

VNBTech GPS REALTRAK System/ Software

REALTRAK TS100 Specification & User's Manual

1. Vehicle Tracking and Fleet Management

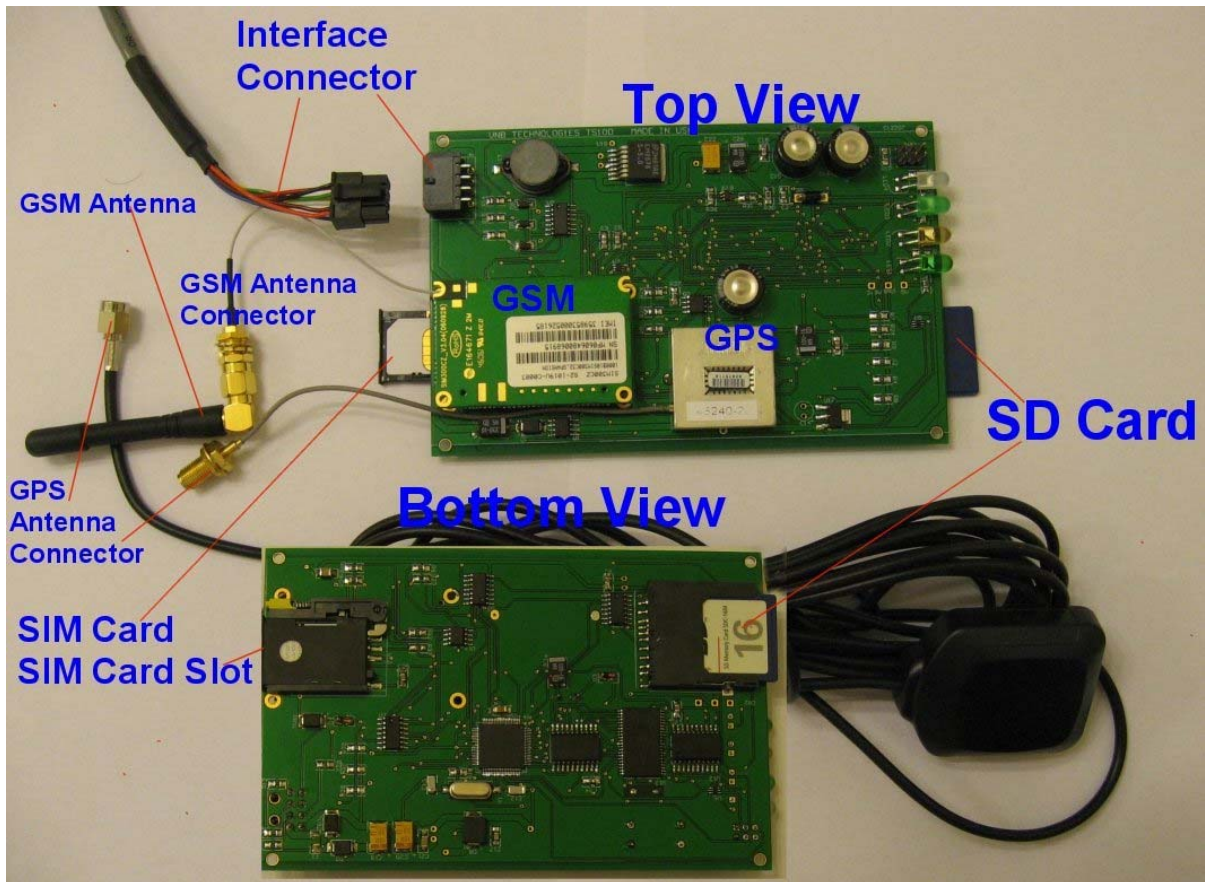


Figure1: REALTRAK TS100 (Top & Bottom View)

We offer you the Real-Time (also static) GPS tracking and reporting. Our REALTRAK TS100 system is designed to provide vehicle location and information. The system allows hooking up to the external sensors such as engine on/off, door open/close, vehicle speed sensor (VSS), temperature sensor etc... Anytime information on your vehicle such as where it is or has been, speed, door open/close, a simple click on your computer will have the tracked vehicle displayed on the screen within seconds. This information is also stored in the MMC/SD card as log file. The log file can be either wirelessly transmitted to your computer or taken from the MMC/SD card for playback. Whether you have one vehicle or over 1000, you can count on us to provide you a complete tracking solution from hardware to software (map & report tools) with the most cost effective way. We can flexibly modify/enhance our hardware or/and software to fit your need.

