Wireless Cable Modem

User Manual

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1. PRODUCT OVERVIEW

The wireless cable modem is a DOCSIS compliant wireless cable router that provides high-speed connectivity to residential, commercial, and education subscribers on public and private networks via an existing cable infrastructure. The wireless cable modem is equipped with IEEE802.11b wireless AP, and can inter-operate with the Wi-Fi compliant IEEE 802.11b wireless LAN card. The wireless cable modem can inter-operate any DOCSIS compliant headend equipment. The IP traffic can transfer between the wireless cable modem and DOCSIS compliant headend equipment. The data security secures upstream and downstream communications.

1.1 Checklist

Before installation, please check the items of the carton. The carton should contain the following items:

- 1. Cable Modem
- 2. Twisted Pair Ethernet Cable (CAT5/RJ-45)
- 3. USB Cable
- 4. Power Adapter & Power Cord
- 5. This User Manual
- 6. USB Driver Disk

1.2 System Requirements

Before installation, please check the following requirements with your computer.

This cable modem equips ETHERNET and USB interfaces. You can choose either one to connect to the cable modem.

System Requirement of Ethernet Connection

PRODUCT OVERVIEW

- 1. IBM compatible PC, Apple Macintosh or other workstation supports TCP/IP protocol.
- 2. An Ethernet port supports 10/100BaseT Ethernet connection.
- 3. Subscribe to a Cable Television Company for cable modem service.

System Requirement of USB Connection

- 1. IBM compatible PC with Microsoft Windows 98/Me or Windows 2000/XP.
- 2. Available USB port.
- 3. Subscribe to a Cable Television company for cable modem service.

1.3 Features

- 1. Up to 42.88 Mbps downstream and up to 10.24 Mbps upstream, two-way cable router.
- 2. F-Connector for the cable interface.
- 3. Build-in IEEE 802.11b Wireless Access Point function.
- 4. Bridging wired & wireless segments of network.
- 5. Provide 11 / 5.5 / 2 / 1 Mbps wireless connectivity to the wireless clients.
- 6. Support Wired Equivalent Privacy Algorithm (WEP).
- 7. Roaming by Association/Re-association/De-association.
- 8. Support 802.11b Power Saving function.
- 9. Standard RJ-45 connector for 10/100BaseT Ethernet with auto-negotiation function and auto-media dependent interface crossover (MDIX).
- 10. USB Connector for USB interfaces.
- 11. Frequency agility.
- 12. NAT (Network Address Translation) to support multiple users with one IP account for routing mode.
- 13. Interoperable with any DOCSIS compatible cable routers and headend equipment.
- 14. SNMP network management support.

- 15. Remote operating firmware downloading
- 16. Support Web pages and private DHCP server for status monitoring
- 17. Clear LED display
- 18. Plug and Play

2. HARDWARE INSTALLATION

This section includes physical description and installation procedure of the cable modem.

2.1 Physical Description

2.1.1 Front Panel Indicators



Figure 2-1: Front Panel LEDs

Four LEDs on the front panel (as figure 2-1) provide status indication of cable modem operation. They are listed in the table below in order as viewed from upper to under.

LEDs	Function	Color	Active	Description
POWER	Power	Green	On	Power is being applied to CM.
PC	Link/PC	Green	On	Ethernet/USB carrier is present.
	Data		Blinking	To indicate Ethernet or USB data.
CABLE	RF Data	Green	Blinking	To indicate transmit RF US traffic.
STATUS	Link	Green	On	Modem registration completed.

			Blinking	To indicate RF link status at different speed.
				Scan downstream channel. (2 sec cycle)
				Downstream sync O.K and receiving US parameters. (1 sec cycle)
				 US ranging is O.K and receiving IP and TFTP configuration. (0.125 sec cycle)
				Registration successfully. (Keep On)
				 If cable lost sync happens after registration, cable LED will keep blinking (2sec cycle) until it recovers again.
Wireless	Wireless	Green	On	To indicate wireless link is present.
	Link/Data		Blinking	To indicate Wireless AP data.

