ADSL Router Pots

4-Port ETHERNET INTERFACE

Table Of Contents

1. About This Manual

This manual contains information about installing, configuring, and operating the ADSL Router.

1.1. Document Objectives

The objectives of this manual are to describe all the initial hardware installation and basic configuration procedures for the ADSL Router. After completing the installation and basic configuration procedures, you can then use the appropriate contents to further configure your system.

2. Product Overview

This section provides an overview of the ADSL Router. It also describes the general applications available with the ADSL Router.

Note! This section documents general product features available in the ADSL Router product series. Please refer to the release notes for a current list of upgraded hardware and software specifications.

2.1. Product Description

ADSL Router is a low cost, high performance and high-speed device that provides full rate ADSL modem with the superb reliability and a complete solution for home and office router. ADSL Router can run downstream maximum data rate at 8Mbps and upstream at 1Mbps. When configure as a DHCP server, it will assign IP address to every connected PC and acts as the only externally recognized Internet device on your local area network. With build in NAT, ADSL Router serves as an Internet firewall, protecting your network from being accessed by outside users. You can safely enjoy the new generation broadband Internet access.

2.2. Specifications

2.2.1. ADSL Standard

ADSL Router series supports either one of the ADSL standard as below:

- Supports ANSI T1.413 Issue 2
- Supports ITU-T G.992.1(G.DMT)/G.992.2 (G.LITE) Annex A

2.2.2. Ports for Connectivity

- 4 RJ-45 for 100 Base-T Ethernet
- One RJ-11 for ADSL line
- One AC power jack for power supply

2.2.3. LEDs

- POWER - Power indicator
- DSL_LNK - ADSL Link indicator
- DSL_ACT - ADSL Active indicator
- LAN 100M (LAN 100M /ACT) - Ethernet 100M speed active indicator

Table 1: LED function

Label	Color	On	Flash	Off
POWER	Red	Power On	NA	Power Off
DSL_LNK	Green	ADSL Connected	Off Line	ADSL Disconnected
DSL_ACT	Green	ADSL Active	NA	ADSL IDLE
LAN_100M LAN_100M/ACT	Green	100M Connected	NA	100M IDEL

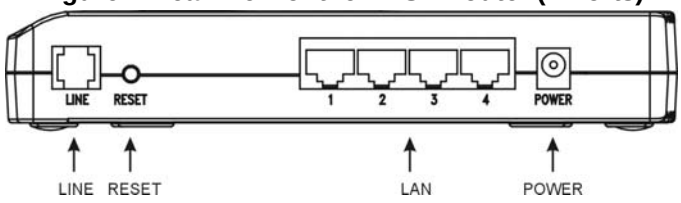
2.2.4. Back Panel Connectors

Table 2 shows the function of each connector and switch of the ADSL Router back panel. See Figure 1 for the location of these connectors.

Table 2:Function Description of Connectors

Connector	Description
ADSL	Connect to wall jack or original outgoing telephone line
Ethernet	Connect to the Ethernet port on your PC, or HUB
Reset Button	Restart the machine
Power	Connect to a 12V AC power adaptor

Figure1: Rear View of the ADSL Router (4 Ports)



2.2.5. Software Features

- RFC 1483 Bridged
- RFC 1483 Routed
- RFC 1577 IPOA (IP Over ATM)
- RFC 2364 PPPOA (PPP Over ATM)
- RFC 2516 PPPOE (PPP Over Ethernet)
- PPP Link Control Protocol (LCP)
- Internet Protocol Control Protocol (IPCP)
- PPP Authentication Protocol (PAP)
- PPP Challenge Handshake Authentication Protocol (CHAP)
- Microsoft PPP CHAP extensions

- NAT (Network Address Translation)
- DHCP (Dynamic Host Configuration Protocol) Server
- RIP version 1 and 2 updating routing tables
- Internet Control Message protocol (ICMP)
- IGMP (Internet Group Management Protocol)
- NAPT (Network Address and Port Translation)
- Supports Dying Gasp

2.2.6. Management

- Remote configuration, diagnosis over http with password protection
- Firmware upgradeable through FTP, http

3. Installation Procedures

This section offers information about installing your ADSL router.

3.1. Hardware Requirements

The following hardware is necessary to configure and use the ADSL Router:

- A PC that has a standard terminal emulation program
- PC with Ethernet port or adapter, or a connection to the immediate LAN
- 12V AC power adaptor (supplied)
- RJ-45 Ethernet crossover cable (supplied)

3.2. Setting Up the Hardware Environment

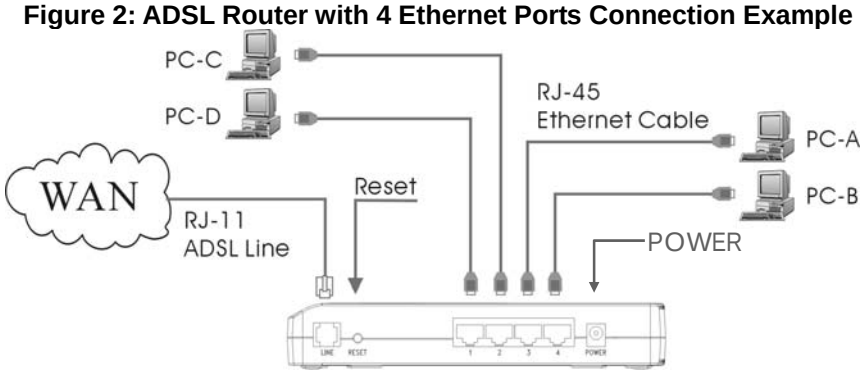
This section describes how to connect ADSL Router to your network.

Note! Be sure you are well insulated from any power source to avoid electricity shock.

3.2.1 Connect the cable to the Network

Connect the cables as shown in Figure 2. To check the cables before connect them, and make sure there is no power connected.

Figure 2: ADSL Router with 4 Ethernet Ports Connection Example



Complete the following steps to connect the cables to the ADSL Router:

1. Plug the power cable into the back of the unit.
2. Connect the Ethernet cable. Attach the ADSL Router to the computer's Ethernet adapter with crossover cable or a straight-through cable.
3. Connect the ADSL cable to the ADSL Router and the other side of the line to socket.

3.2.2 Power on the ADSL Router

1. Connect power to the ADSL Router by plugging the power supply into an appropriate electrical outlet.
2. If the Power LED is on, but the ADSL Router is not working, refer to “Troubleshooting” for assistance.

Note! Use only the manufacture-approved power supply that shipped with the ADSL Router.

4.Configuration

This section intends to provide advanced procedures of configuring the ADSL Router to fit into Telkom's network. You need to know some network information from Telkom, such as connection mode, protocols used, and PVC setting. It is better for an experienced system/network managers to do this step by step. However, if you are not experienced in configuring the ADSL Router, we suggest you use the default value in the Table 3 page 9. It's an easier way to approach these router settings.

The configuration can be divided into several working modes. Usually, you only have to use one of them, and rarely have the need to change them. Before setting the ADSL Router, you have to know some network information about your local site.

