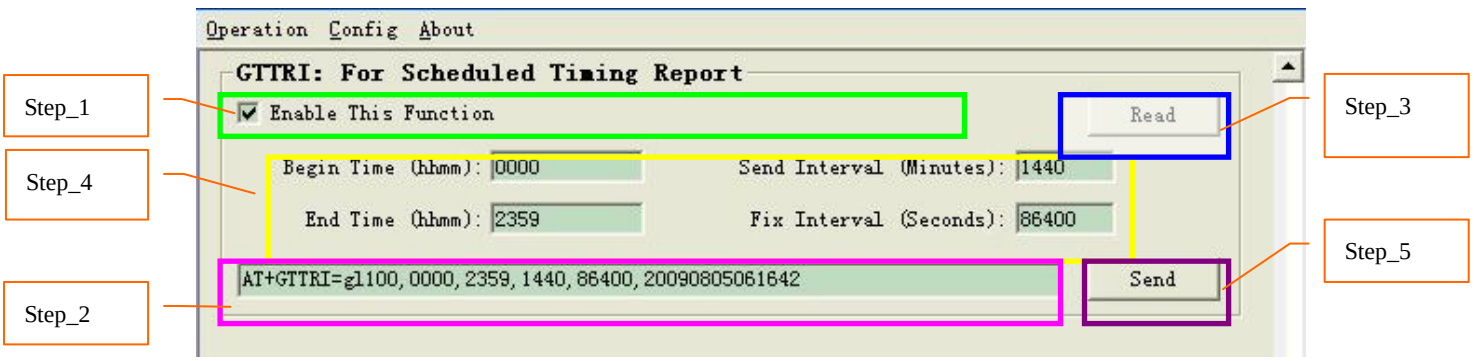
Step_4: Set the parameters of the secondary backend server.

In the "*IP Address*" text box, input the internet IP address and port number of the secondary backend server. The valid value of port number is 0-65535.

Step_5: Location By Call. Configure the "*Location By Call*" function. Please refer to "*GL100 @Track Air Interface Protocol*" for detail.

Step_6: Click the "*Send*" button; download the parameters of GTBEI to GL100.

4.4.3. Set the parameters of scheduled fixed timing report



Step_1: Select "*Enable This Function*", after that the parameters of GTTRI can be changed and the "*Send*" button is enabled.

Step_2: When "*Enable This Function*" is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also be sent to GL100 through SMS or GPRS.

Step_3: It is recommended to read the parameters from GL100 and edit based on them.

Step_4: Set the "*Start Time*", the value range of "HH" is "00"-"23". The value range of "MM" is "00"-"59".

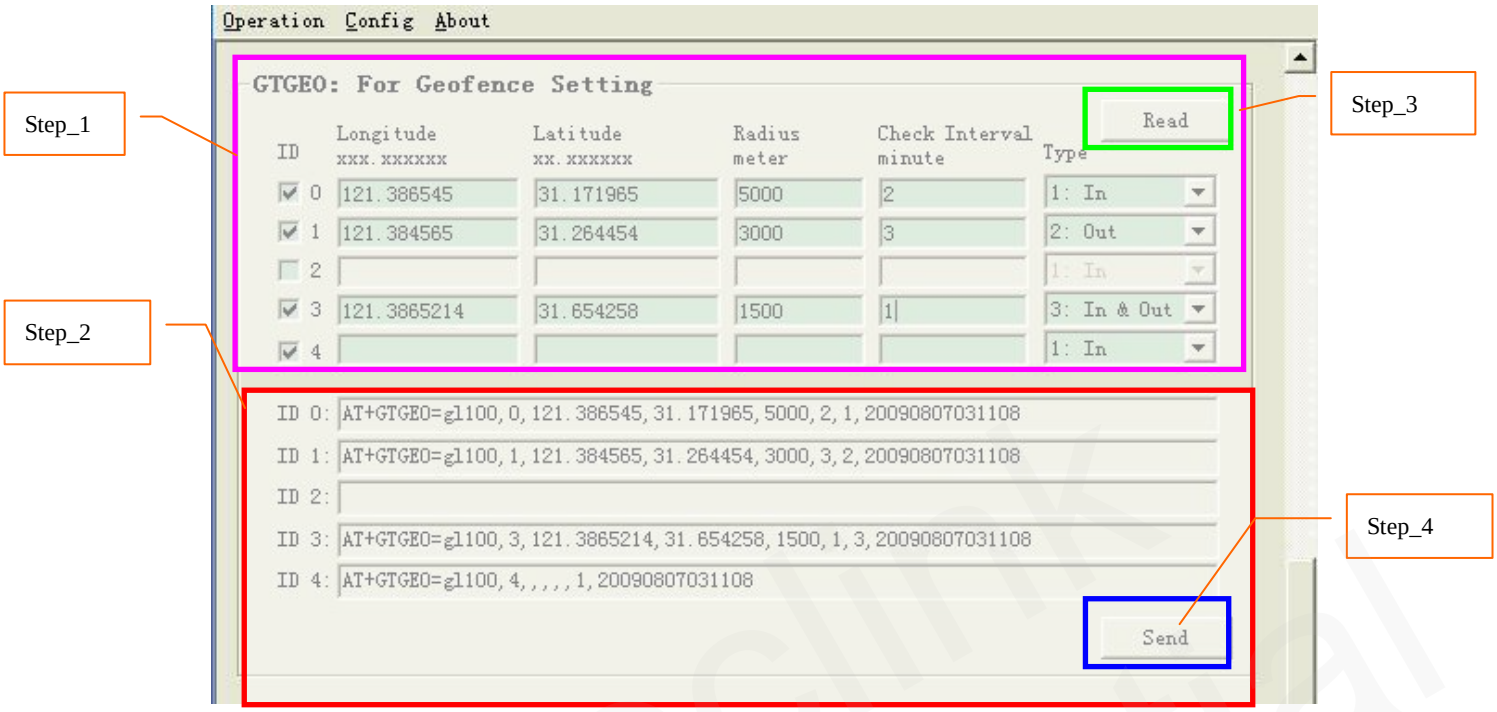
Set the "*End Time*". The valid format and range are same as "*start time*".

