



George Tang Industrial Corp.

GET-400/401M

DVR Notification and Tracking Device

Operation Guide



Version 0.3

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Revision History

Ver	Date	Description
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0.1	Dec. 31 st , 2009	Initial draft
0.2	Dec. 31 st , 2009	Logo revised
0.3	Mar. 12 th , 2010	1. Including GET-401 2. Revised Windows based utility for easy configuration



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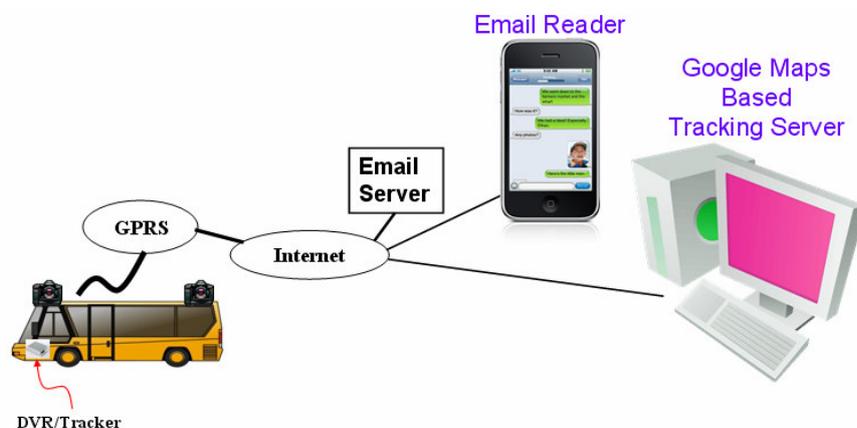


1. Introduction to GET-400/401M

The GET-400 and GET-401M notification and tracking device was specially designed to co-work and integrate with GeorgeTang's mobile DVR system to report the DVR notification status and to provide the valuable live tracking features. The GET-400 is a standalone device, and GET-401M is a slide-in module of DVR rack.

To act as DVR notification devices, GET-400/401M could send DVR related alerts to the predefined managers by e-mail through the GPRS Internet, and issue the emergency call through GSM network if necessary.

Moreover, the mobile DVR system along with integrated GET-400/401M tracker could be easily managed and monitored by the web based tracking server through the GPRS Internet. The users to manage fleets and vehicles could use PC/Windows/IE to login to the tracking server through Internet anywhere, anytime to lively track the vehicles on the Google Map and monitor the events and notifications from DVR system.



1.1. GET-400/401M Features

- ◆ As a standalone DVR notification device and also a tracking device
- ◆ Send e-mail to preconfigured managers if DVR alert occurs
- ◆ Co-work with Google Maps-based tracking server
- ◆ Quad-band GSM/GPRS support
- ◆ With external ultra-high performance GPS mouse receiver through PS/2 connector



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- ◆ Panic button for emergency help
- ◆ Emergency call to up to 3 preset numbers
- ◆ Location and event report to a tracking server
- ◆ Configurable report interval
- ◆ Geo-fence setting
- ◆ Over-speed and G-force limit
- ◆ Real time commands sent from server acceptable
- ◆ Over-the-air firmware update from tracking server

1.2. Technical Spec

GSM/GPRS Characteristic Data

Quad-band	900/1800, 850/1900 MHz GSM phase 2/2+ compliant
GPRS connectivity	GPRS multi-slot Class 10 (default) GPRS multi-slot Class 8 (optional) GPRS mobile station class B
Coding scheme	CS-1, CS-2, CS-3, CS-4
Data transfer rate	Downlink 85.6kbps max. Uplink 42.8kbps max.

GPS Receiver Performance Data (with external SiRF-3 based GPS mouse receiver)

Receiver type	L1 frequency, C/A code
Horizontal Position Accuracy	< 2.5m (Autonomous) < 2.0m (WAAS) (CEP, 50%, 24-hour static, -130dBm, SEP < 3.5m)
Velocity Accuracy	<0.1 m/s (speed) <0.5° (heading) (50% @ 30 m/s)
Time To First Fix	Autonomous (All at -130dBm)
Hot start	1sec
Warm start	32sec
Cold start	32sec
Sensitivity (Autonomous)	-142dBm (acquisition) -159dBm (tracking & navigation)
Max. Update Rate	1Hz
Max. Altitude	< 18,000 m
Max. Velocity	< 1,852 km/hr
Protocol Support	NMEA 0183 v2.3 or newer UART: 4800~115200bps N,8,1;



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	GGA, GSA, GSV, RMC, VTG
SBAS Support	WAAS, EGNOS, MSAS
Dynamics	< 4g

Electrical Data

Power supply	8~28 VDC
Power consumption	TBS

Environmental Data

Operating temperature	-20 ~ 80°C
Storage temperature	-40 ~ 85°C

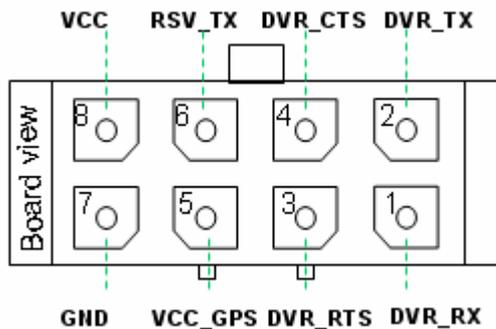
1.3. I/O Interface of GET-400

Mechanical Data – 92 x 56 x 24 (mm)