2.1.2 Rear Panel Connectors



Figure 2-2: Rear Panel

HARDWARE INSTALLATION

The connectors and switch on the rear panel from right to left are:

CABLE: F-Connector

USB: USB Connector

ETHERNET: Ethernet 10/100BaseT RJ-45 connector

RST: Reset-to-Default push button

• 12VDC: Power connector

2.2 Installation Procedure

This cable modem equips USB and Ethernet interfaces. You can choose either one to connect to the cable modem. Go to Section 2.2.1, if your computer has installed TCP/IP and Ethernet card with 10/100BaseT capability. Go to Section 2.2.2, if your PC has USB port and the operating system is Microsoft Windows 98/Me or Windows 2000/XP.

2.2.1 Installation Procedure for Ethernet Interface

Follow the following instructions for proper installation:

- Step 1:Make sure your computer meets the system requirements in Section 1.2.
- Step 2:Connect a coaxial cable (supplied by the local Cable Television Company) to the CABLE connector on the modem.
- **NOTE:** To speed up the initial cable modem registration process, the coaxial cable should be connected to the modem prior to the power connector.
- Step 3:Connect the RJ45 Ethernet cable to the **ETHERNET** connector on the modem, connect the other end with the 10/100BaseT Ethernet port on your computer.
- Step 4: Plug the power adapter into the **POWER** connector of the modem.
- Step 5: Plug the other end of the power adapter into a power outlet.

The cable modem will look for the proper cable modem signal in the Cable Television network and process the initial registration. The cable modem is ready for data transfer after the LED "**STATUS**" is in solid green.

NOTE: The **RST** button at the rear panel is for maintenance purpose only.

2.2.2 Installation Procedure for USB Interface

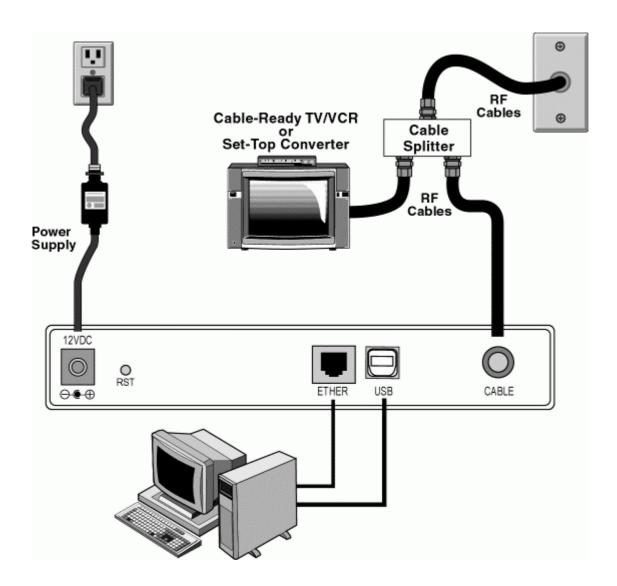
Follow the following instructions for proper installation:

- Step 1:Make sure your computer meets the system requirements in Section 1.2.
- Step 2:Connect a coaxial cable (supplied by the local Cable Television Company) to the CABLE connector on the modem. **NOTE**: To speed up the initial cable modem registration process, the coaxial cable should be connected to the modem prior to the power connector.
- Step 3: Connect the USB cable to the USB connector on the modem.
- Step 4: Plug the power adapter into the **POWER** connector of the modem.
- Step 5: Plug the other end of the power adapter into a power outlet.

The cable modem will look for the proper cable modem signal in the Cable Television network and process the initial registration. The cable modem is ready for data transfer after the LED "**STATUS**" is in solid green.

NOTE: The **RST** button at the rear panel is for maintenance purpose only.

2.2.3 Connecting the Cable Modem to Your Computer



3. SOFTWARE INSTALLATION

3.1 For Microsoft Windows 98/Me Users

Steps 1:Wait for the cable modems is running in the operational state (registration O.K.), and then plug the USB cable into your PC USB port. You will see the next page. Click the "Next" button.



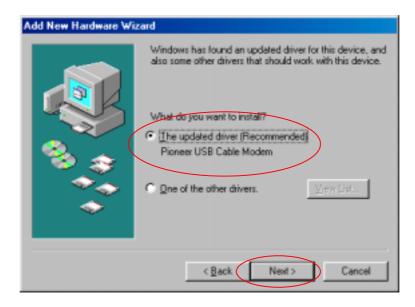
Step 2:Select "Search for the best drivers for your device" and click the "Next" button.