Note! The default (factory setting) is set to bridge mode. In this mode only the PPPoE client software supplied by Telkom needs to be loaded on the computer, to enable the use of this modem. (No further installation is required).

4.1. Prepare Your Network Information

To have a smooth installation, it is better to keep the following information on hand listed in the table below. After setting these values properly, it should not be a problem to access the Internet through your ADSL router.

Table 3: Information required to set your ADSL Router

	Checked	Information	Value
IP		Dynamic	Auto get from TelKom
		Static	Not used at present
		Domain	
		IP Address	
		Subnet Mask	
		Default Gateway	Not required
		DNS Server	Not required
ATM		VPI	8
		VCI	35
		Encapsulation	LLC
Mode		RFC1483 Bridged	(Default)
		RFC2516 PPPoE	
		RFC1577 IPoA	
		RFC2364 PPPoA	
		RFC1483 Routed	
Dial-out Access		Login Account	
		Login Password	

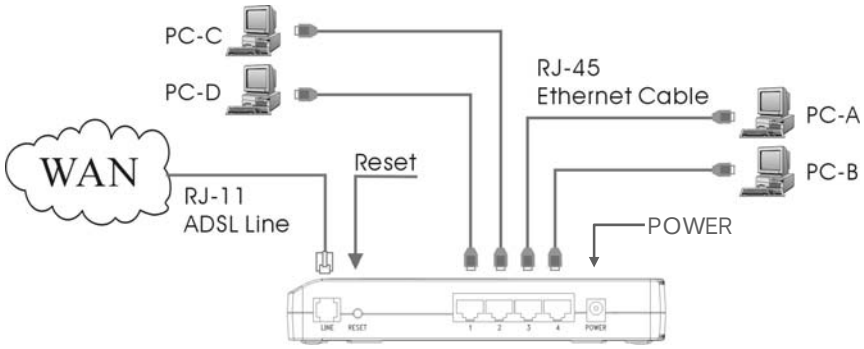
4.2. Select a Connection Mode

The ADSL Router supports two kinds of connecting modes: bridging mode (default) and routing mode.

4.3. Network Setup

You can choose to connect your ADSL Router to a computer with an Ethernet LAN card through a crossover cable or a straight cable. Please refer to the figure below.

Figure 3: Multi-user Connection example



4.3.1. Choice of IP address

All IP addresses used in these examples are from one of the blocks reserved by the Internet Assigned Numbers Authority for use on private IP network. You can use it in your own private network.

4.3.2. Choice of VPI and VCI

The example in this document uses VPI 8 and VCI 35.
Choose the correct value or your data link will not work.

4.3.3. Choice of Configuration method

The method you can use to configure your ADSL Router: is by the web configuration utility, section 4.4. Web Configuration Utility.

4.4. Web Configuration Utility

The Web configuration utility provides the configuration from the HTTP port. Instructions for configuring the system from the browser assume the absence of any previous configuration. After connecting the Ethernet cable, power on the ADSL Router, starting the browser such as IE or Netscape. Type the IP address of the modem in the address field. The default value is 10.0.0.2.

NOTE! Please make sure your ADSL Router has an IP address. If not, you need to press Reset button at least 5 seconds to complete reset function to default 10.0.0.2 in order to be accessed by Telnet and Web browser!

Important Notice!
Telkom is using PPPoE. You could find corresponding manual on the CD-ROM. The CD also contains information on setting the following modes:

- **PPPoE (RFC 2516)**
- **PPPoA (RFC 2364)**
- **Bridged (RFC 1483)**
- **Routed (RFC 1483)**

4.5 LAN Card Internet Protocol (TCP/IP) Configuration Procedures.

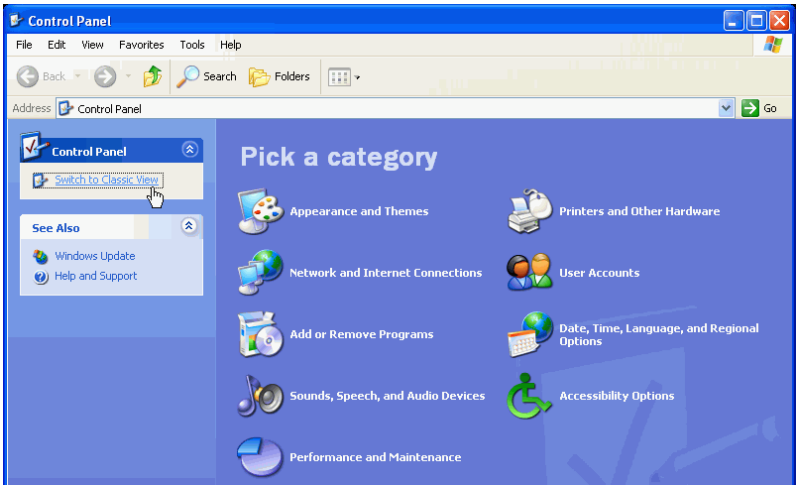
There are 2 ways: automatic and manual to configure the Internet Protocol (TCP/IP) for your system.

4.5.1 IP setting (automatic)

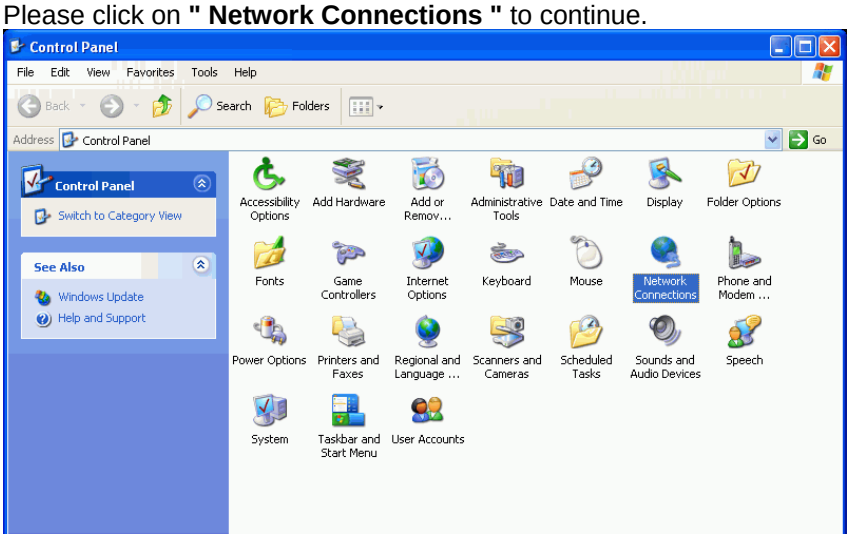
Using XP Operating System (other operating systems use similar method)

Step 01: Please click on " Start --> Control Panel " to continue.

