GPS&GPRS TRACKING SYSTEM GT3100

OPERATION/INSTALLER MANUAL

REV: 2.0 (GT3100-special, V1.51, GT500-SIM340.C1)

I. INTRODUCTION

PORTMAN GPS GPRS tracking system GT3100 utilize the GPS tracking function and car alarm functions in one unit. You can monitor the vehicle location and control the car alarm remotely. In addition, the unit will send event report if any trigger occurs. It has built-in 8 outputs and 5 inputs to perform essential alarm functions.

1.1 Report structure

The standard report sent by the unit includes the information: (1) unit's ID, (2) status, (3) time, (4) GPS's latitude and longitude, (5) speed, (6) direction, (7) temperature, (8) device's status, (9) event number, and (10) report configuration parameters.

(1) Unit's ID: each device has its own unique ID and must be registered in the server in order to perform monitoring or controlling.
(2) Status: A=Valid, L=Last known
(3) Time: report time in Greenwich Mean time zone.
(4) GPS's latitude and longitude.
(5) Speed: in km/H
(6) Direction: in degree to the North.
(7) Temperature: in Celsius. If the temperature is not connected, 'NA' will be shown in this field.
(8) Device's status: there are 32 states to represent the I/O and working modes for the both the device and the build in alarm.
(9) Event number: all the generated reports will include a unique event number to indicate why it has been sent.
(10) Report configuration parameters: user can remotely change the report configuration, and the configuration parameters will be shown in this field.

1.2 Report Setup

GT3100 must be initialized by PORTMAN PC setup program in order to make communication with the remote server /call center. There are four main sections that allow users to program the device, (1) User detail (Device ID, server IP, and port, SMS number, GPRS APN…) (2) In-built Geo-fence definition (up to 5 circular, 5 rectangular and 20 point Geo-fence shapes can be set in the device) (3) Report setting (Time, Distance, Intelligent mode, Temperature, Low battery, Course change…) (4) ALARM report (to enable or disable the event generated by the inputs, e.g. ACC, DOOR). Those data will have been saved in device's EEPROM and will not be lost even if the power is failure.

Note that the device ID, GPRS APN name, GPRS login name and password need to be set in initial PC setup in order to make the connection to the server. All the reports configuration or Geo-fence setup can be changed at anytime via over the air commands.
The automatic reporting mode can be categorized as 'time' report, 'distance' report, or 'time & velocity' report. User can choose the reporting mode and related parameters via the PC setup program or the remote sever.

The event trigger report is also configurable. User can turn on or off any event-generated report from the PC setup program or via the air command. The event-triggered report include (1) In-vehicle Door close/open (2) In-vehicle ignition on/off (3) Temperature range in/out the preset range.

The server cannot only configure the device just like the PC setup program does, but it also can send the command to control the device. The server can control both the device and the build in alarm.

1.3 Geo-fence function

The device has built-in 30 Geo-fence sets (1 immediate Geo-fence, 4 circular, 5 rectangular and 20 point); it will send the report to the server if the Geo-fence event is triggered. User can setup the Geo-fence area from the PC setup program or sending the defined.

A unique immediate Geo-fence function:

'Immediate-Geo-fence function' is a circular type Geo-fence that can be activated or deactivated from a single button. When activated, the system will record the current position and use the pre-defined radius as a circular Geo-fence to guard the vehicle. If the vehicle moves out of the preset Geo-fence zone, a report will be generated to the server. User can deactivate the self-Geo-fence at any time by pressing the valet switch again. If the GPS cannot be located when the Immediate Geo-fence function is been executed, GT3100 will use the last known position as the origin of the circular Geo-fence zone to perform the protection.

US Patten for immediate Geo-fence function is pending.

1.4 Store and forward ability

When there is no GPRS service or the server close. The unit will send short message to the server if defined SMS number. All the stored report will be forward to the server when GPRS connection is completed next time.

1.5 TCP and UDP socket support

GT3100 supports both UDP and TCP socket communication. The server IP, port number and socket type can be selected from the PC-setup program or remote server command. In addition, the connection can be swap over to any server IP or port (either UDP or TCP) via the air command.

1.6 The server can send the command to control the device and the build in alarm.

Command for in-vehicle control:

We design 8 commands that can be integrated into the server, so that the users can control their vehicles. Those commands are: (1) Door lock, (2) Door unlock, (3) Arming, (4) Panic, (5) Enable anti-car jacking, (6) Emergency release, (7) Trunk release, (8) Channel 2 outputs.

Notes:

1. Arming (this command is valid only if when ACC is off): If ACC Off, Server send arming command. The door will lock and the Engine will be Disable starter (if the starter cut relay connected), after the unit received the command.
2. Panic: (can be performed at any time) If Server send panic command, the horn will sound and parking lights will flash for 30 seconds after the unit received the command.
3. Enable anti-car jacking: (can be performed at any time) If Server sends anti-car jacking command, the system will enter anti-carjacking mode after the unit received the command. When the anti-carjacking has activated, from the beginning to 30 seconds, the LED will flash once and siren chirp once interval 10 seconds, from 31 to 60 seconds, the LED will flash once and siren chirp once interval 5 seconds, from 61 to 120 seconds, the LED will flash once and siren chirp once interval 1 seconds, after 120 seconds, system will locked ignition and LED will flash once and siren will chirp once interval 1 seconds. To release anti carjacking: To send emergency commands or ACC ON, press emergency button to release anti carjacking.
4. Emergency release: (can be performed at any time) If Server send Emergency release command while at Arming mode, panic mode, anti-car jacking mode. Then system will exit 'Arming', 'Anti-carjacking', 'Panic' mode. The 'Arming', 'parking light' and 'siren' outputs will back to normal (Disarm) status.