Set the "*send interval*". It is the period to report the position information. The value range is 0-1440 and the unit is minute.

Set the "*fix interval*". It is the period to get GPS fixing, its value range is 0-86400 and the unit is second.

Step_5: Click the "*Send*" button; download the parameters of GTTRI to GL100.

4.4.4. Set the parameters of Geo-Fence



Step_1: User can define up to five Geo-Fence regions on GL100. Each region is a circular area which is defined by central coordinate and radius. When the device enters or leaves a predefined Geo-Fence region, GL100 will send alert information to server.

"*ID*": The "*Send*" button will be enabled when some ID check boxes are selected. After pressing the "*Send*" button, the rule of selected Geo-Fences will be downloaded to GL100.

"*Latitude*": 20bytes, unit: degree, example as 31.187891 degree

"*Longitude*": 20bytes, unit: degree, example as 121.412248 degree

"*Radius*": 10bytes, unit: meter, example as 1000 meters.

"*Check Interval*": The interval of GPS checking for Geo-Fence alarm.

"*Type*": A numeric which indicates when to report the notification to backend server about the Geo-Fence.
In: Reports when enters the Geo-Fence region.
Out: Reports when exits from the Geo-Fence region.
In & out: Reports when enters or exits from the Geo-Fence region.

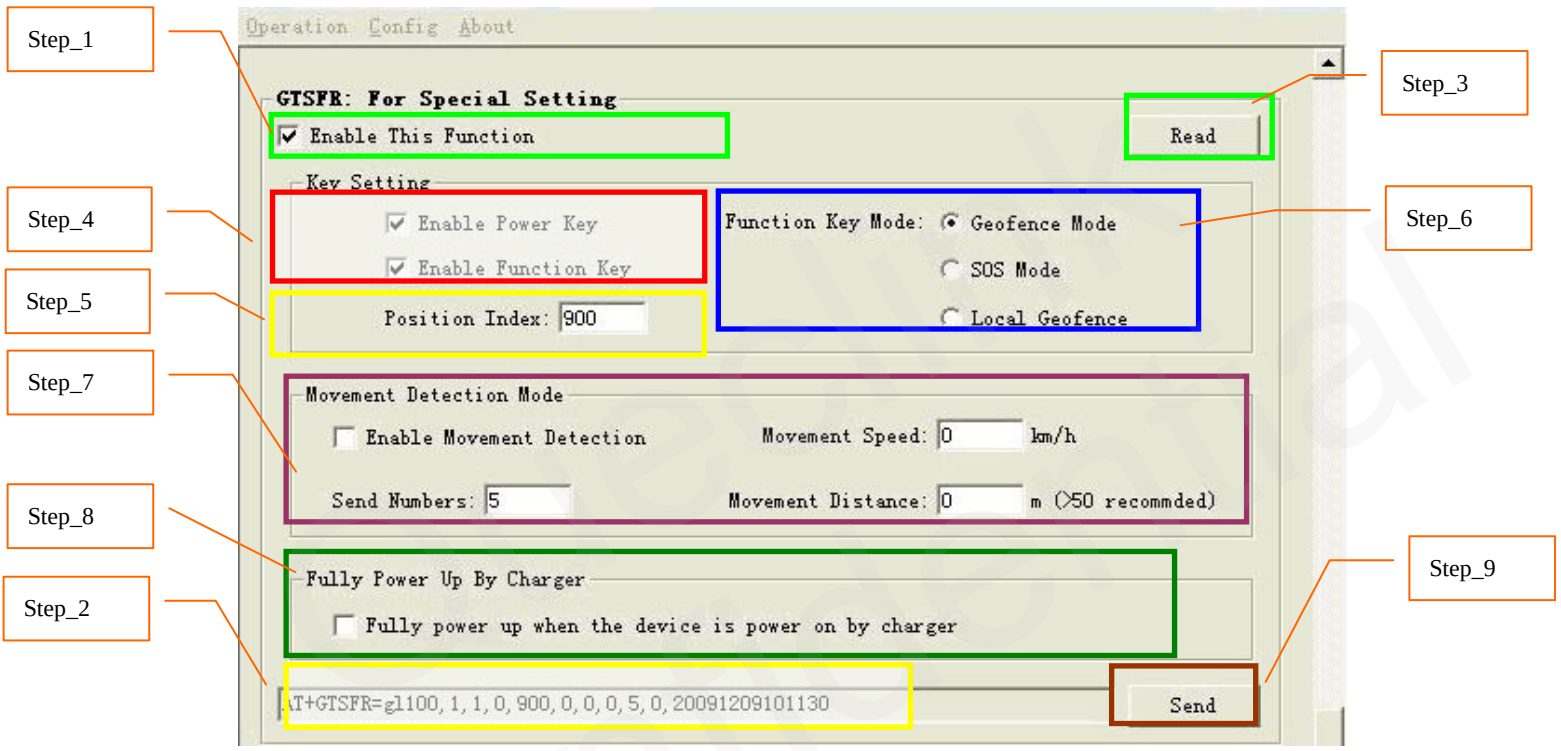
Step_2: When "*ID*" check box is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also