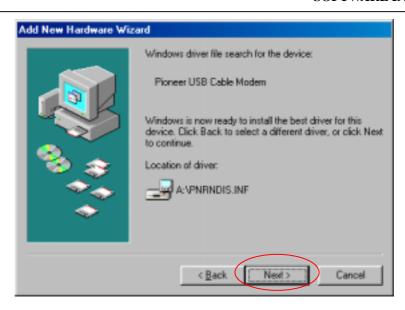
Step 3: Check Floppy disk drives. Click the "Next" button.



Step 4: Select "The updated driver..." and click the "Next" button.



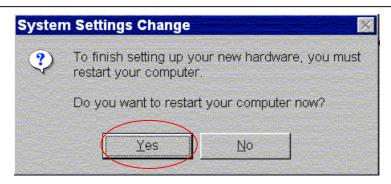
Step 5: Insert the driver disk into floppy drives A. Click the "Next" button.



Step 6: Installation has been completed here. Click the "Finish" button.



Step 7: The system will ask you to restart your computer. Remove the floppy disk from the floppy drives and click "**Yes**" to complete the installation.

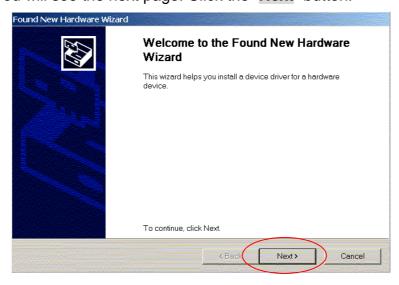


3.2 For Microsoft Windows 2000/XP Users

Steps 1:Wait for the cable modems is running in the operational state (registration O.K.), and then plug the USB cable into your PC USB port.



Step 2: You will see the next page. Click the "Next" button.



Step 3:Select "Search for a suitable driver for my device" and click the "Next" button.

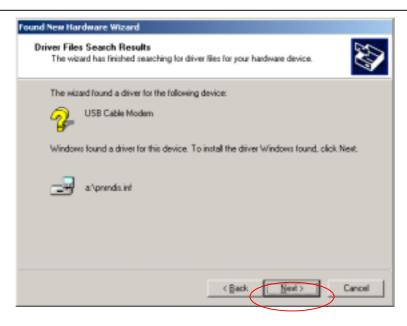


Step 4: Insert the driver disk into floppy drives A. Select "Floppy disk drives" and clicks the "Next" button.



Step 5: Click the "Next" button.

SOFTWARE INSTALLATION



Step 6: Installation has been completed here. Click the "Finish" button.



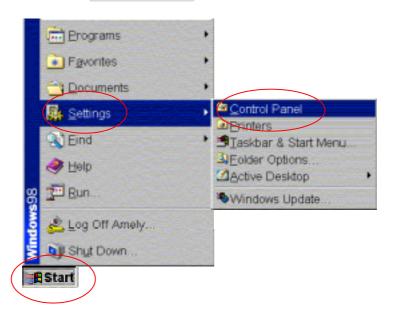
3.3 Configuring the TCP/IP Protocol

After you successfully complete the network interface card (Ethernet card) installation task, you need to make sure the TCP/IP communications

protocol used by the Ethernet card is installed and correctly configured on your system.

3.3.1 Configuration on Windows 98/Me

Step 1:Click "Start" button on your computer's taskbar, point to "Settings", and then click "Control Panel".

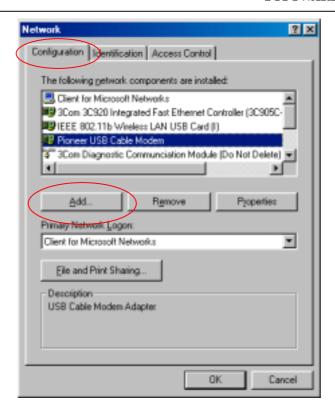


Step 2: The Control Panel window will show up. Double-click the "**Network**" icon in the Control Panel window.

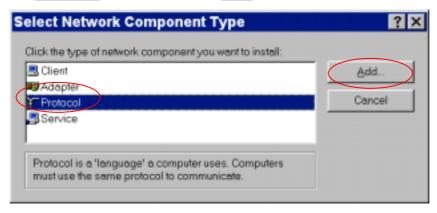


Step 3: Windows will appear the Network dialog box. Click "Configuration" tab to bring it to the front, and on this tab, a list of installed network components appears. Look for an entry that includes TCP/IP-> followed by the Ethernet card installed in your computer.