1.7 Valet switch operation

User can use the supplied Valet switch to perform 5 essential tasks, including (1) sending help report (2) activate or deactivate Immediate Geo-fence (3) sending 'Duty on' or 'Duty off' report to the server (4) Emergency release to exit 'ARM', 'Anti-carjacking' or 'Panic' modes

(1) Sending 'HELP' report

Press the button once, The LED will flash once and a 'HELP' report will be generated.

(2) Activate or deactivate Immediate Geo-fence

Press the button and release it when the LED flashes once. After releasing it, the LED will stay continuously on to indicate the 'Immediate Geo-fence' is on. To deactivate: Press the button (the LED will be temporally off), and release it when the LED flashes once. After releasing it, the LED will then stay continuously off. A report will be sent out if the vehicle goes out/in to the Geo-fence zone.

(3) Panic

Press the button (the LED will be temporally stay off) and release it when the LED flashes twice. After releasing it, a panic action will be generated.

(4) 'Duty on' or 'Duty off' reports / 'Status on' Status off' reports

Press the button (the LED will be temporally stay off) and release it when the LED flashes 3 times. After releasing it, a 'Duty on' report will be sent out. To deactivate: Press the button (the LED will be temporally stay off) and release it when the LED flashes 3 times. After releasing it, a 'Duty off' report will be sent out.

(5) Emergency release to exit 'ARM', 'Anti-carjacking' modes.

ACC ON, press and hold the button (the LED will be temporally stay off) and release it when the LED flashes 5 times. After releasing it, 'ARM', 'parking light', and 'siren' outputs will back to normal (Disarm) status.

1.8 History report

Flash memory for recording reports up to 900 reports. It can be read out from the PC setup program via serial port.

1.9 Backup battery (optional)

The system has a built-in rechargeable battery (4.8V 20mA/H) for emergency use. The system will send a power cut report when all the external power is disconnected.

1.10 LED indication

Three LED indicate the status of the POWER, GPRS signal and GPS signal.

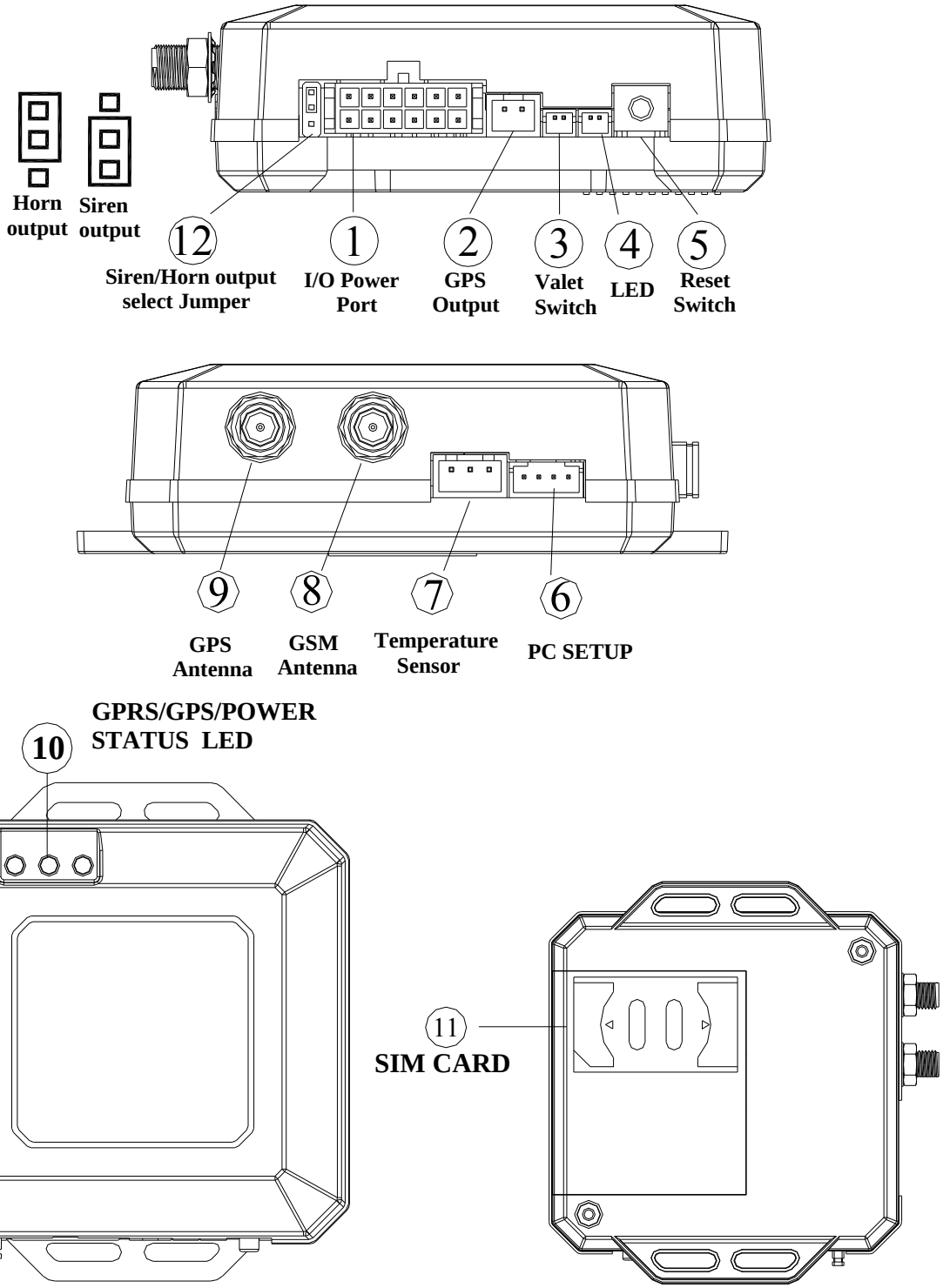
1.11 Keep alive procedure

Keep alive procedure (in order keep connection in GPRS network, the unit can be set to send short keep alive report to the server in order to prevent the disconnection from the mobile service provider)