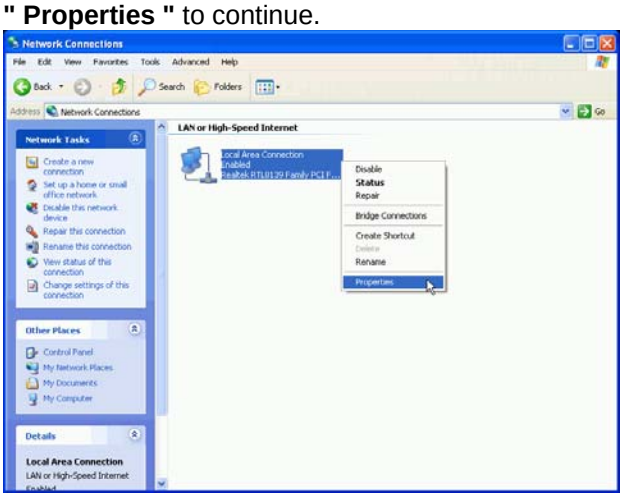
Step 02:
Please click on **" Switch to Classic View "** to continue.



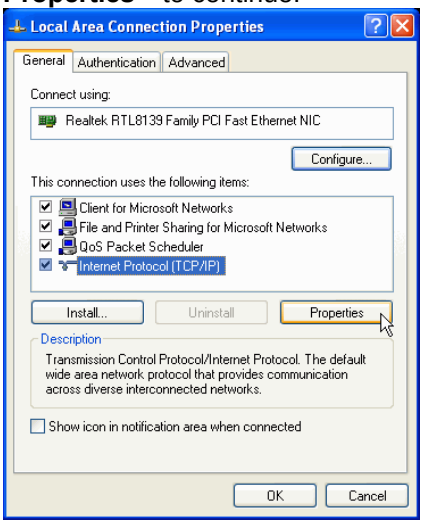
Step 03:
Please click on **" Network Connections "** to continue.



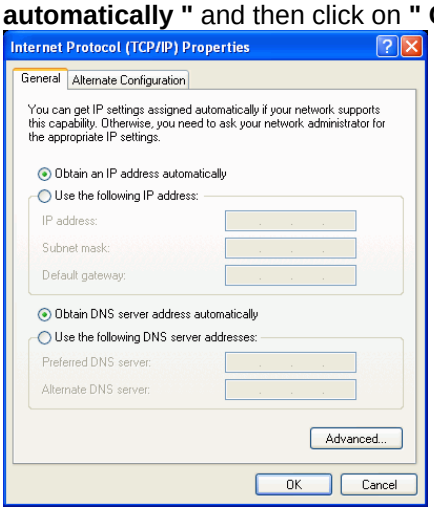
Step 04:
Please right click on**" Local Area connection "** and then click **" Properties "** to continue.



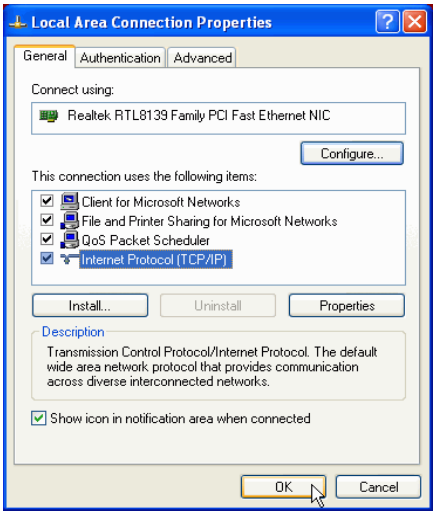
Step 05:
Please click on **" Internet Protocol (TCP/IP) "** and then click **" Properties "** to continue.



Step 06:
Please check your LAN card IP settings by **" Obtain an IP address automatically "** and then click on **" OK "** to continue.



Step 07:
Please check the **" Show icon in notification area when connected "** and then Click on **" OK "** to continue.



4.5.2 IP setting (manual)

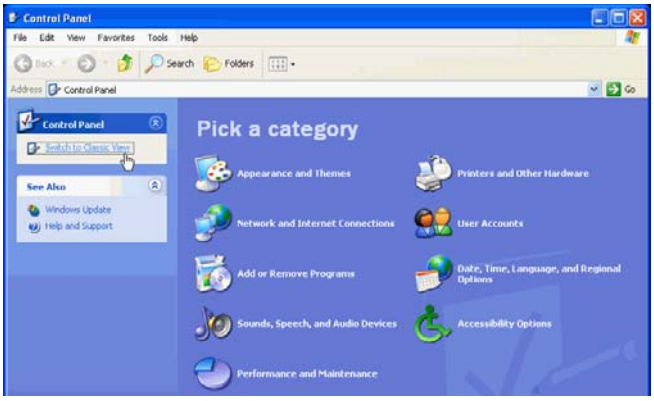
Using XP Operating System (other operating systems use similar method).

Step 01:

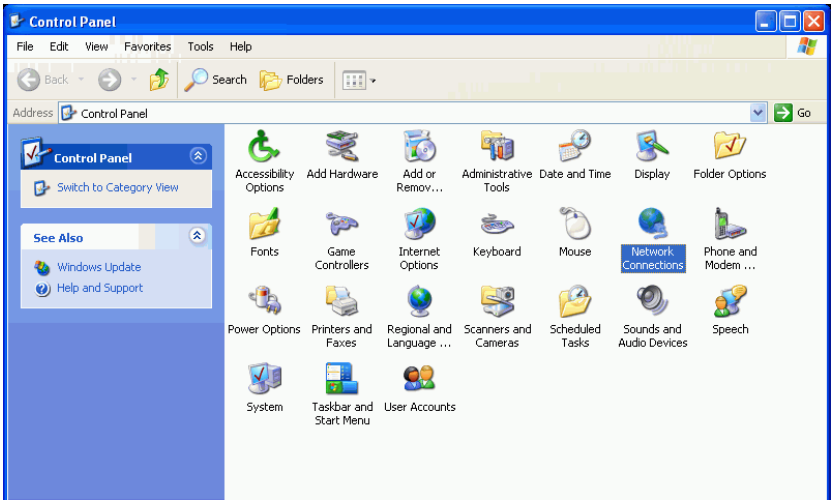
Please click on **" Start --> Control Panel "** to continue.

Step 02:

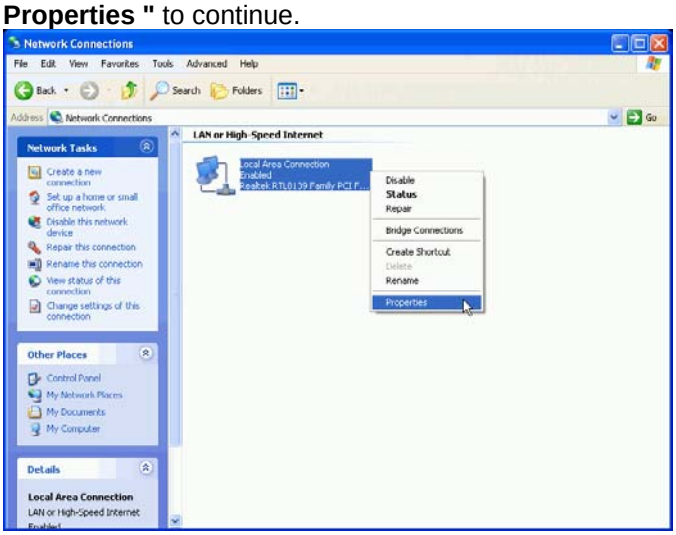
Please click on **" Switch to Classic View "** to continue.