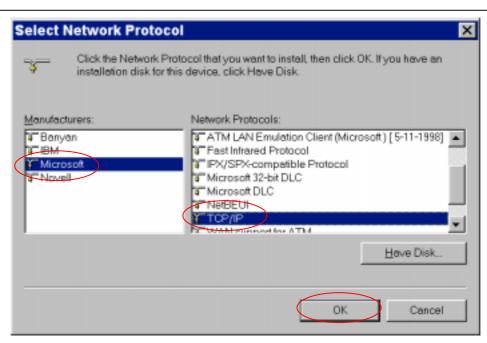
If the entry is not present, click "Add".



Step 4:The Select Network Component Type dialog box will show up. Click "**Protocol**", and then click "**Add**".

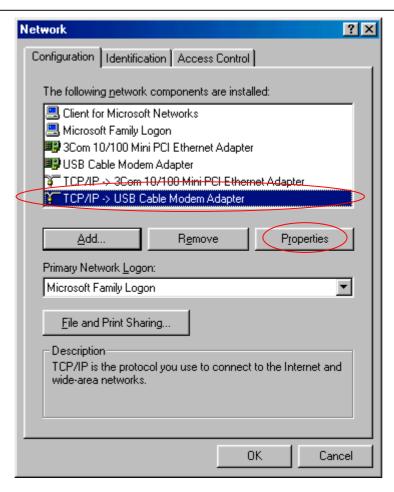


Step 5:You will see the Select Network Protocol dialog box. Click "Microsoft" in the "Manufactures:" list, and then click "TCP/IP" in the "Network Protocols:" list. Click "OK".

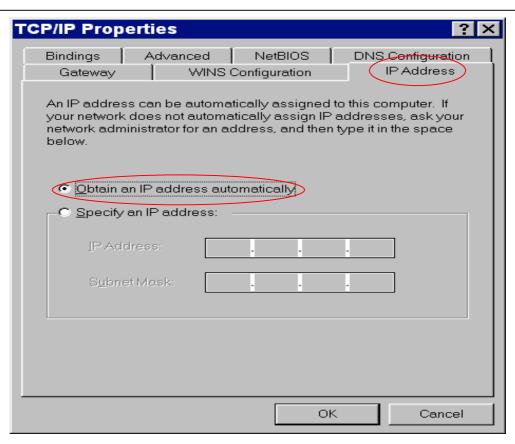


You will be directed back to the Network dialog box, and on the "Configuration" tab, the entry that includes TCP/IP -> followed by the Ethernet card installed in your computer will appear in the list of installed network components.

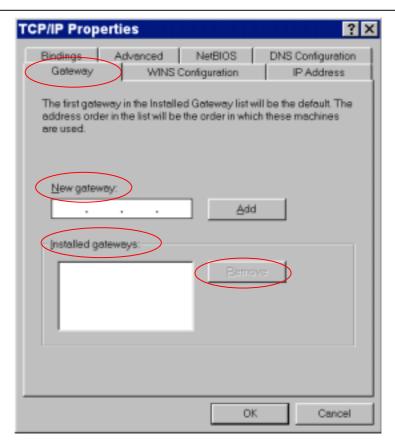
Step 6:Click TCP/IP -> followed by the Ethernet card installed in your computer, and then click "Properties". The TCP/IP Properties dialog box will appear.



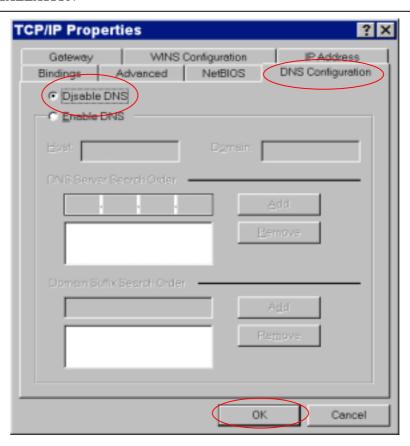
Step 7:In the TCP/IP Properties dialog box, please follow the directions below: Click "IP Address" tab to bring it to the front, and then click "Obtain an IP address automatically" on the tab.