I/O Interfaces

8-pin Interface to DVR – Micro-Fit header



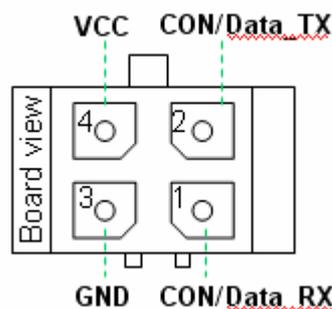
Pin	Name	Function	I/O
1	DVR_RX	DVR RS-232 data input (to DVR)	Output
2	DVR_TX	DVR RS-232 data output (from DVR)	Input



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3	DVR_RTS	DVR RS-232 Request To Send	Output
4	DVR_CTS	DVR RS-232 Clear To Send	Input
5	GPS_VCC	+5VDC GPS power (to GPS)	Output
6	GPS_TX	GPS RS-232 data output (from GPS)	Input
7	GND	Ground	Input
8	VCC	8 ~ 28 VDC power supply	Input

4-pin Interface to Console/RFID – Micro-Fit header



Pin	Name	Function	I/O
1	CON/Data_RX	Console RS-232 data input (to Console)	Output
2	CON/Data_TX	Console RS-232 data output (from Console)	Input
3	GND	Ground	Input
4	(Reserved)		

Other Interface

G-mouse	Mini 6-pin PS/2 connector, male VCC: 5 VDC GND, TX/RX: GPS-TX/RX, RS-232
GSM antenna	SMA RF connector
Status LED	Green, during and after initialization – 1 sec on, 1 sec off: connecting GPRS 1 sec on, 3 sec off: fixing GPS position 1 sec on, 6 sec off: connecting tracking server Steady on: tracker ready
Reset	Push button
Microphone	3.5mm earphone jack
Speaker	RCA port
Emergency	2.5mm earphone jack
SIM card	SIM card holder



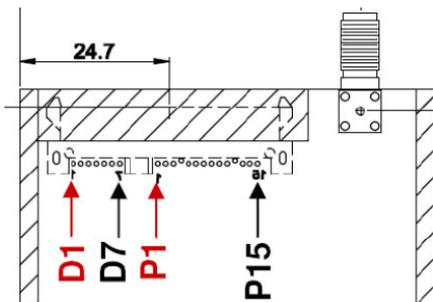
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1.4. I/O Interface of GET-401M

Mechanical Data – 164.6 x 68.4 (mm)



22-pin SATA Connector



Pin#	Pin Name	Pin Description
P15	DVR_TX	RS232 DVR TXD (from DVR)
P14	DVR_RX	RS232 DVR RXD (to DVR)
P13	DVR_CTS	CTS of DVR
P12	GND	Ground
P11	DVR_RTS	RTS of DVR
P10	GPS_TX	RS232 GPS TX (from GPS)
P9	GPS_VCC	Output power to GPS
P8	MIC+	Microphone input
P7	MIC-	Microphone input



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P6	GND	Ground
P5	GND	Ground
P4	GND	Ground
P3	SPK+	Speaker output
P2	SPK-	Speaker output
P1	ACC	KEY_ON
D7	GND	Ground
D6	CON_TX	RS232 console TX (from console)
D5	CON_RX	RS232 console RX (to console)
D4	GND	Ground
D3	VCC_BATT	12V vehicle battery in
D2	VCC_BATT	12V vehicle battery in
D1	GND	Ground

Other Interface

Status LED	Green, during and after initialization – Steady on: tracker ready Blinking: 1 sec on, 1 sec off: connecting GPRS 1 sec on, 3 sec off: fixing GPS position 1 sec on, 6 sec off: connecting tracking server
GSM LED	Green, Steady on: GSM ready Blinking: GPRS problem
SIM card	SIM card holder
Reset	Push button
GSM antenna	SMA RF connector

1.5. Accessories



Power/DVR cable	8-pin micro-fit connector, 50-cm cable
Console cable	4-pin micro-fit connector to USB connector, 3-m cable (option)
G-mouse	PS/2 female connector, 3-m cable
GSM antenna	SMA connector, 3-m cable



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Microphone	Mic. with 3-m cable
Speaker	Speaker with 3-m cable
Emergency	Emergency button with 3-m cable



2. Configuration of DVR Notification Device

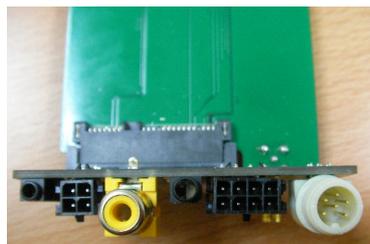
The GET-400/401M notification device (ND) needs to be configured before starting to operate. Through the configuration program, the APN (Access Point Name) of the corresponding ISP of SIM card hold on the GET-400/401M is set first. The e-mail addresses of manager(s) could be set also, to which the e-mail will be sent if any DVR related alert occurs.

2.1 Special Accessories

A power adapter with the interface to 8-pin micro-fit connector is used to apply the power to GET-400/401M. Besides, the USB data cable with the interface to 4-pin micro-fit connector is for the data communication between PC/NB and GET-400/401M. The Prolific USB driver will be required to install first if it's the very first time to use the USB data cable.



For GET-401M, a special adapter to convert SATA connector to 8-pin and 4-pin micro-fit connectors and other ports is provided. The above-mentioned power adapter and USB data cable could be used seamlessly for GET-401M.



