



**Wired / Wireless**

**VDSL 2 Router**

**VC-230N / VC-230**

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**User's Manual**

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## **Federal Communication Commission Interference Statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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:

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

## **FCC Caution**

To assure continued compliance (example-use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the 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.

### **Federal Communication Commission (FCC) Radiation Exposure Statement**

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

### **CE mark Warning**

This is a class B device, in a domestic environment; this product may cause radio interference, in which case the user may be required to take adequate measures.


### **R&TTE Compliance Statement**

This equipment complies with all the requirements of DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE)

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

### **WEEE Regulation**



To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of  electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

### **Safety**

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

### **Revision**

User's Manual for Wired / Wireless VDSL 2 Router

Model: VC-230N / VC-230

Rev: 2.0 (Nov. 2009)

Part No. EM-VC230\_230N\_v2

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# 1. Introduction

The PLANET Wired / Wireless VDSL2 Router, VC-230 / VC-230N are based on several core networking technologies: IEEE 802.11b/g/n (VC-230N), Ethernet and VDSL2 (Very High Speed Digital Subscriber Line 2). This technology offers the absolute fastest data transmission speeds over existing copper telephone lines without the need for rewiring. In the following terms of **VDSL2 Router** will mean **VC-230** or **VC-230N** unless model number is specified.

The PLANET VDSL2 ROUTER can provide very high performance access to Internet, both downstream and upstream up to 100Mbps. The VDSL2 ROUTER complies with ITU-T G993.2 standard, and provide two modes for applications – Bridge and Router. With 4-port 10/100 Ethernet switch, it provide data deliver and receive in local network, so that it is the best solution for small enterprise and residence.

With built-in IEEE 802.11b/g and 802.11n wireless network capability, the VC-230N allows any computer and wireless-enabled network device connect to it without additional cabling. New 802.11n Draft 2.0 wireless capability gives you the highest speed of wireless experience ever. With a compatible wireless card installed in your PC, the files can be transferred at up to 300Mbps. The radio coverage is also doubled to offer the high speed wireless connection even in a wide space of your office or house.

There are two selectable operating modes of VDSL2 ROUTER, CO and CPE. The CO or CPE mode can be adjusted by WEB UI and users can connect two VDSL2 ROUTER for Point-to-Point Application, data transmission between two networks over existing copper telephone lines.

Via the user-friendly management interface, VDSL2 ROUTER can be managed easily by computer running standard web browsers. Furthermore, the VDSL2 ROUTER not only provides basic router's functions, such as DHCP server, Virtual Server, DMZ, QoS, and UPnP, but also provides the fully firewall functions, such as Network Address Translation (NAT), IP/Port/MAC Filtering and Content Filtering. It serves as an Internet firewall to protect your network from being accessed by outside users.

## 1.1 Feature

### Internet Access Features

- ◆ **Shared Internet Access:** All users on the LAN can access the Internet through the VDSL Router using only a single external IP Address. The local (invalid) IP Addresses are hidden from external sources. This process is called NAT (Network Address Translation).
- ◆ **Built-in VDSL2 Modem:** The VDSL Router provides VDSL2 modem, and supports all common VDSL2 connections.
- ◆ **Multiple WAN Connection:** On the Internet (WAN port) connection, the VDSL Router supports Dynamic IP Address (IP Address is allocated on connection), Fixed IP Address, PPPoE, PPTP and L2TP.
- ◆ **CO and CPE type Support:** The VDSL Router provides the Peer-to-Peer connection. Users can select the CO and CPE mode manually.
- ◆ **Bridge and Router Application:** The VDSL Router supports two application modes. Currently, it comes pre-configured with routing mode. Note that, routing mode and bridging mode cannot be used simultaneously.

### Advanced Internet Functions

- ◆ **Virtual Servers:** This feature allows Internet users to access Internet servers on your LAN. The required setup is quick and easy.
- ◆ **Firewall:** Supports simple firewall with NAT technology.
- ◆ **Universal Plug and Play (UPnP):** UPnP allows automatic discovery and configuration of the Broadband Router. UPnP is supported by Windows ME, XP, or later.
- ◆ **Selectable VDSL2 Profiles:** The VDSL Router supports common VDSL2 profiles (30a, 17a, 12a, 12b, 8a, 8b, 8c, 8d) for selectable. Users can choose different VDSL2 profiles based on their requirements.
- ◆ **User Friendly Interface:** The VDSL Router can be managed and controlled through Web UI.
- ◆ **DMZ Support:** The VDSL Router can translate public IP addresses to private IP address to allow unrestricted 2-way communication with Servers or individual users on the Internet. This provides the most flexibility to run programs, which could be incompatible in NAT environment.
- ◆ **Bridge and Router Application:** The VDSL Router supports two application modes. Currently, it comes pre-configured with routing mode. Note that, routing mode and bridging mode cannot be used simultaneously.
- ◆ **RIP1/2 Routing:** It supports RIPv1/2 routing protocol for routing capability.
- ◆ **VPN Pass through Support:** PCs with VPN (Virtual Private Networking) software are transparently supported - no configuration is required.

## **LAN Features**

- ◆ **4-Port Switch:** The VDSL Router incorporates a 4-port 10/100Base-TX switching hub, making it easy to create or extend your LAN.
- ◆ **DHCP Server Support:** Dynamic Host Configuration Protocol provides a dynamic IP address to PCs and other devices upon request. The VDSL Router can act as a DHCP Server for devices on your local LAN.

## **Wireless Features(VC-230N only)**

- ◆ **Support IEEE 802.11b, g and 802.11n Wireless Stations:** The 802.11n standard provides for backward compatibility with the 802.11b and 802.11g standard, so 802.11b, 802.11g, and 802.11n Draft 2.0 can be used simultaneously. IEEE 802.11n (Draft 2.0) wireless technology is capable of up to 300Mbps data rate.
- ◆ **Two External Antennas with MIMO Technology:** The VC-230N provides farther coverage, less dead spaces and higher throughput with 2T2R MIMO technology.
- ◆ **WPS Push Button Control:** The VC-230N supports WPS (Wi-Fi Protected Setup) to easily connect to wireless network without configuring the security.
- ◆ **WEP Support:** WEP (Wired Equivalent Privacy) is included. Key sizes of 64 Bit and 128 Bit are supported.
- ◆ **WPA-PSK Support:** WPA-PSK\_TKIP and WAP-PSK\_AES encryption are supported.
- ◆ **Wireless MAC Access Control:** The Wireless Access Control feature can check the MAC address (hardware address) of Wireless stations to ensure that only trusted Wireless Stations can access your LAN.

## **1.2 Package Contents**

- ◆ VC-230 / VC-230N Unit x 1
- ◆ Power Adapter x 1
- ◆ Quick Installation Guide x 1
- ◆ User's Manual CD x 1
- ◆ RJ-45 cable x 1
- ◆ RJ-11cable x 1
- ◆ Antenna x 2 (VC-230N)



## 1.3 Physical Details

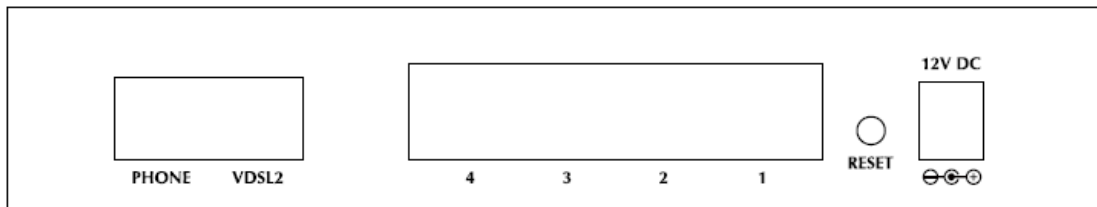
### Front Panel of VC-230



#### Front Panel LED definition

LED	State	Description
PWR	ON	When the router is powered on, and in ready state.
	OFF	When the router is powered off.
DSL	Flashing	Router is trying to establish a VDSL2 connection to VDSL2 device or telecom's network.
	ON	The VDSL2 connection connected successfully.
LAN1-4	Flashing	Data is being transmitted or received via the corresponding LAN port.
	ON	The port is up.

### Rear Panel of VC-230



#### Rear Panel Port and Button Definition

Connector	Description
POWER	Power connector with 12V DC 1 A
RESET	Press more than 3 seconds for reset to factory default setting.
LAN (1-4)	Router is successfully connected to a device through the corresponding port (1, 2, 3, or 4). If the LED light of LNK/ACT is flashing, the Router is actively sending or receiving data over that port.
PHONE	Built-in splitter for POTS connection.
VDSL2	The RJ-11 connector allows data communication between the router and the VDSL2 network through a twisted-pair phone wire

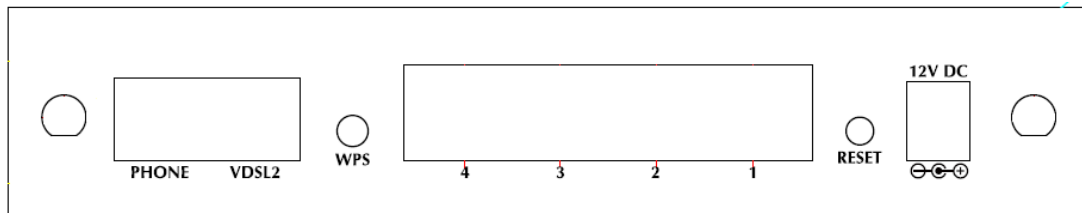
## Front Panel of VC-230N



### Front Panel LED definition

LED	State	Description
<b>PWR</b>	ON	When the router is powered on, and in ready state.
	OFF	When the router is powered off.
<b>WPS</b>	ON	WPS client registration is successful.
	Flashing	WPS client registration window is currently open.
	OFF	WPS is not available, or WPS is not enabled or initialized.
<b>WLAN</b>	ON	WLAN radio is on.
	Flashing	Data is being transmitted through WLAN.
	OFF	WLAN radio is off.
<b>Security</b>	ON	Enable WLAN encryption
	OFF	Disable WLAN encryption
<b>DSL</b>	Flashing	Router is trying to establish a VDSL2 connection to VDSL2 device or telecom's network.
	ON	The VDSL2 connection connected successfully.
<b>LAN1-4</b>	Flashing	Data is being transmitted or received via the corresponding LAN port.
	ON	The port is up.

## Rear Panel of VC-230N



### Rear Panel Port and Button Definition

Connector	Description
<b>POWER</b>	Power connector with 12V DC 1 A
<b>RESET</b>	Press more than 3 seconds for reset to factory default setting.
<b>LAN (1-4)</b>	Router is successfully connected to a device through the corresponding port (1, 2, 3, or 4). If the LED light of LNK/ACT is flashing, the Router is actively sending or receiving data over that port.
<b>WPS</b>	WPS on or off switch.
<b>PHONE</b>	Built-in splitter for POTS connection.
<b>VDSL2</b>	The RJ-11 connector allows data communication between the router and the VDSL2 network through a twisted-pair phone wire

## 2. Installation

This chapter offers information about installing your router. If you are not familiar with the hardware or software parameters presented here, please consult your service provider for the values needed.

### 2.1 System Requirement

1. Personal computer (PC)
2. Pentium III 266 MHz processor or higher
3. 128 MB RAM minimum
4. 20 MB of free disk space minimum
5. RJ45 Ethernet Port

### 2.2 Hardware Installation

Please connect the device to you computer as follow:

- Connect your telephone to the “Phone” Port via RJ-11 telephone line.
- Use another telephone cable to connect “VDSL” port of the router. And connect the other side to your CO side devices, such as VDSL 2 DSLAM, VDSL 2 Switch, or another VDSL2 ROUTER with CO mode.
- Use Ethernet cable to connect “LAN” port of the modem and “LAN” port of your computer.

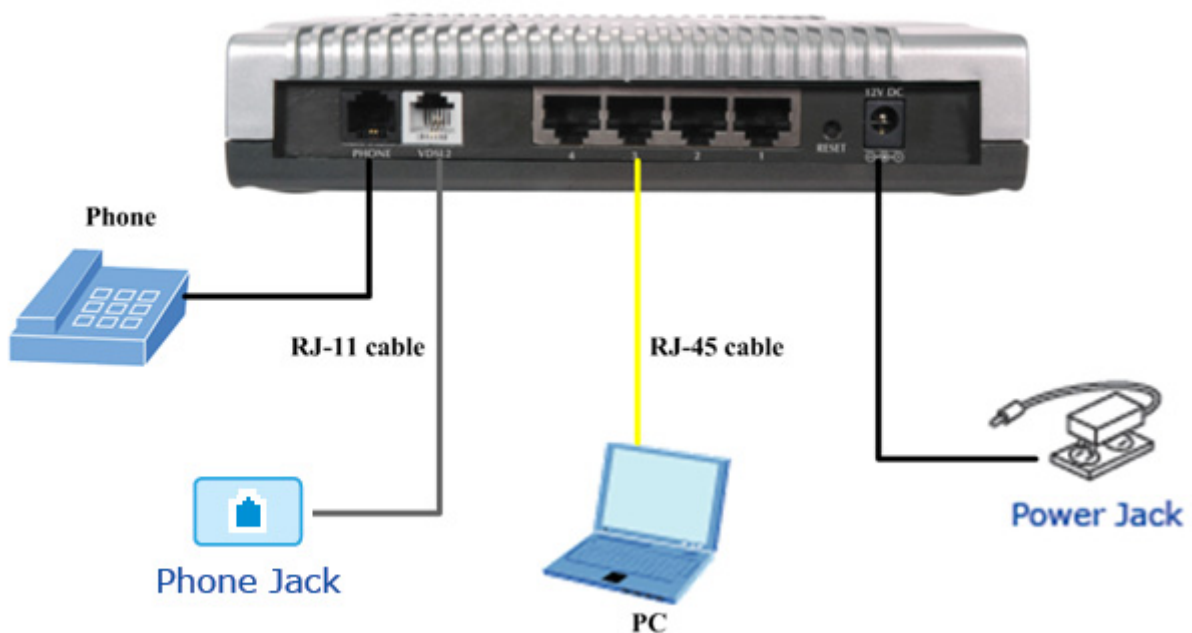
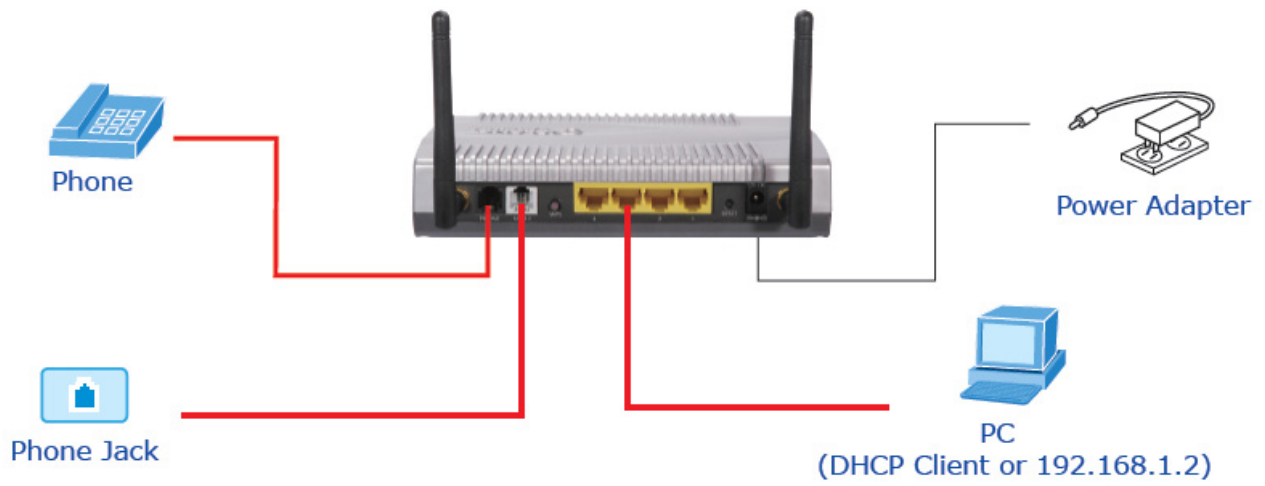