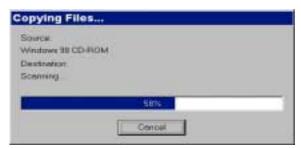
Step 8:Click "Gateway" tab to bring it to the front. On this tab, leave the "New gateway:" blank. If there is the entry in the "Installed gateway:" list, click it and then click "Remove" to remove all installed gateways.



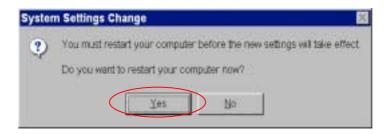
Step 9:Click "DNS Configuration" tabs to bring it to the front, and click "Disable DNS", then click "OK" to close the dialog box.



Step 10:The Copying Files dialog box will pop up and the system will start copying files from Windows. At the first time you will be asked to insert the Windows 98 CD-ROM (or diskette) into the CD-ROM drive (or floppy diskette drive) during the files copying, and follow the instructions when they show up, then click "**OK**". You will be prompted by another Copying Files dialog box. Please type the command line that Windows 98/Me files located in the dialog box (For example, D:\win98). Click "**OK**" to continue the files copying.

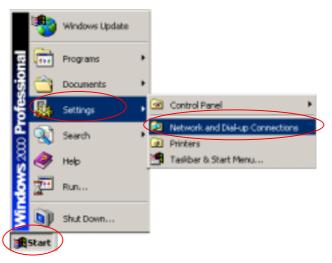


Step 11:Windows will appear the System Settings Change dialog box and ask you if you would like to restart your computer. Click "Yes".



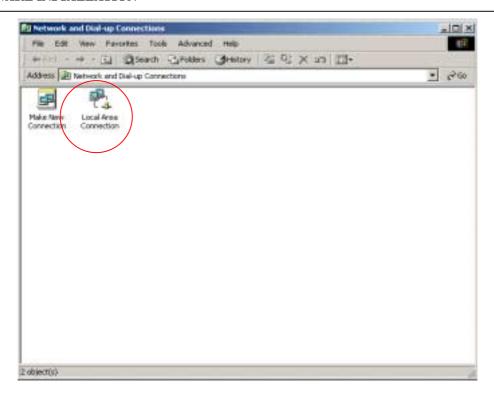
3.3.2 Configuration on Windows 2000/XP

Step 1:Click "Start" button on your computer's taskbar, point to "Settings", and then click "Network and Dial-up Connections".

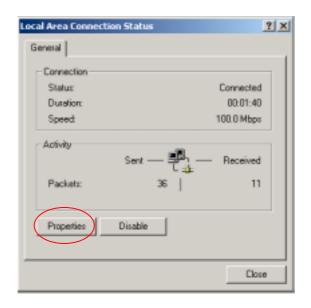


Step 2:The Network and Dial-up Connections window will show up. Doubleclick "Local Area Connection" icon in the Network and Dial-up Connections window.

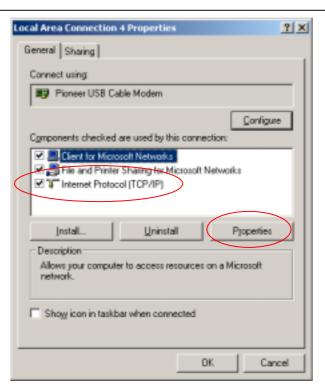
SOFTWARE INSTALLATION



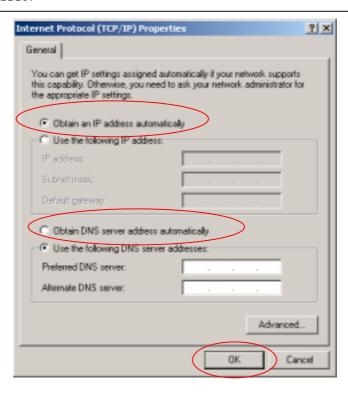
Step 3: The Local Area Connection status window will show up. Click the "Properties" button.



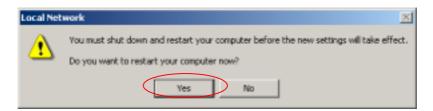
Step 4:Click "Internet Protocol (TCP/IP)" and then click "Properties".



Step 5:The Internet Protocol (TCP/IP) Properties dialog box appears. Click "Obtain an IP address automatically". Click "Obtain DNS server address automatically". Click "OK" to close the dialog box.