be sent to GL100 through SMS or GPRS.

Step_3: It is recommended to read the parameters from GL100 and edit based on them.

Step_4: Click the "*Send*" button; download the parameters of GTGEO to GL100.

4.4.5. Set the parameters of special function



Step_1: Select "*Enable This Function*", after that the parameters of GTSFR can be changed and the "*Send*" button is enabled.

Step_2: When "*Enable This Function*" is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also be sent to GL100 through SMS or GPRS.

Step_3: It is recommended to read the parameters from GL100 and edit based on them.

Step_4: Key Setting

Set check box to enable/disable the function of buttons.

Step_5: Set the parameters of position Index. Please refer to the "*GL100 @Track Air Interface Protocol*" for detail.

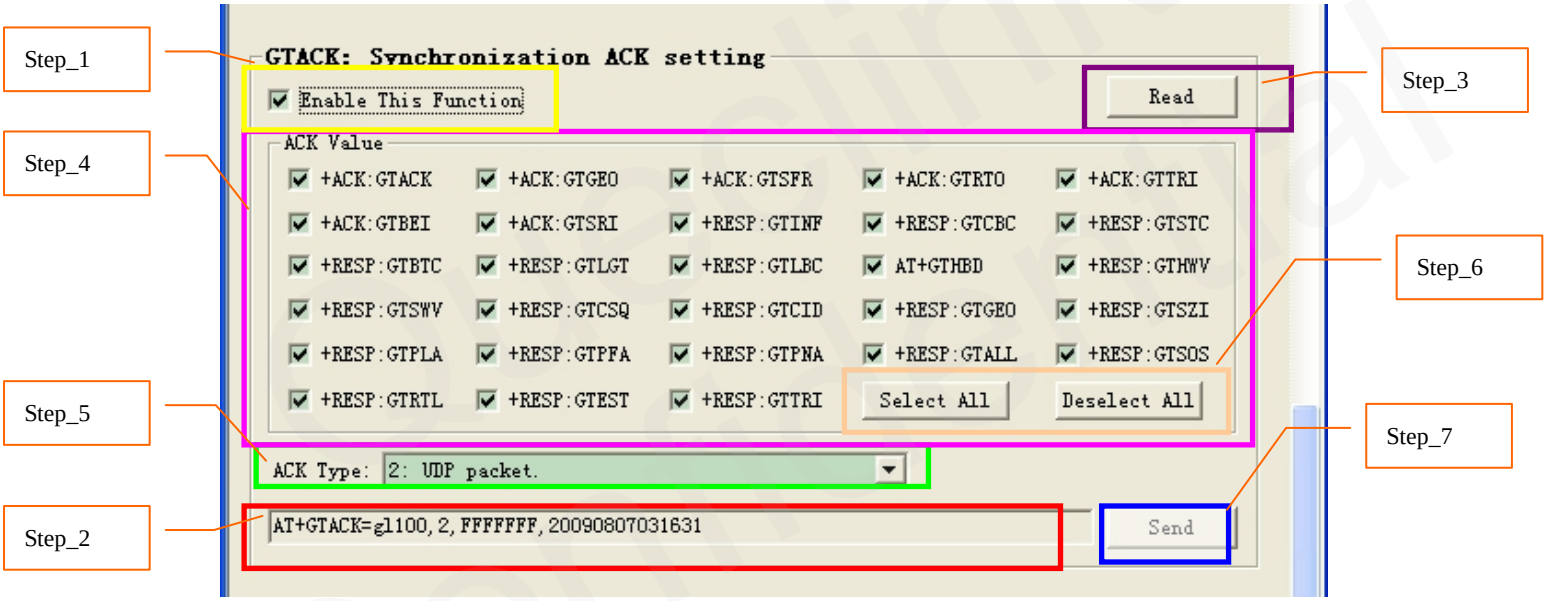
Step_6: Set the mode of function key. Please refer to "*GL100 @Track Air Interface Protocol*" for detail.