Figure 1: VC-230 connection diagram

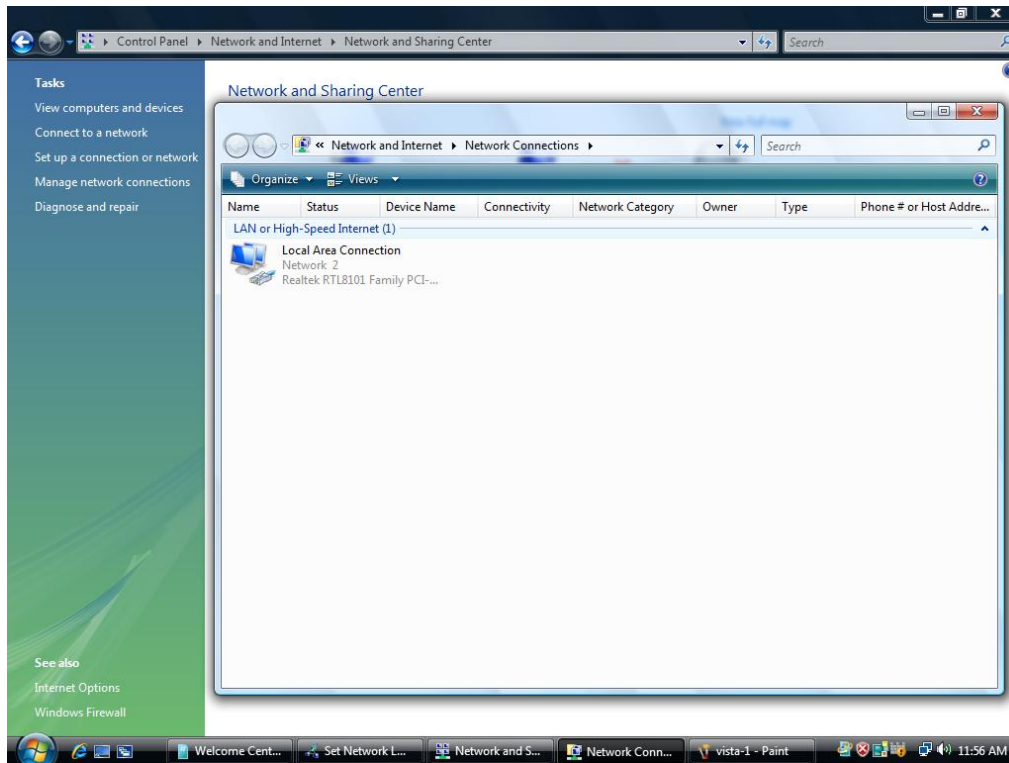


**Figure 2: VC-230N connection diagram**

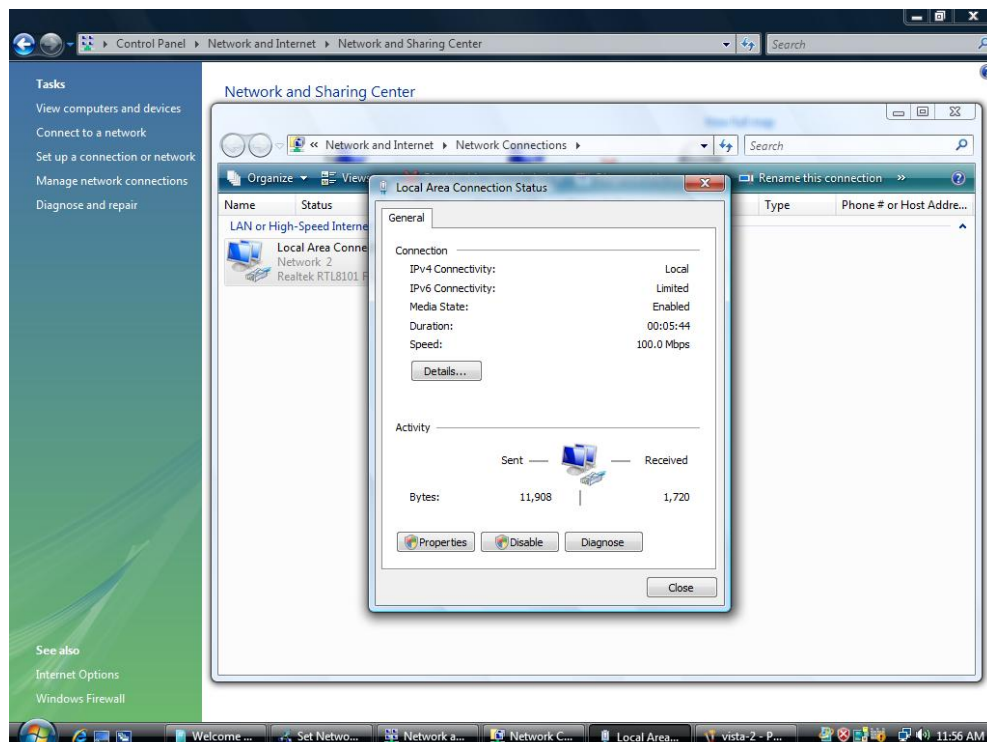
## 2.3 Configuring the Network Properties

### Configuring PC in Windows Vista

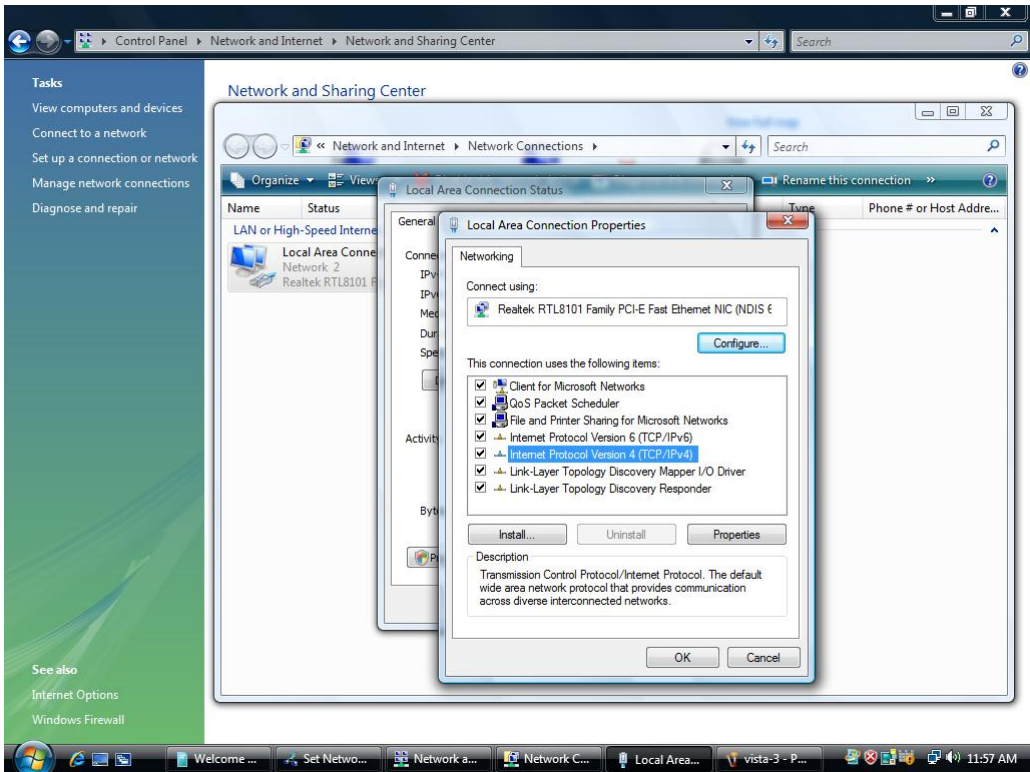
1. Go to **Start / Control Panel / Network and Internet / Network and Sharing Center**. Double-click on **Network Connections**.
2. Double-click **Local Area Connection**.



3. In the **Local Area Connection Status** window, click **Properties**.

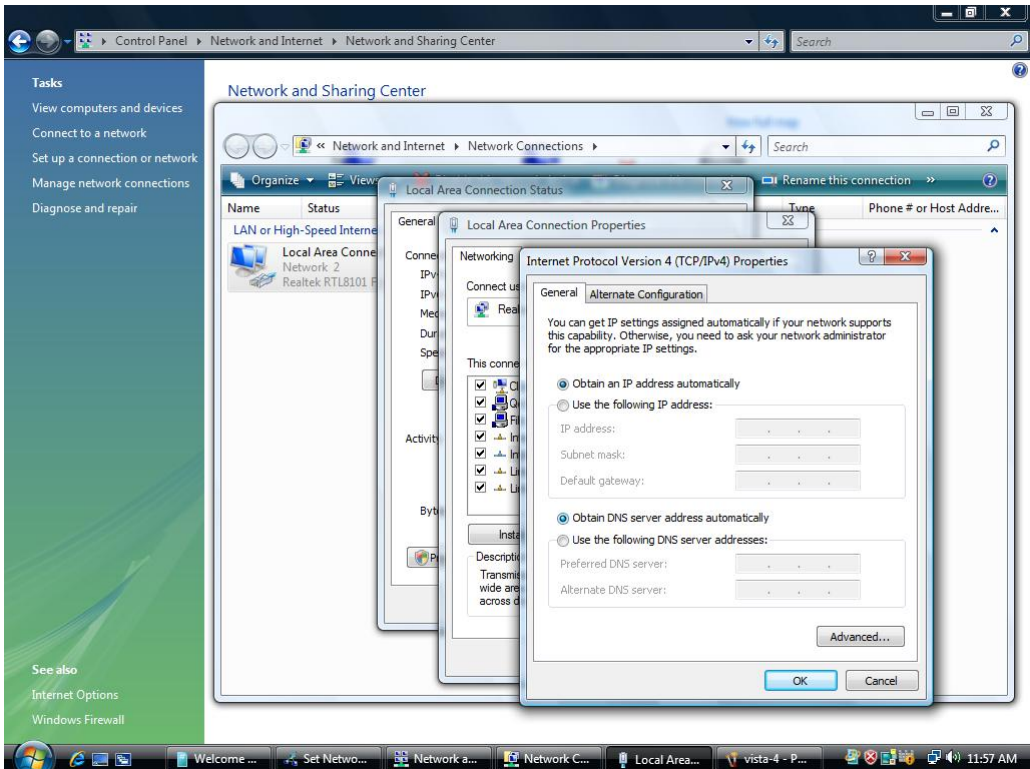


4. Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



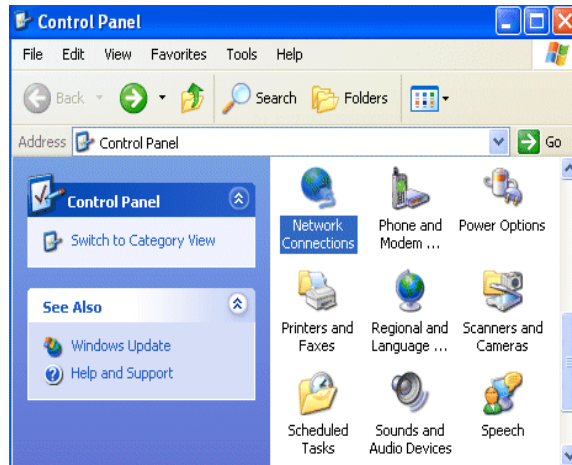
5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.

6. Click **OK** to finish the configuration.

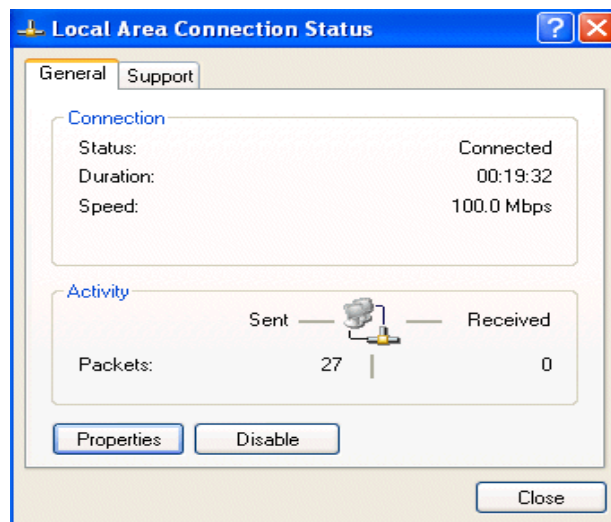


## Configuring PC in Windows XP

1. Go to **Start / Control Panel (in Classic View)**. In the Control Panel, double-click on **Network Connections**
2. Double-click **Local Area Connection**.

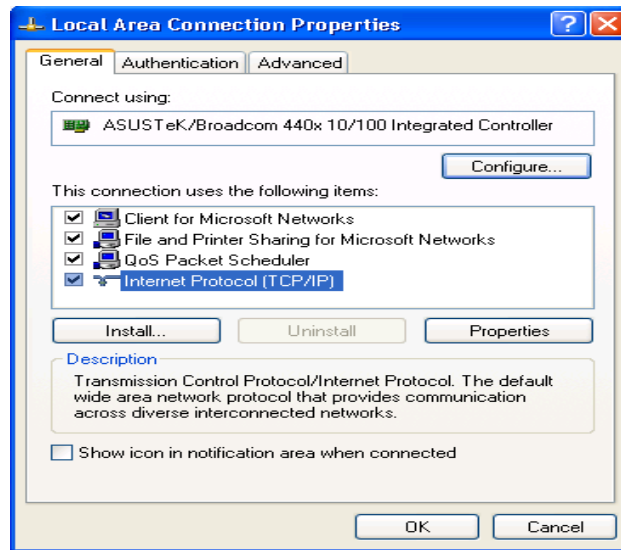


3. In the **Local Area Connection Status** window, click **Properties**.



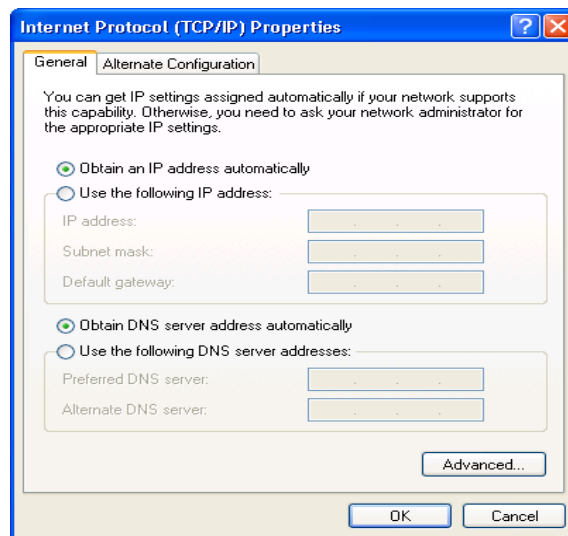


4. Select **Internet Protocol (TCP/IP)** and click **Properties**.



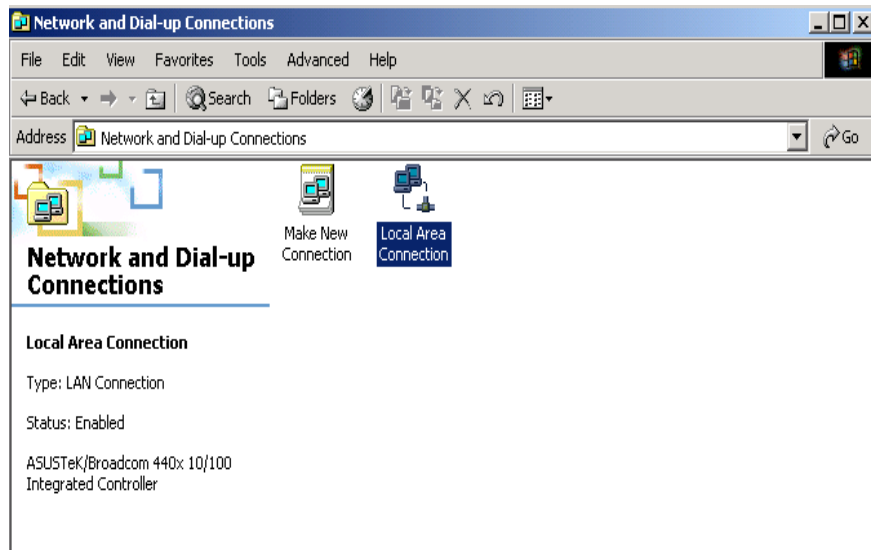
5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.

6. Click **OK** to finish the configuration.

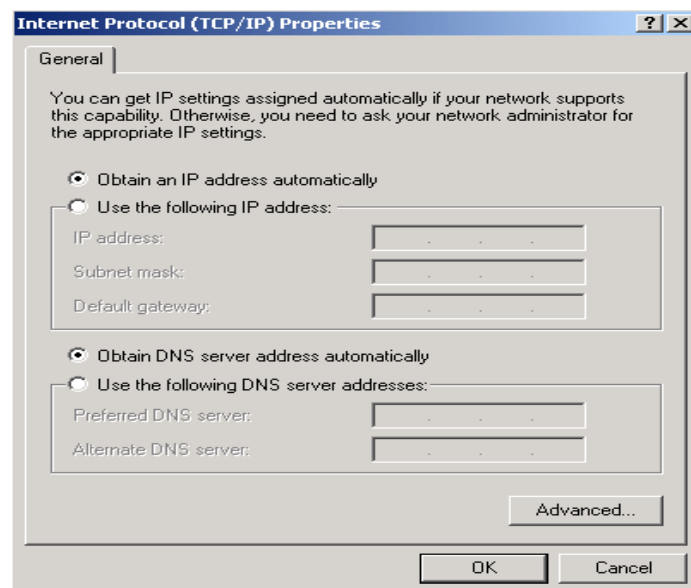


## Configuring PC in Windows 2000

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network and Dial-up Connections**.
2. Double-click **Local Area Connection**.