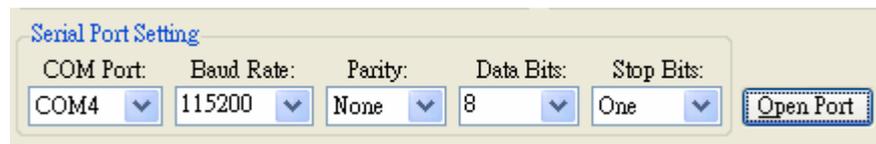


2.2 Notification Device Configuration Tool

The PC/Windows based DVR Notification & Tracking Configuration Tool (DNTC) is provided. Please run **setup** to install it before execution. It will take some minutes to download Microsoft's NET Framework during the installation.

When executing DNTC tool, select the correct COM port and activate the button **Open Port**. The default parameters are 115200 baud and N,8,1. The COM port converted by USB data cable could be checked as below:

Windows Start → Setup → Control → System → Hardware → Device Manager → Connection Port (COM & LPT)



It's unnecessary to check the **Report to sever** for notification device. There are 10 different types of alerts generated by DVR as listed. When the alert type is set on, an e-mail will be sent to the configured manager(s) if the enabled alert occurs. For emergent **Panic** alert, a snapshot will be sent by an additional e-mail together. If the **Panic voice call** is enabled, the emergency call will be made, too. One the contrary, the managers with preconfigured Phone Numbers could call in the ND for voice communication, or just silent monitor.

Please check **DVR-Stop Email** if the all the events except **Panic** are required to send by an e-mail together only when DVR stops. Below is the introduction of some parameters.

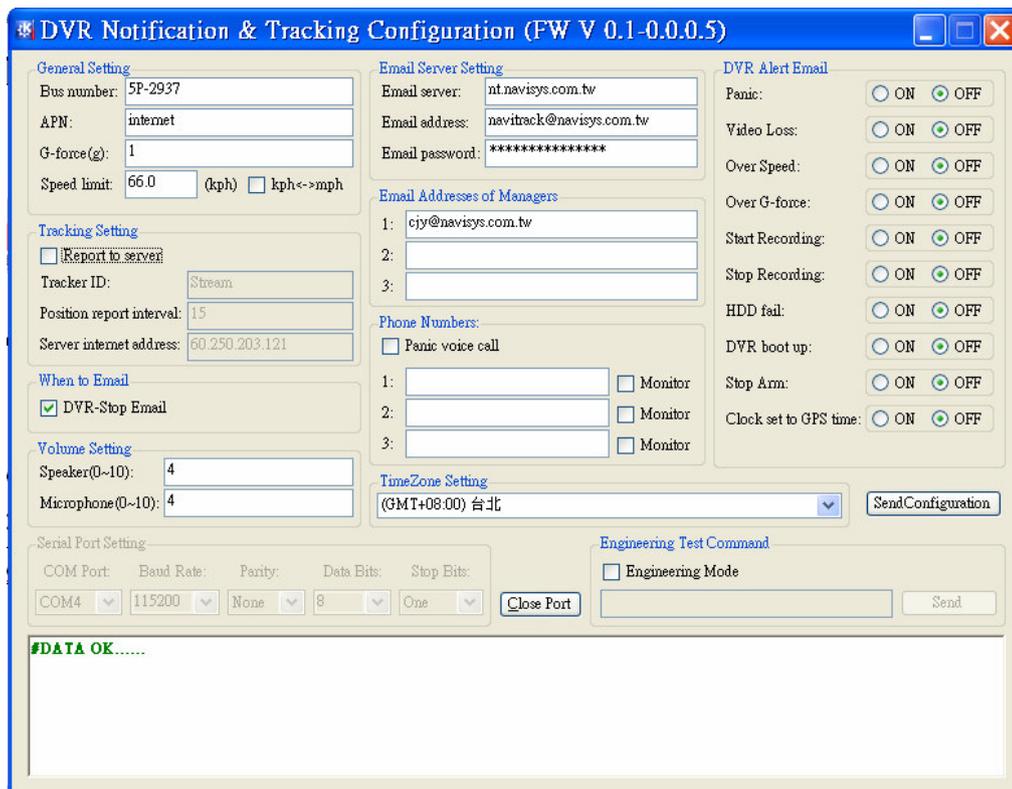
- ✧ APN (Access Point Name): to identify the ISP of the target GSM/GPRS system. For example, it's "isp.cingular" for some AT&T wireless cellular system.
- ✧ Bus number: the license plate of the vehicle on that the ND will be installed
- ✧ Speed limit and G-force: the limit of speeding and G-force. Just check **kph <-> mph** to choose metric or imperial unit. DVR will issue a corresponding alert once exceeds the limit if enabled.
- ✧ Time zone: a pull-down window to select the appropriate one.
- ✧ Email server: The e-mail server with the sender account and password



through which the ND could send an e-mail.

- ✧ Managers' e-mail addresses: up to three accounts that the ND will send an e-mail in case there is any alert event.
- ✧ Phone numbers: up to three phone numbers that the ND could communicate with. For incoming call, it could be silent if the **monitor** is check. The outgoing call will be issued to preconfigured phone numbers one by one until one succeeds or all fails if panic occurs and **Panic voice call** is checked.
- ✧ Speaker and Microphone: Just set the appropriate value depending on real environment for voice communication. 5 is suggested default value.

