VPC100 Series

Quick Start Guide

Release Notes

Version	Release Date	Notes
1.0	October , 2016	Initial release
1.1	December, 2016	Remove T57 OBDII info

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1 Precautions

1.1   Safety Precautions

In order to use this product safely, please take special note of the following precautions.

- Read all product manuals and related documentation before using this product. Use this product correctly and safely. Follow all warnings.
- If operating or extending this product in a manner not described in this manual, please do so at your own risk. Be sure to fully read this manual and other technical information on our website and proceed safely and responsibly.
- Do not install this product in a place with a lot of water, moisture, dust or soot. This could cause product failure, fire, or an electric shock.
- Some parts of this product generate heat and can reach high temperatures. This may cause burns if it is improperly handled. Do not touch the electronic components or surrounding area while powered on or immediately after being turned off.
- Carry out any design and development only after you have thoroughly read and understood this manual and any other related technical materials on the website or in the data sheets. Test your product thoroughly for reliability and safety.
- This product is not intended for applications that require extremely high reliability, safety, functionality and accuracy: including but not limited to medical equipment, traffic control systems, combustion control systems, and safety equipment. This company is not liable for death or injury if used in such systems.
- This product uses semiconductor components designed for generic electronics equipment such as office automation, communications, measurement equipment and machine tools. Foreign noise or a power surge may cause this product to malfunction or fail.
- To ensure there is no risk of bodily harm or property damage, be sure to take all electrical safety precautions such as protection circuits, limit switches, fuse breakers, or redundant systems. Only use the device after sufficient reliability and safety measures are in place.

1.2   Write Prohibited Regions

Data stored by the EEPROM, i.MX6 electrical fuse (e-Fuse) is used by the software contained in this product. Do not write to these regions as this may cause the product stop working correctly. Purposely writing to these regions voids the product warranty.

1.3   Warranty

As described in the Product Warranty Policy provided with this product, the main board is covered by a one year replacement warranty starting from the time of purchase. Please note that the other included goods and software are not covered under this warranty. Some knowledge used by IC-NEXUS is provided by third parties, and IC-NEXUS makes no representation or warranty as to the accuracy of such information.

2 Overview

The VPC100 is a communication gateway designed for in-vehicle applications or IOT (Internet of Things) applications. The VPC100 offers some unique features, including the latest NXP iMX6UL (ARM Cortex-A7) application processor, a dual (or quad) band 3G modem and a ublox GPS receiver.

With the latest Linux kernel and tools, the VPC100 allows users to design and deploy custom software for various applications, such as vehicle tracking, fleet management and IOT communication gateway.

Features
- ARM processor / Linux enables quick software development and deployment
- 9-36V wide input voltage range for vehicle application
- Photo-coupled GPIO for vehicle sensor monitoring
- (**optional**) Bluetooth interface to support BT-based (**optional**) OBD2 module

Hardware Specifications
- NXP iMX6UL ARM Cortex™-A7 core @ 500MHz
- 256MB DDR3 ; 512MB Flash
- 9V-36V DC power input
- (**optional**) DC power input with over-voltage protection
- USB 2.0 host port x2 ; USB 2.0 OTG port x1; Micro SD card socket x1
- GPS receiver x1; G-sensor x1; E-compass x1
- 3G (WCDMA) x1; SIM card socket x1
- RS485 port x1; RS232 port x1; CAN bus x1; I^{2}C port x1
- Photo coupler GP Input x10; Photo coupler GP Output x2; Analog input x2
- 10/100 Mbps Ethernet (RJ-45) x1
- Audio (MIC and Headphone) (**optional**)
- 802.11b/g/n Wifi and Bluetooth 4.0 (**optional**)
- Dimension: 125mm x 147mm x 41mm (L/W/H)

Software Specifications
- Yocto 1.8 (Linux kernel 3.14)

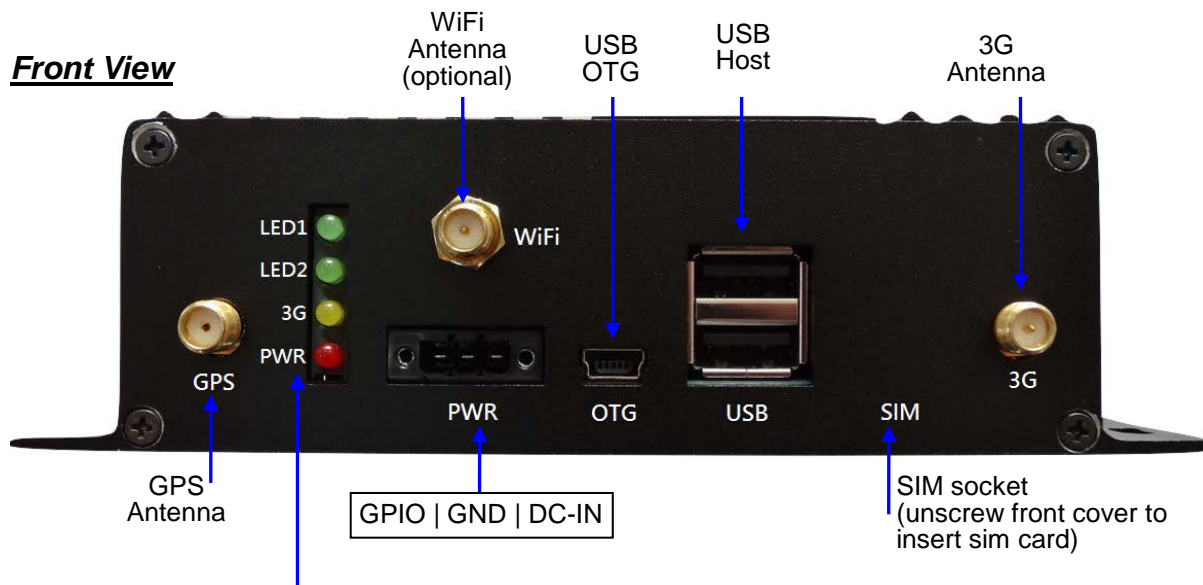## 2.1   VPC100 Package Contents

Standard package content:

Item	Notes
VPC100	---
CD	Software and User's Manual

Optional items:

Item	Notes
+12V Power adapter	---
WiFi/Bluetooth Module with Antenna	---
GPS Antenna	---
3G Antenna	---
C220 debug board/cables	For VPC100 console, debug port

2.2 VPC100 Connectors

Front View

WiFi Antenna (optional)
USB OTG
USB Host
3G Antenna

LED1
LED2
3G
PWR

WiFi

GPS

GPS Antenna

PWR

GPIO | GND | DC-IN

OTG

USB

SIM

3G

SIM socket (unscrew front cover to insert sim card)

Label	Color	Status
LED1	Green	Can be set on/off by GPIO2_18
LED2	Green	Can be set on/off by GPIO2_19
3G	Yellow	When VPC100 is connected to 3G network, the LED is ON. In searching 3G network, the LED keeps blinking.
PWR	Red	The LED is ON when VPC100 is powered on.