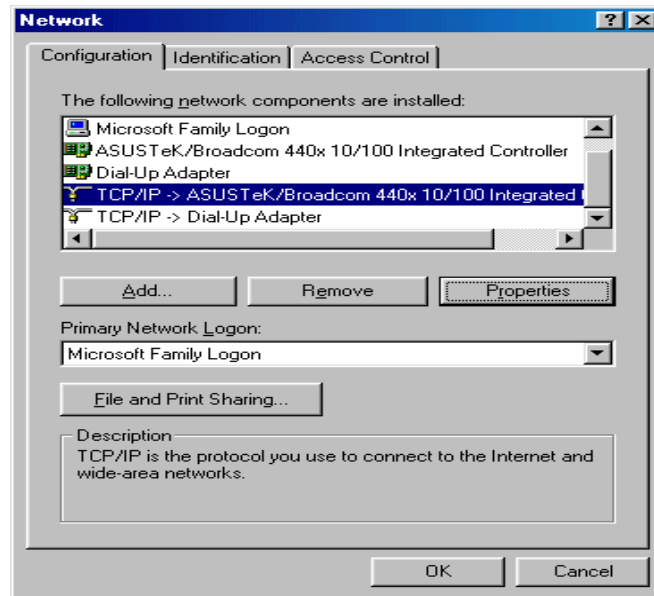


3. In the **Local Area Connection Status** window click **Properties**.
4. Select **Internet Protocol (TCP/IP)** and click **Properties**.
5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.
6. Click **OK** to finish the configuration.

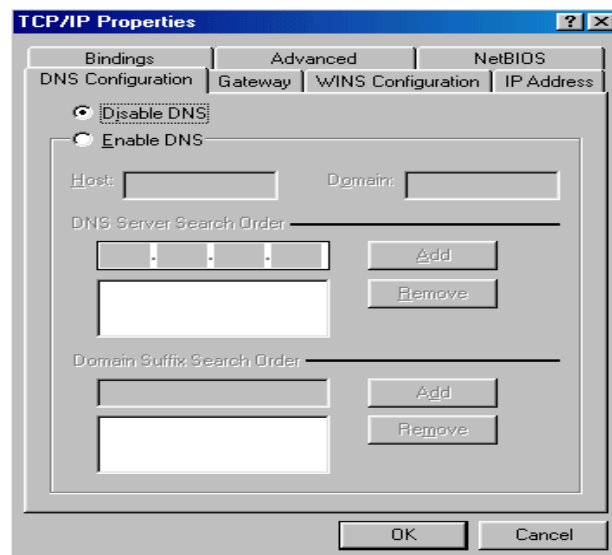


## Configuring PC in Windows 98/Me

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network** and choose the **Configuration** tab.
2. Select **TCP/IP → NE2000 Compatible**, or the name of your Network Interface Card (NIC) in your PC.



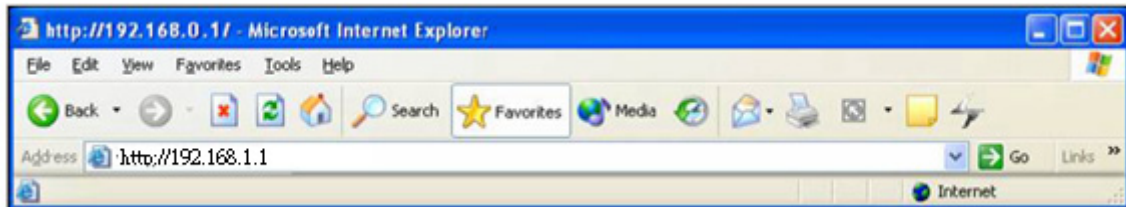
3. Select the **Obtain an IP address automatically** radio button.
4. Then select the **DNS Configuration** tab.
5. Select the **Disable DNS** radio button and click **OK** to finish the configuration.



## 2.4 Configuring with Web Browser

It is advisable to change the administrator password to safeguard the security of your network. To configure the router, open your browser, type “**http: //192.168.1.1**” into the address bar and click “**Go**” to get to the login page.

Save this address in your Favorites for future reference.



At the User name and Password prompt, type your proper user name and password to login. The default user name / password are “**admin / admin**”. You can change these later if you wish. Click “**OK**”.



If the user name and password are correct, you will login VDSL2 ROUTER successfully and see the status page. Now you can configure the VDSL2 ROUTER for your needs.

**PLANET**  
Networking & Communication

**VDSL2 Router**

logout

VC-230

- Operation Mode
- Internet Settings
- Firewall
- VDSL
- Administration

### Router Status

System Info	
Firmware Version	Beta091015
SDK Version	3.3.0.0
System Up Time	0 day, 0 hour, 4 min, 58 sec
Operation Mode	Gateway Mode

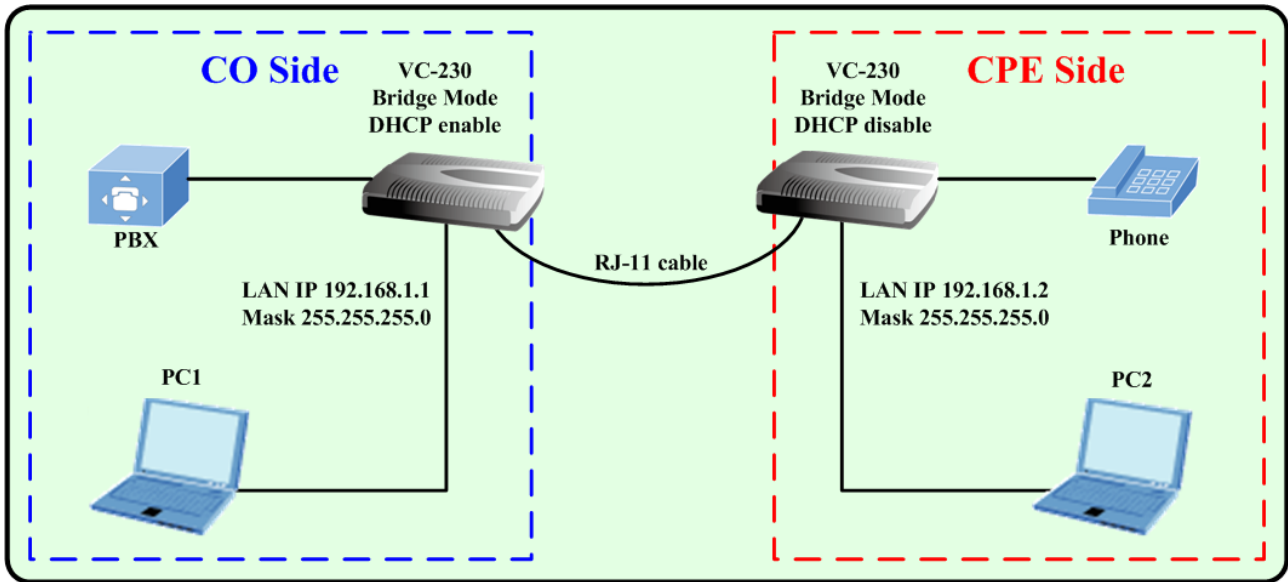
Internet Configurations	
Connected Type	PPPOE
WAN IP Address	203.73.50.173
Subnet Mask	255.255.255.255
Default Gateway	203.73.50.1
Primary Domain Name Server	139.175.55.244
Secondary Domain Name Server	139.175.252.16
MAC Address	00:30:4F:30:52:11

Local Network	
Local IP Address	192.168.100.1
Local Netmask	255.255.255.0
MAC Address	00:30:4F:30:52:10

## 2.5 Applications

The VDSL2 ROUTER supports two modes, users can select Router or Bridge mode for your applications. Please check as below examples for more details.

### 2.5.1 Bridge Mode for LAN-to-LAN connection



## Web UI Configuration

### For VDSL2 ROUTER CO side

- Step 1: Select the Bridge mode.

The screenshot shows the web interface for a PLANET VDSL2 Router. The left sidebar contains a navigation menu with 'VC-230' selected, and sub-items for 'Operation Mode', 'Internet Settings', 'Firewall', 'VDSL', and 'Administration'. The main content area is titled 'Operation Mode Configuration' and includes the text: 'You may configure the operation mode suitable for you environment.' Below this, there are two radio button options: 'Bridge:' (which is selected and highlighted with a red box) and 'Gateway:'. The 'Bridge:' option is described as 'All interfaces are bridged into a single bridge interface.' The 'Gateway:' option is described as 'The VDSL port is treated as WAN port. The other interfaces are bridged together and are treated as LAN ports.' At the bottom of the configuration area, there are 'Apply' and 'Reset' buttons, both of which are highlighted with red boxes.

- **Step 2: Setup your LAN IP, for example, we use the 192.168.1.1 / 255.255.255.0 and enable DHCP server for VDSL2 ROUTER CO side.**

The screenshot shows the 'Local Area Network (LAN) Settings' page. The left sidebar contains a navigation tree with 'Internet Settings' expanded to 'LAN'. The main content area has a title 'Local Area Network (LAN) Settings' and a sub-header 'LAN Interface Setup'. Below this is a table of configuration fields:

LAN Interface Setup	
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
LAN2	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
MAC Address	00:30:4F:30:52:10
DHCP Type	Server
DHCP Start IP	192.168.1.2
DHCP End IP	192.168.1.100
DHCP Subnet Mask	255.255.255.0
DHCP Primary DNS	192.168.1.1
DHCP Secondary DNS	168.95.1.1

- **Step 3: Modify your VDSL mode, default is CPE mode. Select the VDSL CO mode.**

The screenshot shows the 'VDSL Configuration' page. The left sidebar has 'VDSL' selected and 'VDSL Configuration' highlighted with a red box. The main content area has a title 'VDSL Configuration' and a sub-header 'VDSL Configuration'. Below this is a table of configuration fields:

VDSL Configuration	
Mode	<input checked="" type="radio"/> CO <input type="radio"/> CPE
VDSL Profile	AnnexA_R_POTS_D-32_EU-32_30a
VDSL SNR	6 db (range 0-31)
Line Type	Interleave
Interleave Max delay	8 ms (range 2-255)
INP	3 (0.1 symbols, range 30a:1-17, others:1-18)
Upstream Rate Limit	No Limit Mbps
Downstream Rate Limit	No Limit Mbps

At the bottom of the page are 'Apply' and 'Cancel' buttons.

## For VDSL2 ROUTER CPE side

- Step 1: Select the Bridge mode.

The screenshot shows the PLANET VDSL2 Router configuration interface. The left sidebar lists navigation options: VC-230, Operation Mode, Internet Settings, Firewall, VDSL, and Administration. The main content area is titled "Operation Mode Configuration" and contains the text: "You may configure the operation mode suitable for you environment." Below this, there are two radio button options: "Bridge:" (selected) and "Gateway:". The "Bridge:" option is highlighted with a red box and includes the text "All interfaces are bridged into a single bridge interface." The "Gateway:" option includes the text "The VDSL port is treated as WAN port. The other interfaces are bridged together and are treated as LAN ports." At the bottom of the configuration area, there are two buttons: "Apply" (highlighted with a red box) and "Reset".

- Step 2: Setup your LAN IP, for example, we use the 192.168.1.2 / 255.255.255.0 and disable DHCP server for VDSL2 ROUTER CPE side.

The screenshot shows the PLANET VDSL2 Router configuration interface for "Local Area Network (LAN) Settings". The left sidebar lists navigation options: VC-230, Operation Mode, Internet Settings (with sub-items WAN, LAN, DHCP Clients, Advanced Routing, QoS), Firewall, VDSL, and Administration. The main content area is titled "Local Area Network (LAN) Settings" and contains the text: "You may enable/disable networking functions and configure their parameters as your wish." Below this is a table for "LAN Interface Setup" with the following data:

LAN Interface Setup	
IP Address	192.168.1.2
Subnet Mask	255.255.255.0
LAN2	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
MAC Address	00:30:4F:30:52:10
DHCP Type	Disable
802.1d Spanning Tree	Disable
IGMP proxy	Disable
UPNP	Disable
Router Advertisement	Disable
DNS proxy	Enable

At the bottom of the configuration area, there are two buttons: "Apply" and "Cancel".



■ Step 3: Modify your VDSL mode, default is CPE mode.

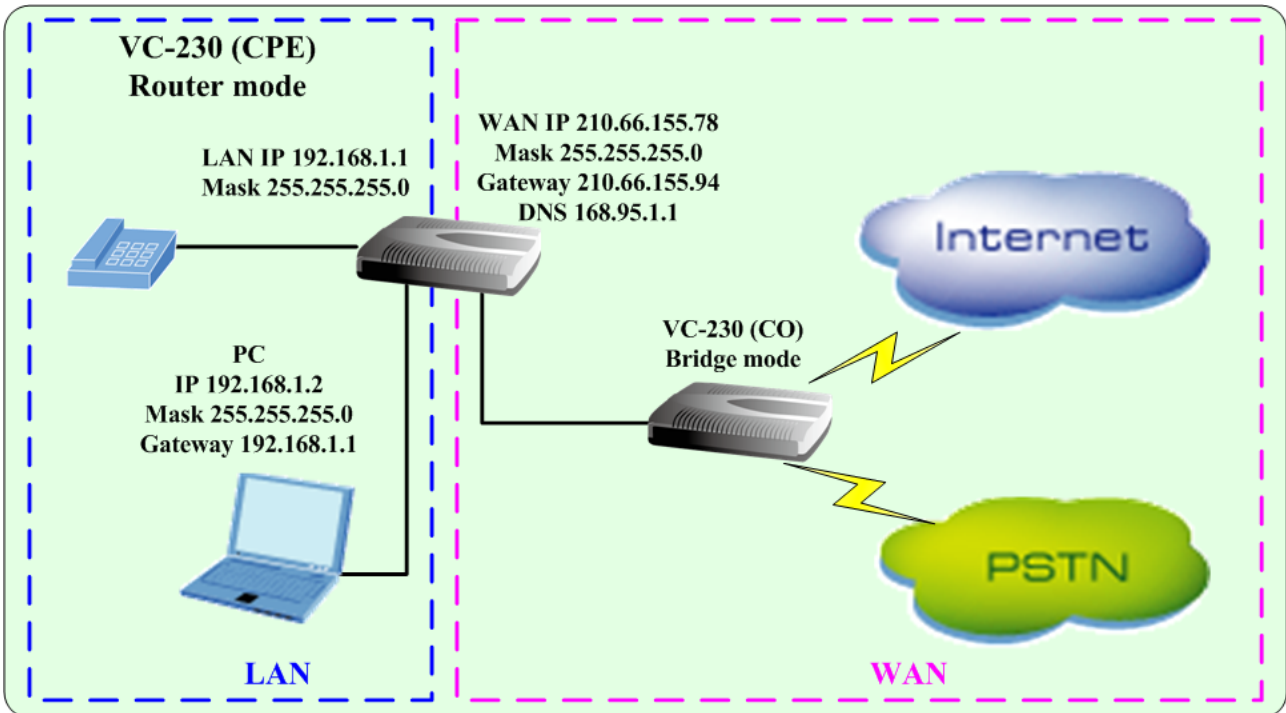
The screenshot shows the PLANET VDSL2 Router configuration interface. The left sidebar contains a navigation menu with the following items: VC-230, Operation Mode, Internet Settings, Firewall, VDSL (highlighted with a red box), VDSL Status, VDSL Configuration (highlighted with a red box), and Administration. The main content area is titled "VDSL Configuration" and includes the instruction "Set VDSL Configuration." Below this is a table of configuration parameters:

VDSL Configuration	
Mode	<input type="radio"/> CO <input checked="" type="radio"/> CPE
VDSL Profile	AnnexA_R_POTS_D-32_EU-32_17a
VDSL SNR	6 db (range 0-31)
Line Type	Interleave
Interleave Max delay	8 ms (range 2-255)
INP	3 (0.1 symbols, range 30a:1-17, others:1-18)
Upstream Rate Limit	No Limit Mbps
Downstream Rate Limit	No Limit Mbps

At the bottom of the configuration area are two buttons: "Apply" and "Cancel".