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2. REALTRAK System Overview

- 8-pin input/output (Ground, 9-36V DC power input, VSS/Discrete input, 2 discrete inputs, 1 power output controlled via SMS, 1 TTL debug output pin, 1 spared pin).
- 20 MHz CPU.
- Built-in 12-channel GPS receiver (Accuracy: < 5 meters 50% & < 16 meters 90%, Hot/Warm/Cold Start < 10/38/50 sec 90%, Reacquisition: <2 sec 90%).
- Built-in 900/1800/1900 MHz tri-band GSM/GPRS module (multi-slot class 10 and mobile station class B) for Real-time vehicle information reporting and wireless log data download.
- 64MB (up to 2GB can be used) MMC/SD card for log data storage.
- 4Mbit of SRAM with power backup for securing MMC/SD card logging.
- 4 LEDs indicating system status (GPS, GSM, MMC/SD card, system monitor).
- Support OTA (Configuration Over the Air)
- Real-time vehicle location and status monitoring
- Free support map software & tools for data analysis and real-time track.

3. Interfaces

8-pin Input/Output Connector (color coded wires)	<table border="1" data-bbox="634 919 980 1010"> <tr> <td>1</td> <td>3</td> <td>5</td> <td>7</td> </tr> <tr> <td>2</td> <td>4</td> <td>6</td> <td>8</td> </tr> </table> <p>Wire 1: 9-36V DC Input (required) Wire 2: Ground (required) Wire 3: VSS or Discrete Input (optional) Wire 4: Debug TX output (debug info sent at TTL level, optional) Wire 5: Discrete Input (optional) Wire 6: Spared – Unconnected Wire 7: Discrete Input (optional) Wire 8: 12V-DC Output (optional, remotely controlled via SMS)</p>	1	3	5	7	2	4	6	8
1	3	5	7						
2	4	6	8						
SIM Card Slot	SIM card insertion								
MMC/SD Slot	MMC/SD card insertion								
GPS Antenna Connector	Compact magnetic mount antenna connection (5m cable)								
GSM Antenna Connector	External or Internal GSM Antenna connection								
4 LEDs	LED1: GPS status: blink is acquiring, On: fix is obtained, OFF: GPS is malfunctioned or no power input LED2: MMC/SD card status: blink is data writing, On: card is functional, OFF: card is malfunctioned or no power LED3: GSM status : blink is data receiving/transmitting, ON: GSM is functional, OFF: GSM is malfunctioned or no power input LED4: System status, On: system is functional, OFF: system is malfunctioned or no power input								
Firmware Upgrade Port	Allow to upgrade firmware								

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4. Environmental Specifications

- Operating Temperatures: -25°C to $+80^{\circ}\text{C}$
- Storage Temperatures: -55°C to $+105^{\circ}\text{C}$
- Vibration: 0.008 g²/Hz 5 Hz to 20 Hz, 0.05 g²/Hz 20 Hz to 100 Hz -3 dB/octave 100 Hz to 900 Hz
- Operating Humidity 5% to 95% R.H. non-condensing, at $+60^{\circ}\text{C}$

5. Power Supply

The system requires DC input power ranging from 9V to 36V. It has built-in circuitry for power surge & ESD protection. See 8-pin input/output in the interfaces section for power connection.

6. Dimension & Mounting

Length: 135mm, Width: 87mm, Height: 16mm
Mount: 4 holes at 4 corners (2.8mm in diameter), or slide-in

7. REALTRAK Software

We provide customers friendly-used VNBTrack tool that works with OziExplorer map tool (VNBTrack tool is free. Free OziExplorer map tool for evaluation trial can either be downloaded from <http://www.ozieplorer.com/> or www.vnbtech.com under Training & Supports -> Software & Tools, and license fee is under 99\$ fee per seat)

Here is how it works.