II. BASIC FUNCTIONS

FUNCTIONS	APPLICATIONS
GPS	GPS receiver will output a complete position, velocity, and time (PVT) solution in the NMEA Version 3.0 protocol
GPRS, SMS	GPRS use standard TCP or UDP communicate protocol. If the GPRS service is failed, the SMS mode will be turned on for emergency use.
5 input	In-vehicle Door. In-vehicle ACC Temperature sensor port (optional) Valet switch port
8 output	1. Parking light (-300mA) 2. Door Lock (-300mA) 3. Door Unlock (-300mA) 4. Start kill output (-300mA) 5. Siren/Horn output 6. Trunk Release (-300mA) 7. Channel 2 output (-300mA) 8. GPS output
GPS output interface	GPS port will output NMEA 0183 GPS data. Data rate: 9600 bps
Valet Switch	(1) Sending HELP report (2) activate or deactivate Immediate Geo-fence (3) panic (4) sending 'Duty on' or 'Duty off' report to the server (5) Emergency release to exit 'ARM', 'Anti-carjacking' or 'Panic' modes
PC-setup	Initialize the unit and program the device, including Network APN, server IP address, user message, report control, and Geo-fence setting, etc … Note that Network APN and server IP details must be set before the installation.
Standard Report	Automatic report for AVL tracking purpose: Fixed time report Fixed distance report Intelligent report (combine time and distance) Keep alive report
Event Report	Temperature report Speeding report Low battery report Geo-fence trigger report ALARM trigger report, e.g. PANIC mode, ARM, ACC inputs, etc …
History data store	900 report can be saved in unit, and read from server and pc-setup

III. PANEL INSTALLATION AND WIRING DIAGRAM



1.) In-vehicle I/O and power port: for in-vehicle I/O, and power, etc ….
2.) GPS output port: white 2-pin connector.
3.) VALET switch port: white 2-pin mini connector.
4.) LED port: red 2-pin mini connector
5.) RESET button (on PCB board)
6.) PC setup port: white 4-pin connector
7.) Temperature sensor port (optional sensor): white 3-pin connector.
8.) GSM antenna: female SMA.

9.) GPS antenna: female SMA..
10.) System LED: RED- Power indicator; Green- GPS indicator, Yellow- GSM indicator.
Warning! Power off the system until the Red LED completely turns off before unplug or insert the SIM card. Otherwise, it may damage your SIM card.
11.) SIM CARD.
12.) Siren or Horn output select jumper.

IV. STATUS INDICATOR

System LED:

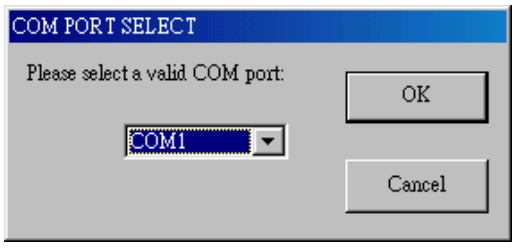
RED: Power indicator. When the unit power on, the led will light all the time. When power cut off the unit works with backup battery, the led will flash until all the report is sent to server.
YELLOW: GSM/GPRS indicator. Yellow LED will flash when the device is connected to the server with valid GPRS connection. It will stay continuously on when it is in GSM mode. It will stay off if there is no GSM reception.
Green: GPS indicator. This LED will be ON when the unit received a valid GPS data.
Note that the YELLOW and Green LEDs indication will not be valid until the system goes to the working mode, normally 30 seconds after power on.

V. PC SETUP AND SYSTEM INITIATION

PC setup Procedure:
(1.) Connect the 3pin to RS232 cable to the DB9 port.
(2.) Open the PC setup program.
(3.) Select the correct COM port for communication.
(4.) Power on the device or press the reset button for at least 2 second.
(5.) Click “ok” to start the program
Note that, if the connection fails, please check the cable connection is secured correctly. Press the reset button for a longer time, e.g. another 3 seconds.