Once the parameters are set, just press the button **SendConfiguration** for confirmation. The **Engineering Mode** is reserved for engineering use.



2.3 Start to use the Notification Device

The ND is bundled with GPS mouse receiver, GSM/GPRS antenna, and wired microphone, speaker and emergence button. Before the use of ND, a SIM card **with PIN code disabled** needs to be inserted first.





3. Configuration of Tracker and Tracking Server

In addition to as DVR notification device, GET-400/401M could also act as tracker device. The web based tracking sever provides the easy-to-use, user-friendly GUI for more configuration before the tracking function is operational.

In case there is any enhanced feature to be updated to the firmware of the tracker device, the simple over-the-air firmware upgrade function is supported on the tracking server.

3.1 Configuration on Tracker

When activating DVR Notification & Tracking Configuration Tool, just check **Report to server** to set the required parameters below for the connection to tracking server and enable the tracking function.

- ✧ Tracker ID: a unique ID to represent this tracker device. It's used to establish the GPRS based TCP/IP connection to tracking server.
- ✧ Position report interval: 15 sec will be the suggest value. Based on the configured period, the server could lively track the tracker.
- ✧ Server internet address: the domain name or IP address of tracking server.

Tracking Setting	
<input checked="" type="checkbox"/> Report to server	
Tracker ID:	Stream
Position report interval:	10
Server internet address:	60.250.203.121

3.2 Configuration on Tracking Server

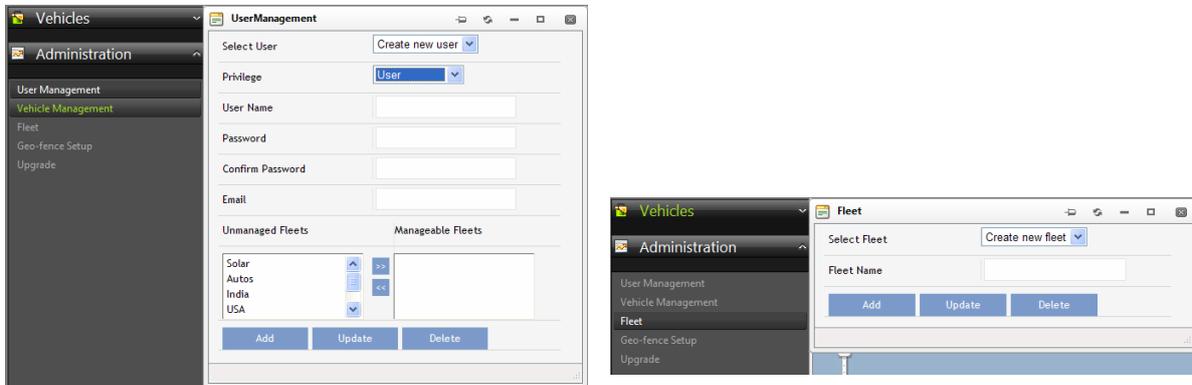
One default administrator account will be created automatically once the tracker server is set up.

If there is no existing user account to manage the specific fleet and vehicles, a



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new user account needs to be created first. There are two privilege levels of accounts: user and administrator. More than one fleet could be managed by each user account.



Every vehicle belongs to a fleet. The fleet needs to be created ahead to which the vehicle belongs.

A unique tracker ID is requested to create for each new vehicle. The tracker ID needs to be exactly the same one as that already configured to the tracker to be managed. The Vehicle Name is nick name of the associated vehicle/tracker, through which the server could manage it.



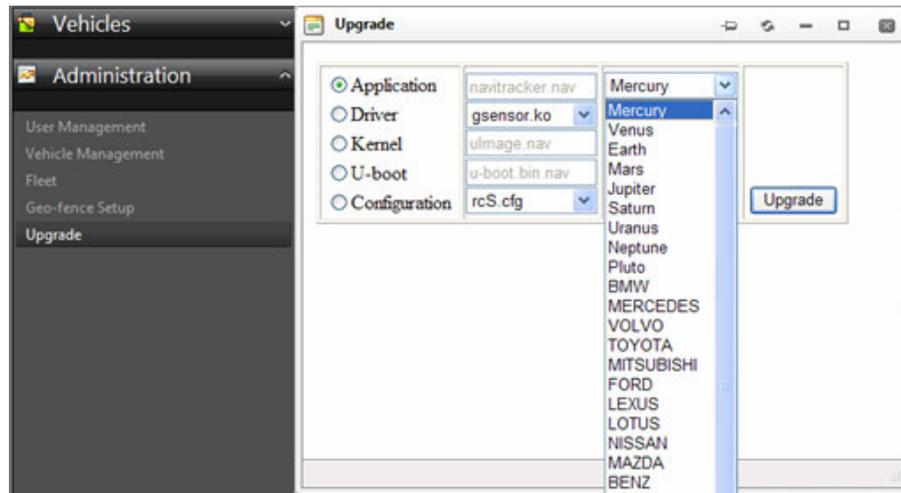
3.3 Over-the-air Firmware Upgrade through Tracking Server

The simple over-the-air firmware upgrade function could be performed by administrator only, and the upgraded firmware could be selected as configuration file,



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u-boot code, kernel, driver, or embedded tracker application to each. The upgrade process is performed to each tracker/vehicle, which should be on line during the process.





4 Vehicle Tracking and Events Report

The user could login to the website below to track the vehicles and fleet that he manages in real time. The traveled route of each vehicle is also logged in the data base of tracking server so that the user could also check the history route of the vehicle.