Rear View

GPIO
COM/CAN
LAN
Audio

GPI GPO Analog-in

RS232 RS485 CAN I^2C

10/100 Ethernet

MIC & Headphone (optional)
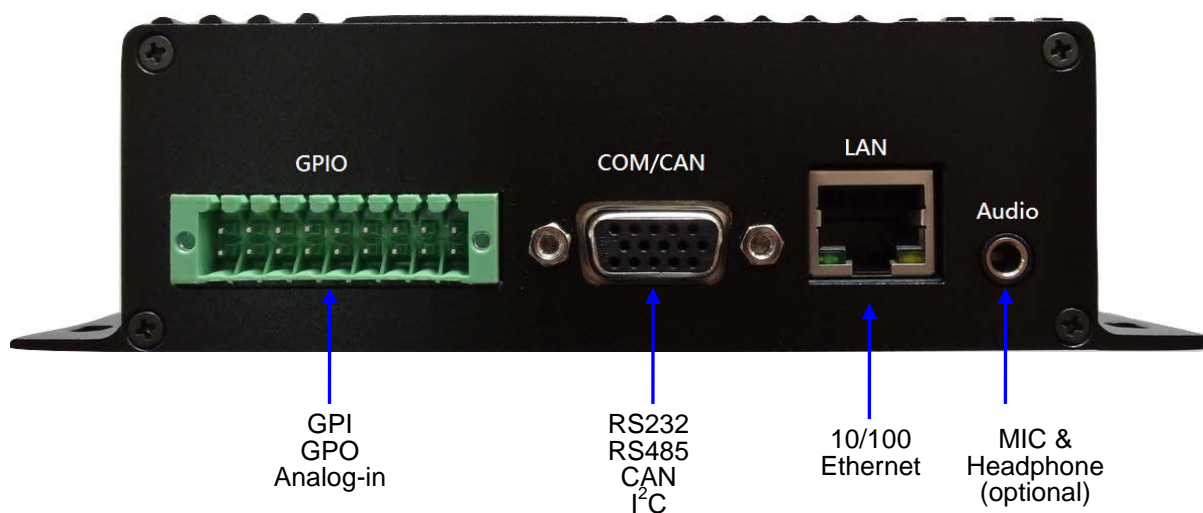
For detailed descriptions of the VPC100 connector functions, please refer to "**VPC100 Reference Manual**".

3 VPC100 Installation

VPC100 installation is divided into two portions, basic installation and full installation.

You are allowed to perform the following functions after completing basic installation:
(1). A PC (or a mobile phone, a tablet with WiFi function) is connected to internet through VPC100, and
(2). A PC (or a mobile phone, a tablet with WiFi function) may communicate VPC100 device manager using browser for enquiring various VPC I/O settings, GPS coordinates, etc. For more information about detailed functions of VPC100 device manager, please refer to Appendix A in this manual.

You are allowed to perform the following functions after completing full installation:
(1). All functions completed under the basic installation
(2). VPC100 can send information (GPS, I/O, etc.) to remote Server OpenGTS
(3). VPC100 can read vehicle-related data through OBDII Dongle.

For more information about detailed installation, please refer to "Section 3.1 Basic Installation" and "Section 3.2 Full Installation".

3.1 Basic Installation

You need to prepare the following devices and accessories before basic installation:
- One VPC100
- One 3G SIM Card
- One network cable and one PC (Windows), or
- One mobile phone/tablet/PC/NB device with WiFi function
  - Note: You have to additionally purchase WiFi module for VPC100 while using a WiFi device to connect to VPC100.

Step 1：Inserting 3G sim card into sim card slot on VPC100 (as shown below):
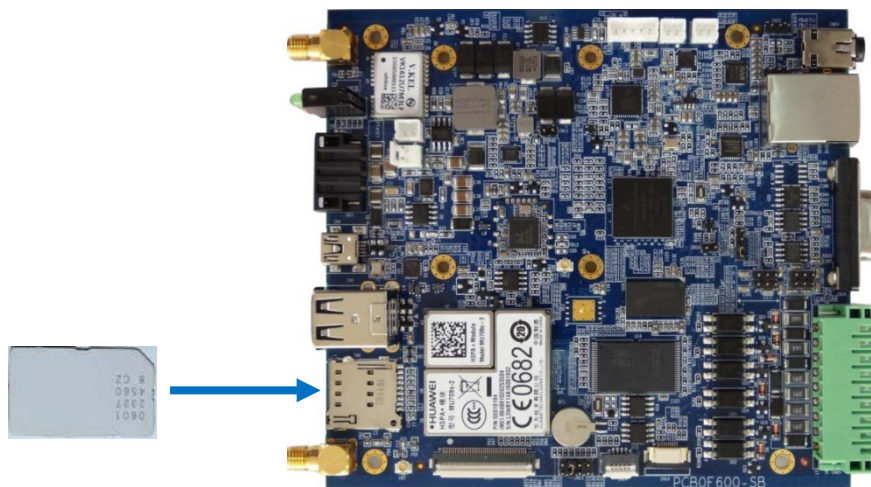
Step 2：Connecting 3G, Wi-Fi, GPS antennas onto antenna connectors on VPC100 (shown as dashed circles in the figure below). Note: WiFi module, 3G antenna, GPS antenna and WiFi antenna have to be purchased separately.
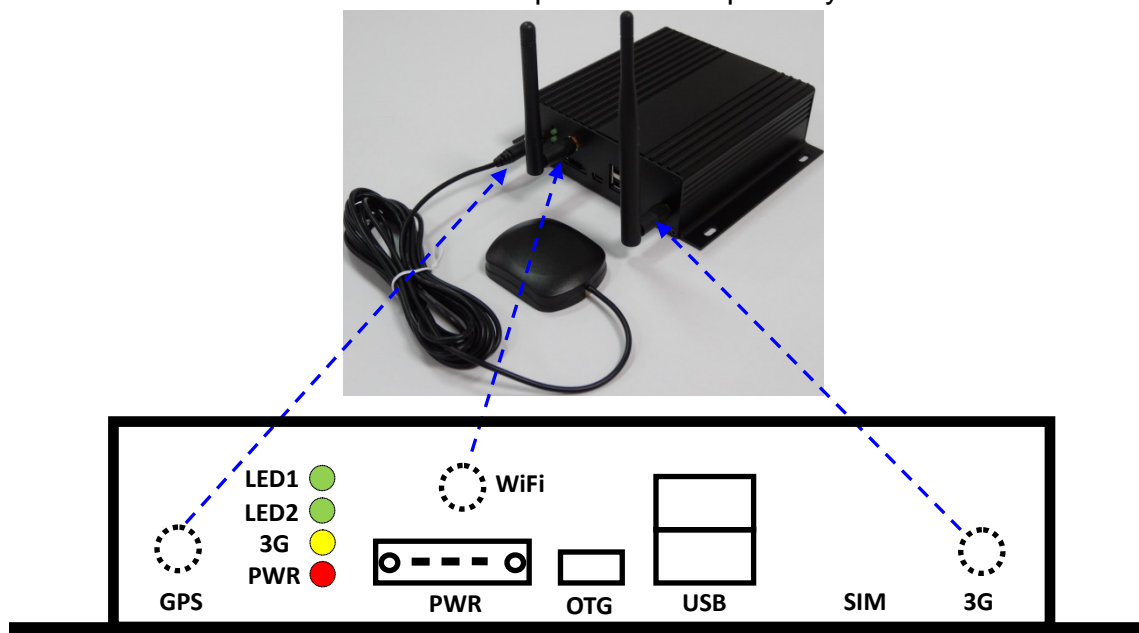