REALTRAK periodically logs the vehicle position, speed, time, door open/close status into the SRAM. Once in awhile and when it is appropriate, the log data in the SRAM is automatically transferred to the MMC/SD card as a log file. The log file can either be wirelessly downloaded from REALTRAK system to the tracking center or can be taken from the MMC/SD card. Using the VNBTrack software tool and map software installed in the computer, the log file can be analyzed to show the track on map and where and when the vehicle committing speed violation, opening/closing door or stopping/idling longer than a specified time duration, going outside the geofence etc... At anytime, the user at the tracking center wants to know the where a particular vehicle is located. He/she just simply clicks that vehicle ID shown on the VNBTrack tool, a command requesting for position is sent to that tracked vehicle. The REALTRAK system installed in that vehicle will response with an SMS message packed with 4 most recent GPS locations with time & date, speed, sensor status to the tracking center. Normally, it takes about 15 seconds from the moment the track button is

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clicked till the vehicle location is shown on the map. The user will be notified instantly if the vehicle is in the non-coverage area.

The REALTRAK can be configured to send back its location/status on periodic time, or/and when having moved a certain distance, gone beyond the geofence etc... The configuration procedure is simple by inserting the MMC/SD card having configuration files into the system or by wirelessly sending SMS command message. Please see system configuration section for details.

8. Setup Procedures

8.1 System Setup

- Connect external GSM antenna to GSM antenna connector
- Connect external GPS antenna to GPS antenna connector
- Insert the MMC/SD card into MMC/SD card slot (optional)
- Insert SIM card to SIM card holder (optional for Real-Time track and wireless download)
- Hook up external sensors: VSS (used for anti-tampering such as GPS antenna covering), Temperature etc.. (optional, see 8-pin connector description in Interfaces section for details)
- Hook up power (see 8-pin connector description in Interfaces section for details)

8.2 System Configuration

There are two types of configuration: Manufacture configuration and User Configuration.

8.2.1 Manufacture Configuration

- The system can be configured manufacture data by using the file in MMC/SD card
- During power up, the system will look for the file name vnbtech.cfg
- The content of the **default** vnbtech.cfg file is shown below:

```
xxxxxxx,0,3000,08000
0,002,02000
1,10,8587524376
```

where

xxxxxxx is system ID or box ID (example: 1234567)

0 : VSS is NOT calibrated yet, 1 : VSS is already calibrated

3000 : calibration distance in meters

08000: VSS pulse count corresponding to 3000 meters

1 : Tracking enabled, 0: Tracking disabled

10: Phone number length (10 digits)

8587524376: Master phone number (used by system administrator to communicate with the system).

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Notice that calibration distance and its corresponding VSS pulse count varies from one vehicle to another depending on the circumference of the tire, tire pressure etc...

8.2.2 User Configuration

- The system can be configured user data by using the file in MMC/SD card
- During power up, the system will look for the file name xxxxxxx.cfg where xxxxxxx is the system ID or box ID
- The content of the **default** xxxxxxx.cfg file is shown below:

```
0,002,02000
1,2
8587524376,0
8587524393,1
www.tmobile-gateway.com
192.45.34.120
baonguyen,thisisme
```