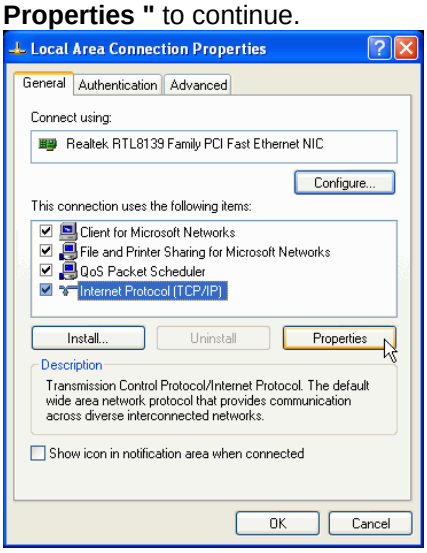
Step 03:
Please click on **" Network Connections "** to continue.



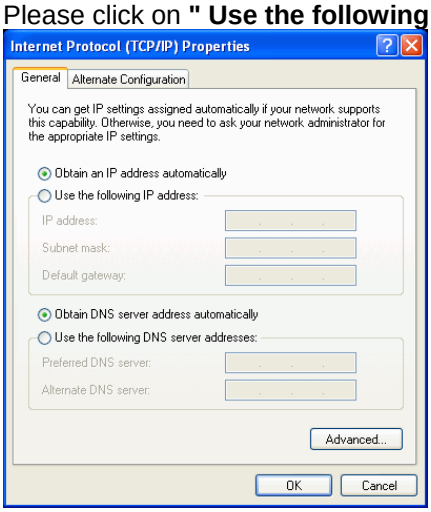
Step 04:
Please right click on**" Local Area connection "** and then click **" Properties "** to continue.



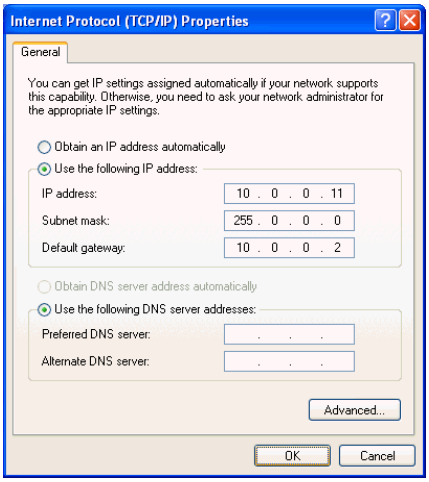
Step 05:
Please click on **" Internet Protocol (TCP/IP) "** and then click **" Properties "** to continue.



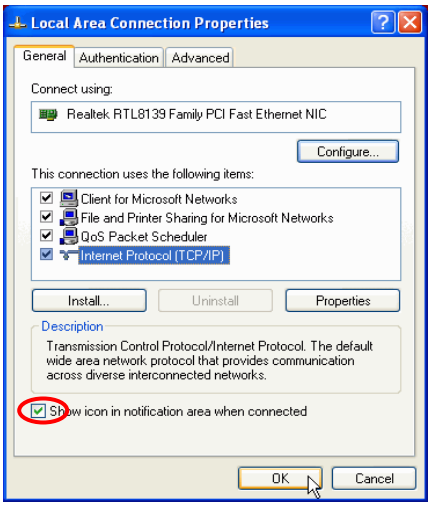
Step 06:
Please click on **" Use the following IP address "** to continue.



Step 07:
Please type **" IP Address "**, **" Subnet Mask ", " Default gateway "** as indicated in picture below and then click **" OK"** to continue.



Step 08:
Please check the **" Show icon in notification area when connected "** and then Click on **" OK "** to continue.

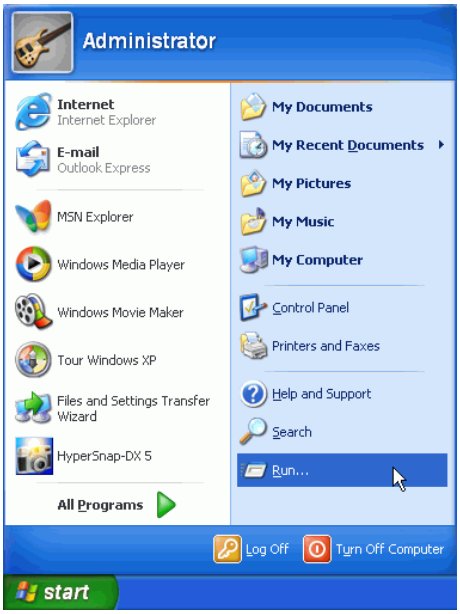


4.5.3 Installation procedure of ADSL Router RFC 2516 in PPPoE Mode:

Using XP Operating System (other operating system use similar method).

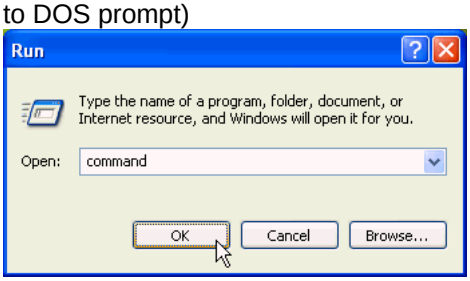
Step 01:

Please click on **" Start --> Run "** to continue.

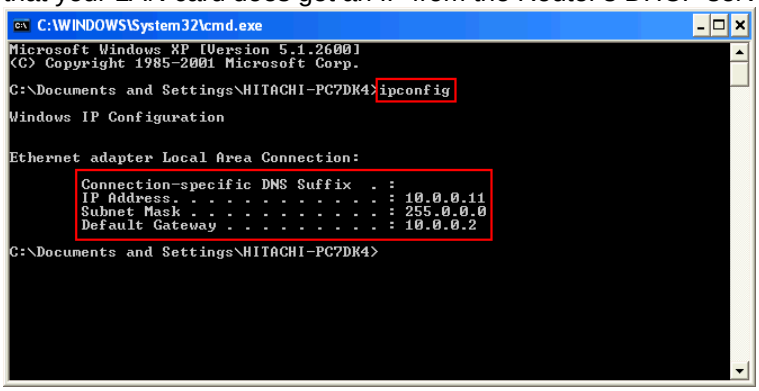


Step 02:

Enter command **" command "** and then click on **" OK "** to continue. (Go to DOS prompt)

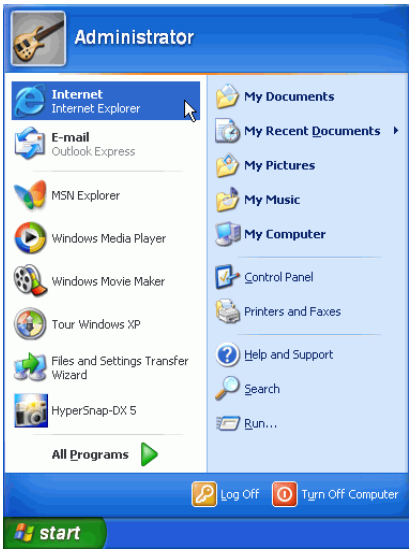


Step 03:
Enter command **" ipconfig "** and then press **" Enter "** key to confirm that your LAN card does get an IP from the Router's DHCP server.