VPC100 Front Panel

If you want to:
- Connect VPC100 to PC with a network cable, go to **Step 3**。
- Connect VPC100 to a mobile phone or tablet with WiFi function, go to **Step 4**。

Step 3：Connecting one end of a network cable to VPC100 LAN port and connecting the other end to PC LAN port. Connect power line to PWR connector on VPC100. Note: PC is a DHCP client, and fixed IP setting is not allowed. In PC browser, type http://192.168.1.1 to connect to VPC100 device manager。

Network settings on VPC100:
- Default LAN IP address is 192.168.1.1
- Username: admin & Password: 12345678.
- VPC100 is a DHCP server and it will broadcast an IP address to PC (192.168.1.2 ~ 192.168.1.100).
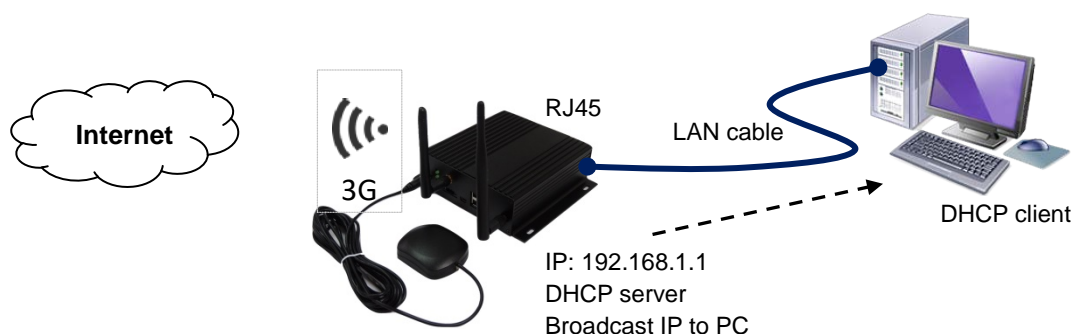
Step 4：Setting the following wireless network settings on an available mobile phone or a tablet with WiFi function:
- WiFi AP SSID name for VPC100: F600-AP
- WiFi frequency : Channel 4
- WPA mode

To activate VPC100 device manager, enter http://192.168.2.1 on mobile or tablet browser.
- Default WiFi IP address is 192.168.2.1
- Username: admin & Password: 12345678.
- VPC100 is a DHCP server and it will broadcast an IP address to WiFi phone or tablet (192.168.2.2 ~ 192.168.2.100).

Note:

VPC100 Ethernet default IP: 192.168.1.1

VPC100 Ethernet DHCP server IP range: 192.168.1.2 ~ 192.168.1.100

VPC100 WiFi default IP: 192.168.2.1

VPC100 WiFi DHCP server IP range: 192.168.2.2 ~ 192.168.2.100

While connecting to VPC100 device manager, you can either type http://192.168.1.1 or http://192.168.2.1. VPC100 has two IP addresses (for Ethernet and WiFi, 2 network devices). Two network segments 192.168.1.x and 192.168.2.x are bridged together in VPC100.

Step 5：If you complete above Step1~Step4 you have completed basic installation on VPC100. After entering VPC100 device manager on PC (or a phone or a tablet with WiFi function), you may connect to Internet through 3G modem.

For more information about detailed VPC100 device manager functions, refer to Appendix A.

3.2 Full Installation

You need to prepare the following devices and accessories before full installation:
- One VPC100
- One 3G SIM Card
- One network cable and one PC (Windows), or
- One mobile phone/tablet/PC/NB device with WiFi function
    - Note: You have to additionally purchase WiFi module for VPC100 while using a WiFi device to connect to VPC100.
- One PC (Windows), which can be installed OpenGTS server software

Before starting full installation, make sure you have successfully completed the basic installation steps described in previous section.

If it is not properly installed, please complete basic installation first.

➢ **OpenGTS server Installtion**

Please refer to Appendix B or Appendix C for detailed OpenGTS server installation.

Appendix A: VPC 100 Device Manager

The default IP address for VPC100 is 192.168.1.1

In your browser's address bar, enter http://192.168.1.1.

Enter username & password (default username: admin, password: 12345678), and press Login to log into the system.

NOTE: The source code of VPC100 Device Manager is available for your modification after a purchase. For more information, please contact our sales representative.