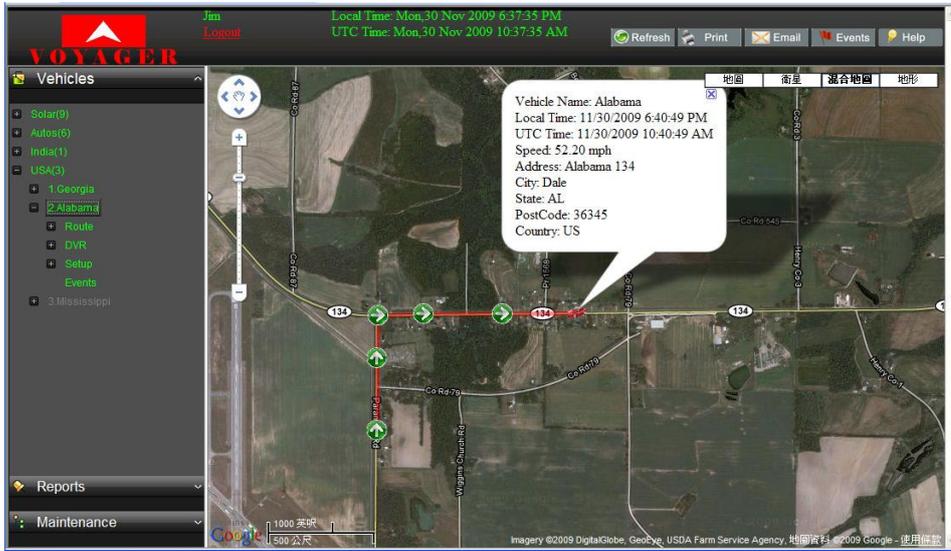
<http://60.250.203.121/TrackingServerSkt/default.aspx>

Not only IP address, the domain name is also supported. The IP address or domain name needs to be set as compatible (trust) website for Microsoft IE revision 8 or later.

4.1 Live Tracking

After login, the user could view the current locations of all the fleets and vehicles on the web under his authority. Just press fleet to check the up-to-date locations of each vehicle belonging to that fleet.

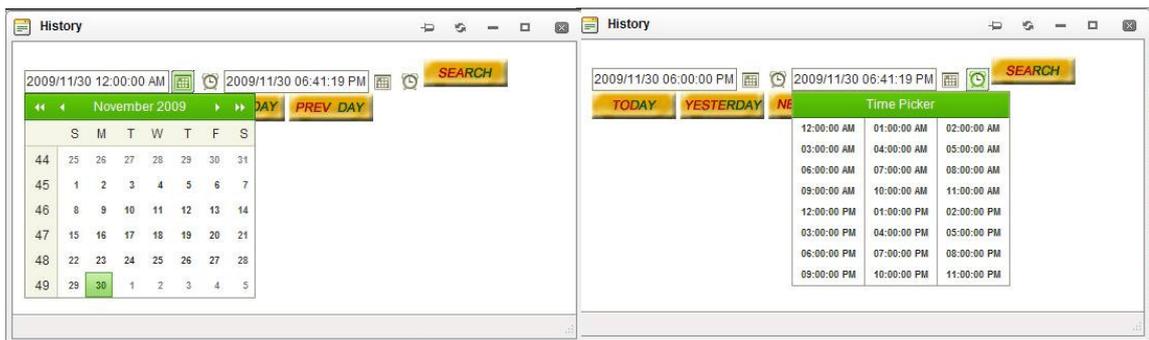
For individual vehicle, the vehicle is marked **green** when it's on line. The default is to view the live tracking of this vehicle when activates it. The useful moving direction is also shown in the path that the vehicle travels. The user could click each icon to check the detail location information on the Google Map, which is converted by reverse geo-coding scheme.



4.2 History Route with Logged Data

In addition to live tracking feature, the user could view the history route of each vehicle on the Google Map easily. Just select the desired date and time to set the time period to review the history route. The quick buttons **Today**, **Yesterday**, **Next Day** and **Prev Day** are also supported.

Please note that the date/time specified in the period is the server local time.