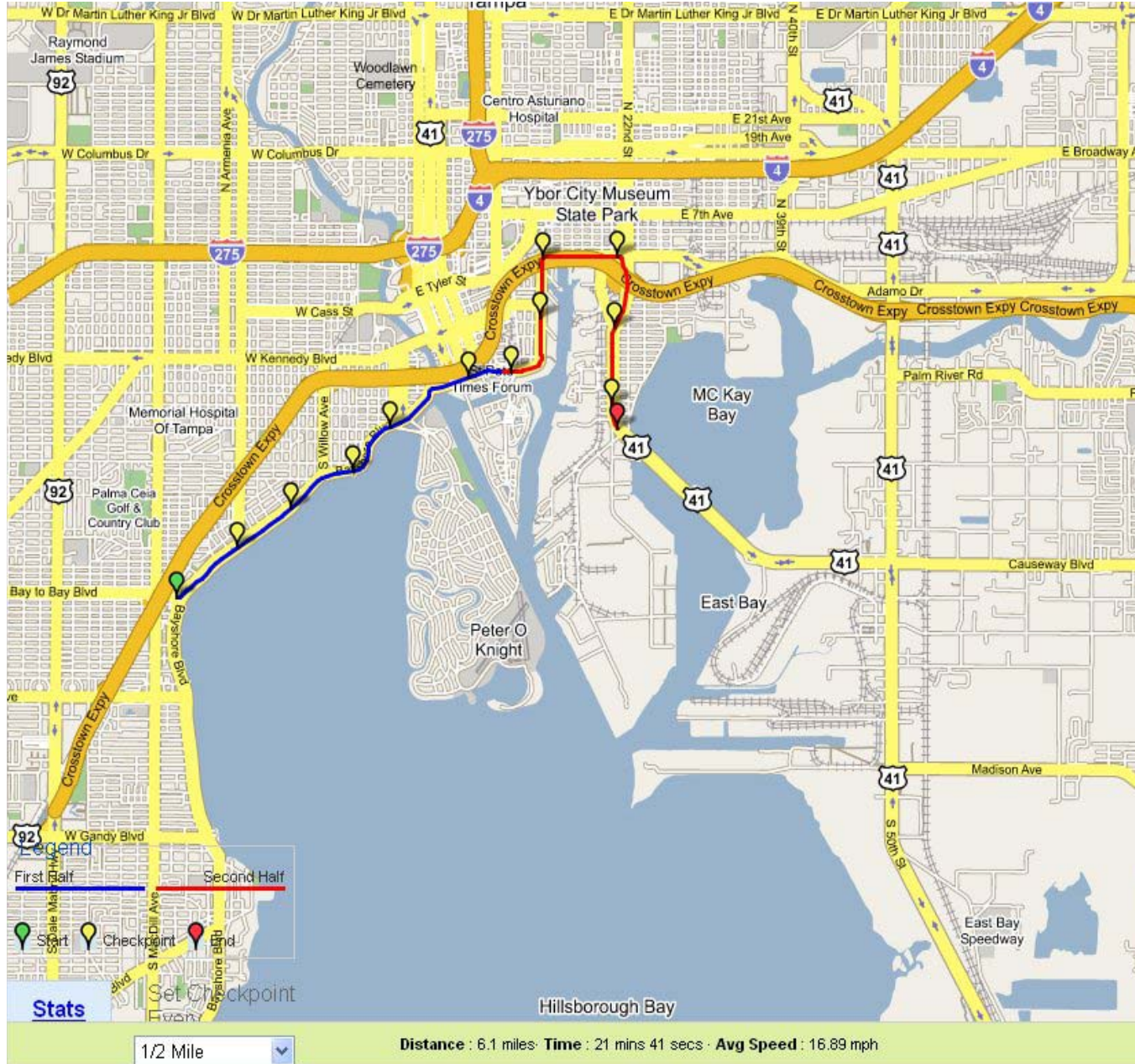
where

```
0      : GPS log mode
002    : Log every two seconds
02000: Long every 2000 meters
1      : SMS mode
2      : 2 phone numbers used
8587524376,0 : use this number 8587524376 for SMS (if 8587524376,1: use for M2M)
8583574393,1 : use this number 8583574393for M2M (if 8583574393,0: use for SMS)
www.tmobile-gateway.com : Service provider IP gateway
192.45.34.120: Tracking Server IP
baonguyen: User name
thisisme  : Password
```