A-1   GPS function

When GPS antenna is connected and with signal quality, VPC100 device manager will display GPS coordinates at 1Hz frequency (refresh coordinates 1 time per second).
Note: The map used in device manager is Google Map. The PC (or mobile phone) must be connected to Internet for browser to show GPS coordinates with Google Map.
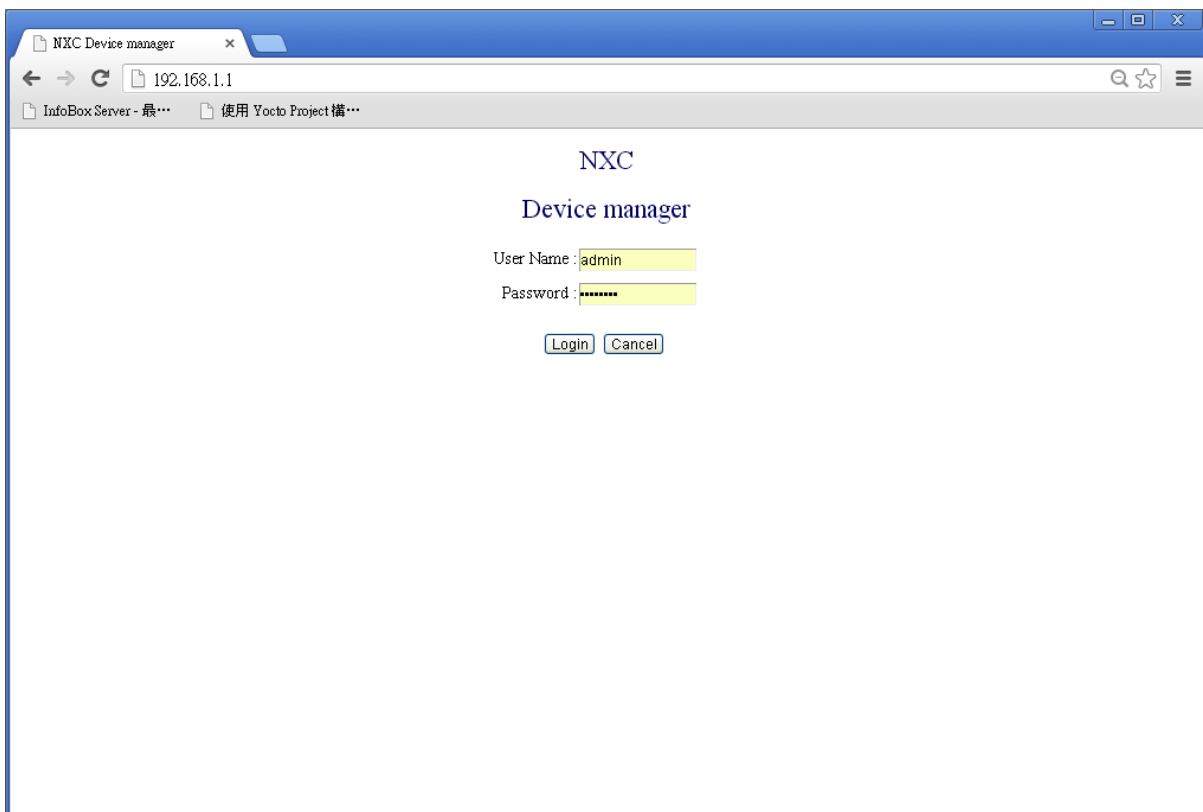
A-2   GPIO function

GPIO OUT can set HIGH/LOW value and output it to GPO pin on VPC100.
For example, to enable (turn on) LED 1, select HIGH on device manager and press <Change it> to modify its setting. To disable (turn off) LED 1, select LOW on device manager and press <Change it> to modify its setting.

GPIO IN on device manager can display VPC100 GPIO input values.

A-3   3-Axis G-sensor Data

This function of 3-axis micro accelerator can measure the changes of x, y, z axes based on the gravity.
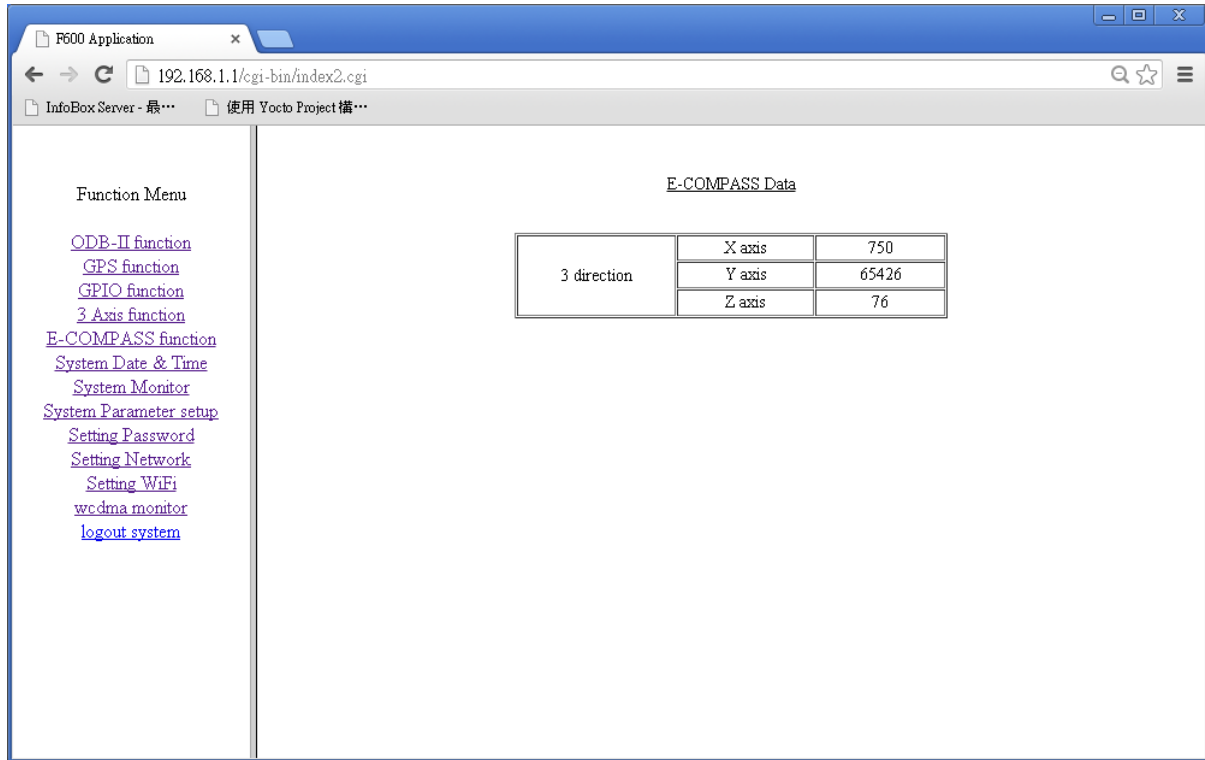
In case the GPS signal quality is poor and this signal loses GPS navigation ability, the 3-axis information combined with E-compass can be used to establish a complementary azimuth computing system.
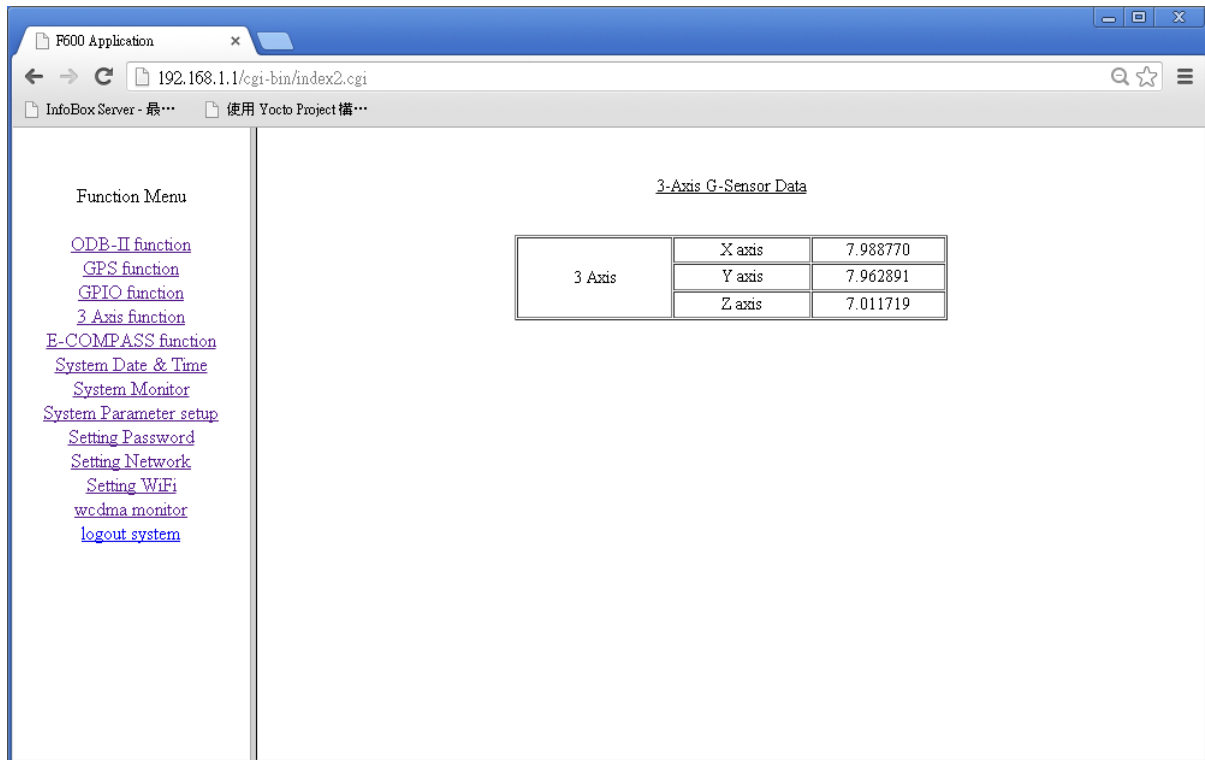
A-4   E-compass function