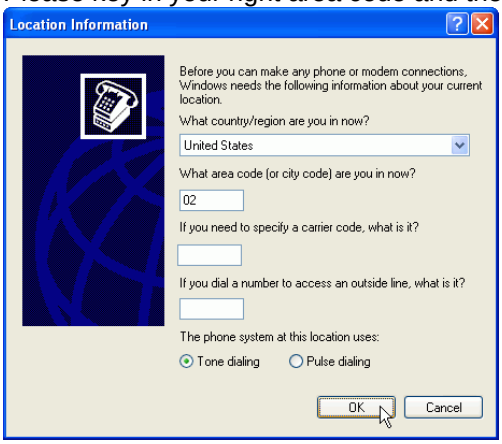


Step 03a:
Close Dos prompt.

Step 04:
Please Click on **" Start --> Internet Explorer "** to execute Web Browser.

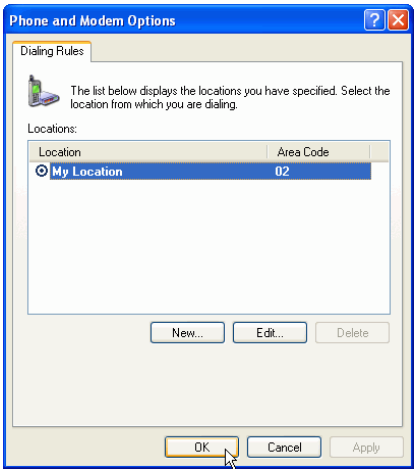


Step 05:
Please key in your right area code and then click on **" OK "** to continue.



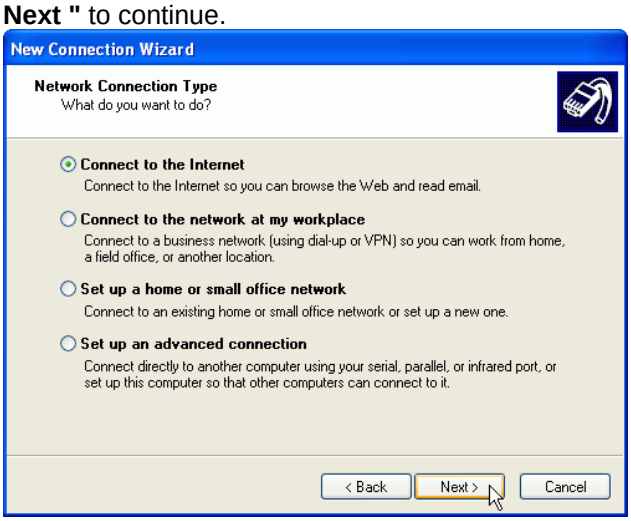
NOTE! Only if you are a first time internet user then steps 5 to 12 is required. Otherwise you will automatically go to Step 13.

Step 06:
Click on **" OK "** to continue.

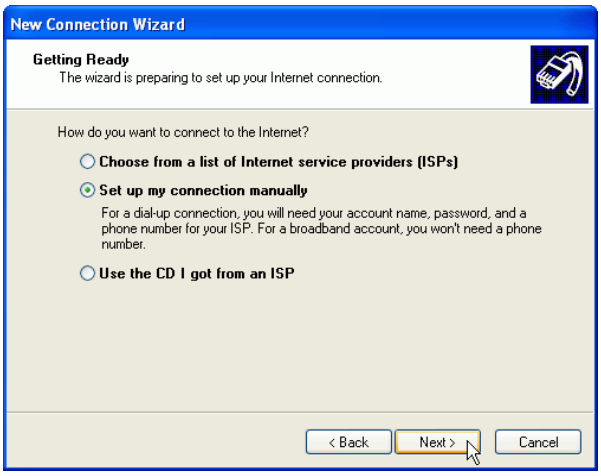


Step 07:
Click on **" Next "** to continue.

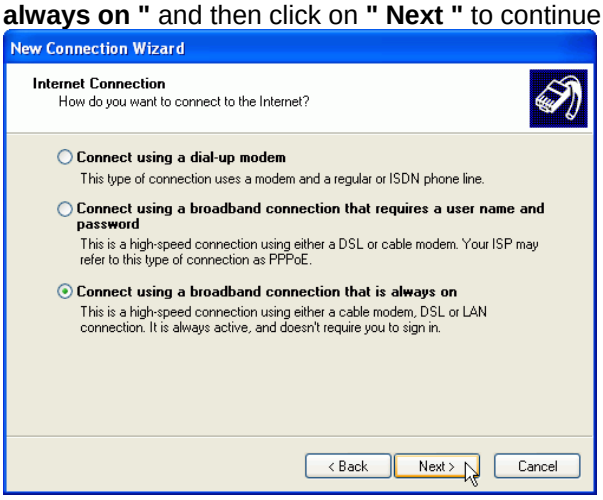
Step 08:
Please select option **" Connect to the Internet "** and then click on **" Next "** to continue.



Step 09:
Please select option **" Set up my connection manually "** and then click on **" Next "** to continue.

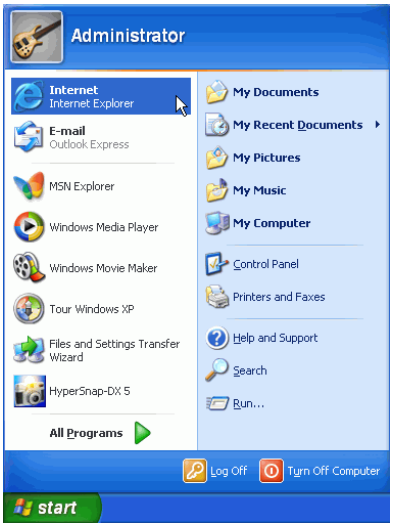


Step 10:
Please select option **" Connect using a broadband connection that is always on "** and then click on **" Next "** to continue.

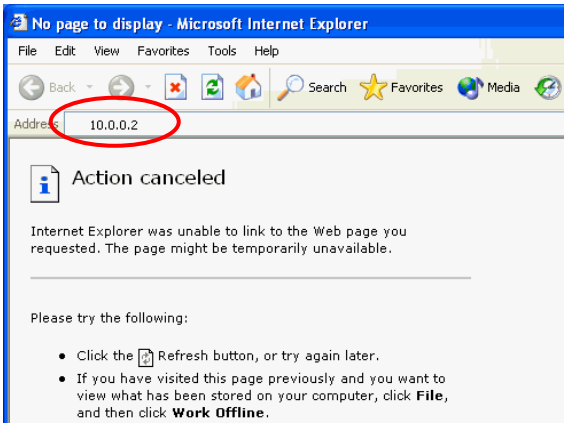


Step 11:
Click on **" Finish "** to complete Web Browser configuration.