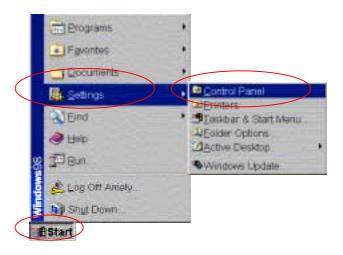
Step 6: Windows will appear the System Settings Change dialog box and ask you if you would like to restart your computer. Click "Yes".



4. UNINSTALL THE USB DRIVER

4.1 For Microsoft Windows 98/Me Users

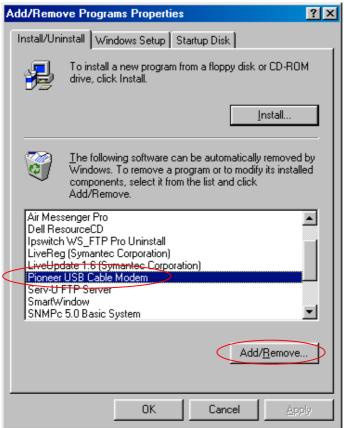
Step 1:Click the "Start" button on your computer's taskbar, point to Settings", and then click "Control Panel".



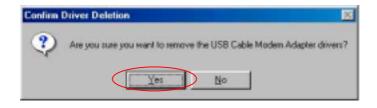
Step 2: The Control Panel window will show up. Double-click the "Add/Remove Programs" icon in the Control Panel window.



Step 3: Select "USB Cable Modem Adapter". Click the "Add/Remove" button.



Step 4: Click the "Yes" button.

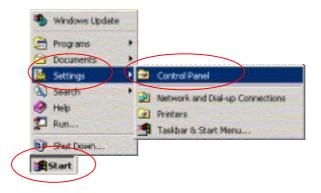


Step 5: Unplug the USB cable and click the "OK" button.



4.2 For Microsoft Windows 2000/XP Users

Step 1:Click the "Start" button on your computer's taskbar, point to Settings", and then click "Control Panel".

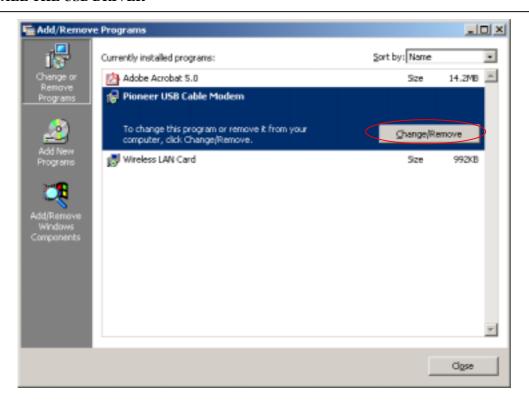


Step 2: The Control Panel window will show up. Double-click the "Add/Remove Programs" icon in the Control Panel window.

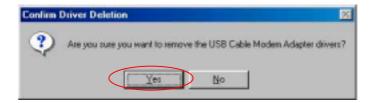


Step 3: Select "USB Cable Modem Adapter". Click the "Change/Remove" button.

UNINSTALL THE USB DRIVER



Step 4: Click the "Yes" button.



Step 4: Unplug the USB cable and click the "OK" button.



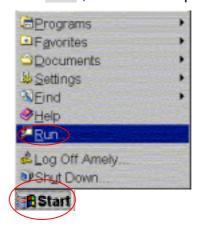
5. DHCP SERVER

PC connected to the cable modem can automatically get a private IP address from the DHCP server of cable modem before cable modem is on line.

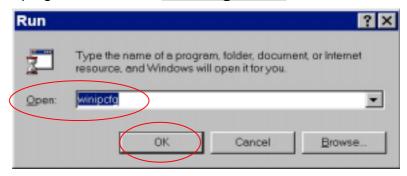
The following steps will show you how to get an IP address from DHCP server of cable modem before cable modem is on line.

5.1 For Microsoft Windows 98/Me Users

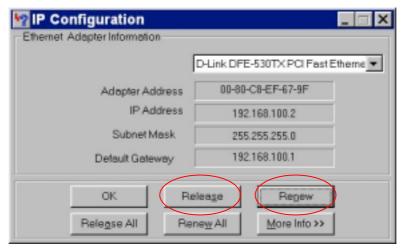
Step 1: Click "Start", point to "Run", and click to open the "Run" windows.