This page displays VPC100 on-board E-compass 3-axis (x, y, z) data. E-compass reports the data by measuring the direction of the Earth's magnetic field.
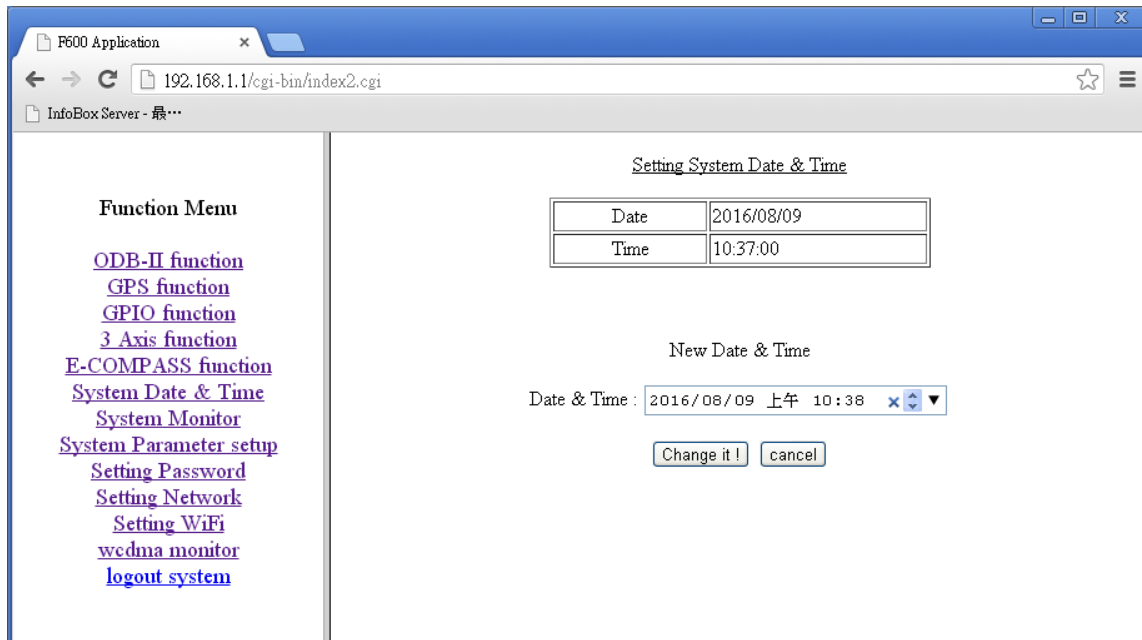This function can be used to show your present vehicle direction.

A-5   System Date & Time

This function allows user to set system date and time. In lower portion of user interface, you may use New Date & Time to set system date and time, and click <Change it> to change the present time to new system date and time.

A-6   System Monitor

This System Monitor function can display current usage of CPU & memory on VPC100.

- CPU frequency: For showing present processor operating frequency
- CPU usage: For showing present processor usage (loading)
- Memory Size
  - Total: For showing total system memory capacity
  - Free: For showing free system memory capacity
- CPU Temperature: For showing present processor temperature

If you need to reboot system, please click <Reboot System > (when you set/update new system parameters or password, use this button to reboot system).

A-7   System Parameter setup

This function allows you to set some system parameters:

- OpenGTS Sever IP: for setting OpenGTS Server TCP/IP information
- Unique ID: It sets present device ID. User can setup device ID for this device. Do not use the same ID on multiple devces (ID must be UNIQUE).
- Connect Periodic: for showing connection time (in minutes).
- Connect Interval: for setting the connection interval of auto-retry (in minutes).
- Event Interval: It sets the time interval to send event signal to the device (in minutes) , in case the connection is failed.
- WCDMA produce path: for showing a directory storing batch command for 3G connection, and this directory is unchangeable.
- ODB-II Bluetooth MAC address: for setting Bluetooth MAC address of ODBII dongle.
- UTC Location: for setting the current time zone of the device location.
- Enable GTS UTC Time: for using GPS standard time and updating system time after it is checked.
- 3G Dial-up Parameter Setting: for setting 3G dial-up parameters (Note: For more information about APN parameters, please consult your local telecommunication service provide or visit Internet at http://www.imei.info/faq-apn/ .
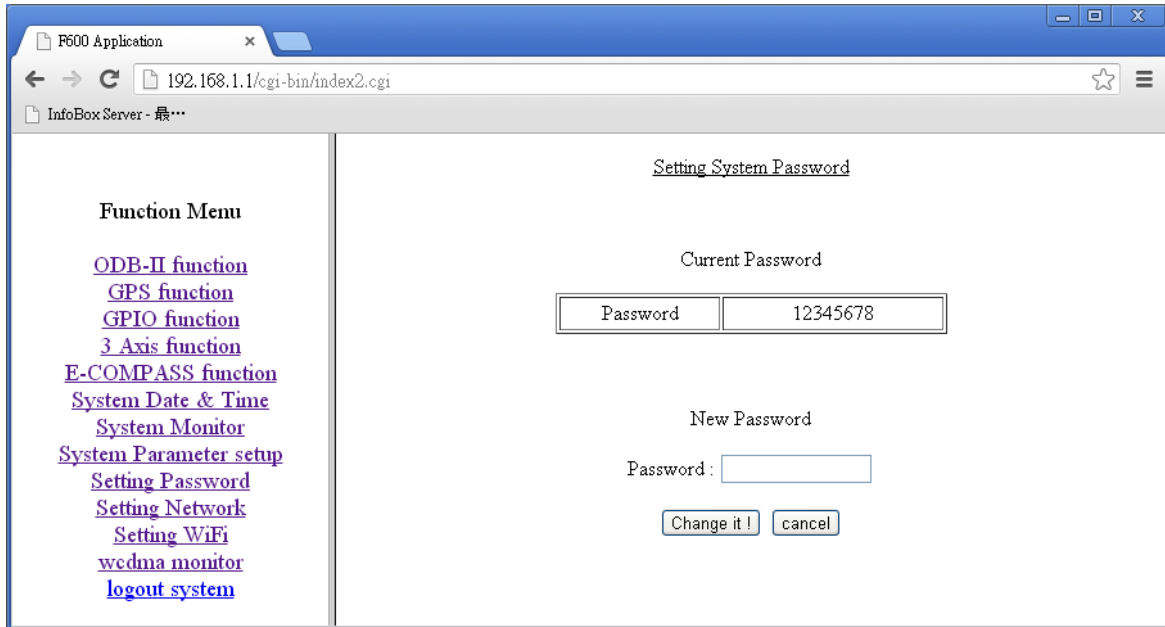
After completing all settings, click <Change it> to update system parameter settings. Note: You MUST reboot your system to activate all parameters.
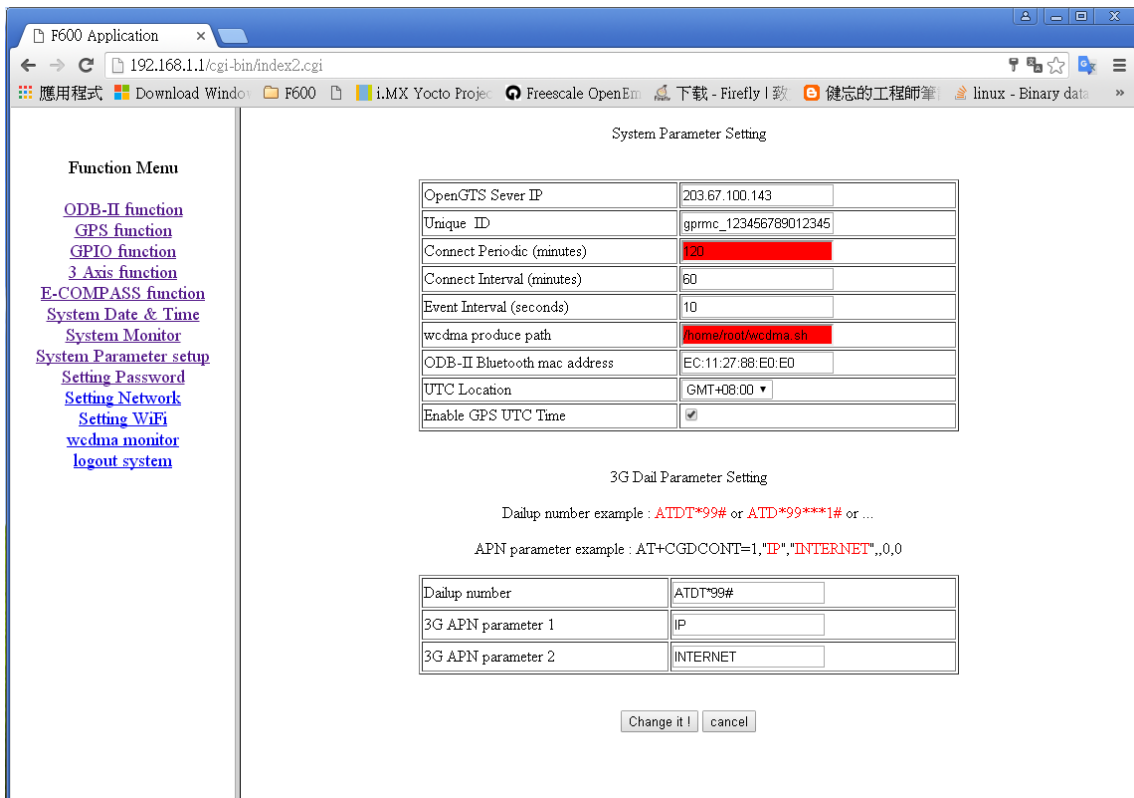
A-8   Setting Password

Enter your new system login password in New Password field, and click <Change it> to update your old password to the new one.

A-9 Setting Network

Wlan0(WiFi interface) IP setting: for showing and/or setting present TCP/IP, DNS, DHCP for WiFi network.
Eth0(Ethernet interface) IP setting: for showing and/or setting present TCP/IP, DNS, DHCP for Ethernet.

After completing all network settings, click <Change it> to save them.

A-10 Setting WiFi

WiFi Access Point Parameters Setting:

- SSID: for setting WiFi Acess Point name.
- Channel: for setting WiFi channel.
- Operation Mode: WiFi standard/protocol (b/g/n).
- Security Mode: for setting WiFi encryption protocol.
- WiFi Password: for setting WiFi password.

After completing all settings, click <Change it> to update system settings.

A-11 wcdma monitor

This function is to show the status of 3G (GSM/WCDMA) modem.

- SIM card: for showing a message about whether SIM card is detected.
- Mode: for showing SIM card transmission mode for wireless transmission (GSM(2G), WCDMA(3G))
- sub-mode: for showing SIM card transmission mode for wireless transmission (GSM/GPRS/EDGE/HSDPA/HSUPA/HSPA/HSPA+)
- signal strength: for showing 3G connection signal strength.

Appendix B: OpenGTS Installation (Windows)

OpenGTS is a web server based system created with Java (Open source) so you are required to install a web server (Tomcat). For recording vehicle traveling status, you need to additionally install a MySQL database. Because the web server will connect to MySQL, you need to install MySQL JDBC Driver. OpenGTS has a function to inform user by mail in case of the occurrence of any event so you also need to install Java mail API.

Note: OpenGTS software and its trademark are not part of VPC100 products. For more information, visit web site at http://www.opengts.org/.

B-1 Hardware Requirements

1.) Windows 20XX, Windows vista, Windows 7 or windows 10
2.) CPU: Intel i3 or later
3.) RAM size: 4G bytes
4.) HDD: at least 5G bytes free space

B-2 Software Requirements

1.) Oracle JDK 8 (Java Compiler for OpenGTS source code)
2.) Sun Java Mail API (mail event to user by OpenGTS system)
3.) Apache Ant tool (Java Build tool for Java Complier)
4.) Apache Tomcat (Web Server for OpenGTS System)
5.) MySQL (Database Server for OpneGTS)
6.) MySQL JDBC (Database driver for Java & Tomcat)
7.) OpenGTS

B-3 Steps to Install OpenGTS

1.) Installing Oracle JDK 8
Download：JDK 8 (jdk-8u91-windows-i586.exe)
Download Link：http://www.java.com/en/download/manual.jsp
You simply launch jdk-8u91-windows-i586.exe, and it will start to install JDK & JRE. Before installing, you NEED to create two file folders -- C:\Program File(x86)\Java\jdk1.8.0_91\ and C:\Program File(x86)\Java\jre1.8.0_91\, because Ant Tool Build does not allow you to leave them blank while installing.