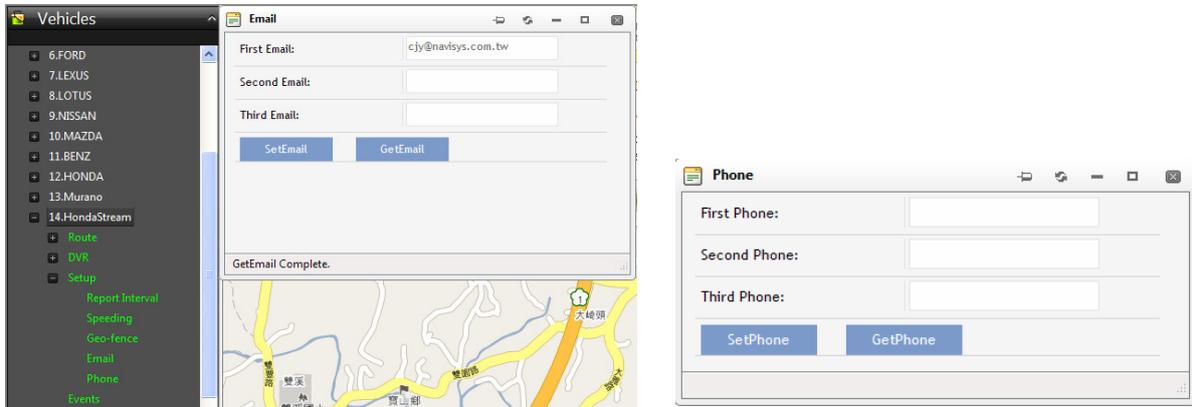




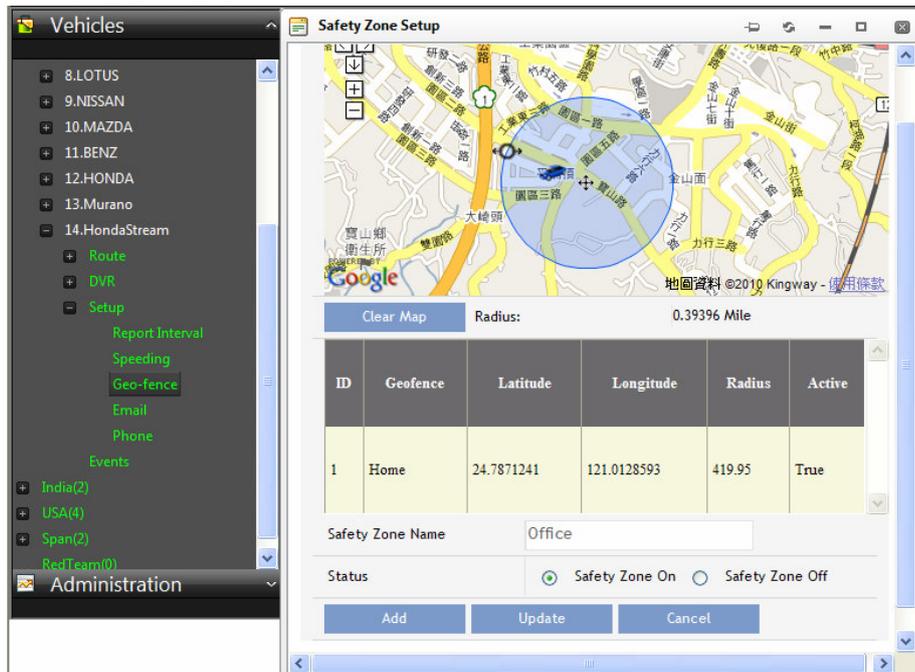
4.3 Parameters Setup

When Setup function is selected, it shows 5 sub-functions: Report Interval, Speeding, Geo-fence, Email and Phone. **The setting is validated only when the corresponding tracker/vehicle is on line.**

- ✧ Report Interval: Set the position report interval of vehicle tracker, 15 sec is the suggested value.
- ✧ Speeding: Set the speeding of vehicle tracker, which should be faster than 40 mile/hour.
- ✧ Geo-fence: Add or update the Geo-fence of vehicle tracker, which could be disabled or enabled also.
- ✧ Email: Set up to three e-mail addresses of manger(s), to which the e-mail will be sent whenever an enabled alert event occurs. The preconfigured e-mail address could be read back for check.
- ✧ Phone: Set the phone number for emergency call when panic occurs with enabled alert. Only the configured phone numbers are able to make the phone call to tracker/vehicle.

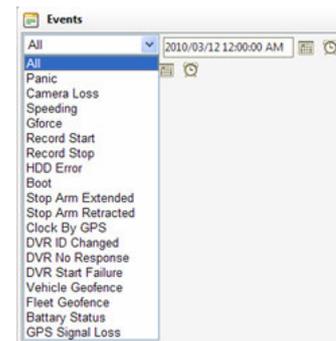


The Geo-fence is easily set by creating a new map on the Google Map, on which the user could choose the location to adjust the radius.



4.4 Events Report

To search the events, the user could select the specific event or all events. Besides, the time period is also specified together. The location where event occurs will be shown on the Google Map with a red flag, and the detailed address information will be converted, too. The events are generated either from tracker itself or from DVR originally.





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The screenshot displays a software interface with a sidebar on the left containing a tree view of locations: Solar(9), Autos(6), India(1), USA(3), 1. Georgia, 2. Alabama (expanded), Route, DVR, Setup, Events, and 3. Mississippi. The main window is titled 'Events' and shows a table of speeding incidents. The table has columns for No., Latitude, Longitude, Event, and DateTime. The events listed are all 'Speeding' incidents occurring on 12/1/2009. A popup window on the right provides details for a specific event: Vehicle Name: Alabama, Local Time: 12/1/2009 3:04:45 AM, UTC Time: 11/30/2009 7:04:45 PM, Latitude: 33.2020833, Longitude: -84.8364400, Event: Speeding, Speed: 75.93 mph, Address: Interstate 85, City: Meriwether, State: GA, PostCode: 30220, Country: US. The background of the popup is a map showing the location of the event on Interstate 85 near Meriwether, Georgia.