Step_7: Set the parameters of movement detection function. Please refer to the "*GL100 @Track Air Interface Protocol*" for detail.

Step_8: "*Fully Power Up By Charger*": If selected, GL100 will enter normal power-on mode even when it is powered on by charger.

Step_9: Click the "*Send*" button; download the parameters of GTSFR to GL100.

4.4.6. Set the parameters of Synchronization ACK setting



The purpose of Synchronization ACK function is to provide a way to make sure the message from GL100 to backend server was sent successfully. Please refer to "*GL100 @Track Air Interface Protocol*" for detail.

Step_1: Select "*Enable This Function*", after that the parameters of GTACK can be changed and the "*Send*" button is enabled.

Step_2: When "*Enable This Function*" is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also be sent to GL100 through SMS or GPRS.

Step_3: It is recommended to read the parameters from GL100 and edit based on them.

Step_4: Decide which uplink messages need Synchronization ACK. If the selected uplink

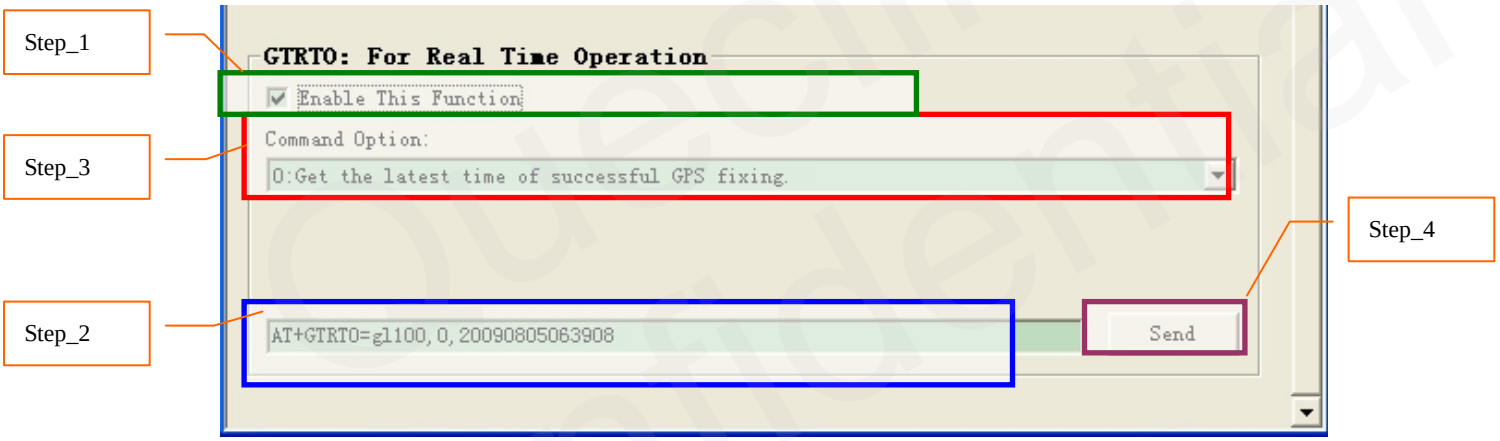
message is sent through the connection specified by *"Ack Type"*, GL100 will wait for the Synchronization ACK message. Otherwise, GL100 won't wait for the Synchronization ACK message. Please refer to "*GL100 @Track Air Interface Protocol*" for detail.

Step_5: Select the connection which enables Synchronization ACK mechanism. In the current version only UDP is supported and choice 1, 4 is reserved for future use.
1: TCP packet. Not supported at present.
2: UDP packet.
4: SMS PDU. Not supported at present.

Step_6: Click "*Select All*" button to select all the messages if necessary.
Click "*Deselect All*" button to deselect all the messages if necessary.

Step_7: Click the "*Send*" button; download the parameters of GTACK to GL100.

4.4.7. Real Time Operation



Step_1: Select "*Enable This Function*", after that the parameters of GTRTO can be changed and the "*Send*" button is enabled.

Step_2: When "*Enable This Function*" is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also be sent to GL100 through SMS or GPRS.

Step_3: Select "*Command Option*":

Choice 0-8, A-B is just for a dedicated action without any parameter. 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 the following parameter 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*").

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.

A: Get the battery level of the terminal.

B: Power off the terminal.