After setting, the DSL line will try to establish the connection between two VDSL2 ROUTER. you can check the DSL LED, when the LED stop flashing and steady, the VDSL2 ROUTER will establish a connection and the PC1 and PC2 can access to each other.

## 2.5.2 Router Mode for Internet connection



## Web UI Configuration

### For VDSL2 ROUTER CO side

- Step 1: Select the Bridge mode.

The screenshot shows the Planet VDSL2 Router Web UI. The left sidebar contains a navigation menu with the following items: VC-230, Operation Mode, Internet Settings, Firewall, VDSL, and Administration. The main content area is titled "Operation Mode Configuration" and contains the text: "You may configure the operation mode suitable for you environment." Below this text, there are two radio button options: "Bridge:" (selected) and "Gateway:". The "Bridge:" option is highlighted with a red box and includes the text: "All interfaces are bridged into a single bridge interface." The "Gateway:" option includes the text: "The VDSL port is treated as WAN port. The other interfaces are bridged together and are treated as LAN ports." At the bottom of the page, there are two buttons: "Apply" (highlighted with a red box) and "Reset".

- **Step 2: Setup your LAN IP, for example, we use the 192.168.1.1 / 255.255.255.0 for VDSL2 ROUTER CO side.**

The screenshot shows the 'Local Area Network (LAN) Settings' page. The left sidebar contains a navigation menu with 'Internet Settings' expanded to 'LAN'. The main content area has a title 'Local Area Network (LAN) Settings' and a sub-header 'LAN Interface Setup'. Below this is a table of configuration fields:

LAN Interface Setup	
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
LAN2	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
MAC Address	00:30:4F:30:52:10
DHCP Type	Server
DHCP Start IP	192.168.1.2
DHCP End IP	192.168.1.100
DHCP Subnet Mask	255.255.255.0
DHCP Primary DNS	192.168.1.1
DHCP Secondary DNS	168.95.1.1

- **Step 3: Modify your VDSL mode, default is CPE mode. Select the VDSL CO mode.**

The screenshot shows the 'VDSL Configuration' page. The left sidebar has 'VDSL' selected and 'VDSL Configuration' highlighted with a red box. The main content area has a title 'VDSL Configuration' and a sub-header 'Set VDSL Configuration.'. Below this is a table of configuration fields:

VDSL Configuration	
Mode	<input checked="" type="radio"/> CO <input type="radio"/> CPE
VDSL Profile	AnnexA_R_POTS_D-32_EU-32_30a
VDSL SNR	6 db (range 0-31)
Line Type	Interleave
Interleave Max delay	8 ms (range 2-255)
INP	3 (0.1 symbols, range 30a:1-17, others:1-18)
Upstream Rate Limit	No Limit Mbps
Downstream Rate Limit	No Limit Mbps

At the bottom of the page are 'Apply' and 'Cancel' buttons.

## For VDSL2 ROUTER CPE side

- Step 1: Select the Router mode and enable the NAT.

The screenshot shows the 'Operation Mode Configuration' page in the PLANET VDSL2 Router web interface. The left sidebar shows a navigation tree with 'Operation Mode' selected. The main content area has the title 'Operation Mode Configuration' and a sub-header 'You may configure the operation mode suitable for you environment.' There are two radio button options: 'Bridge:' (unselected) and 'Gateway:' (selected and circled in red). Below the 'Gateway:' option is a text description: 'The VDSL port is treated as WAN port. The other interfaces are bridged together and are treated as LAN ports.' Below this is a 'NAT Enabled:' dropdown menu set to 'Enable' (circled in red). At the bottom are 'Apply' and 'Reset' buttons.

- Step 2: Configure your WAN settings, type your WAN IP, Mask, Gateway and DNS.

The screenshot shows the 'Wide Area Network (WAN) Settings' page in the PLANET VDSL2 Router web interface. The left sidebar shows a navigation tree with 'Internet Settings' > 'WAN' selected. The main content area has the title 'Wide Area Network (WAN) Settings' and a sub-header 'You may choose different connection type suitable for your environment. Besides, you may also configure parameters according to the selected connection type.' There is a 'WAN Connection Type:' dropdown menu set to 'Static Mode (fixed IP)' (circled in red). Below this is a table with the following data:

Static Mode	
IP Address	210.66.155.78
Subnet Mask	255.255.255.0
Default Gateway	210.66.155.94
Primary DNS Server	168.95.1.1
Secondary DNS Server	168.95.192.1

Below the table is a 'MAC Address Clone' section with an 'Enabled' dropdown menu set to 'Disable'. At the bottom are 'Apply' and 'Cancel' buttons.

■ Step 3: Modify your VDSL mode, default is CPE mode.

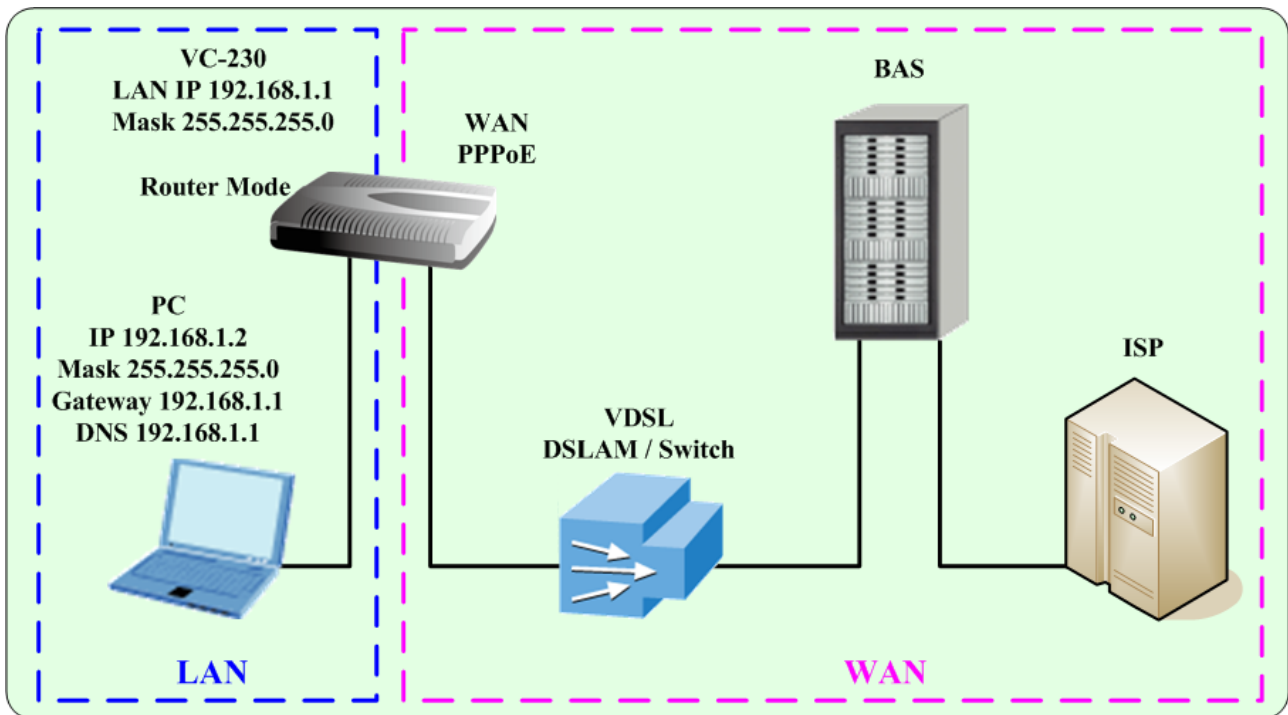
The screenshot shows the PLANET VDSL2 Router configuration interface. The left sidebar contains a navigation menu with the following items: VC-230, Operation Mode, Internet Settings, Firewall, VDSL (highlighted with a red box), VDSL Status, VDSL Configuration (highlighted with a red box), and Administration. The main content area is titled "VDSL Configuration" and includes the instruction "Set VDSL Configuration." Below this is a table of configuration parameters:

VDSL Configuration	
Mode	<input type="radio"/> CO <input checked="" type="radio"/> CPE
VDSL Profile	AnnexA_R_POTS_D-32_EU-32_17a
VDSL SNR	6 db (range 0-31)
Line Type	Interleave
Interleave Max delay	8 ms (range 2-255)
INP	3 (0.1 symbols, range 30a:1-17, others:1-18)
Upstream Rate Limit	No Limit Mbps
Downstream Rate Limit	No Limit Mbps

At the bottom of the configuration area are two buttons: "Apply" and "Cancel".

After setting, the DSL line will try to establish the connection between two VDSL2 ROUTER. You can check the DSL LED, when the LED stop flashing and steady, the VDSL2 ROUTER will establish a connection and the PC can access to Internet through VDSL connection.

## 2.5.3 Router Mode for PPPoE with IP Sharing



## Web UI Configuration

- Step 1: Select the Router mode and enable the NAT.

The screenshot shows the Web UI Configuration page for a Planet VDSL2 Router. The page title is "VDSL2 Router" and the logo is "PLANET Networking & Communication".

The left sidebar shows the navigation menu:

- VC-230
- Operation Mode
- Internet Settings
- Firewall
- VDSL
- Administration

The main content area is titled "Operation Mode Configuration" and contains the following text:

You may configure the operation mode suitable for you environment.

The configuration options are:

- Bridge: All interfaces are bridged into a single bridge interface.
- Gateway: The VDSL port is treated as WAN port. The other interfaces are bridged together and are treated as LAN ports.

The "NAT Enabled" dropdown menu is set to "Enable".

Buttons for "Apply" and "Reset" are located at the bottom of the configuration area.

- Step 2: Configure your WAN settings, select the PPPoE connection type and enter your PPPoE user name and password.

The screenshot shows the 'Wide Area Network (WAN) Settings' page on the PLANET VDSL2 Router. The 'WAN Connection Type' is set to 'PPPoE'. The 'PPPoE Mode' section includes fields for 'User Name' (t0399199), 'Password', and 'Verify Password', all of which are highlighted with a red box. Other settings include MRU (1500), Keep Alive mode, and MAC Address Clone (Disabled).

Wide Area Network (WAN) Settings	
You may choose different connection type suitable for your environment. Besides, you may also configure parameters according to the selected connection type.	
WAN Connection Type: <input type="text" value="PPPoE"/>	
PPPoE Mode	
User Name	<input type="text" value="t0399199"/>
Password	<input type="password" value="....."/>
Verify Password	<input type="password" value="....."/>
MRU(Maximum Receive Unit)	<input type="text" value="1500"/> (range 128 - 16384, default 1500)
Keep Alive	<input type="text" value="Keep Alive"/>
Operation Mode	Keep Alive Mode: Redial Period <input type="text" value="60"/> seconds On demand Mode: Idle Time <input type="text" value="5"/> minutes
MAC Address Clone	
Enabled	<input type="text" value="Disable"/>

- Step 3: When the PPPoE connection is OK, the PC will access to Internet through PPPoE connection.

The screenshot shows the 'Router Status' page on the PLANET VDSL2 Router. The 'Internet Configurations' section is highlighted with a red box, showing the connected type as PPPoE and various IP addresses and MAC addresses.

Router Status	
System Info	
Firmware Version	Beta091015
SDK Version	3.3.0.0
System Up Time	0 day, 6 hour, 29 min, 54 sec
Operation Mode	Gateway Mode
Internet Configurations	
Connected Type	PPPOE
WAN IP Address	203.73.50.173
Subnet Mask	255.255.255.255
Default Gateway	203.73.50.1
Primary Domain Name Server	139.175.55.244
Secondary Domain Name Server	139.175.252.16
MAC Address	00:30:4F:30:52:11
Local Network	
Local IP Address	192.168.100.1
Local Netmask	255.255.255.0
MAC Address	00:30:4F:30:52:10

## 3. Web Configuration Management

### Determine your connection settings

Before you configure the router, you need to know the connection information supplied by your service provider.

### Connecting the VDSL 2 Router to your network

Unlike a simple hub or switch, the setup of the VDSL Router consists of more than simply plugging everything together. Because the Router acts as a DHCP server, you will have to set some values within the Router, and also configure your networked PCs to accept the IP Addresses the Router chooses to assign them.

Generally there are several different operating modes for your applications. And you can know which mode is necessary for your system from ISP. These modes are router, bridge, and PPPoE+NAT.

### Configuring with Web Browser

It is advisable to change the administrator password to safeguard the security of your network. To configure the router, open your browser, type “**http: //192.168.1.1**” into the address bar and click “**Go**” to get to the login page.

Save this address in your Favorites for future reference.



At the User name prompt, type “**admin**”. And the Password prompt, type “**admin**”. You can change these later if you wish. Click “**OK**” to login the router and you can start to configure it now.





### 3.1 Operation Mode


The VC-230 supports two operation modes – Router and Bridge and VC-230N supports three operation modes – Router, Bridge and WISP. Currently, it comes pre-configured with routing mode.

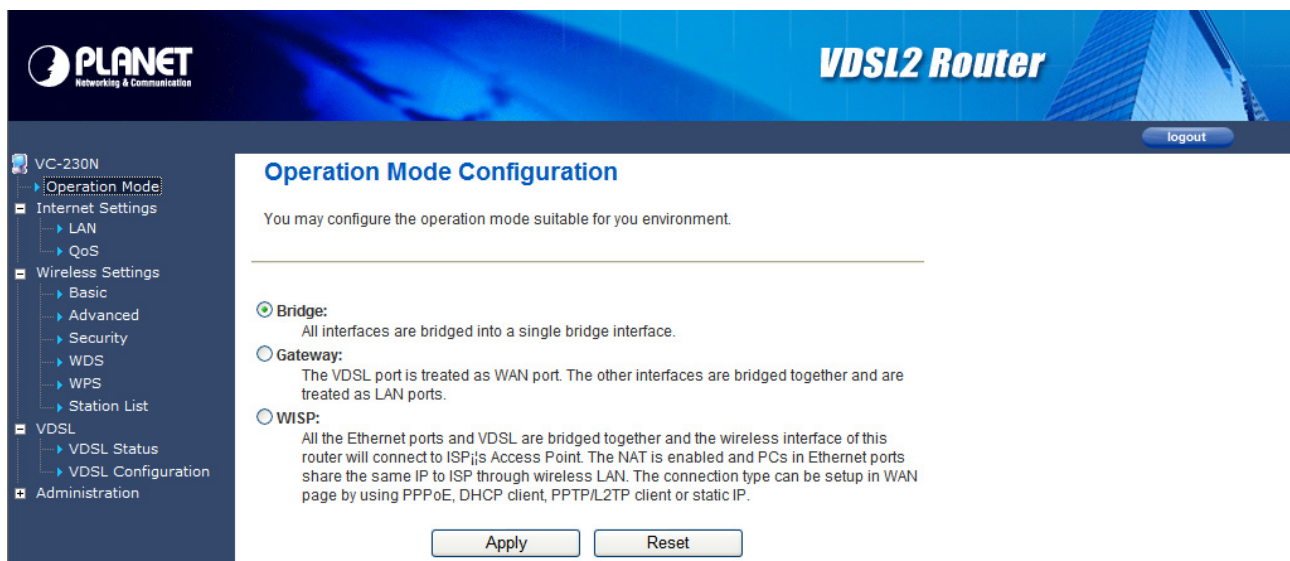
Note that, routing mode and bridging mode cannot be used simultaneously.

For **Bridge mode**, all interfaces are bridged into a single bridge interface.

For **Router mode**, the VDSL port is treated as WAN port. The other interfaces are bridged together and are treated as LAN ports.

For **WISP Mode**, all the Ethernet ports (including VDSL2) are bridged together and the wireless interface of this router will come to WAN port for connecting to an ISP's Access Point as Internet connection. The NAT is enabled and PCs in Ethernet ports share the same IP to ISP through wireless LAN. The connection type can be setup in WAN page by using PPPoE, DHCP client, PPTP/L2TP client or static IP.

	If you select <b>Bridge operation mode</b> , <b>WAN configuration</b> in Internet Settings are not available. (Firewall functions on the left page are not available, too.)
---	---



**PLANET** Networking & Communication **VDSL2 Router** [logout](#)

VC-230N

- Operation Mode
- Internet Settings
  - LAN
  - QoS
- Wireless Settings
  - Basic
  - Advanced
  - Security
  - WDS
  - WPS
  - Station List
- VDSL
  - VDSL Status
  - VDSL Configuration
- Administration

#### Operation Mode Configuration

You may configure the operation mode suitable for you environment.

**Bridge:**  
All interfaces are bridged into a single bridge interface.

**Gateway:**  
The VDSL port is treated as WAN port. The other interfaces are bridged together and are treated as LAN ports.