No.	Latitude	Longitude	Event	DateTime
1	33.2020833	-84.8364400	Speeding	12/1/2009 12:01:57 AM
2	33.5857883	-84.5119133	Speeding	12/1/2009 12:31:57 AM
3	31.4602733	-85.3078149	Speeding	12/1/2009 1:01:57 AM
4	31.9225233	-85.1456033	Speeding	12/1/2009 1:34:45 AM
5	32.3526599	-85.1172766	Speeding	12/1/2009 2:04:45 AM
6	32.7158449	-85.0165133	Speeding	12/1/2009 2:34:45 AM
7	33.2020833	-84.8364400	Speeding	12/1/2009 3:04:45 AM
8	33.5857883	-84.5119133	Speeding	12/1/2009 3:34:45 AM
9	31.4605466	-85.3077083	Speeding	12/1/2009 4:04:45 AM
10	31.9225233	-85.1456033	Speeding	12/1/2009 4:37:32 AM
11	32.3526599	-85.1172766	Speeding	12/1/2009 5:07:32 AM
12	32.7155799	-85.0163450	Speeding	12/1/2009 5:37:32 AM
13	33.2018683	-84.8366999	Speeding	12/1/2009 6:07:32 AM
14	33.5856083	-84.5121716	Speeding	12/1/2009 6:37:32 AM
15	31.4602733	-85.3078149	Speeding	12/1/2009 7:07:32 AM



4 DVR Commands, Responses and Notifications

There are several DVR commands supported: Recording, Date & Time, HDD Info, Camera Info, DVR ID, Snapshot, G-Force, Event Info and Email Alert. If any kind of alert is set ON as enabled, an e-mail will be sent to the configured managers whenever the corresponding alert happens. Moreover, a snapshot will be also attached for emergent Panic Alert.



The DVR related events could be checked by the Event Report of the associated vehicle.

4.1 DVR Commands and Response

Again, the setting is validated only when the corresponding tracker/vehicle is on line and corresponding DVR is active.

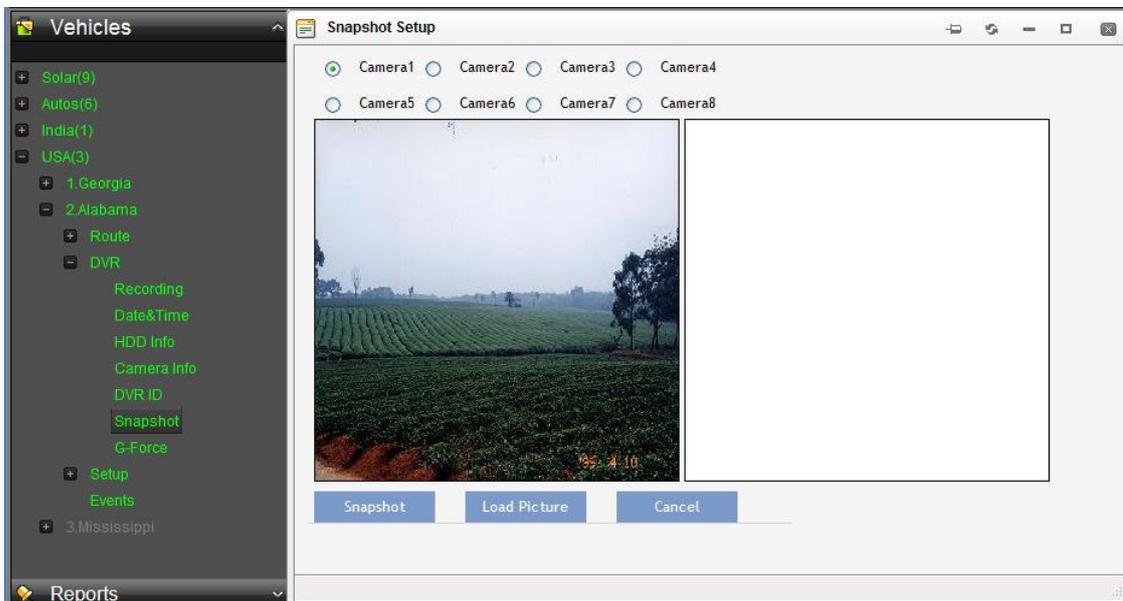
- ✧ Recording: Request DVR to start (ON) or stop (OFF) recording
- ✧ Date & Time: Request to set date & time of DVR
- ✧ HDD Info: Request to get the hard disk information of DVR, including if Overwrite setting enabled, Overwriting or not, and the Usage (%)
- ✧ Camera Info: Power On/Off status of cameras, and also Video normal/loss status of cameras
- ✧ DVR ID: Request to get the ID of the DVR
- ✧ Snapshot: Request a camera to take a picture, and display the picture in a new window if the picture is received completely.
- ✧ G-Force: Request to set the G-force.
- ✧ Event Info: Request the event information stored in the DVR, up to 999 records. The event info could be saved to a specific file.
- ✧ Alert: To inquire or change the Alert setting (ON/OFF) of each event of DVR.

4.2 Snapshot of DVR Camera

When the user requests the snapshot from DVR, the specific camera (1 to 8) needs to be selected first. The loaded picture will be displayed on the window and



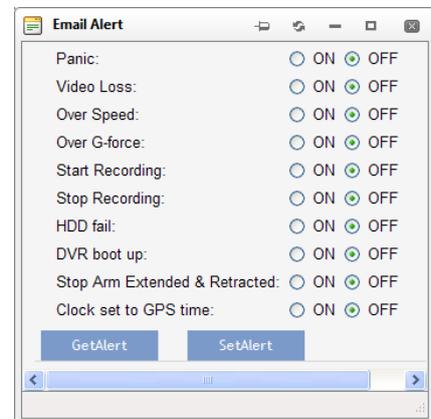
also stored in the file. The previously stored pictures could be displayed also.