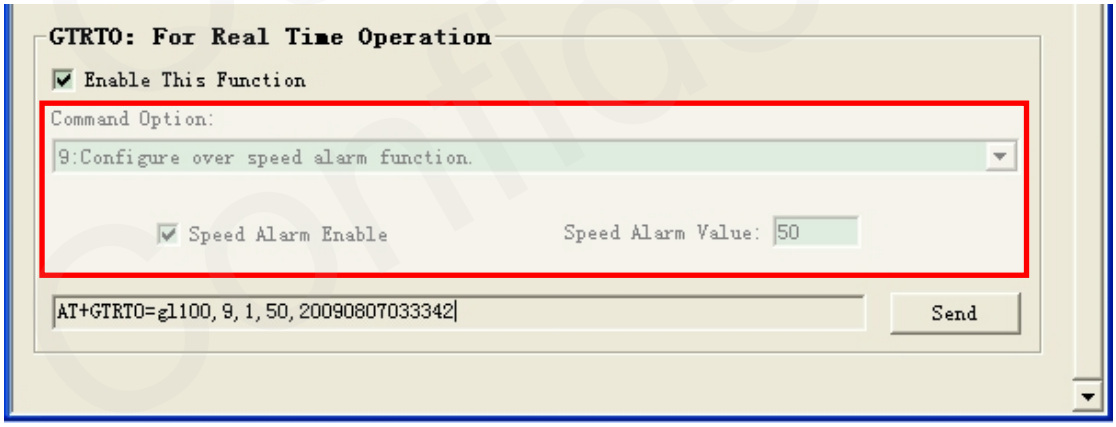
C: Configure the terminal to periodically report the information (ICCID, GSM signal level, battery level and the status of charger). Please refer to chapter 3.3.3 for the report message: **+RESP:GTINF**.

D: Set whether to maintain GPS on for ever.

E: Set the terminal name.

F: Set whether to report the message **+RESP:GTGSM** (including MCC, MNC, LAC, CellID and signal strength of each neighbor cells and MCC, MNC, LAC, CellID, signal strength and TA of the service cell) after the report message **+RESP:GTSOS**, **+RESP:GTRTL**, **+RESP:GTLBC** and **+RESP:GTTRI** when GPS fixing was failed.

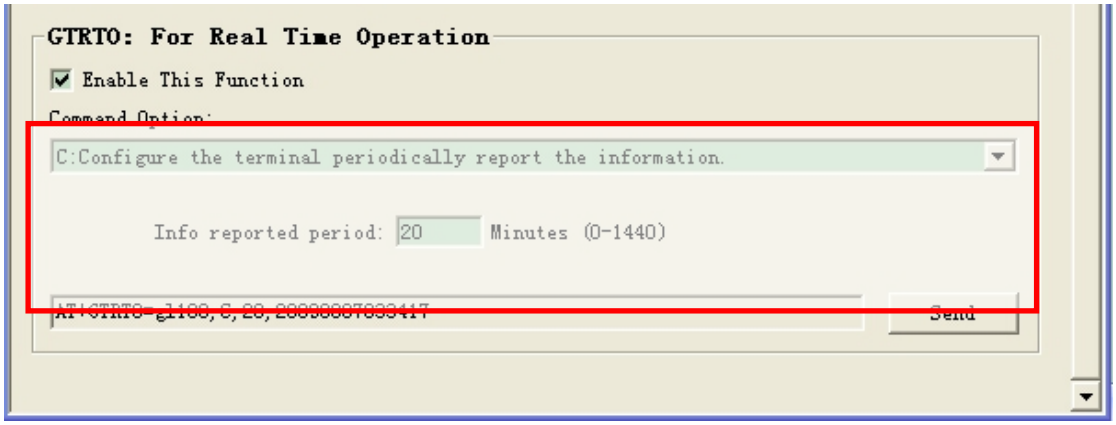
G: Set the mask to control whether to report the event messages.



Choice 9 is used to set the parameters of over speed alarm.

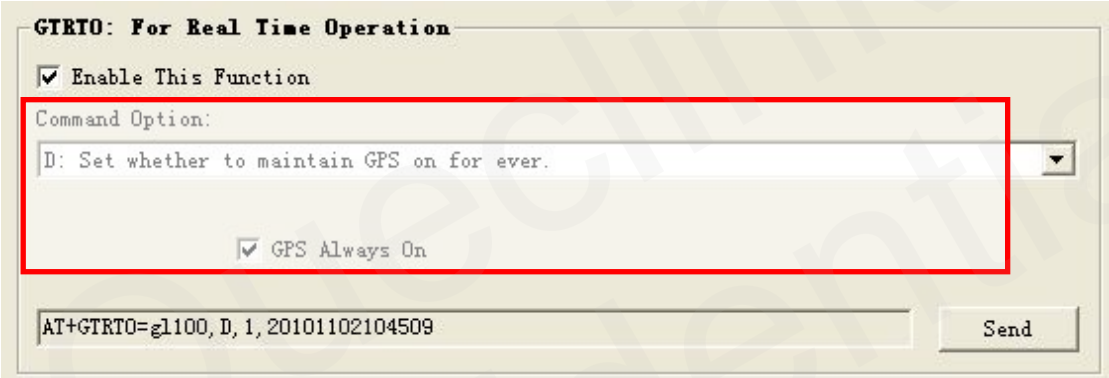
"*Speed Alarm Enable*": Disable or enable the over speed alarm function

"*Speed Alarm Value*": When the over speed alarm function is enabled, GL100 will report to the backend server when its speed is larger than this value.