8.3 Software Setup (all tools listed below can be found from <http://www.vnbtech.com/>)

- Download & Install OziExplorer map tool. (chose the default path C:\OziExplorer)
- Download VNBTrack folder. It should be copied in your computer with the path C:\VNBTrack (VNBTrack.exe, Data, Profile folder should be seen in that path)
- Copy map files from C:\VNBTrack\Maps to C:\OziExplorer\Maps
- Double click on VNBTrack.exe (you can create short cut on desktop for your convenience) to invoke VNBTrack's GUI screen
- On VNBTrack's GUI screen, click on "Start OziExplorer" (OziExplorer window should be popped up)
- On OziExplorer window, Click on "View" tab, then select "Show tracks on Map"
- On VNBTrack window, Click on "Play Log", then browse to select C:\VNBTrack\Data\Demo.txt file to play back the demo log file.

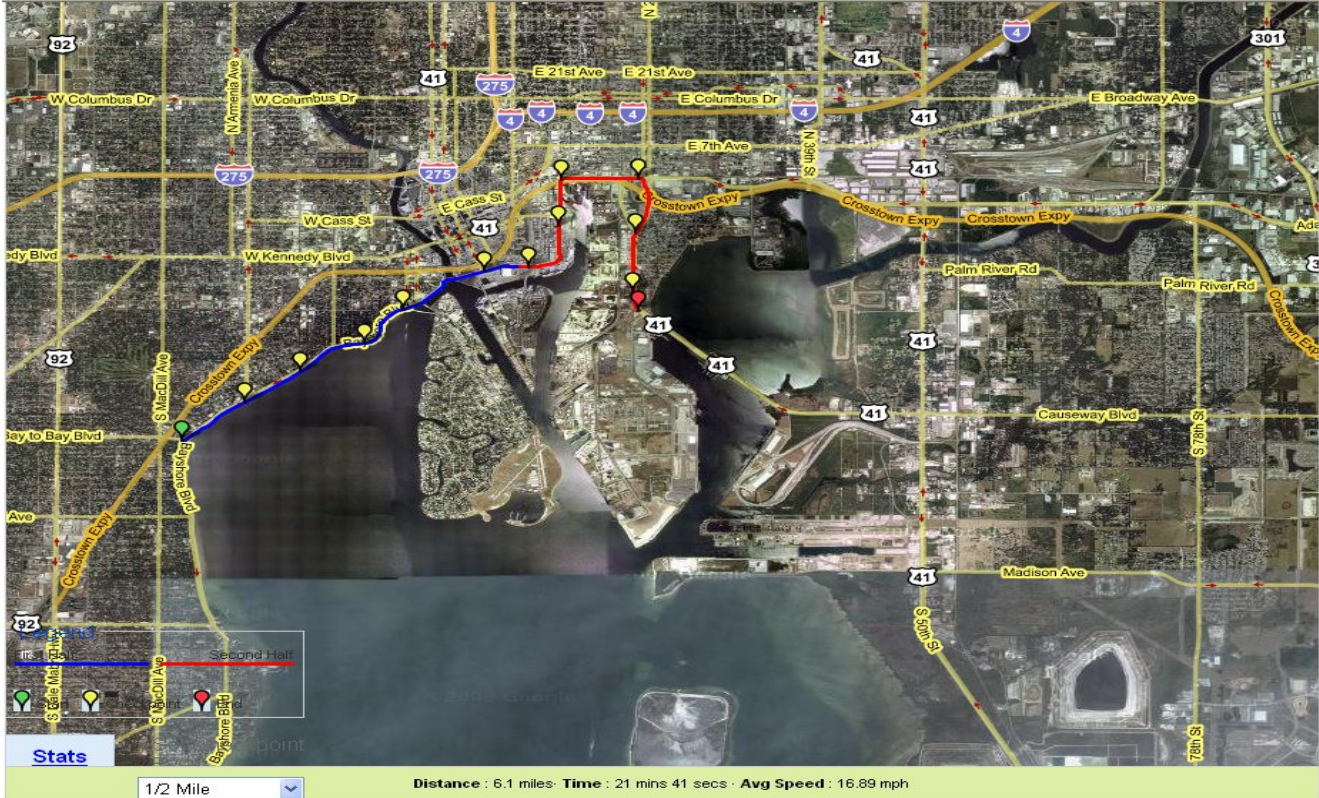
You are now ready to play back the log file or track the vehicle in real-time. Refer to the VNBTrack's User manual for details.