**WISP:**  
All the Ethernet ports and VDSL are bridged together and the wireless interface of this router will connect to ISP's Access Point. The NAT is enabled and PCs in Ethernet ports share the same IP to ISP through wireless LAN. The connection type can be setup in WAN page by using PPPoE, DHCP client, PPTP/L2TP client or static IP.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect. Click **Cancel** to close without saving.

## 3.2 Internet Settings

### 3.2.1 WAN

The WAN Settings screen allows you to specify the type of Internet connection. The WAN settings offer the following selections for the router's WAN port, STATIC (fixed IP), DHCP (Auto config), PPPoE, L2TP, and PPTP.

**PLANET** Networking & Communication **VDSL2 Router** logout

### Wide Area Network (WAN) Settings

You may choose different connection type suitable for your environment. Besides, you may also configure parameters according to the selected connection type.

WAN Connection Type:

Static Mode	
IP Address	<input type="text" value="203.73.50.173"/>
Subnet Mask	<input type="text" value="255.255.255.255"/>
Default Gateway	<input type="text" value="203.73.50.1"/>
Primary DNS Server	<input type="text" value="139.175.55.244"/>
Secondary DNS Server	<input type="text" value="139.175.252.16"/>

MAC Address Clone	
Enabled	<input type="text" value="Disable"/>

#### ➤ **STATIC (FIXED IP)**

Select **STATIC (fixed IP)** in the **WAN Connection Type** drop-down list and the following page appears.

### Wide Area Network (WAN) Settings

You may choose different connection type suitable for your environment. Besides, you may also configure parameters according to the selected connection type.

WAN Connection Type:

Static Mode	
IP Address	<input type="text"/>
Subnet Mask	<input type="text"/>
Default Gateway	<input type="text"/>
Primary DNS Server	<input type="text"/>
Secondary DNS Server	<input type="text"/>

MAC Clone	
Enabled	<input type="text" value="Disable"/>

## Static Mode

- **IP Address:** Enter the IP address of WAN port.
- **Subnet Mask:** Enter IP subnet mask of WAN port.
- **Default Gateway:** Enter the default gateway address of WAN port.
- **Primary DNS Server:** Primary DNS Server of WAN port.
- **Secondary DNS Server:** Secondary DNS Server of WAN port.

## MAC Clone

**MAC Clone** provides WAN to connect to a MAC address.

- **Enabled:** Enable or disable MAC clone.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.

Click **Cancel** to close without saving.

## ➤ **DHCP (AUTO CONFIG)**

Select **DHCP (Auto config)** in the **WAN Connection Type** drop-down list and the following page appears. If the WAN connection type is set to **DHCP**, the device automatically obtains the IP address, gateway and DNS address from the DHCP server on WAN interface.

## Wide Area Network (WAN) Settings

You may choose different connection type suitable for your environment. Besides, you may also configure parameters according to the selected connection type.

---

WAN Connection Type: DHCP (Auto Config) ▼

DHCP Mode	
Host Name (optional)	<input type="text"/>
MAC Address Clone	
Enabled	Disable ▼

## MAC Clone

**MAC Clone** provides WAN to connect to a MAC address.

- **Enabled:** Enable or disable MAC clone.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.

Click **Cancel** to close without saving.

## ➤ PPPOE

Select **PPPoE (ADSL)** in the **WAN Connection Type** drop-down list and the following page appears. If the WAN connection type is set to **PPPoE**, you can configure the following parameters to PPPoE dial up.

You may choose different connection type suitable for your environment. Besides, you may also configure parameters according to the selected connection type.

---

WAN Connection Type:

PPPoE Mode	
User Name	<input type="text" value="t0399199"/>
Password	<input type="password" value="••••••••"/>
Verify Password	<input type="password" value="••••••••"/>
MRU(Maximum Receive Unit)	<input type="text" value="1500"/> (range 128 - 16384, default 1500)
Operation Mode	<input type="text" value="Keep Alive"/>
	Keep Alive Mode: Redial Period <input type="text" value="60"/> seconds On demand Mode: Idle Time <input type="text" value="5"/> minutes
MAC Address Clone	
Enabled	<input type="text" value="Disable"/>

### PPPoE Mode

- **User Name:** User name of PPPoE account
- **Password:** Password of PPPoE account
- **Verify Password:** Enter the password of PPPoE account again.
- **Operation Mode:** It provides two types of operation modes.
  - **Keep Alive** means keeping on-line mode. You can set the redial period in the field. When the redial period expires, Router will execute dial-up again to keep online.
  - **On Demand** means executing dial-up on demand. Within the preset idle time, if Router does not detect the flow of the user continuously, Router automatically stops the PPPOE connection. Once it detects the flow (e.g., accessing a webpage), the router restarts the PPPOE dial-up.

### MAC Clone

- **Enabled:** Enable or disable.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.

Click **Cancel** to close without saving.

➤ **L2TP**

Select **L2TP** in the **WAN Connection Type** drop-down list and the following page appears. There are two address modes: **Static** and **Dynamic**.

1. If you select **Static** in the **Address Mode** field, the page shown in the following figure appears.

The screenshot shows the L2TP configuration interface. At the top, 'WAN Connection Type' is set to 'L2TP'. Below this, the 'L2TP Mode' section contains the following fields: 'Server IP' (10.10.10.123), 'User Name' (l2tp\_user), 'Password' (masked with dots), 'Address Mode' (Static), 'IP Address' (10.10.10.254), 'Subnet Mask' (255.255.255.0), and 'Default Gateway' (10.10.10.253). The 'Operation Mode' section includes a 'Keep Alive' dropdown, 'Keep Alive Mode: Redial Period' (60 seconds), and 'On demand Mode: Idle Time' (5 minutes). At the bottom, the 'MAC Clone' section has 'Enabled' set to 'Disable'. 'Apply' and 'Cancel' buttons are at the bottom.

2. If you select **Dynamic** in the **Address Mode** field, the page shown in the following figure appears.

The screenshot shows the L2TP configuration interface with 'Address Mode' set to 'Dynamic'. All other fields are identical to the previous screenshot: 'WAN Connection Type' is 'L2TP', 'Server IP' is 10.10.10.123, 'User Name' is l2tp\_user, 'Password' is masked, 'IP Address' is 10.10.10.254, 'Subnet Mask' is 255.255.255.0, 'Default Gateway' is 10.10.10.253, 'Keep Alive' is selected, 'Keep Alive Mode: Redial Period' is 60 seconds, 'On demand Mode: Idle Time' is 5 minutes, and 'MAC Clone' is 'Disable'. 'Apply' and 'Cancel' buttons are at the bottom.

## L2TP Mode

- **Server IP:** Address of L2TP server.
- **User Name:** The user name of L2TP account.
- **Password:** The password of L2TP account.
- **IP Address:** IP address of WAN port.
- **Subnet Mask:** Subnet mask of WAN port.
- **Default Gateway:** The default gate way of WAN port.
- **Operation Mode:** It provides two types of operation modes.
  - **Keep Alive** means keeping on-line mode. You can set the redial period in the field. When the redial period expires, Router will execute dial-up again to keep online.
  - **On Demand** means executing dial-up on demand. Within the preset idle time, if Router does not detect the flow of the user continuously, Router automatically stops the PPPOE connection. Once it detects the flow (e.g., accessing a webpage), the router restarts the PPPOE dial-up.

## MAC Clone

- **Enabled:** Enable or disable.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.

Click **Cancel** to close without saving.

## ➤ PPTP

Select **PPTP** in the **WAN Connection Type** drop-down list and the following page appears. There are two address modes: **Static** and **Dynamic**.

WAN Connection Type: PPTP	
<b>PPTP Mode</b>	
Server IP	10.10.10.123
User Name	pptp_user
Password	.....
Address Mode	Static
IP Address	10.10.10.254
Subnet Mask	255.255.255.0
Default Gateway	10.10.10.253
Operation Mode	Keep Alive
	Keep Alive Mode: Redial Period 60 seconds
	On demand Mode: Idle Time 5 minutes
<b>MAC Clone</b>	
Enabled	Disable
Apply Cancel	

### PPTP Mode

- **Server IP:** Address of PPTP server.
- **User Name:** The user name of PPTP account.
- **Password:** The password of PPTP account.
- **IP Address:** IP address of WAN port.
- **Subnet Mask:** Subnet mask of WAN port.
- **Default Gateway:** The default gate way of WAN port.
- **Operation Mode:** It provides two types of operation modes.
  - **Keep Alive** means keeping on-line mode. You can set the redial period in the field. When the redial period expires, Router will execute dial-up again to keep online.
  - **On Demand** means executing dial-up on demand. Within the preset idle time, if Router does not detect the flow of the user continuously, Router automatically stops the PPPOE connection. Once it detects the flow (e.g., accessing a webpage), the router restarts the PPPOE dial-up.

### MAC Clone

- **Enabled:** Enable or disable.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.

Click **Cancel** to close without saving.

### 3.2.2 LAN

This page allows you may enable or disable networking functions and configure their parameters according to your practice.

#### Local Area Network (LAN) Settings

You may enable/disable networking functions and configure their parameters as your wish.

---

##### LAN Setup

IP Address	<input type="text" value="192.168.0.1"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
LAN 2	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
LAN2 IP Address	<input type="text"/>
LAN2 Subnet Mask	<input type="text"/>
MAC Address	00:30:4F:6E:5D:38
DHCP Type	Server <input type="button" value="v"/>
Start IP Address	<input type="text" value="192.168.0.100"/>
End IP Address	<input type="text" value="192.168.0.200"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Primary DNS Server	<input type="text" value="192.168.1.1"/>
Secondary DNS Server	<input type="text" value="192.168.1.1"/>
Default Gateway	<input type="text" value="192.168.1.1"/>
Lease Time	<input type="text" value="86400"/>
Statically Assigned	MAC: <input type="text"/> IP: <input type="text"/>

- **IP Address:** Enter the IP address of LAN port.
- **Subnet mask:** Enter the subnet mask of LAN port.
- **LAN2:** The second IP switch of LAN port. You can enable or disable this function.
- **LAN2 IP Address:** The second IP address of LAN port.
- **LAN2 Subnet Mask:** The second IP Subnet Mask of LAN port.
- **MAC Address:** MAC address of LAN port (Read-only).
- **DHCP Type:** You can select **Server** or **Disable**. If you select Disable, the DHCP service of LAN port is disabled. After selecting Server, you can set the following items.
- **Start IP Address:** The first IP address that DHCP server assigns.
- **End IP Address:** The last IP address that DHCP server assigns.
- **Subnet Mask:** The subnet mask of dynamic IP.



- **Primary DNS Server:** The primary DNS server address.
- **Secondary DNS Server:** The secondary DNS Server address.
- **Default Gateway:** The default gateway that DHCP server assigns.
- **Lease Time:** Lease time of the IP address.
- **Statically Assigned:** Assign IP to the assigned MAC address. Enter the assigned MAC address and IP in the corresponding fields.
- **802.1d Spanning Tree:** Spanning Tree Protocol. You can select Enable or Disable.
- **IGMP Proxy:** You can select Enable or Disable.
- **UPNP:** Universal Plug and Play (UPNP). You can select Enable or Disable.
- **Router Advertisement:** You can select Enable or Disable.
- **DNS Proxy:** You can select Enable or Disable.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.

Click **Cancel** to close without saving.

### 3.2.3 DHCP clients

You can view the information about DHCP clients in the page.

DHCP Client List		
You could monitor DHCP clients here.		
DHCP Clients		
MAC Address	IP Address	Expires in
00:30:40:11:22:33	192.168.0.100	23:44:34

### 3.2.4 Advanced Routing

You can add or delete routing rules, enable or disable dynamic routing protocol in the page.

#### Static Routing Settings

You may add and remote custom Internet routing rules, and/or enable dynamic routing exchange protocol here.

---

##### Add a routing rule

Destination	<input type="text"/>
Range	Host <input type="button" value="v"/>
Gateway	<input type="text"/>
Interface	LAN <input type="button" value="v"/> <input type="text"/>
Comment	<input type="text"/>

---

##### Current Routing table in the system:

No.	Destination	Netmask	Gateway	Flags	Metric	Ref	Use	Interface	Comment
1	255.255.255.255	255.255.255.255	0.0.0.0	5	0	0	0	LAN (br0)	
2	192.168.0.0	255.255.255.0	0.0.0.0	1	0	0	0	LAN (br0)	

#### Add a routing rule

- **Destination:** Enter the legal destination IP address.
- **Range:** Destination IP address is a host address or the network address.
- **Gateway:** Enter the specific gateway.
- **Interface:** The interface for this route. You can select LAN, WAN and Custom.
- **Comment:** Add the description of this route.

After finishing the setting above, click **Apply** to make the new routing rule take effect. Otherwise, click **Reset** to cancel the new routing rule.

#### Current Routing table in the system

You can delete or reset the routing rules.

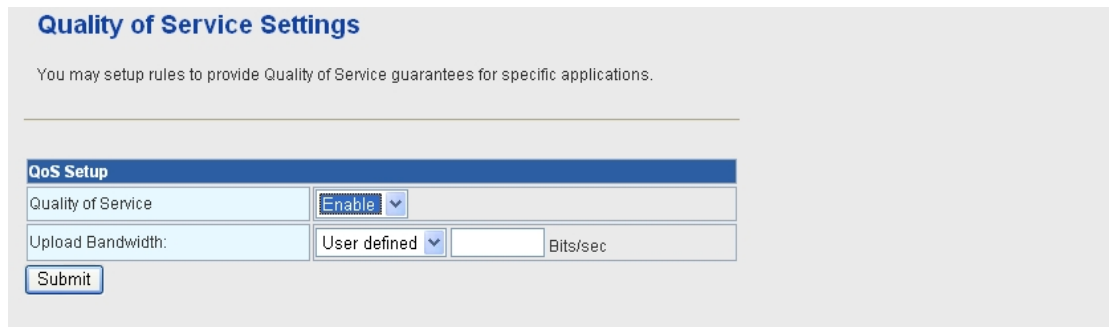
#### Dynamic Routing Settings

You can enable or disable the **RIP**.

After finishing the setting above, click **Apply** to make the new routing rule take effect. Otherwise, click **Reset** to cancel the new routing rule.

### 3.2.5 QoS

You may set up rules to provide Quality of Service (QoS) guarantee for some specific applications. In the page, you can enable or disable Quality of Service. After enabling QoS, you can set upload bandwidth and download bandwidth.



The image shows a web interface titled "Quality of Service Settings". Below the title is a descriptive sentence: "You may setup rules to provide Quality of Service guarantees for specific applications." Below this is a form section titled "QoS Setup". The form contains two rows of controls. The first row is for "Quality of Service", with a dropdown menu currently set to "Enable". The second row is for "Upload Bandwidth:", with a dropdown menu set to "User defined" and an adjacent empty text input field followed by the label "Bits/sec". At the bottom left of the form is a "Submit" button.

- **Upload Bandwidth:** You can select the proper bandwidth in the drop-down list. The value is from **64K** to **60M**. You can also set the bandwidth by selecting **User defined** and enter the proper bandwidth in the field.
- **Download Bandwidth:** You can select the proper bandwidth in the drop-down list. The value is from **64K** to **60M**. You can also set the bandwidth by select **User defined** and enter the proper bandwidth in the field.

After finishing the setting above, click **Submit** to save the new configuration.

## 3.3 Wireless Setting (For VC-230N only)

### 3.3.1 Basic

You can configure the minimum number of wireless settings for communication, such as network name (SSID) and channel.

Basic Wireless Settings	
You could configure the minimum number of Wireless settings for communication, such as Network Name (SSID) and Channel. The Access Point can be set simply with only the minimum setting items.	
<b>Wireless Network</b>	
Radio On/Off	<input type="button" value="RADIO OFF"/>
Network Mode	11b/g/n mixed mode ▾
Network Name(SSID)	default
Multiple SSID1	
Multiple SSID2	
Multiple SSID3	
Multiple SSID4	
Multiple SSID5	
Multiple SSID6	
Multiple SSID7	
Broadcast Network Name (SSID)	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
AP Isolation	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
MBSSID AP Isolation	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
BSSID	00:30:4F:6E:5D:38

#### Wireless Network

- **Radio On/Off:** Enable or disable the wireless LAN.
- **Network Mode:** There are 6 modes: 11b only, 11g only, 11b/g mixed mode, and 11b/g/n mixed mode.
- **Network Name (SSID):** The service set identification (SSID) is a unique name to identify the router in the wireless LAN. Wireless stations associating to the router must have the same SSID. Enter a descriptive name. Its length is up to 32 characters.
- **Multiple SSID 1/2/3/4/5/6/7:** There are 7 multiple SSIDs. Enter their descriptive names that you want to use.
- **Broadcast Network Name (SSID):** Select **Enable** to allow the SSID broadcast on the network, so that the STA can find it. Otherwise, the STA can not find it.