A. LOGIN dialog window

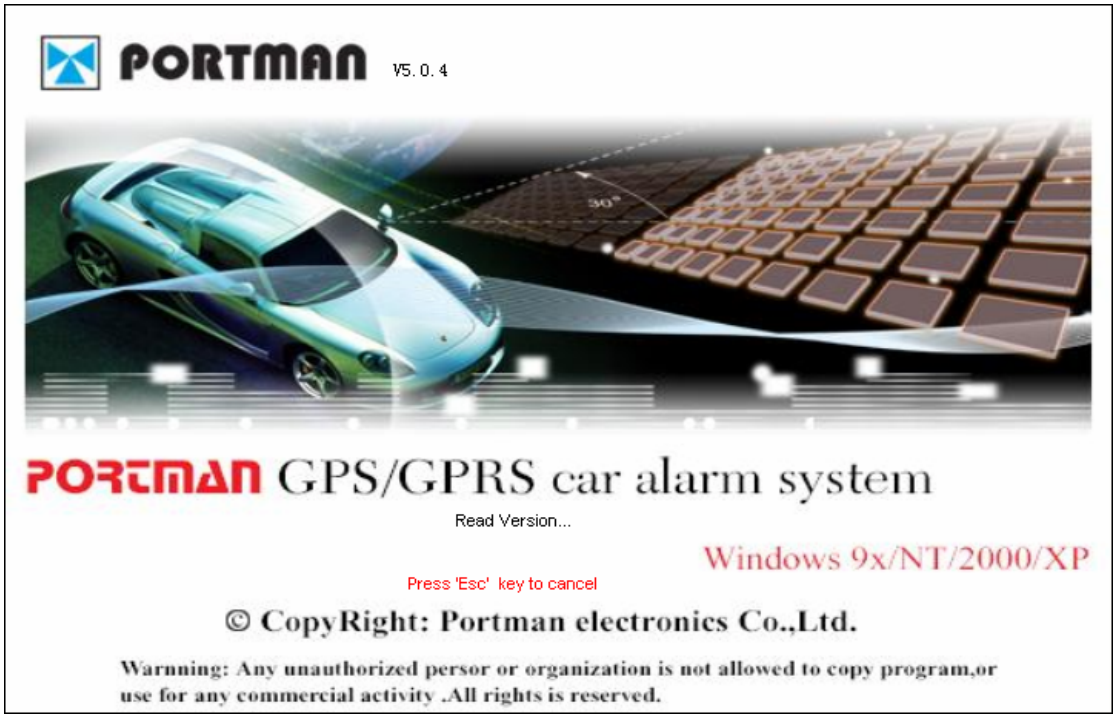
Select the correct COM port number, then “reset” the unit by pressing the reset button, and next click “OK”.



Note that: it is necessary to power on and reset the PORTMAN device soon after click the “ok” button.
PC setup program will detect the hardware for 60 seconds. If no hardware is detected, it will exit.
During the opening up screen shown as below, user can press “Esc” key to terminate the program.

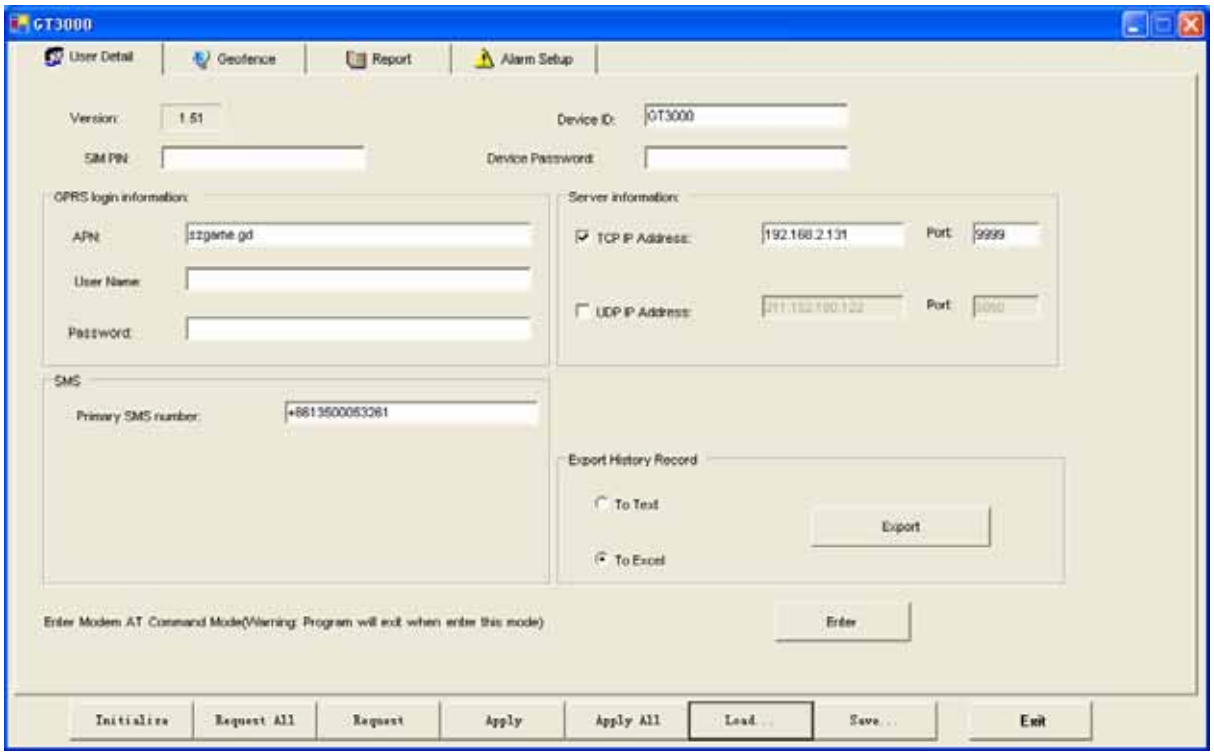
B. Version No. Checking

The below interface will last until correct UNIT Version No. is checked. (You should run this program before turn on power of UNIT)