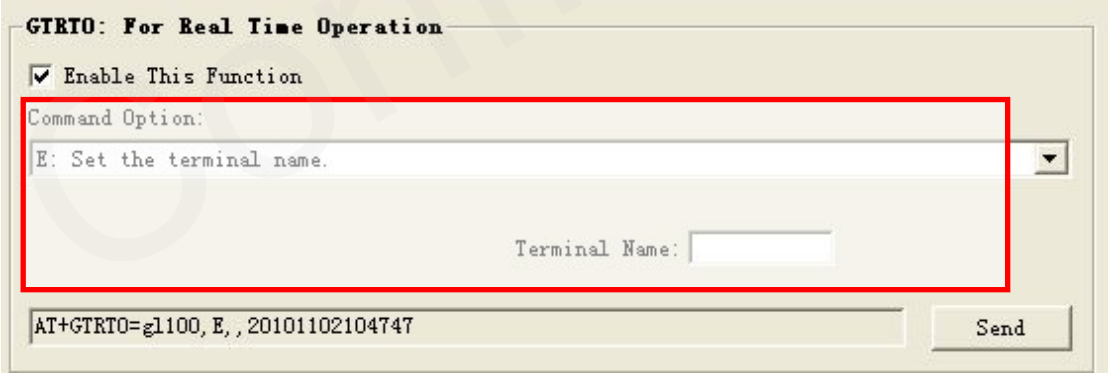
Choice C is used to configure the terminal to periodically report the information. (ICCID, GSM signal level, battery level and the status of charging).

"*Info reported period*": 0 means disable report the terminal's information; 1-1440 means the period of reporting, and the unit is minutes.



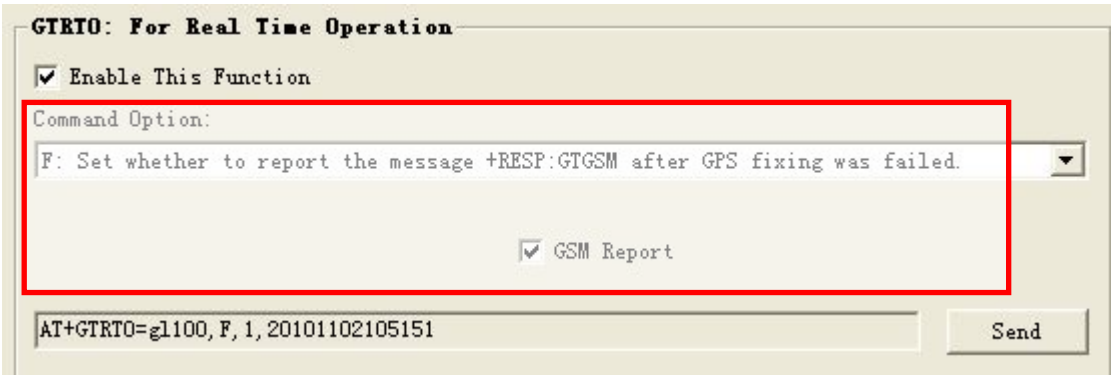
Choice D is used to choose whether to maintain GPS on for ever.

"*gps always on*": Disable or enable GPS on for ever.



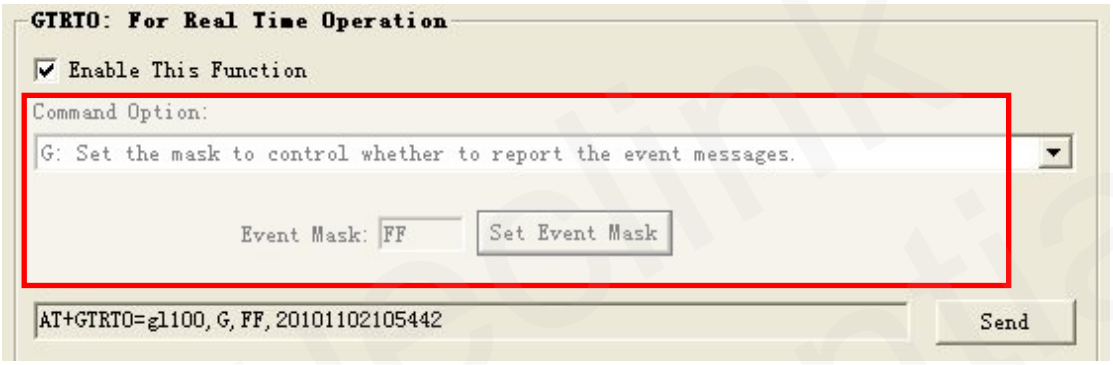
Choice E is used to set the terminal name.

"*Terminal Name*": A string as the terminal name.



Choice F is used to set whether to report the message +RESP:GTGSM after fixing was failed.

"*GSM Report*": Indicate whether to report the message +RESP:GTGSM.