- **AP Isolation:** Enable or disable AP Isolation. When many clients connect to the same access point, they can access each other. If you want to disable the access between clients which connect the same access point, you can enable this function.
- **MBSSID AP Isolation:** Enable or disable MBSSID AP Isolation.
- **BSSID:** Basic Service Set Identifier. This is the assigned MAC address of the station in the access point. This unique identifier is in Hex format and can only be edited when Multi BSSID is enabled in the previous screen.
- **Frequency (Channel):** A channel is the radio frequency used by wireless device. Channels available depend on your geographical area. You may have a choice of channels (for your region) and you should use a different channel from an adjacent AP to reduce the interference. The Interference and degrading performance occurs when radio signals from different APs overlap.

## HT Physical Mode

HT Physical Mode	
Operating Mode	<input checked="" type="radio"/> Mixed Mode <input type="radio"/> Green Field
Channel BandWidth	<input type="radio"/> 20 <input checked="" type="radio"/> 20/40
Guard Interval	<input type="radio"/> Long <input checked="" type="radio"/> Auto
MCS	Auto ▼
Reverse Direction Grant(RDG)	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Extension Channel	2457MHz (Channel 10) ▼
Aggregation MSDU(A-MSDU)	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Auto Block ACK	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Decline BA Request	<input checked="" type="radio"/> Disable <input type="radio"/> Enable

## HT Physical Mode

- **Operation Mode:** Select Mixed Mode or Green Field.
- **Channel Bandwidth:** Select 20 or 20/40.
- **Guard Interval:** Select Long or Auto.
- **MCS:** Select the proper value between 0 and 15 or 32. Auto is the default value.
- **Reverse Direction Grant (RDG):** Select Disable or Enable.
- **Extension Channel:** Select the proper extension channel in the drop-down list.
- **Aggregation MSDU (A-MSDU):** Select Disable or Enable.
- **Auto Block ACK:** Select Disable or Enable.
- **Decline BA Request:** Select Disable or Enable.

### 3.3.2 Advanced

This page makes more detailed settings for the AP. **Advanced Wireless Settings** page includes items that are not available in the **Basic Wireless Settings** page, such as basic data rates, beacon interval, and data beacon rate.

Advanced Wireless Settings	
Use the Advanced Setup page to make detailed settings for the Wireless. Advanced Setup includes items that are not available from the Basic Setup page, such as Beacon Interval, Control Tx Rates and Basic Data Rates.	
<b>Advanced Wireless</b>	
BG Protection Mode	Auto <input type="button" value="v"/>
Beacon Interval	100 <input type="text"/> ms (range 20 - 999, default 100)
Data Beacon Rate (DTIM)	1 <input type="text"/> ms (range 1 - 255, default 1)
Fragment Threshold	2346 <input type="text"/> (range 256 - 2346, default 2346)
RTS Threshold	2347 <input type="text"/> (range 1 - 2347, default 2347)
TX Power	50 <input type="text"/> (range 1 - 100, default 100)
Short Preamble	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Short Slot	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Tx Burst	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Pkt_Aggregate	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Country Code	None <input type="button" value="v"/>

#### Advanced Wireless

- **BG Protection Mode:** It provides 3 options, including Auto, On, and Off. The default BG protection mode is **Auto**.
- **Beacon Interval:** The interval time range is between 20ms and 999ms for each beacon transmission. The default value is 100ms.
- **Date Beacon Rate (DTM):** The DTM range is between 1 ms and 255 ms. The default value is 1ms.
- **Fragment Threshold:** This is the maximum data fragment size (between 256 bytes and 2346 bytes) that can be sent in the wireless network before the router fragments the packet into smaller data frames. The default value is 2346.
- **RTS Threshold:** Request to send (RTS) is designed to prevent collisions due to hidden node. A RTS defines the biggest size data frame you can send before a RTS handshake invoked. The RTS threshold value is between 1 and 2347. The default value is 2347.  
If the RTS threshold value is greater than the fragment threshold value, the RTS handshake does not occur. Because the data frames are fragmented before they reach the RTS size.
- **Tx Power:** The Tx Power range is between 1 and 100. The default value is 100.
- **Short Preamble:** Select Disable or Enable.

- **Short Slot:** Select Disable or Enable.
- **Tx Burst:** Select Disable or Enable.
- **Pkt\_Aggregate:** Select Disable or Enable.
- **Country Code:** Select the region which area you are. It provides six regions in the drop-down list.

Wi-Fi Multimedia	
WMM Capable	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
APSD Capable	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
DLS Capable	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
WMM Parameters	<input type="button" value="WMM Configuration"/>

### Wi-Fi Multimedia

- **WMM Capable:** Enable or disable WMM.
- **APSD Capable:** Enable or disable APSD.
- **WMM Parameter:** Click WMM Configuration button to pop up WMM Parameters of Access Point page. You can configure WMM parameters in the page.

Multicast-to-Unicast Converter	
Multicast-to-Unicast	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

### Multicast-to-Unicast Converter

**Multicast-to-Unicast Converter:** Enable or disable Multicast-to-Unicast Converter.

After finishing the settings above, click **Apply** to save the settings and make the new configuration take effect. Click **Cancel** to close without saving.

### 3.3.3 Security

Choose **Wireless Settings>Security** and the following page appears. It allows you to modify the settings to prevent the unauthorized accesses.

Wireless Security/Encryption Settings	
Setup the wireless security and encryption to prevent from unauthorized access and monitoring.	
<b>Select SSID</b>	
SSID choice	default ▼
<b>"default"</b>	
Security Mode	Disable ▼
<b>Access Policy</b>	
Policy	Disable ▼
Add a station Mac:	<input type="text"/>
Apply Cancel	

#### Select SSID

**SSID choice:** Select SSID in the drop-down list.

#### Security

**Security Mode:** There are 11 options, including **Disable, OPEN, SHARED, WEPAUTO, WPA, WPA-PSK, WPA2, WPA2-PSK, WPAPSKWPA2PSK, WPA1WPA2,** and **802.1X.**

#### [EXAMPLE]

Take 802.1x for example. Select 802.1x in the **Security Mode** down-list. The page shown in the following page appears.

"default"	
Security Mode	802.1X ▼
<b>802.1x WEP</b>	
WEP	<input type="radio"/> Disable <input type="radio"/> Enable
<b>Radius Server</b>	
IP Address	<input type="text"/>
Port	1812
Shared Secret	<input type="text"/>
Session Timeout	0
Idle Timeout	<input type="text"/>



- **WEP:** Disable or enable WEP.

### Radius Server

- **IP Address:** Enter the IP address of Radius Server.
- **Port:** The default port of the RADIUS server for authentication is 1812. You need not change this value unless your network administrator instructs you to do so with additional information.
- **Shared Secret:** Enter a password as the key to be shared between the external authentication server and the access point. The key is not send over the network. This key must be the same on the external authentication server and your router.
- **Session Timeout:** Set the time interval for session. Enter the proper value in the field.
- **Idle Timeout:** Set the idle time interval. Enter the proper value in the field.

Access Policy	
Policy	Disable ▾
Add a station Mac:	<input type="text"/>

### Access Policy

- **Policy:** There are three options, including Disable, Allow, and Reject. You can choose Disable, Allow or Reject. Select Allow, only the clients whose MAC address is listed can access the router. Select Reject, the clients whose MAC address is listed are denied to access the router.
- **Add a station MAC:** If you want to add a station MAC, enter the MAC address of the wireless station that are allowed or denied access to your router in this address field.

After finishing the settings above, click **Apply** to save the settings and make the new configuration take effect. Click **Cancel** to close without saving.

### 3.3.4 WDS

#### Wireless Distribution System (WDS)

**WDS Mode:** There are four options, including **Disable**, **Lazy Mode**, **Bridge Mode**, and **Repeater Mode**.

➤ **Disable**

Select Disable to disable the WDS mode.

➤ **Lazy Mode**

Wireless Distribution System(WDS)	
WDS Mode	Lazy Mode ▼
Phy Mode	CCK ▼
EncrypType	NONE ▼

- **WDS Mode:** Select Lazy Mode. The VC-230N WDS Lazy mode is allowed the other VC-230N WDS bridge / repeater mode link automatically.
- **Phy Mode:** It provides 4 options, including **CCK**, **OFDM**, **HTMIX**, and **GREENFIELD**.
- **Encryp Type:** It provides 4 options, including **None**, **WEP**, **TKIP**, and **AES**.

➤ **Bridge Mode/ Repeater Mode**

Wireless Distribution System(WDS)	
WDS Mode	Bridge Mode ▼
Phy Mode	CCK ▼
EncrypType	NONE ▼
AP MAC Address	<input type="text"/>
AP MAC Address	<input type="text"/>
AP MAC Address	<input type="text"/>
AP MAC Address	<input type="text"/>

- **WDS Mode:** Select **Bridge Mode** or **Repeater Mode**.
- **Phy Mode:** It provides 4 options, including **CCK**, **OFDM**, **HTMIX**, and **GREENFIELD**.
- **Encryp Type:** It provides 4 options, including **None**, **WEP**, **TKIP**, and **AES**.
- **AP MAC Address:** It provides 4 AP MAC Address. Enter the MAC address of the other APs.

**WDS (Wireless Distribution System)** allows access points to communicate with one another wirelessly in a standardized way. It can also simplify the network infrastructure by reducing the amount of cabling required. Basically the access points will act as a client and an access point at the same time.

WDS is incompatible with WPA. Both features cannot be used at the same time. A WDS link is bi-directional, so the AP must know the MAC address of the other AP, and the other AP must have a WDS link back to the AP.

Dynamically assigned and rotated encryption key are not supported in a WDS connection. This means that WPA and other dynamic key assignment technologies may not be used. Only Static WEP keys may be used in a WDS connection, including any STAs that are associated with a WDS repeating AP.

Enter the MAC address of the other APs that you want to link to and click enable.

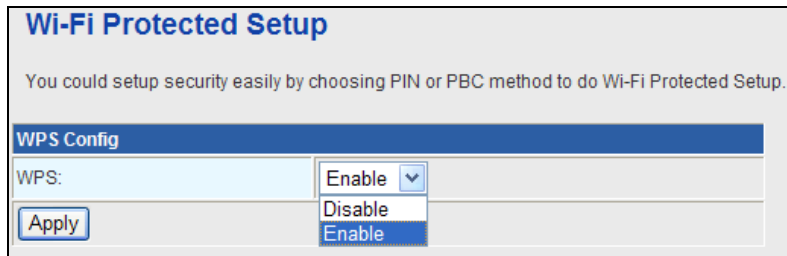
Supports up to 4 point to multipoint WDS links, check Enable WDS and then enable on the MAC addresses.

**Example of a WDS topology:**

**AP1 <-- WDS --> Master AP (our AP) <-- WDS --> AP3<-- WDS --> AP4**

### 3.3.5 WPS

You can enable or disable the WPS function in this page.



**Wi-Fi Protected Setup**

You could setup security easily by choosing PIN or PBC method to do Wi-Fi Protected Setup.

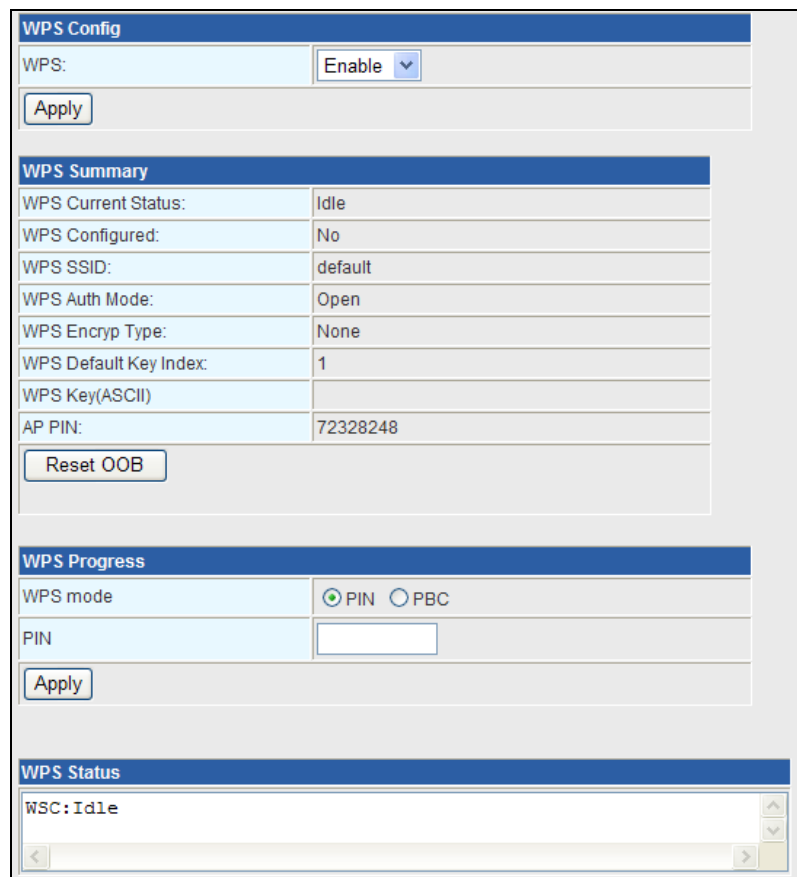
**WPS Config**

WPS:  Enable ▾

Disable

Enable

Select **Enable** in the WPS drop-down list. Click **Apply** and the following page appear.



**WPS Config**

WPS:  Enable ▾

**WPS Summary**

WPS Current Status:	Idle
WPS Configured:	No
WPS SSID:	default
WPS Auth Mode:	Open
WPS Encryp Type:	None
WPS Default Key Index:	1
WPS Key(ASCII)	
AP PIN:	72328248

**WPS Progress**

WPS mode  PIN  PBC

PIN

**WPS Status**

WSC: Idle

#### WPS Summary

It displays the WPS information, such as WPS Current Status, WPS Configured, and WPS SSID.

Reset OOB: Reset to out of box (OoB) configuration

#### WPS Progress

- **WPS mode:** There are two way for you to enable WPS function: **PIN**, **PBC**. You can use a push button configuration (PBC) on the Wi-Fi router. If there is no button, enter a 4- or 8-digit PIN code. Each STA supporting WPS comes with a hard-coded PIN code.
- **PIN:** If you select PIN mode, you need enter the PIN number in the field.

#### WPS Status

It displays the information about WPS status.

### 3.3.6 Station List

Through this page, you can easily identify the connected wireless stations. It automatically observes the ID of connected wireless station (if specified), MAC address, SSID, and current status.

**Station List**

You could monitor stations which associated to this AP here.

Wireless Network							
MAC Address	Aid	PSM	MimoPS	MCS	BW	SGI	STBC
00-30-40-56-12-3f	1	1	1	7	20M	1	0

## 3.4 Firewall

The VDSL Router provides the fully firewall functions, such as IP/Port/MAC Filtering, Port Forwarding, DMZ, SPI Firewall and Content Filtering. It serves as an Internet firewall to protect your network from being accessed by outside users.

### 3.4.1 MAC/IP/Port Filtering

Use the MAC/IP/Port filters to deny / allow particular LAN IP addresses from accessing the Internet. You can deny / allow specific port numbers or all ports for a specific IP address.

You may set up firewall rules to protect your network from malicious activity on the Internet. It is also convenient for you to delete these settings.

#### MAC/IP/Port Filtering Settings

You may setup firewall rules to protect your network from virus, worm and malicious activity on the Internet.

---

##### Basic Settings

MAC/IP/Port Filtering

Default Policy -- The packet that don't match with any rules would be:

---

##### MAC/IP/Port Filter Settings

MAC address	<input type="text"/>
Dest IP Address	<input type="text"/>
Source IP Address	<input type="text"/>
Protocol	<input type="text" value="None"/>
Dest Port Range	<input type="text"/> - <input type="text"/>
Source Port Range	<input type="text"/> - <input type="text"/>
Action	<input type="text" value="Drop"/>
Comment	<input type="text"/>

(The maximum rule count is 32.)

---

##### Current MAC/IP/Port filtering rules in system:

No.	MAC address	Dest IP Address	Source IP Address	Protocol	Dest Port Range	Source Port Range	Action	Comment	Pkt Cnt
Others would be accepted									-

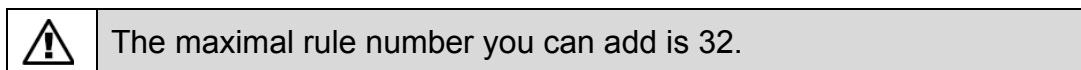
## Basic Settings

- **MAC/IP/Port Filtering:** Enable or disable the MAC/IP/Port filtering function.
- **Default Policy:** The Packet that does not match any rules would be dropped or accepted.