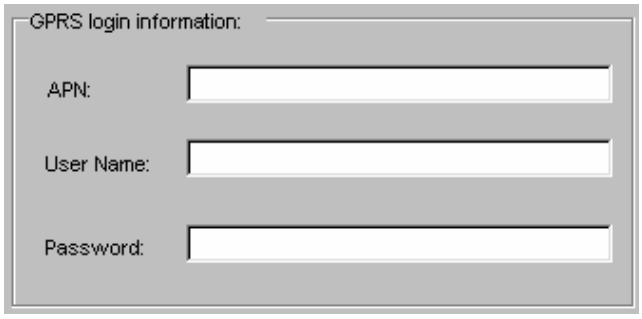
C. MAIN INTERFACE

1. [User detail:]

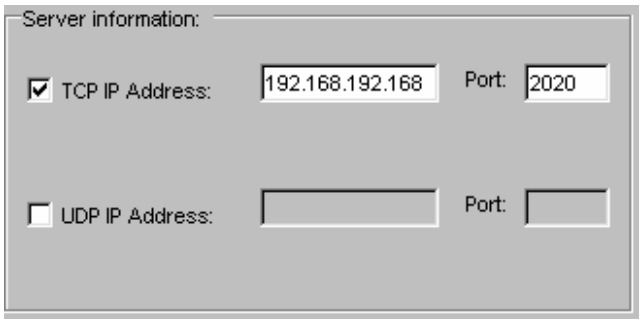


If the SIM card is password protected, user can input the “SIM PIN” window to set password of SIM Card.

Set UNIT ID for the device.

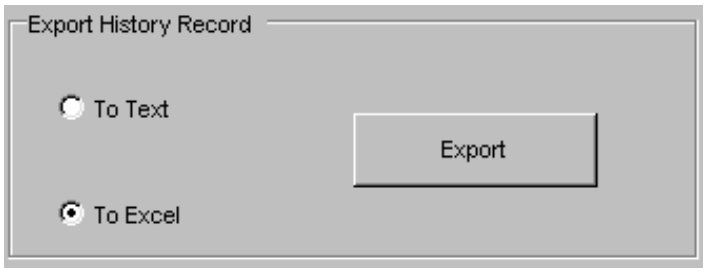


Set Access Point Name (APN), User Name, Password. The maximum length of the APN, User name and Password is 49 characters.



TCP/UDP address and Port number of the remote server being set, UNIT will send report to these address. Note that only one TCP or UDP server will be used at the same time.

Set the SMS Number of the server. The unit will send reports to the server if GPRS connection is failed.



UNIT can save 900 reports (900-1) recently; Click 'Export' button can export them with Excel or Text format.

"Initialize " button: clear all data in UNIT.

Request All: read out the whole existing setting from GT3100.

Request: read out the setting in the current page.

Apply: transfer the setting to GT3100 in the current pages.

Apply All: transfer the whole setting to GT3100.

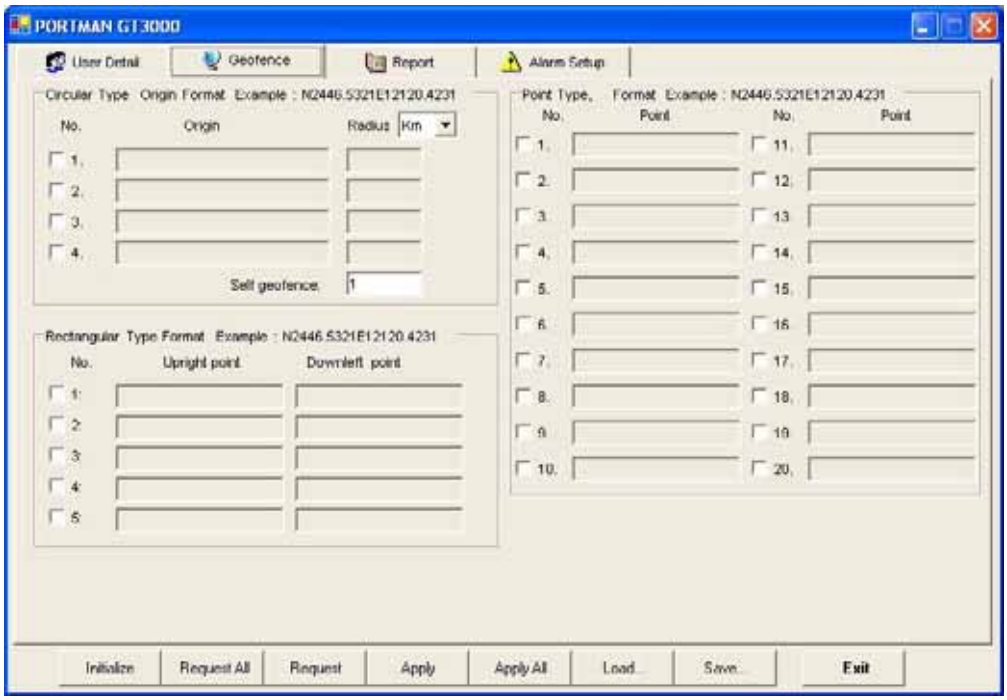
Load: load the saved configuration files.

Save: save the current configuration setting to a file.

"Exit " button: exit PC-Setup to main program.

Note that Device ID, GPRS Login and server IP/Port information need to be input correctly in order to make the connection. If the report sending using GPRS connection fails, the report will be sent to the 'primary' SMS number first. The report will be resent, when the GPRS connection becomes available.