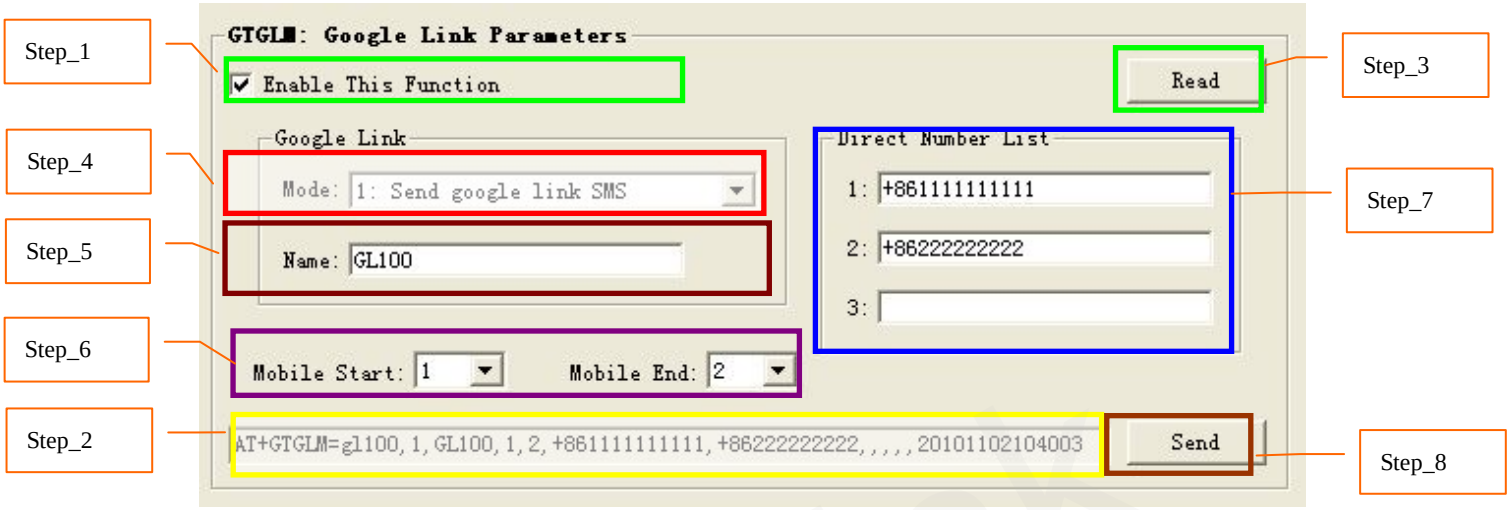
Choice G is used to set the mask which is to control whether to report the event message.

"*Event Mask*": A numeric in hex style to mask the report message. One bit represents a message.

Click "Set Even Mask", and select which message type you want to report by terminal in pop box.

Step_4: Click the "*Send*" button; download the parameters of GTRTO to GL100.

4.4.8. Set the parameters of google link function



Step_1: Select "*Enable This Function*", after that the parameters of GTGLM can be changed and the "*Send*" button is enabled.

Step_2: When "*Enable This Function*" is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also be sent to GL100 through SMS or GPRS.

Step_3: It is recommended to read the parameters from GL100 and edit based on them.

Step_4: Set mode of google link function. Please refer to "GL100 @Track Air Interface Protocol" for detail.