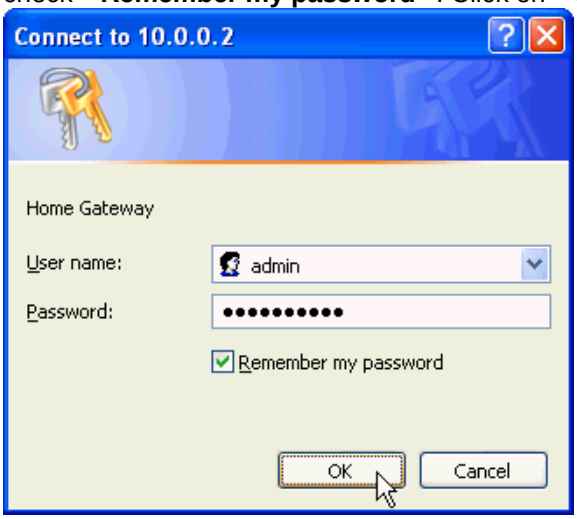
Step 12:
Please click on **" Start --> Internet "** to execute Web Browser again.



Step 13:
Type the IP Address **10.0.0.2** as indicated in picture and then press **" Enter "** to continue.



Step 14:
Type the User Name: **" admin ",** Password: **" administrator "** and then check **" Remember my password "**. Click on **" OK"** to continue.

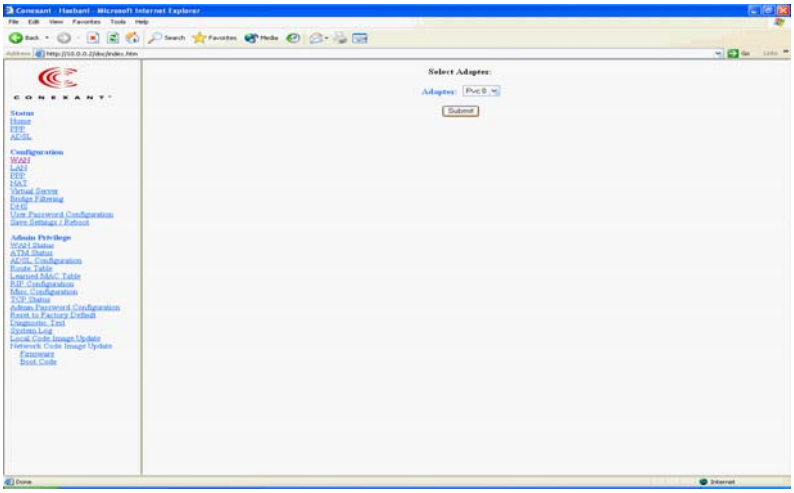


Step 15:

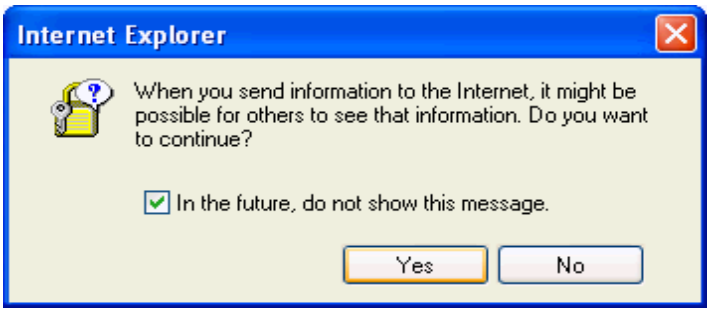
Please click on **" Configuration -->WAN "** to configure PPPoE mode.

Step 16

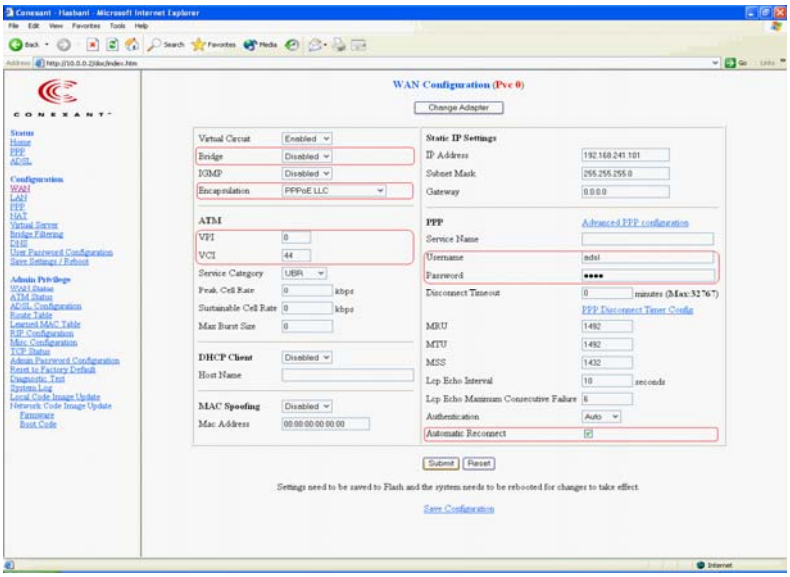
Click on **" Submit "** to continue.



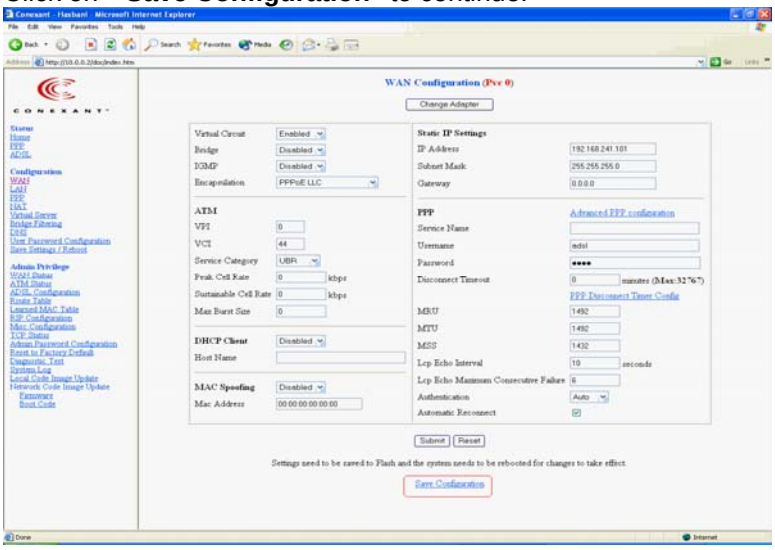
Step 17:
Click on **" Yes "** to continue.