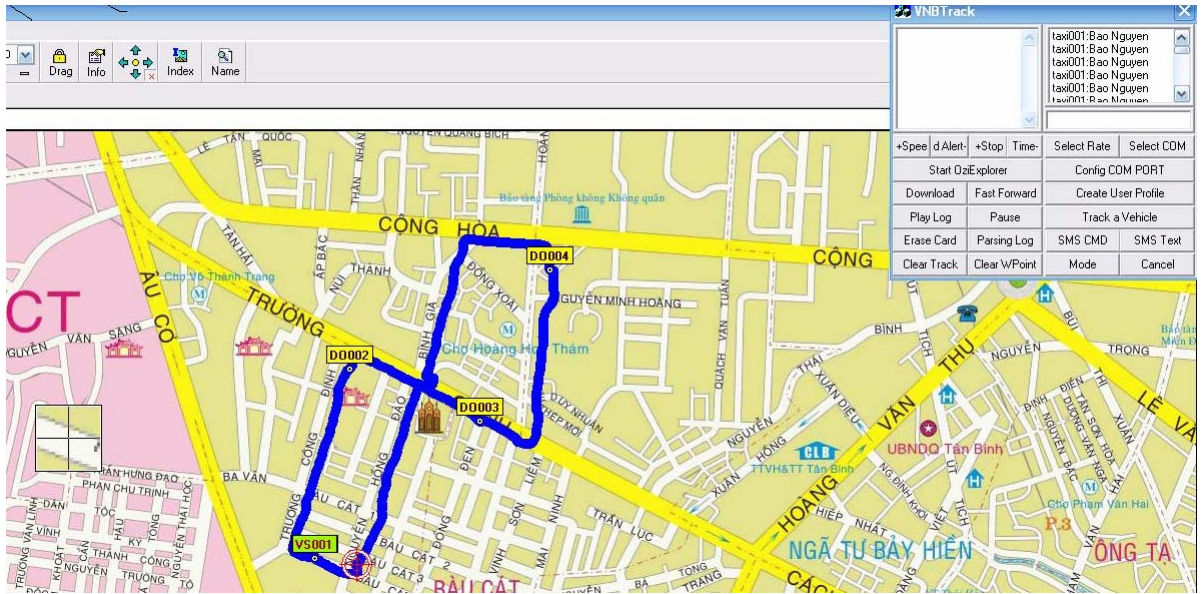
Tampa Bay, Florida Map View

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Tampa Bay, Florida Satellite View



Saigon Map View

9. Log scheme for MMC/SD data logging secured by battery backed-up SRAM:

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The log data (GPS location, time, date, sensor status) is stored into the 4Mbit SRAM. If the MMC/SD card is present, the log data from the SRAM will be transferred to the MMC/SD card periodically. The data is written/appended to the log file named xxxxxxx.dow where xxxxxxx is the system ID.

If the MMC/SD card is NOT present, then the log data will be stored in the SRAM in circular fashion. The most recent of data will be retained (at least a month of log data) so it can be transferred to the MMC/SD card upon insertion or wirelessly transferred to the tracking center.

If the MMC/SD card is not present in the slot for more than 20 seconds, then its insertion will trigger the system to transfer the entire 4Mb SRAM into the MMC/SD card. The log file will be created/appended as xxxxxxx.dow (where xxxxxxx is the system ID)

If the MMC/SD is not present in the slot for less than 20 seconds, then its re-insertion will trigger the flushing. The system will flush all the new data from the SRAM that has not been saved into the MMC/SD card.

10. Contact information:

Visit our company website <http://www.vnbtech.com>
or send email to supports@vnbtech.com

In Vietnam, please contact our local VNBTECH members:

- Mr. Phan Tan Dat @ 0903151886

Revision History

Date	Version	Description of change	Author
2007-02-09	1.0	Initial Release	TVN

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