## MAC/IP/Port Filter Settings

- **MAC Address:** Enter the MAC address that matches the source address of the packet (optional).
- **Dest IP Address:** Enter the IP address that matches the destination address of the packet (optional).
- **Source IP Address:** Enter the IP address that matches the source address of the packet (optional).
- **Protocol:** There are 4 options, including none, TCP, UDP and ICMP.
- **Dest Port Range:** After setting a valid protocol, you may enter the UPD or TCP destination port range.
- **Source Port Range:** After setting a valid protocol, you may enter the UPD or TCP source port range.
- **Action:** Select **Drop** or **Accept** in the drop down list.
- **Comment:** Add description for this rule.

Click **Apply** to make the configuration take effect. Click **Reset** to cancel the new configuration.



Current MAC/IP/Port filtering rules in system:									
No.	MAC address	Dest IP Address	Source IP Address	Protocol	Dest Port Range	Source Port Range	Action	Comment	Pkt Cnt
Others would be accepted									-
<input type="button" value="Delete Selected"/>					<input type="button" value="Reset"/>				

## Current MAC/IP/Port filtering rules in system

If you want to delete some rules in the table above, select the rules, and then click **Delete Selected**. Otherwise, click **Reset**.

### 3.4.2 Port Forwarding (Virtual Server)

The Virtual Server is the server or server(s) behind NAT (on the LAN), for example, Web server or FTP server, that you can make visible to the outside world even though NAT makes your whole inside network appear as a single machine to the outside world.

This page allows you to set virtual server to provide services on the Internet.

#### Virtual Server Settings


You may setup Virtual Servers to provide services on Internet. The VDSL Roter's default remote management is Port 80, if you want to use this port for your Virtual server, please change the remote management port to another port (Ex. Port 8080). you can change it on "Firewall --> [System Security](#)" setting menu.

Virtual Server Settings	
Virtual Server Settings	Disable ▾
Protocol	TCP&UDP ▾
WAN Port Range	<input type="text"/> - <input type="text"/>
Server IP Address	<input type="text"/>
Server Host Port	<input type="text"/>
Comment	<input type="text"/>

(The maximum rule count is 32.)

#### Virtual Server Settings

- **Virtual Server Settings:** Enable or disable this function. After selecting **Enable**, you can set the following parameters.
- **Protocol:** There are 3 options, including none, TCP& UDP, TCP, and UDP.
- **WAN Port Range:** You can setup your port range for your WAN side.
- **Server IP Address:** Enter the virtual server IP address in internal network.
- **Server Host Port:** Set the port range of your virtual server.
- **Comment:** Add description for this rule.

 The maximal rule number you can add is 32.

Click **Apply** to make the configuration take effect. Click **Reset** to cancel the new configuration.



### 3.4.3 DMZ

**DMZ (Demilitarized Zone)** allows a single computer on your LAN to expose ALL of its ports to the Internet. Enter the IP address of that computer as a DMZ (Demilitarized Zone) host with unrestricted Internet access. When doing this, the DMZ host is no longer behind the firewall.

This page allows you to set a De-militarized Zone (DMZ) to separate internal network and Internet.

DMZ Settings	
You may setup a De-militarized Zone(DMZ) to separate internal network and Internet.	
DMZ Settings	Disable ▾
DMZ IP Address	<input type="text"/>
<input type="button" value="Apply"/> <input type="button" value="Reset"/>	

- **DMZ Settings:** Enable or disable this function. After selecting Enable, you can set the DMZ IP address.
- **DMZ IP Address:** Enter the DMZ host IP address.

Click **Apply** to make the configuration take effect. Click **Reset** to cancel the new configuration.

### 3.4.4 System Security Settings

Choose **Firewall > System Security** and the following page appears. This page allows you to configure the system firewall to protect Router from attacking.

#### System Firewall Settings

You may configure the system firewall to protect itself from attacking.

Remote management	
Remote management (via WAN)	Enable ▾
Remote Web Management Port	8080

Ping from WAN Filter	
Ping from WAN Filter	Disable ▾

Stateful Packet Inspection (SPI) Firewall	
SPI Firewall	Disable ▾

#### Remote Management

**Remote management (via WAN):** Deny or allow remote management through web.

**Remote management Port:** The default remote management port is 80, you can change the remote management port for your needs. Ex. 8080.

#### Ping from WAN Filter

**Ping from WAN Filter:** You may select enable or disable to determine whether to filter the ping package which comes from the external network.

#### Stateful Packet Inspection (SPI)

**SPI Firewall:** You may disable or enable the SPI firewall.

Click **Apply** to make the configuration take effect. Click **Reset** to cancel the new configuration.

### 3.4.5 Content Filtering

This page is used to configure the Blocked FQDN (Such as tw.yahoo.com) and filtered keyword. Here you can add / delete FQDN and filtered keyword.

Choose **Firewall > Content Filtering** and the following page appears. You can set content filter to restrict the improper content access.

The screenshot shows the 'Content Filter Settings' page. At the top, there is a title 'Content Filter Settings' and a subtitle 'You can setup Content Filter to restrict the improper content access.' Below this is a section titled 'Webs Content Filter' with a 'Filters:' label and three checkboxes: 'Proxy', 'Java', and 'ActiveX'. There are 'Apply' and 'Reset' buttons below the checkboxes. The next section is 'Webs URL Filter Settings', which contains a table for 'Current Webs URL Filters'. The table has two columns: 'No' and 'URL'. Below the table are 'Delete' and 'Reset' buttons. The final section is 'Add a URL filter:', which has a 'URL:' label and an input field, with 'Add' and 'Reset' buttons below it.

**Webs Content Filters:** If you want to block some applications as Proxy, Java and ActiveX of web pages please select the check box and click “Apply”.

**Current Webs URL Filters:** If you want to delete some filters in the table above, select the rules, and then click **Delete**. Otherwise, click **Reset**.

#### **Add a URL filter**

**URL:** Enter the FQDN and click “Add” to apply this URL filter rule.

Click **Add** to add a URL filter. Otherwise, click **Reset** to cancel the URL filter.


## 3.5 VDSL

VDSL2 (Very High-Bit-Rate Digital Subscriber Line 2), G.993.2 is the newest and most advanced standard of xDSL broadband wire line communications. Designed to support the wide deployment of Triple Play services such as voice, data, high definition television (HDTV) and interactive gaming, VDSL2 enable operators and carrier to gradually, flexibly, and cost efficiently upgrade exiting xDSL-infrastructure.

The PLANET VDSL Router can provide very high performance access to Internet, both downstream and upstream up to 100Mbps. The VDSL Router complies with ITU-T G993.2 standard, and supports two selectable operating modes of VDSL2, CO and CPE mode. The CO or CPE mode can be adjusted by WEB UI and users can connect two VC-230 / VC-230N for Point-to-Point Application, data transmission between two networks over existing copper telephone lines.

### 3.5.1 VDSL Status

Users can check the VDSL Line status in this page, it includes Line status, Date Rate, SNR, Delay and Impulse Noise Protection.



The screenshot shows the PLANET VDSL Router web interface. The main content area is titled "VDSL Status" and displays the following information:

VDSL Status.

VDSL				
Link Status	Showtime			
Firmware Version	010100			
Mode	CPE			
Basic Status		Upstream	Downstream	Unit
Line Rate	9496	54536		Kb/s
Actual Data Rate	7628	48124		Kb/s
SNR	64	69		0.1dB
Advance Status		Upstream	Downstream	Unit
Actual delay	8	8		ms
Actual INP	20	20		0.1 symbols
15M CV	0	0		counter
1Day CV	0	0		counter
15M FEC	703	1146		counter
1Day FEC	469830	13205047		counter
Previous Data Rate	6936	48602		Kbps

### 3.5.2 VDSL Configuration

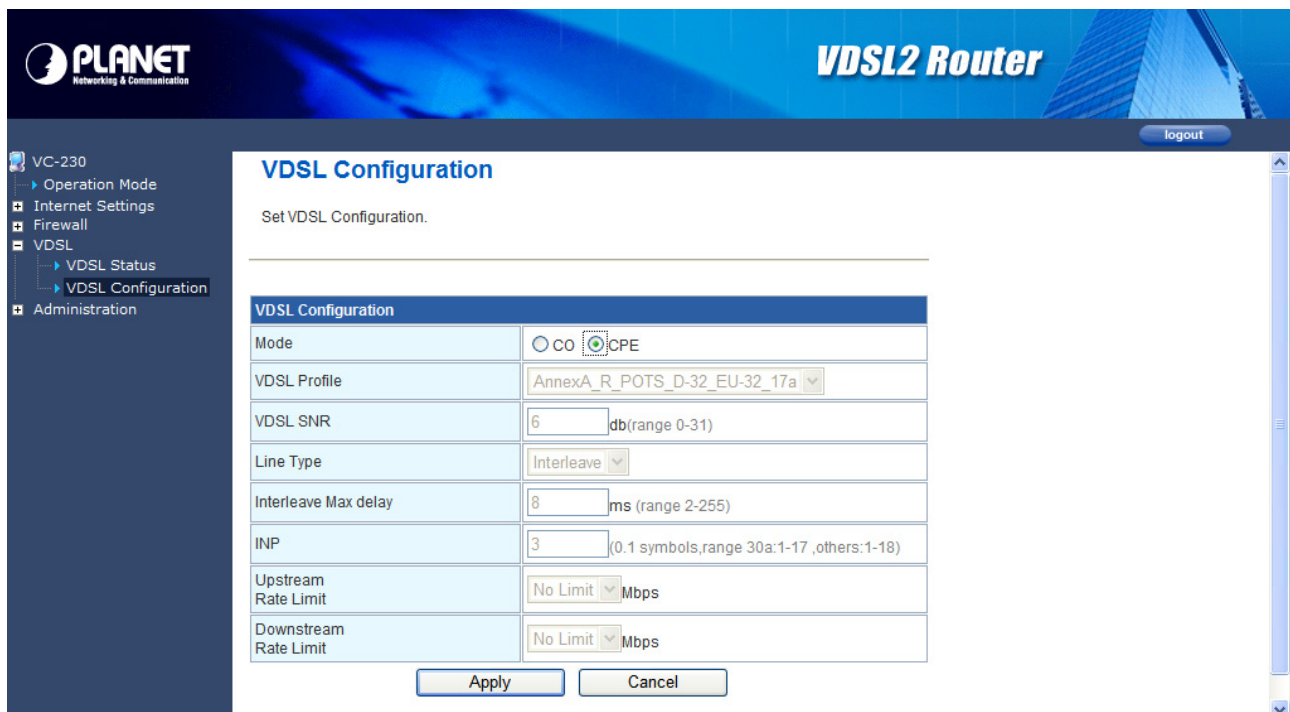
The VDSL Router provides two VDSL operation modes for applications. Users can select the CO and CPE mode manually.

For CPE mode, the router works as a VDSL client device, the VDSL connection is based on the CO side; users don't need to configure any VDSL settings on this mode.

For CO mode, the router works as a VDSL CO device such as VDSL DSLAM or Switch, you can configure the VDSL basic parameters for your VDSL connection.

#### CPE Mode

The VDSL Router default is CPE mode, in this mode, all VDSL parameters will be blocked and users don't need to configure it. Just connect to CO device for VDSL connection.



## CO Mode

If you want to configure the VDSL Router as a CO device for Peer-to-Peer connection, please select CO mode and you can select proper settings for your VDSL connection.

### Default CO parameters:

- VDSL Profile: AnnexA\_R\_POTS\_D-32\_EU-32\_30a
- VDSL SNR: 6 dB
- Line Type: Interleave
- Interleave Max. Delay: 8 ms
- INP : 3
- Upstream / Downstream Rate Limit : No Limit

The screenshot displays the VDSL2 Router configuration page. The left sidebar shows a navigation menu with options: VC-230, Operation Mode, Internet Settings, Firewall, VDSL (selected), VDSL Status, VDSL Configuration (selected), and Administration. The main content area is titled 'VDSL Configuration' and includes the instruction 'Set VDSL Configuration.' Below this is a table of configuration parameters:

VDSL Configuration	
Mode	<input checked="" type="radio"/> CO <input type="radio"/> CPE
VDSL Profile	AnnexA_R_POTS_D-32_EU-32_17a
VDSL SNR	6 db (range 0-31)
Line Type	Interleave
Interleave Max delay	8 ms (range 2-255)
INP	3 (0.1 symbols, range 30a:1-17, others:1-18)
Upstream Rate Limit	No Limit Mbps
Downstream Rate Limit	No Limit Mbps

At the bottom of the configuration table are two buttons: 'Apply' and 'Cancel'.

### VDSL Profile

The VDSL Router provides most common VDSL2 profiles for user; it supports the 30a, 17a, 12a, 12b, 8a, 8b, 8c and 8d. You can select the proper profile for your real environment.

Different profiles provide different connection status of data rate and distance; please refer to **Appendix A** for more information.

The VDSL Router supports below profiles.

1. AnnexA\_R\_POTS\_D-64\_EU-64\_30a
2. AnnexA\_R\_POTS\_D-32\_EU-32\_30a
3. AnnexA\_R\_POTS\_D-64\_EU-64\_17a
4. AnnexA\_R\_POTS\_D-32\_EU-32\_17a
5. AnnexA\_R\_POTS\_D-32\_EU-32\_12b
6. AnnexA\_R\_POTS\_D-32\_EU-32\_12a
7. AnnexA\_R\_POTS\_D-32\_EU-32\_8a
8. AnnexA\_R\_POTS\_D-32\_EU-32\_8b

9. AnnexA\_R\_POTS\_D-32\_EU-32\_8c
10. AnnexA\_R\_POTS\_D-32\_EU-32\_8d
11. AnnexB\_997\_997E17-M2x-A
12. AnnexB\_997\_997E30-M2x-NUS0
13. AnnexB\_998\_998E17-M2x-NUS0
14. AnnexB\_998\_998E30-M2x-NUS0
15. AnnexC\_POTS\_25-138\_b
16. AnnexC\_POTS\_25-276\_b
17. AnnexC\_TCM-ISDN

### **VDSL SNR**

In analog and digital communications, Signal-to-Noise Ratio, often written SNR, is a measure of signal strength relative to background noise. The ratio is usually measured in decibels (dB).

In digital communications, the SNR will probably cause a reduction in data speed because of frequent errors that require the source (transmitting) computer or terminal to resend some packets of data. SNR measures the quality of a transmission channel over a network channel. The greater the ratio, the easier it is to identify and subsequently isolate and eliminate the source of noise.

Generally speaking, the higher SNR value gets better line quality, but lower performance.

You can set your SNR in this field, default is 6.

### **Line Type**

You can select the VDSL line type, there are three types for selection – Interleave, fast and No Limit. Default is Interleave type for VDSL CO mode.

- **Fast mode:** guarantees a minimum end to end latency less than 1 ms.
- **Interleaved mode:** provides impulse noises protection for any impulse noise with a duration less than 250 us. Interleaved mode has a maximum end to end latency of 10m sec.

### **Rate Limit**

You can limit your Max. Data Rate for Upstream and Downstream, select the data rate which you want for Upstream and Downstream.

- **Upstream Rate Limit:** The value of outbound traffic limitation in Mbps, from the VDSL2 CO to the CPE. Default is **No Limit**. The range between 1Mbps to 100Mbps.
- **Downstream Rate Limit:** The value of inbound traffic limitation in Mbps, from the VDSL2 CPE to the CO. Default is **No Limit**. The range between 1Mbps to 100Mbps.

## 3.6 Administration

You can configure admin management in this part. It includes Management, Update Firmware, Setting management, Reboot, Status, Statistics and System Log.

### 3.6.1 Management

Choose **Administration > Management**, and the following page appears. You may configure administrator account and password, NTP settings, and dynamic DNS settings in the page.

The screenshot shows the 'System Management' configuration page. It has a title 'System Management' and a subtitle 'You may configure administrator account and password, NTP settings, and Dynamic DNS settings here.' Below this are three sections: 'Administrator Settings', 'NTP Settings', and 'DDNS Settings'. Each section has input fields and 'Apply'/'Cancel' buttons.

Administrator Settings	
Account	<input type="text" value="admin"/>
Password	<input type="password" value="....."/>
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

NTP Settings	
Current Time	<input type="text" value="Sat Jan 1 01:43:07 UTC 2000"/> <input type="button" value="Sync with host"/>
Time Zone:	<input type="text" value="(GMT-11:00) Midway Island, Samoa"/>
NTP Server	<input type="text"/> <small>ex: time.nist.gov ntp0.broad.mit.edu time.stdtime.gov.tw</small>
NTP synchronization(hours)	<input type="text"/>
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

DDNS Settings	
Dynamic DNS Provider	<input type="text" value="None"/>
Account	<input type="text"/>
Password	<input type="text"/>
DDNS	<input type="text"/>
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

#### Administrator Settings

- **Account:** Enter the username of the administrator in the field.
- **Password:** Enter the password of the administrator in the field.