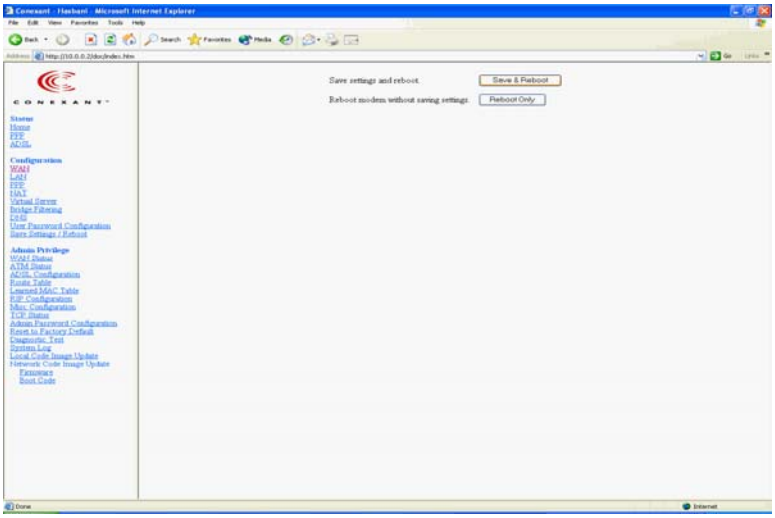
Step 18:
Please select Bridge on **" Disabled ",** select Encapsulation on **" PPPoE LLC " ,** enter **Virtual Path Identifier (VPI)** and **Virtual Circuit Identifier (VCI) ,**enter the PPP connection **" User Name "** and **" Password " ,** check **" Automatic Reconnect "** and then click **" Submit "** to continue.



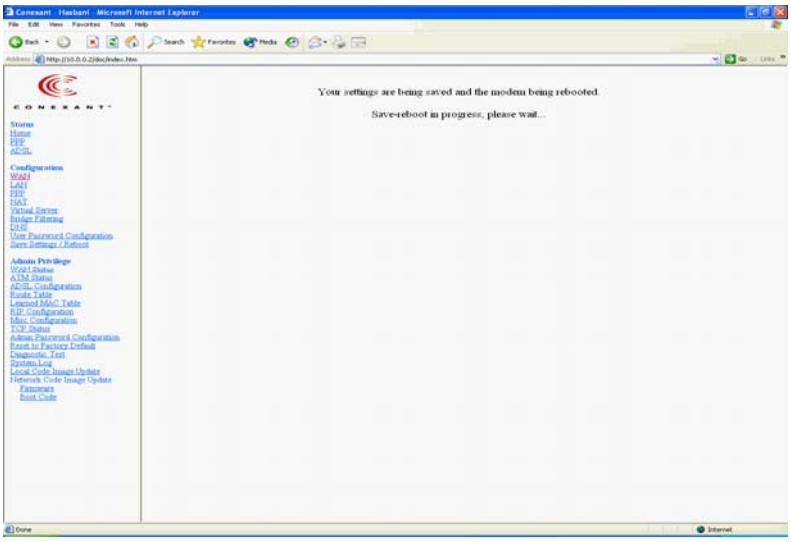
Step 19:
Click on **" Save Configuration"** to continue.



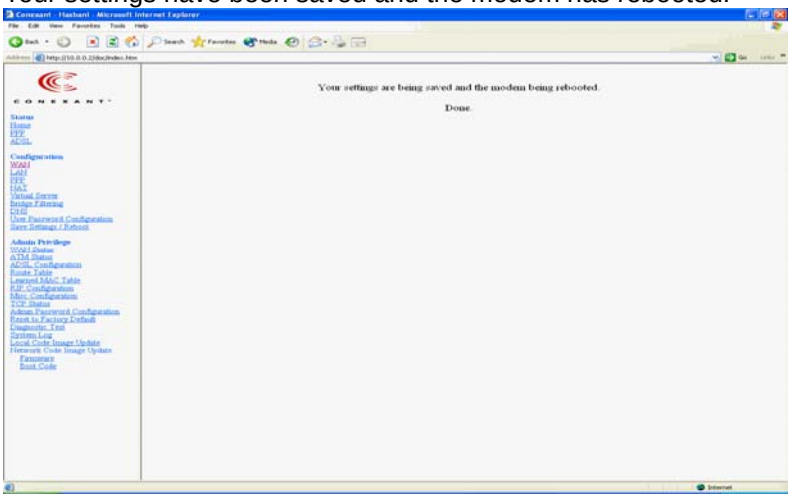
Step 20:
Click on **" Save & Reboot "**



Step 21:
Your settings are being saved and the modem being rebooted. Please wait.

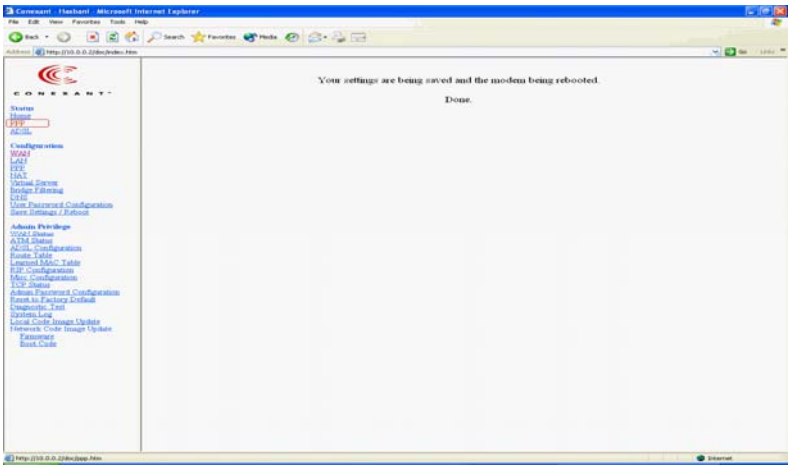


Step 22:
Your settings have been saved and the modem has rebooted.



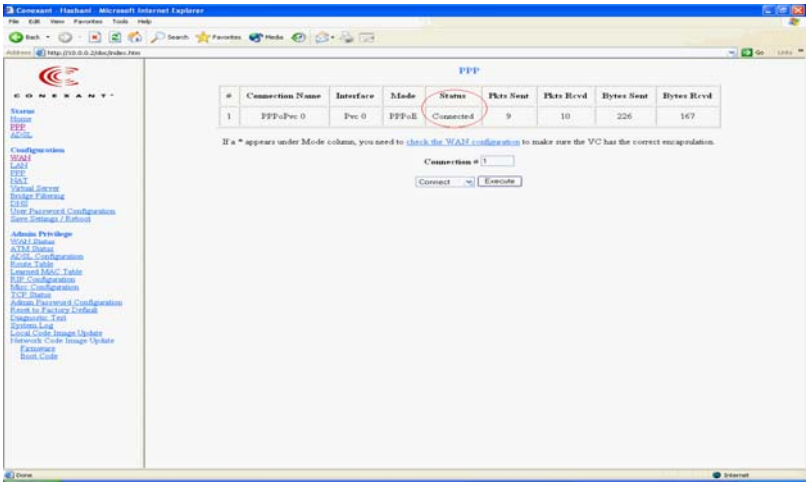
Step 23:

Please confirm that the **DSL LNK LED** is light and then click on **" PPP "** item to continue.