4.3 DVR Alert by e-mail

There are 10 different types of Alerts generated by DVR as listed in the right picture. Any alert will notify tracking server and could be checked in the Events Report.

When the Alert type is set on, an e-mail will be also sent to configured manager(s) if the enabled alert occurs. For emergent Panic Alert, a snapshot will be sent by an additional e-mail together.





Appendix. Tips to Update Firmware of ND/Tracker through Linux Console

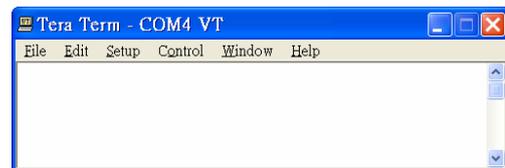
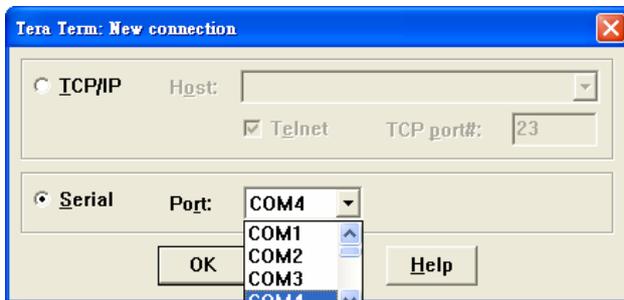
If engineer is willing to update the firmware through console port, please use a terminal emulator, say, HyperTerminal or TeraTerm that supports ZMODEM protocol. Following description takes TeraTerm as an example.

Before starting

- Save the compressed firmware file “**nd.tar**” and script file “**update**” in a directory for later use.
- Plug the power adapter and power on the device first.

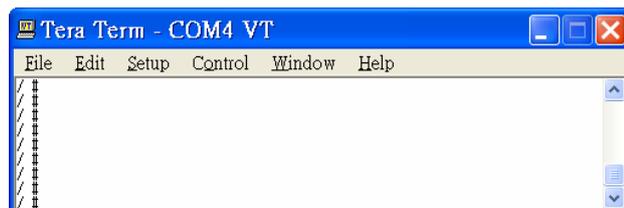
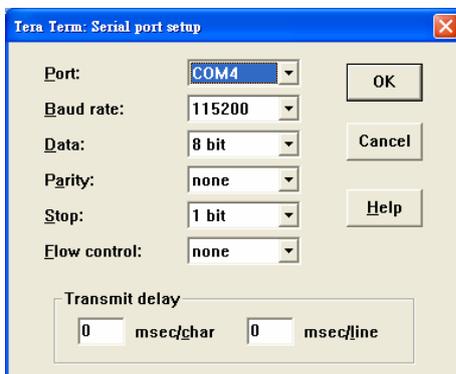
Connect Terminal Tool

Connect customized USB data cable to the notification device and PC. Run the terminal tool and select an appropriate COM port.



Select menu: **Setup => Serial Port**

Set baud rate to 115200 and then click button OK.



It connects to the device.

Press any key will see the prompt sign #

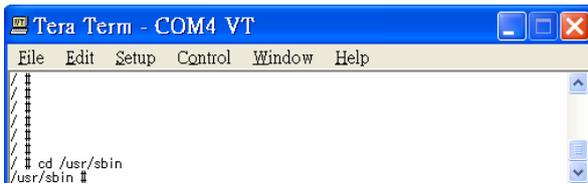


V0.3

There might be some engineering messages displayed in the screen. Just ignore it.

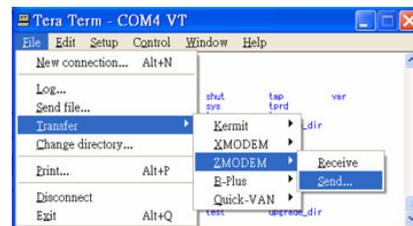
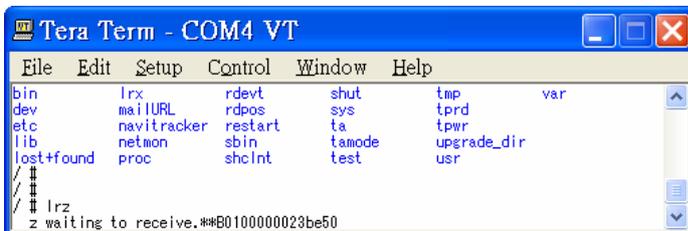
Work in directory /usr/sbin

Enter command `cd /usr/sbin` **ENTER** to change the working directory.



Firmware Upgrade

Please enter command “lrz” to receive file from PC.

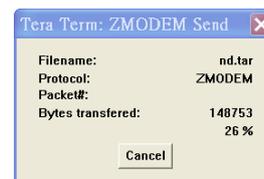
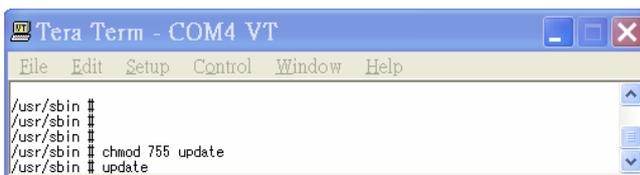


Select menu **Transfer => ZMODEM => Send...**

Select the tool file “update” and open it.

Make the download file executable

Please enter command `chmod 755 update` **ENTER**



Execute **update** to download the compressed file “nd.tar” with the same procedure again.

It will run automatically after completing the download.

Just power recycle the device for normal operation.