2. [Geo-fence:]



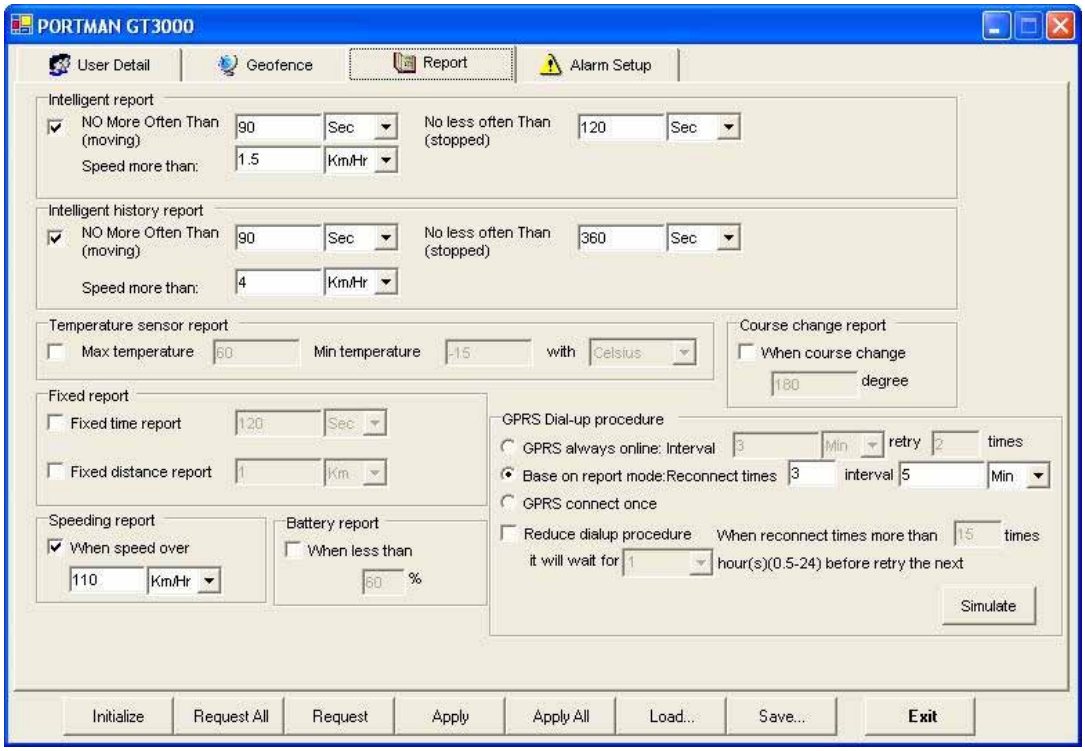
4 circular, 5 rectangle and 20 point Geo-fence areas can be set. When UNIT is out of these predefined zones, a report will be generated. When self Geo-fence is activated, It will record the current position as the origin and use the predefined distance for the radius to enable a circular Geo-fence.

Origin\Upright point\Downright point has the format: N2446.5321E12120.4231 (21 fixed digits)

Radius has the format:

User can input the circular radius from 0.1 to 1000 (in km).

3. [Report:]



Automatic report can be configured in this section. To activate the function(s), please select "√" in checkbox and fill in data in the textbox.

The reports will be summarized as
(1)Intelligent report
Parameters: On/Off, Report time when moving, Report time when stop, and threshold speed. (min. speed is 0.1 km/Hr, max. speed is 1000 km/Hr).

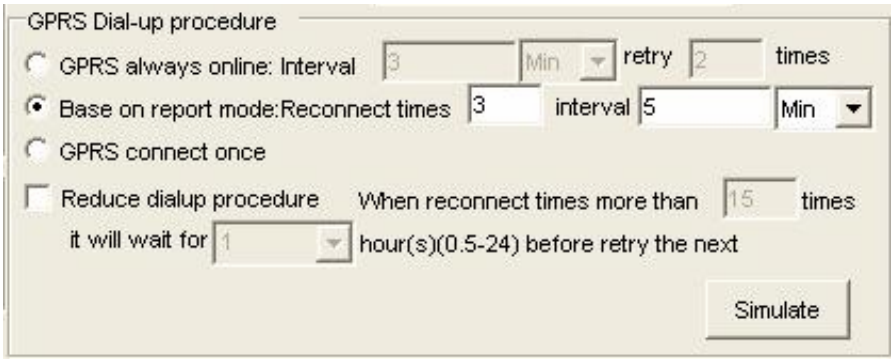
(2)Intelligent history report (record the report in the system's flash ram)
Parameters: On/Off, Report time when moving, Report time when stop, and threshold speed. (min. speed is 0.1 km/Hr, max. speed is 1000 km/Hr).

(3)Fixed time report
Parameters: On/Off, and time.

(4)Fixed distance report
Parameters: On/Off, and distance. (Min. distance is 0.1 km, max. distance is 100 km).

(5)Keep alive procedure

GPRS dial-up procedure



1) GPRS always one-line with keep alive packet
Parameters: interval and retry times.
While using this mode, the unit will send out the "keep alive packet" to the server and wait for "ACK" back to maintain the connection. If no "ACK" is received, the unit will actively retry GPRS connection within the settings.

2) Base on report mode (no keep alive)
Parameters: Max. reconnect times, reconnect interval
While using this mode, the unit will connect to the server when there is a report to send. If the first connection is failed, it will retry to connect to the server up to the max. reconnect times. Each retry will be separated by the reconnect "interval".

3) GPRS connect once
While using this mode, the unit will connect to the server when there is a report to send (but only try once). If it is not successful, the report will be stored and sent out in the next successful connection. Disconnect GPRS connection when report sending is completed.

Reduce GPRS dialup method
Parameters: On/Off, Max. reconnect times, connect delay
If this method is used, the unit will reduce the GPRS dial-up connection when the dial-up is failed after number of times. User can define the delay time for the unit before try to reconnect to the server. If there is trigger report, the unit will connect to server immediately.