#### NTP Settings

- **Current Time:** Display the current date and time. Click **Sync with host**, the current time is synchronized by your PC which is connected to Router.



- **Time Zone:** Select the proper time zone in the drop-down list.
- **NTP Server:** Enter the IP address or domain name of NTP server.
- **NTP Synchronization (hours):** Enter the time interval for synchronization.


### DDNS Settings

- **Dynamic DNS Provider:** Select the proper dynamic DNS provider in the drop-down list. After selecting a dynamic DNS provider, you are allowed to set the following parameters.
- **Account:** Enter the username of DDNS provider in the field.
- **Password:** Enter the password of DDNS provider in the field.
- **DDNS:** Enter the domain name of your device.

Click **Apply** to make the configuration take effect. Click **Cancel** to cancel the new configuration.

### 3.6.2 Upload Firmware

Choose **Administration > Upload Firmware** and the following page appears. In this page, you may upgrade the correct new version firmware to obtain new functionality. It takes about 1 minute to upload upgrade flash.

	If the firmware is uploaded in an improper way, the system would core dump.
---	---

### Upgrade Firmware

Upgrade firmware to obtain new functionality. **It takes about 1 minute to upload & upgrade flash and be patient please. Caution! A corrupted image will hang up the system.**

---

Update Firmware

Location:

### Update Firmware

**Location:** Click **Browse** to select the firmware file, and click **Apply** to upgrade the firmware.

### 3.6.3 Setting Management

Choose **Administration > Settings Management** and the following page appears. You may save system settings by exporting them to a configuration file, restore them by importing the file, or reset them to the factory default.

The screenshot shows the 'Settings Management' page. At the top, there is a title 'Settings Management' and a descriptive paragraph: 'You might save system settings by exporting them to a configuration file, restore them by importing the file, or reset them to factory default.' Below this, there are three main sections: 'Export Settings', 'Import Settings', and 'Load Factory Defaults'. Each section contains a button to perform the respective action.

Export Settings	
Export Button	Export

Import Settings	
Settings file location	<input type="text"/> Browse..
Import	Cancel

Load Factory Defaults	
Load Default Button	Load Default

#### Export Settings

**Export Button:** Click the **Export** to export the settings.

#### Import Settings

**Settings file location:** Click **Browse** to select the configuration file, and then click **Import** to upload the configuration file. Click **Cancel** to cancel the uploading operation.

#### Load Factory Defaults

**Load Default Button:** Click **Load Default** to make Router return to the default settings.

### 3.6.4 Reboot

The **Reboot** screen allows you to restart your router with its current settings. Click the “Reboot” button and the device will restart.

#### Reboot

You might reboot device.

Reboot Device	
Reboot Button	<input type="button" value="Reboot"/>

### 3.6.5 Status

Choose **Administration > Status** and the following page appears. It displays the information about Router status, including system information, Internet configurations, and local network.

#### Router Status

System Info	
Firmware Version	Beta091015
SDK Version	3.3.0.0
System Up Time	1 day, 3 hour, 28 min, 47 sec
Operation Mode	Gateway Mode
Internet Configurations	
Connected Type	PPPOE
WAN IP Address	61.59.238.49
Subnet Mask	255.255.255.255
Default Gateway	61.59.238.1
Primary Domain Name Server	139.175.55.244
Secondary Domain Name Server	139.175.252.16
MAC Address	00:30:4F:30:52:11
Local Network	
Local IP Address	192.168.100.1
Local Netmask	255.255.255.0
MAC Address	00:30:4F:30:52:10

### 3.6.6 Statistics

You can see the Statistic information in this screen. It includes the Traffic for all interfaces.



The screenshot shows the Planet VDSL2 Router web interface. The top header includes the Planet logo and the text "VDSL2 Router" with a "logout" button. A left sidebar contains a navigation menu with the following items: VC-230, Operation Mode, Internet Settings, Firewall, VDSL, and Administration. Under Administration, there are sub-items: Management, Upload Firmware, Settings Management, Reboot, Status, Statistics (highlighted), and System Log.

The main content area is titled "Statistic" and contains three tables of data:

Memory	
Memory total:	29236 kB
Memory left:	15704 kB

WAN/LAN	
WAN Rx packets:	269011
WAN Rx bytes:	35926804
WAN Tx packets:	248535
WAN Tx bytes:	29510723
LAN Rx packets:	23866
LAN Rx bytes:	1510175
LAN Tx packets:	22358
LAN Tx bytes:	2139535

All interfaces	
Name	lo
Rx Packet	50
Rx Byte	27561
Tx Packet	50

### 3.6.7 System Log

The system log dialog allows you to view the system log and click the “Refresh” button to refresh the system event logs. Choose **Administration > System Log** and the following page appears. You are allowed to view and disable / enable the system log in this page.

#### System Log

**System Log Setup**

System log mode	Enable <input type="button" value="v"/>
-----------------	---

**System Log:**

```
Jan  2 08:45:46 PLANET syslog.info syslogd started: BusyBox v1.12.1
Oct 21 11:23:59 PLANET user.info kernel: br0: topology change detected, propagat
Oct 21 11:23:59 PLANET user.info kernel: br0: port 1(eth2.1) entering forwarding
Oct 21 11:24:08 PLANET local0.info udhcpd[2661]: Sending ACK to 192.168.100.10
Oct 21 11:24:25 PLANET local0.info udhcpd[2661]: Sending OFFER of 192.168.100.2
Oct 21 11:24:25 PLANET local0.info udhcpd[2661]: Sending ACK to 192.168.100.2
Oct 21 11:24:26 PLANET local0.info udhcpd[2661]: Sending OFFER of 192.168.100.3
Oct 21 11:24:26 PLANET local0.info udhcpd[2661]: Sending ACK to 192.168.100.3
Oct 21 11:27:18 PLANET daemon.notice pppd[2226]: Serial link appears to be disco
Oct 21 11:27:24 PLANET daemon.notice pppd[2226]: Connection terminated.
Oct 21 11:27:24 PLANET daemon.info pppd[2226]: Connect time 5155361.8 minutes.
Oct 21 11:27:24 PLANET daemon.info pppd[2226]: Sent 15834 bytes, received 12308
Oct 21 11:27:54 PLANET daemon.info pppd[2226]: PPP session is 903
Oct 21 11:27:54 PLANET daemon.info pppd[2226]: Using interface ppp0
Oct 21 11:27:54 PLANET daemon.notice pppd[2226]: Connect: ppp0 <--> eth2.2
```

Click **Refresh** to refresh the log. Click **Clear** to clear the log.


# Appendix A: Performance of VDSL Router Profiles

Below table is a performance table for profile and line distance, this data is just for reference. The actual data rate will vary on the quality of the telephone line and environment factors.

For better performance, we suggest using the AWG-26 or above cable for your connection, and the best line distance is about 1km.

(Data rate: Mbps)

Profile \ Distance		200m	400m	800m	1000m
AnnexA_EU-32_30a	Up	100	50	5	
	Down	100	100	60	
AnnexA_EU-32_17a	Up	55	45	20	7
	Down	100	100	55	50
AnnexA_EU-32_12a	Up	55	45	20	7
	Down	80	70	60	50
AnnexA_EU-32_12b	Up	55	45	20	7
	Down	80	70	60	50
AnnexA_EU-32_8a	Up	15	13	9	6
	Down	80	72	60	50
AnnexA_EU-32_8b	Up	15	13	9	6
	Down	80	72	60	50
AnnexA_EU-32_8c	Up	15	14	10	7.5
	Down	80	72	60	50
AnnexA_EU-32_8d	Up	15	13	9	6
	Down	80	72	60	50

	The real data rate and distance are based on your real environment, this is just for reference.
---	---

# Appendix B: Glossary

## **Address mask**

A bit mask select bits from an Internet address for subnet addressing. The mask is 32 bits long and selects the network portion of the Internet address and one or more bits of the local portion. Sometimes it called subnet mask.

## **VDSL**

VDSL2 (Very High-Bit-Rate Digital Subscriber Line 2), G.993.2 is the newest and most advanced standard of xDSL broadband wire line communications.

## **ADSL**

Asymmetric digital subscriber line

## **AAL5**

ATM Adaptation Layer - This layer maps higher layer user data into ATM cells, making the data suitable for transport through the ATM network.

## **ATM**

Asynchronous Transfer Mode - A cell-based data transfer technique in which channel demand determines packet allocation. ATM offers fast packet technology, real time, and demand led switching for efficient use of network resources.

## **AWG**

American Wire Gauge - The measurement of thickness of a wire

## **Bridge**

A device connects two or more physical networks and forward packets between them. Bridges can usually be made to filter packets, that is, to forward only certain traffic. Related devices are repeaters which simply forward electrical signals from one cable to the other and full-fledged routers which make routing decisions based on several criteria.

## **Broadband**

Characteristic of any network multiplexes independent network carriers onto a single cable. Broadband technology allows several networks to coexist on one single cable; traffic from one network does not interfere with traffic from another. Broadcast a packet delivery system where a copy of a given packet is given to all hosts attached to the network. Example: Ethernet.

**CO**

Central Office. Refers to equipment located at a Telco or service provider's office.

**CPE**

Customer Premises Equipment located in a user's premises

**DHCP (Dynamic Host Configuration Protocol)**

DHCP is software that automatically assigns IP addresses to client stations logging onto a TCP/IP network. DHCP eliminates having to manually assign permanent IP addresses to every device on your network. DHCP software typically runs in servers and is also found in network devices such as Routers.

**DMT**

Discrete Multi-Tone frequency signal modulation

**Downstream rate**

The line rate for return messages or data transfers from the network machine to the user's premises machine.

**DSLAM**

Digital Subscriber Line Access Multiplex

**Dynamic IP Addresses**

A dynamic IP address is an IP address that is automatically assigned to a client station (computer, printer, etc.) in a TCP/IP network. Dynamic IP addresses are typically assigned by a DHCP server, which can be a computer on the network or another piece of hardware, such as the Router. A dynamic IP address may change every time your computer connects to the network.

**Encapsulation**

The technique layer protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the physical layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), and followed by the application protocol data.

**Ethernet**

One of the most common local area network (LAN) wiring schemes, Ethernet has a transmission rate of 10 Mbps.



**FTP**

File Transfer Protocol. The Internet protocol (and program) transfer files between hosts.

**Hop count**

A measure of distance between two points on the Internet. It is equivalent to the number of gateways that separate the source and destination.

**HTML**

Hypertext Markup Language - The page-coding language for the World Wide Web.

**HTML browser**

A browser used to traverse the Internet, such as Netscape or Microsoft Internet Explorer.

**http**

Hypertext Transfer Protocol - The protocol carry world-wide-web (www) traffic between a www browser computer and the www server being accessed.

**ICMP**

Internet Control Message Protocol - The protocol handle errors and control messages at the IP layer. ICMP is actually part of the IP protocol.

**Internet address**

An IP address is assigned in blocks of numbers to user organizations accessing the Internet. These addresses are established by the United States Department of Defense's Network Information Center. Duplicate addresses can cause major problems on the network, but the NIC trusts organizations to use individual addresses responsibly. Each address is a 32-bit address in the form of x.x.x.x where x is an eight-bit number from 0 to 255. There are three classes: A, B and C, depending on how many computers on the site are likely to be connected.

**Internet Protocol (IP)**

The network layer protocol for the Internet protocol suite

**IP address**

The 32-bit address assigned to hosts that want to participate in a TCP/IP Internet.

**ISP**

Internet service provider - A company allows home and corporate users to connect to the Internet.

**MAC**

Media Access Control Layer - A sub-layer of the Data Link Layer (Layer 2) of the ISO OSI Model responsible for media control.

**MIB**

Management Information Base - A collection of objects can be accessed via a network management protocol, such as SNMP and CMIP (Common Management Information Protocol).

**NAT**

Network Address Translation - A proposal for IP address reuse, where the local IP address is mapped to a globally unique address.

**NVT**

Network Virtual Terminal

**PAP**

Password Authentication Protocol

**PORT**

The abstraction used in Internet transport protocols to distinguish among multiple simultaneous connections to a single destination host.

**POTS**

Plain Old Telephone Service - This is the term describe basic telephone service.

**PPP**

Point-to-Point-Protocol - The successor to SLIP, PPP provides router-to-router and host-to-network connections over both synchronous and asynchronous circuits.

**PPPoE**

PPP over Ethernet is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

**Remote server**

A network computer allows a user to log on to the network from a distant location.

## **RFC**

Request for Comments - Refers to documents published by the Internet Engineering Task Force (IETF) proposing standard protocols and procedures for the Internet. RFC can be found at [www.ietf.org](http://www.ietf.org).

## **Route**

The path that network traffic takes from its source to its destination. The route a datagram may follow can include many gateways and many physical networks.

In the Internet, each datagram is routed separately.

## **Router**

A system is responsible for making decisions about which of several paths network (or Internet) traffic will follow. To do this, it uses a routing protocol to gain information about the network and algorithms to choose the best route based on several criteria known as "routing metrics".

## **Routing Table**

Information stored within a router that contains network path and status information. It is used to select the most appropriate route to forward information along.

## **Routing Information Protocol**

Routers periodically exchange information with one another so that they can determine minimum distance paths between sources and destinations.

## **SNMP**

Simple Network Management Protocol - The network management protocol of choice for TCP/IP-based Internet.

## **SOCKET**

- (1) The Berkeley UNIX mechanism for creating a virtual connection between processes.
- (2) IBM term for software interfaces that allow two UNIX application programs to talk via TCP/IP protocols.

## **Spanning-Tree Bridge Protocol (STP)**

Spanning-Tree Bridge Protocol (STP) - Part of an IEEE standard. A mechanism for detecting and preventing loops from occurring in a multi-bridged environment.

When three or more LAN's segments are connected via bridges, a loop can occur. Because of a bridge forwards all packets that are not recognized as being local, some packets can circulate for long periods of time, eventually degrading system performance. This algorithm ensures only one path connects any pair of stations, selecting

one bridge as the 'root' bridge, with the highest priority one as identifier, from which all paths should radiate.

### **Spoofing**

A method of fooling network end stations into believing that keep alive signals have come from and returned to the host. Polls are received and returned locally at either end

### **Static IP Address**

A static IP address is an IP address permanently assigned to computer in a TCP/IP network. Static IP addresses are usually assigned to networked devices that are consistently accessed by multiple users, such as Server PCs, or printers. If you are using your Router to share your cable or DSL Internet connection, contact your ISP to see if they have assigned your home a static IP address. You will need that address during your Router's configuration.

### **Subnet**

For routing purposes, IP networks can be divided into logical subnets by using a subnet mask. Values below those of the mask are valid addresses on the subnet.

### **TCP**

Transmission Control Protocol - The major transport protocol in the Internet suite of protocols provides reliable, connection-oriented full-duplex streams.

### **TFTP**

Trivial File Transfer Protocol. A simple file transfer protocol (a simplified version of FTP) that is often boot diskless workstations and other network devices such as routers over a network (typically a LAN).

### **Telnet**

The virtual terminal protocol in the Internet suite of protocols - Allows users of one host to log into a remote host and act as normal terminal users of that host.

### **Transparent bridging**

The intelligence necessary to make relaying decisions exists in the bridge itself and is thus transparent to the communicating workstations. It involves frame forwarding, learning workstation addresses, and ensuring no topology loops exist (in conjunction with the Spanning-Tree algorithm).

## **UDP**

User Datagram Protocol - A connectionless transport protocol that runs on top of TCP/IP's IP. UDP, like TCP, uses IP for delivery; however, unlike TCP, UDP provides for exchange of datagram without acknowledgments or guaranteed delivery. Best suited for small, independent requests, such as requesting a MIB value from an SNMP agent, in which first setting up a connection would take more time than sending the data.

## **UNI signaling**

User Network Interface signaling for ATM communications.

## **Virtual Connection (VC)**

A link that seems and behaves like a dedicated point-to-point line or a system that delivers packets in sequence, as happens on an actual point-to-point network. In reality, the data is delivered across a network via the most appropriate route. The sending and receiving devices do not have to be aware of the options and the route is chosen only when a message is sent. There is no pre-arrangement, so each virtual connection exists only for the duration of that one transmission.

## **WAN**

Wide area network - A data communications network that spans any distance and is usually provided by a public carrier (such as a telephone company or service provider).