Setup folders and system parameters:

In Windows desktop, click **Start** → **Programs** → **Accessories** and right click on "**Command Line Tool**", and select "**Run as Administrator**" to run Windows command line tool. In command line tool, enter below commands:

- md C:\ProgramData\Oracle\Java\javapath\
- cd c:\ProgramData\Oracle\Java\javapath\
- mklink /D JDK "C:\Program File(x86)\Java\jdk1.8.0_91\"

In Windows desktop, click **Start** → **Setup** → **Console** and click **System** → **Advanced** → **Environment Variable**. In Environment Variable, add a system variable JAVA_HOME.

Setting this system environment variable as below:

JAVA_HOME ➔C:\ProgramData\Oracle\Java\javapath\

2.) Installing Sun JavaMail API

Download：javax.mail.jar

Download Link：http://www.oracle.com/technetwork/java/index-138643.html

In Windows desktop, click **Start** → **Programs** → **Accessories** and right click on "**Command Line Tool**", and select "**Run as Administrator**" to run Windows command line tool. Copy javax.mail.jar to the following two file folders:

- copy c:\your download path\ javax.mail.jar C:\Program File(x86)\Java\jdk1.8.0_91\jre\lib\ext\
- copy c:\your download path\ javax.mail.jar C:\Program File(x86)\Java\jre1.8.0_91\lib\ext\

3.) Installing Apache Ant Build Tool

Download：apache-ant-1.9.4-bin.zip

Download Link：https://ant.apache.org/bindownload.cgi

After downloading this archive file, decompress it and all files will be extracted to this folder D:\ apache-ant-1.9.4 (disk D:\ preferred), and also assign D:\ apache-ant-1.9.4\bin to your system variable PATH.

(To change PATH variable, in Windows desktop click **Start** → **Setup** → **Console**, and then click **System** → **Advanced** → **Environment Variables** to edit system variable PATH)

4.) Installing Tomcat v7.x (DO NOT install V8 version)

Download：apache-tomcat-7.0.69.exe

Download Link：https://tomcat.apache.org/download-70.cgi

After downloading, run apache-tomcat-7.0.69.exe with default configuration option. Disk D:\ is preferred for target installation. After completing installation, you also need to add system variable.

In Windows desktop, click **Start → Setup → Console** and then click **System → Advanced → Environment Variables**.

In system environment variables, add a system variable CATLINA_HOME.

Set the system environment variable CATALINA_HOME to D:\Tomcat 7.0

5.) Installing MySQL v5.X.X

Download：mysql-essential-5.1.45-winx64.msi

Download Link：http://dev.mysql.com/downloads/mysql/ or
http://www.eisafe.com/safe/x64/

After downloading, simply run mysql-essential-5.1.45-winx64.msi. During installation, be sure to click checkbox to set PATH for MySQL bin (for MySQl executable files).

6.) Installing MySQL JDBC Driver

Download：mysql-connector-java-5.1.38.zip

Download Link：https://dev.mysql.com/downloads/connector/j/

After downloading & unzipping, in Windows desktop click **Start → Programs → Accessories** and right click on "**Command Line Tool**" and select "Run as Administrator" to enter command line tool. Copy mysql-connector-java-5.1.38-bin.jar to the following two folders:

① C:\Program File(x86)\Java\ jdk1.8.0_91\jre\lib\ext\
② C:\Program File(x86)\Java\jre1.8.0_91\lib\ext\

7.) Installing and Compiling OpenGTS

Download：OpenGTS_2.6.1.zip

Download Link：http://www.opengts.org/

After downloading, unzip the file and extract them to folder D:\OpenGTS_2.6.1 (disk D:\ preferred).

In Windows desktop, click **Start → Setup → Console** and click **System → Advanced → Environment Variables**.

In system environment variables, add a system variable GTS_HOME.

Set this system environment variable GTS_HOME to D:\OpenFTS_2.6.1

Before compiling, verify all environment variables again to make sure they are all correct (including path setting):
① JAVA_HOME
② ANT_HOME

③ CATALINA_HOME
④ GTS_HOME

To starting your compilation, click windows **Start → Programs → Accessories** in Windows desktop and click on "**Command Prompt**" and select "Run as Administrator" to open a command prompt, and type the following commands:

```
C:\> D:
D:\> cd OpenGTS_2.6.1
D:\ OpenGTS_2.6.1> ant all
```

The following files will be created under the "build" folder if commands are properly executed:

① "lib/gtsutils.jar" – This jar contains the base utilities and db access tools.
② "lib/gtsdb.jar" – This jar contains the database access utilities and table definition.
③ "lib/gtsdmtp.jar" – This jar contains the SQL db data store wrappers around the OpenDMTP server.
④ "lib/tools.jar" – This jar contains miscellaneous system check and administrative tools.
⑤ "track.war" – This "war" file (web-archive) contains the web-interface 'Track' servlet.
⑥ "events.war" – This "war" file contains the web accessible EventData access servlet.
⑦ "molomgogo.war" – This "war" file contains the Mologogo device servlet.
⑧ "gc101.war" – This "war" file contains support for the Sanav GC-101 device.
⑨ "gprmc.war" – This "war" file contains a servlet support server for a generic http-based device server.

8.) Initializing OpenGTS in MySQL Database
Creating a database on OpenGTS, and its name is gts.
In the folder D:\OpenGts_2.6.1, execute the following command:

bin\initdb.bat "-rootUser:root" "-rootPass:userPass"
(userPass: use your own password, for example. bin\initdb.bat
"-rootUser:root" "-rootPass:icn"，password is icn)

MySQL Server should be running now. If not, you should manually launch it

and thus a database gts and the following data tables will be created:

① **Account** - Account owner table
② **User** - User table
③ **UserAcl** - User Access-Control-List table
④ **Device** - Device information table
⑤ **EventData** - Received Event data
⑥ **Geozone**- Geozone/Geofence definitions
⑦ **EventTemplate** - Custom event packet templates (DMTP only)
⑧ **PendingPacket** - Packets pending transmission to device (DMTP only)

Checking Your Installation Status:
In the folder D:\OpenGts_2.6.1, execute the following command:

bin\checkInstall.bat

Creating Administrator Account on OpenGTS:
In the folder D:\OpenGts_2.6.1, execute the following command to create administrator account:

bin\admin.bat Account -account:sysadmin -pass:password –create
(Set the administrator password at -pass，e.g. bin\admin.bat Account -account:sysadmin -pass:test –create，password is test)

9.) Installing *.war to Tomcat sever
In D:\OpenGts_2.6.1\build folder, execute the following commands:

copy *.war D:\Tomcat 7.0\webapps
(*.war including track.war, events.war, gprmc.war)

If any event occurs and you must send out a notification mail, you should find SMTP settings in the file D:\OpenGTS_2.6.1\config.conf and then change it to your SMTP server IP and launch ant all (compile opengts) to copy *.war to the folder D:\Tomcat 7.0\webapps.