Simulate

Click this buttons, it will base on the configurations to generate an approximate maximum dial-up numbers within 24 hrs. Therefore, user can predict the worst case dial-up connection if the server link is dead or GPRS disconnected.

Special command for SMS mode:

If the GT3100 is not in the GPRS online status, user can send command &&Y02 or &&Y04 to ask unit to connect to server. This command can be sent from any device via SMS;

&&Y02:

When received this command, system will actively try to connect to server in next 600 seconds.

&&Y04,[connection time],[report interval]:

For example: &&Y04, 3600, 60

When received this command, system will connect to server in the next 3600 seconds, and send one report out every 60 seconds.

(6)Course change report (to send a report when the course change is bigger than the value set here)

Parameters: On/Off, and course change in degree.

(7)Temperature report

Parameters: On/Off, and min. and max. Temperature.

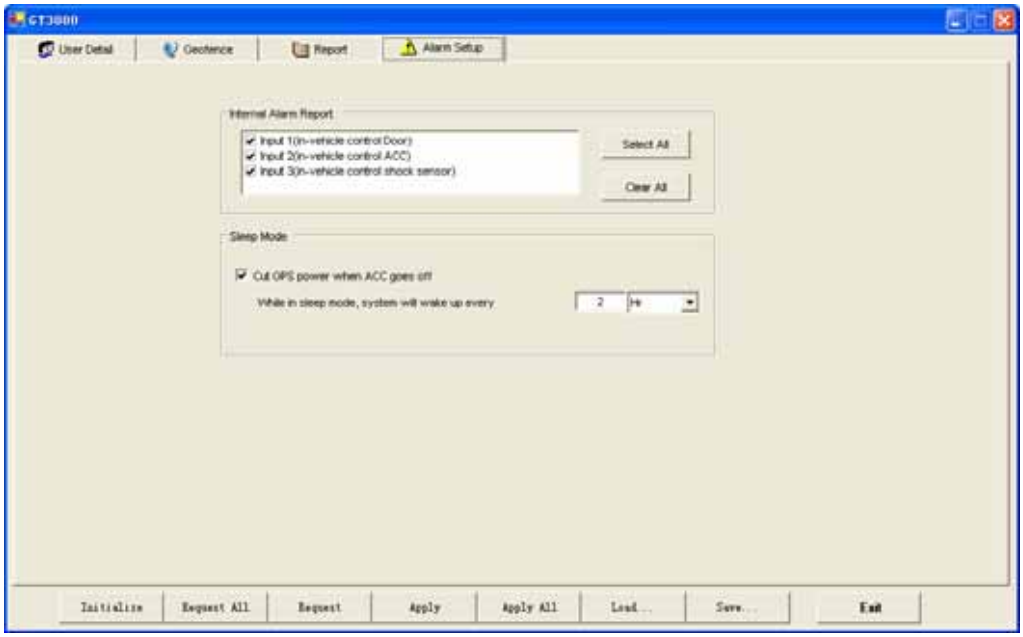
(8)Low battery warning report (to alert user when the external battery level is low)

Parameters: On/Off, and warning battery level for report. For example, 50 to represent 50% lower level report. The system will ignore the parameter with a value '0' to prevent continuous non-stop reporting.

(9) Speeding report: (min. speed is 0.1 km/Hr, max. speed is 1000 km/Hr).

Parameters: on/off, and speed

4. [Alarm REPORT setup]



Alarm report(s) is also configurable. User can customize the events generated by the in-vehicle input or build in car alarm to be sent to the server. If the item(s) were selected (VALID), the related reports will be sent. Otherwise the report will be ignored even when an event is occurred internally.

Sleep mode: ACC OFF without any trigger in 5 minutes, system will enter sleep mode, any trigger in anytime can awaken system.

APPENDIX

GT3100 SPECIFICATIONS

Physical Parameters

Enclosure dimensions	88(L)*76(W)*25(H)
Weight	100g

Electrical

DC Supply voltage	12V
DC Tolerance voltage	9V－16V
Current (GPRS online)	60mA
Current (GPRS transmission)	80mA
Current (Peak)	120mA

GPRS*

Frequency Range (MHz)	Support 4-frequency 850/900/1800/1900
Channel spacing (Hz)	200
GPRS connectivity	GPRS multi-slot class 8 GPRS mobile station class B
SIM card interface	3V/5V
SMS storage Capacity	40 in ME
Antenna Connector	Silver Male TNC or SMA
Antenna Impedance	50ohms

GPS*

* Data provided by trimble

Protocol	NMEA0183
Baud Rate	9600
Signal	1575MHz
Number of Channels	12 Channel Simultaneous Operation
Accuracy Horizontal	<5 meters (50%), <8 meters (90%)
Altitude	<10 meters (50%), <16 meters (90%)
Velocity	0.06 m/sec.
Hot Start:	<10 sec. (50%), <13 sec. (90%)
Warm Start:	<38 sec. (50%), <42 sec. (90%)
Cold Start:	<50 sec. (50%), <84 sec. (90%)
Antenna Type	Active 3.3V
Antenna Connector	Gold Male SMA