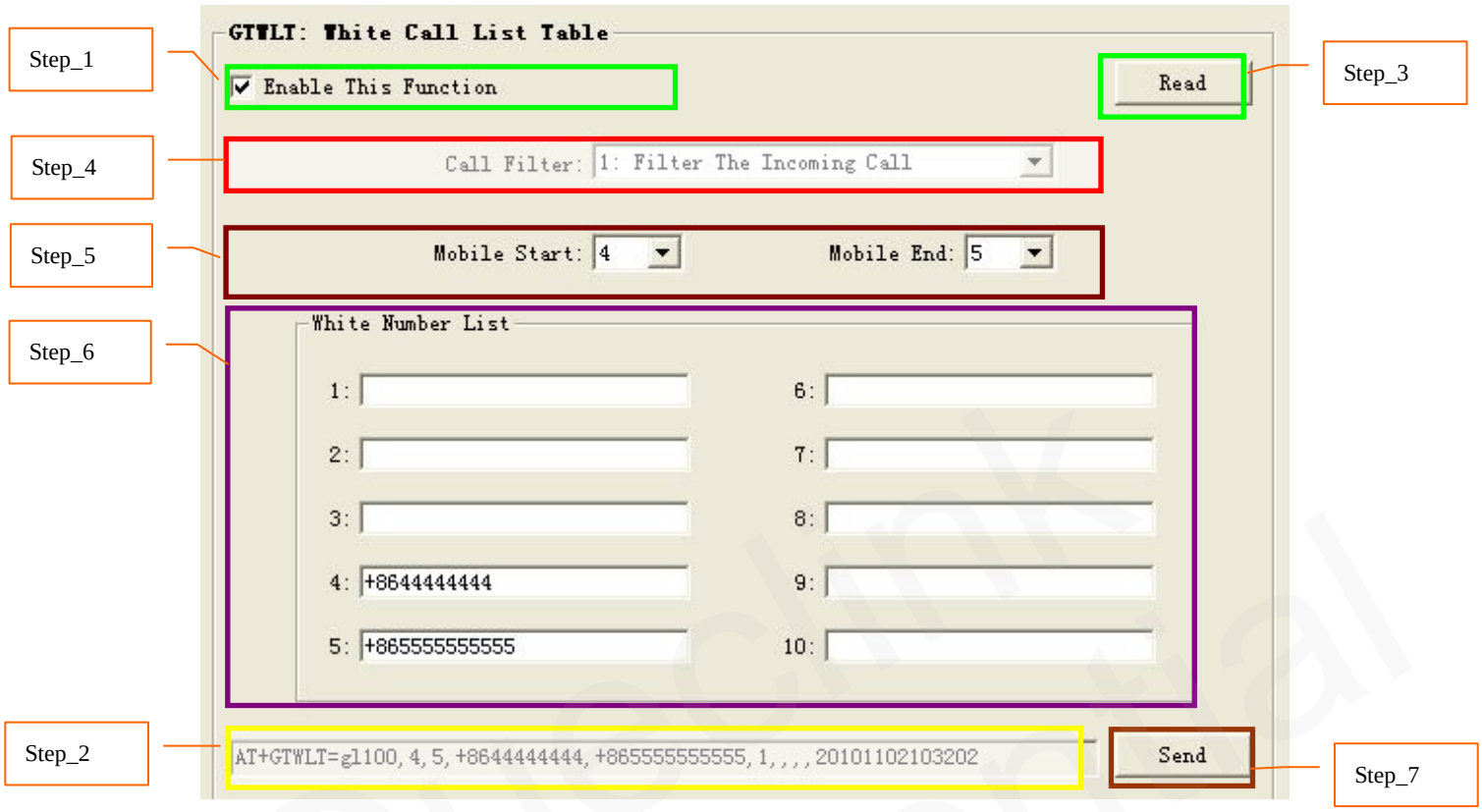
Step_5: Set google link name. Please refer to the "*GL100 @Track Air Interface Protocol*" for detail.

Step_6: Set the mobile index from start to end which you want to edit. Please refer to "*GL100 @Track Air Interface Protocol*" for detail.

Step_7: Set the direct number list of google link. Please refer to the "*GL100 @Track Air Interface Protocol*" for detail.

Step_8: Click the "*Send*" button; download the parameters of GTGLM to GL100.

4.4.9. Set the parameters of white call list



Step_1: Select "*Enable This Function*", after that the parameters of GTWLT can be changed and the "*Send*" button is enabled.

Step_2: When "*Enable This Function*" is selected, the command message which shall be sent to GL100 will be generated based on input and displayed here. Please note this command message can also be sent to GL100 through SMS or GPRS.

Step_3: It is recommended to read the parameters from GL100 and edit based on them.

Step_4: Set call filter enable or disable in white call list function. Please refer to "GL100 @Track Air Interface Protocol" for detail.

Step_5: Set the white call list index from start to end which you want to edit. Please refer to the "*GL100 @Track Air Interface Protocol*" for detail.

Step_6: Set the number list of white call list function. Please refer to "*GL100 @Track Air Interface Protocol*" for detail.

Step_7: Click the "*Send*" button; download the parameters of GTWLT to GL100.

5. Troubleshooting and Safety info

5.1. Troubleshooting

Trouble	Possible Reason	Solution
After GL100 is turned on, the Red LED 1 flashes quickly always.	The SIM card is not inserted.	Please insert the SIM card into GL100.
	The signal is too weak; GL100 can't register to the network.	Please move GL100 into place with good GSM coverage.
Messages can't be reported to the backend server by GPRS.	The SIM card in GL100 doesn't support GPRS.	Try a GPRS supported SIM card.
	APN is wrong. Some APN can not visit the internet directly.	Ask the network operator for the right APN.
	The IP address or port of the backend server is wrong.	Make sure the IP address for the backend server is an identified address in the internet.
Unable to power off GL100.	The function of power key was disabled by AT+GTSFR.	Enable the function of power key by AT+GTSFR.
GL100 is turned on after insert a charging cable.	The function of full power up was enabled by AT+GTSFR.	Disable the function of full power up by AT+GTSFR.
No response from UART when configure GL100 through UART	GL100 is in power saving mode.	Remove the Data_Cable, and plug it in again. After this operation, GL100 will exit from power saving mode for 10 seconds.
GL100 can't get successful GPS fixing.	The GPS signal is weak.	Please move GL100 to a place with open sky.
		It is better to let the top surface face to sky. (The same surface with indication LED)
		GL100 will stop GPS if it can't get GPS fixing in 2 minutes (except in emergency mode). So please make sure the GPS signal is good enough when doing the first time of GPS fixing.

5.2. Safety info

- Please do not disassemble the device by yourself.
- Please do not put the device on the overheating or too humid place, avoid exposure to direct sunlight. Too high temperature will damage the device or even cause the battery explosion.
- Please do not use GL100 on the airplane or near medical equipment.