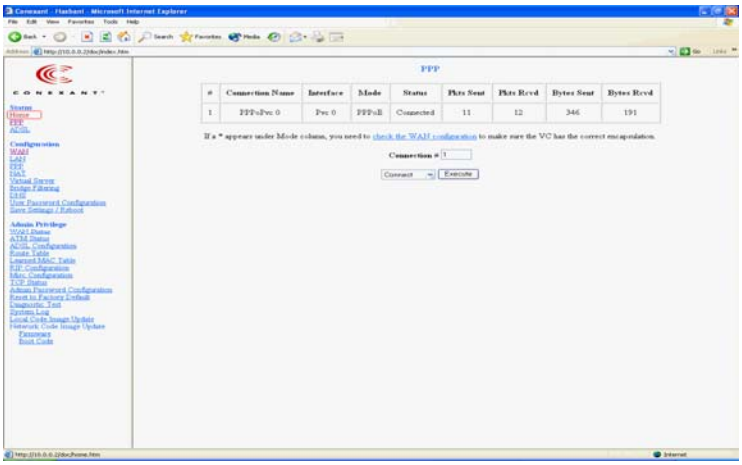


Step 24:

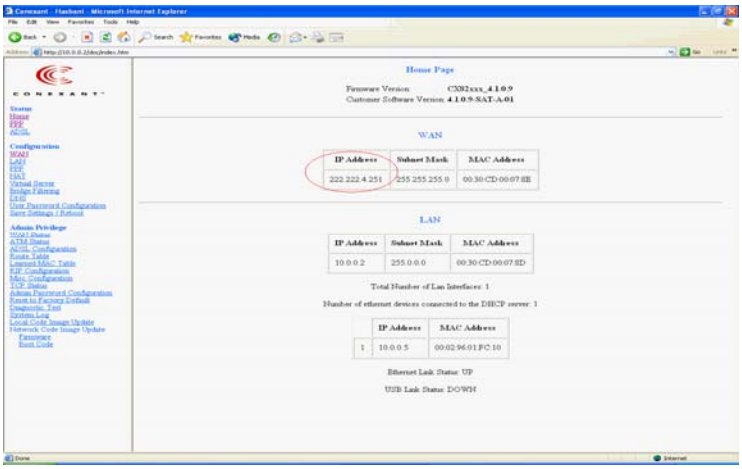
If the PPPoE connection is successfully connect to ISP. You will see below screen.



Step 25:
Click on **" Home "** item to continue.



Step 26:
If the PPPoE connection is successfully connect to ISP. Your ADSL Router WAN port will get an IP address from ISP.



5. Troubleshooting

1. None of the LEDs are on when power is on

   →Check the connection between the AC adapter and ADSL ROUTER.

2. Cannot access the ADSL Router via Telnet/Web

   →Check if you set an IP for the ADSL Router

   →Check the IP setting of your computer

   →Check if the LAN port is connect correctly

3. Cannot access your ISP (internet)

   →Check to see if the ADSL link LED is on. If not, the ADSL link is not connected.

   →Check to see if the LAN link LED is on. If not, the LAN connection is not connected correctly. Make sure you are connected to PC.

   →Verify that the IP address/Subnet mask are correct, and make sure you can ping to the neighbour PC or that the PC can ping to the ADSL Router.

   →Check your VPI/VCI value and encapsulation mode are the same as indicated in table 3 (page 9).

   →See if dialtone is available on the phone sharing the line with ADSL.

4. Reset Button

   →Restart the ADSL Router and restore the router IP address to 10.0.0.2 and the default setting to Bridge mode (table 3 page 9).

6. Technology Glossary

100 Base-T

An adaptation of the Ethernet standard for Local Area Network (LAN). 100 Base-T uses a twisted pair cable with maximum length of 100 meters.

AAL

ATM Adaptation Layer that defines the rules governing segmentation and reassembly of data into cells. Different AAL types are suited to different traffic classes.

Address mask

A bit mask used to 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 called subnet mask.

ADSL

Asymmetric Digital Subscriber Line, as it's name showing, is an asymmetrical data transmission technology with high traffic rate downstream and low traffic rate upstream. ADSL technology satisfies the bandwidth requirement of applications, which demand "asymmetric" traffic, such as web surfing, file download and Video-on-demand (VOD).

ATM

Asynchronous Transfer Mode is a layer 2 protocol supporting high-speed asynchronous data with advanced traffic management and quality of service features.

bps

Bits per second. A standard measurement of digital transmission speeds.

Bridge

A device that connects two or more physical networks and forwards 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.

CPE

Customer Premises Equipment, such as ADSL router, USB modem.

DHCP

Dynamic Host Configuration Protocol. Used for assigning dynamic IP address to devices on a network. Used by ISPs for dialup users.

DNS

Domain Name Server, translates domain names into IP addresses to help user recognize and remember. However, the Internet actually runs on numbered IP addresses, DNS servers needs to translate domain names back to their respective IP addresses.

DSL

Digital Line Subscriber (DSL) technology provides high-speed access over twisted copper pair for connection to the Internet, LAN interfaces, and to broadband services such as video-on-demand, distance learning, and video conferencing.

FTP

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

IPoA (RFC 1577)

Classical IP and ARP over ATM. Considers ATM configured as a Logic IP Sub-network(LIS) to replace Ethernet local LAN segments.

ISP

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

LAN

Local area network. A limited distance (typically under a few kilometers or a couple of miles) high-speed network (typically 4 to 100 Mbps) that supports many computers.

MAC

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

MTU

Maximum Transmission Unit

NAT

Network Address Translator as defined by RFC 1631. Enables a LAN to use one set of IP address for internal traffic. A NAT box located where the LAN meets the Internet provides the necessary IP address translation. This helps provide a sort of firewall and allow for a wider address range to be used internally without danger of conflict.

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.

PPPoA (RFC 2364)

The Point-to-Point Protocol(PPP) provides a standard method for transporting multi-protocol datagrams over point-to-point links. This document describes the use of ATM Adaptation Layer 5 (AAL5) for framing PPP encapsulated packets.

PPPoE (RFC 2516)

This document describes how to build PPP sessions and encapsulate PPP packets over Ethernet. PPP over Ethernet (PPPoE) provides the ability to connect a network of hosts over a simple bridging access device to a remote Access Concentrator.

PVC

Permanent Virtual Circuit. Connection-oriented permanent leased line circuit between end-stations on a network over a separate ATM circuit.

RFC

Request for Comments. The document series, begun in 1969, which describes the Internet suite of protocols and related experiments. Not all RFCs describe Internet standards, but all Internet standards are written up as RFCs

RFC 1483

Multi-protocol encapsulation over AAL-5. Two encapsulation methods for carrying network interconnect traffic over ATM AAL-5. The first method allows multiplexing of multiple protocols over a single ATM virtual circuit. The protocol of a carried PDU is identified by prefixing the PDU by an IEEE 802.2 Logical Link Control (LLC) header. This method is in the following called "LLC Encapsulation". The second method does higher-layer protocol multiplexing implicitly by ATM Virtual Circuits (VCs). It is in the following called "VC Based Multiplexing".

Router

A system 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.

Spanning Tree

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 bridges connect three or more LAN segments, a loop can occur. Because 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.

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.

VCI

Virtual Circuit Identifier. Part of the ATM cell header, a VCI is a tag indicating the channel over which a cell will travel. The VCI of a cell can be changed as it moves between switches via Signaling.

VPI

Virtual Path Identifier. Part of the ATM cell header, a VPI is a pipe for a number of Virtual Circuits.

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)

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155-2078-01