Communication

	GPRS \SMS\RS232

Environmental

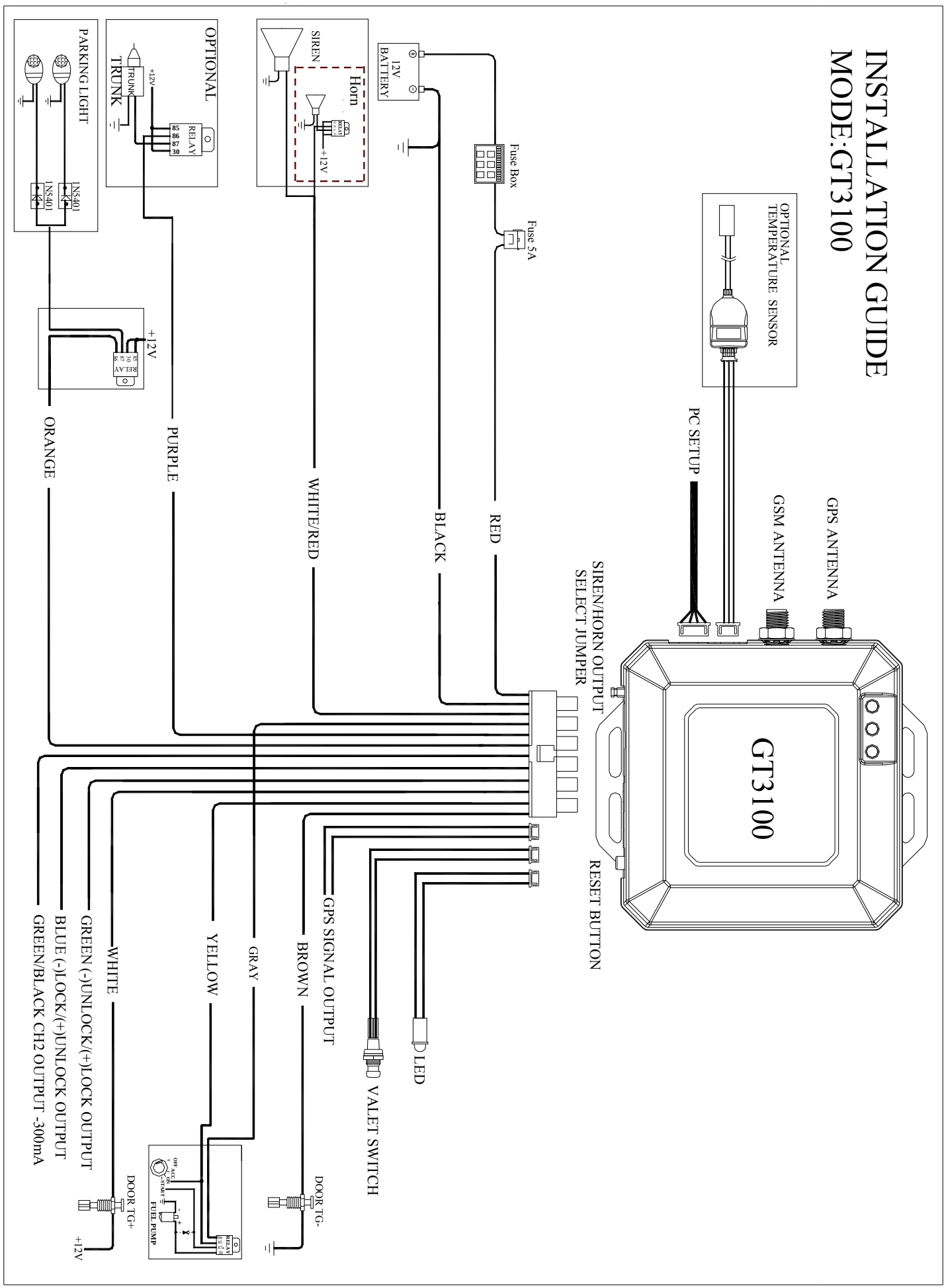
Operating Temperature	-20°C to +55°C
Storage Temperature	-40°C to +85°C

Accessories

1. Main unit
2. Operation/installer manual
3. Wire harness
4. GSM Antenna
5. GPS Antenna
6. Starter kill relay (RL-100)
7. Valet switch (SW-2)
8. LED (LD-4)

Optional Accessories

1. Built in 20mA/H Ni-Mh 4.8V backup battery (optional)
2. Combined Antenna (with GPRS and active GPS) 900/1800 and 850/1900 MHz two types (optional)
3. GPS Active Antenna (optional)
4. Siren (optional)
5. Temperature sensor (optional)
6. PORTMAN PC-setup Cable (optional)


INSTALLATION GUIDE
MODE:GT3100
OPTIONAL TEMPERATURE SENSOR
GPS ANTENNA
GSM ANTENNA
PC SETUP
GT3100
SIREN/HORN OUTPUT SELECT JUMPER
RESET BUTTON
Fuse Box
Fuse 5A
12V BATTERY
SIREN
Horn
RELAY
+12V
OPTIONAL
RELAY
85 86 87 30
TRUNK
+12V
PARKING LIGHT
IN5401
IN5401
RED
BLACK
WHITE/RED
PURPLE
ORANGE
LED
VALET SWITCH
GPS SIGNAL OUTPUT
BROWN
GRAY
YELLOW
WHITE
GREEN (-)UNLOCK/(+)LOCK OUTPUT
BLUE (-)LOCK/(+)UNLOCK OUTPUT
GREEN/BLACK CH2 OUTPUT -300mA
DOOR TG-
DOOR TG+
+12V
OFF
ACC
START
FUEL PUMP
RELAY

VI. Federal Communications Commission (FCC) Statement

1)

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

2)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

VII Operation is subject to the following two conditions:

1) this device may not cause interference and

2) this device must accept any interference, including interference that may cause undesired operation of the device.

VIII FCC RF Radiation Exposure Statement:

1) This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2) This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.