10.) Testing OpenGTS server
To test OpenGTS on the local server (the PC installed with OpenGTS), type either one of the following two URL address in browser:

http://localhost:8080/track/Track or http://127.0.0.1:8080/track/Track

You will see the OpenGTS login screen. In Account field, enter your account,

and in Password field, enter your password

(Account and Password are created by executing the command

bin\admin.bat Account -account:sysadmin -pass:password –create).

Appendix C: OpenGTS Installation (Linux)

Note: OpenGTS is used as a demonstration server to work with VPC100. It is not part of VPC100 product. Please check below link for more information on OpenGTS: http://www.opengts.org/

C-1 Host Computer

Setup a Linux host computer with the following minimum software and hardware requirements:

- Ubuntu version 12.04 or later
- 120GB hard drive free space (for X11 backend)

C-2 OpenGTS Installation procedures

- Install ubuntu 10.04 server + LAMP + Java Tomcat

        sudo aptitude update
        sudo aptitude safe-upgrade

- Remove apparmor

        sudo /etc/init.d/apparmor stop
        sudo update-rc.d -f apparmor remove
        sudo aptitude remove apparmor apparmor-utils

- Install package

        sudo aptitude install binutils cpp fetchmail flex gcc libarchive-zip-perl libc6-dev
        libcompress-zlib-perllibdb4.6-dev libpcre3 libpopt-dev lynx m4 make ncftp
        nmap openssl perl perl-modules unzip zip zlib1g-dev autoconf automake1.9
        libtool bison autotools-dev g++ build-essential

- Edit /etc/mysql/my.cnf

        bind-address = 127.0.0.1 ➔ #bind-address = 127.0.0.1

- Edit /etc/apache2/mods-available/dir.conf

        DirectoryIndex index.html index.htm index.shtml index.cgi index.php
        index.php3 index.pl index.xhtml

```
sudo a2enmod ssl
sudo a2enmod rewrite
sudo a2enmod suexec
sudo a2enmod include
sudo a2enmod dav_fs
sudo a2enmod dav
sudo /etc/init.d/apache2 restart
```

- Disable ruby

```
sudo vi /etc/mime.types
#application/x-ruby
/etc/init.d/apache2 restart
```

- Install Perl modules

```
sudo aptitude install libhtml-parser-perl libdb-file-lock-perl libnet-dns-perl
libnetaddr-ip-perl libarchive-tar-perl
```

- Add & Install repository and Java

```
sudo apt-get install python-software-properties
sudo add-apt-repository "deb http://archive.canonical.com/ lucid partner"
sudo apt-get update
```

- Install java open-jdk-6

```
sudo apt-get install default-jdk
```

- Setup Tomcat

```
vi /etc/tomcat6/tomcat-users.xml
add following line：
    <role rolename="manager"/>
    <role rolename="admin"/>
    <user username="admin" password="admin" roles="admin,manager"/>
```

- Install ANT

```
sudo apt-get install ant
```

- Setup environment

```
add following line to /etc/environment：
    export JAVA_HOME=/usr/lib/jvm/java-6-openjdk
    export ANT_HOME=/usr/share/ant
    export CATALINA_HOME=/usr/share/tomcat6
```

export GTS_HOME=/usr/local/OpenGTS

- Setup mysql JDBC

  wget -c

  http://dev.mysql.com/get/Downloads/Connector-J/mysql-connector-java-5.1.1

  8.tar.gz

  tar xzvf mysql-connector-java-5.1.18.tar.gz

  sudo cp mysql-connector-java-5.1.18-bin.jar $JAVA_HOME/jre/lib/ext/.

  sudo ln -s /usr/local/OpenGTS_2.6.0 /usr/local/OpenGTS

- Download OpenGTS：

  Download OpenGTS from http://www.opengts.org/

  unzip OpenGTS_2.6.0.zip

  sudo cp OpenGTS_2.6.0 /usr/local

- Then we **ant** all files and deploy **track.war** file.

  ant all

  anttrack.war

  use tomcat manager to deploy:

  (assuming your PC IP address is 192.168.200.150)

  http://192.168.200.150:8080/manager/html

  deploy path /var/lib/tomcat6/webapps

- Initialize OpenGTS database

  cd /usr/local/OpenGTS_2.6.0/bin

  ./initdb.sh -rootUser=root -rootPass=**root**

  (Note: -rootPass is root password, you can change it if you want)

- Create Admin account

  ./admin.sh Account -account=admin –create

  ./admin.sh Account -account=admin –edit

  ./admin.sh Account –list

- Setup link

  cd /usr/local

  sudo ln -s $JAVA_HOME java

  sudo ln -s $CATALINA_HOME tomcat

  sudo ln -s $GTS_HOME gts

- Run Device server

  bin/runserver.sh -s gtsdmtp

- Show java prcess
  $GTS_HOME/bin/psjava

- Installing "events.war"
  ant events
  use tomcat manager to deploy
  (assuming your PC IP address is 192.168.200.150)
  http://192.168.200.150:8080/manager/html

- HTTP Based Device Communication Servers (using the "gprmc" servlet)
  Building the "gprmc" Servlet:
  ant gprmc
  use tomcat manager to deploy
  (assuming your PC IP address is 192.168.200.150)
  http://192.168.200.150:8080/manager/html

- List running task
  $GTS_HOME/bin/psjava

C-3 Change OpenGTS map provider to Google Map

edit build/track/WEB-INF/private.xml

Apply **google map API key** from Google.

Find <MapProvider name="**openLayers**"> tag

   active="${Domain.MapProvider.active=**false**}"

   ??/span>

   ...

   <MapProvider name="**googleMaps**"

      active="${Domain.MapProvider.active=**true**}"

      class="org.opengts.war.maps.jsmap.GoogleMaps"

      key="${Domain.MapProvider.key=**AlzaSyBc1Y4npcHdkkQYT1NopchLcu-N RMgcrfl**}"

      rtPropPrefix="Domain.MapProvider.">

Then rebuild track and deploy again.

FCC Statement

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 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.

FCC RF Radiation Exposure Statement

1. The equipment complies with RF exposure limits set forth for an uncontrolled environment. The antenna(s) used for 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.
3. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference and
(2) this device must accept any interference received, including interference that may cause undesired operation