Step 2: Enter "winipcfg" in the "Open" field. Click "OK" to execute the winipcfg and show the "IP Configuration" window.

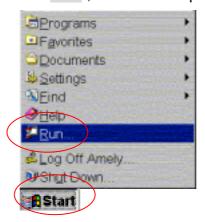


Step 3: Select the "**Ethernet adapter**" to show the IP address. Press "**Release**" and "**Renew**" if the PC is not accessing the Internet. After the cable modem is on line, you need to press the "**Release**" and "**Renew**" to get a new IP address from your ISP's server.

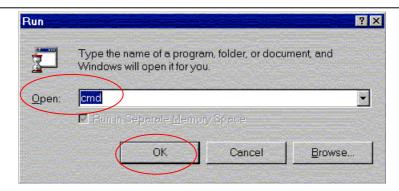


5.2 For Microsoft NT 4.0/Windows 2000/XP Users

Step 1: Click "Start", point to "Run", and click to open the "Run" windows.



Step 2:The Run dialog box appears. Type "cmd" in the "Open" field, and then click "OK" to execute the command.



Step 3: You will enter the dos mode, type "**ipconfig**", press "**Enter**" on your keyboard, and you will see the IP address your computer get from the cable modem.

Step 4: If PC is not access Internet, type "**ipconfig /release**", and press "**Enter**" on your keyboard to release the IP.

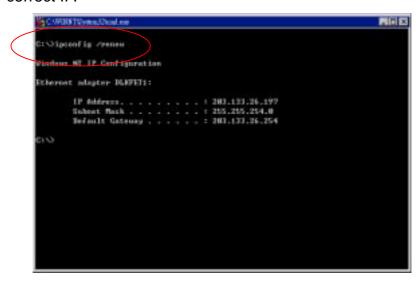
```
C:\Dignorfig /release

Visitur No if Configuration

[P address 283.133.26,197 surcessfully released for adapter "BLAPETI"

C:\D_*
```

Step 5:Type "**ipconfig /renew**", and press "**Enter**" on your keyboard to renew the IP. You can repeat the steps until your computer get the correct IP.



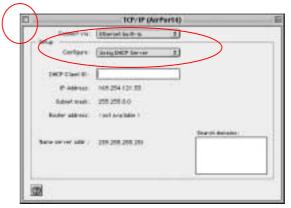
5.3 For Apple Macintosh Users

Step 1: Click "Apple menu", point to "Control Panels", and click "TCP/IP" to open the "TCP/IP" window.

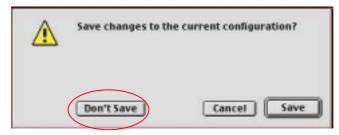


Step 2:If the iMac get an invalid IP, select "Using DHCP Server" in "Configure" field.

Click the "Close box" at the upper left corner to close the "TCP/IP" window



Step 3: Click the "Save" in the prompted message box.

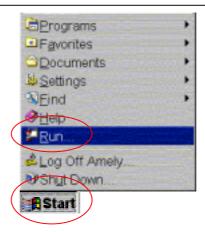


Step 4: You need to wait about 2 minutes and open "TCP/IP" window to see the new TCP/IP status...

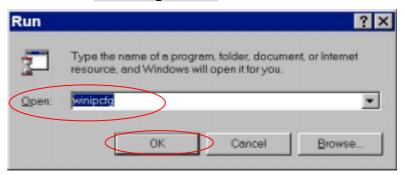
5.4 Renew PC IP Address

There is a chance that your PC does not renew its IP address after cable modem is on line and the PC cannot access the Internet. Please follow the procedures below to renew PC's IP address after the cable modem is on line.

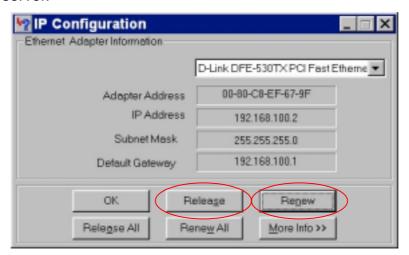
Step 1: Click "Start", point to "Run", and click to open the "Run" windows.



Step 2: Enter winipcfg in the "Open" field. Click "OK" to execute the winipcfg and show the "IP Configuration" window.



Step 3: Select the "Ethernet adapter" to show the IP address. Press "Release" and "Renew" to get a new IP address from your ISP's server.

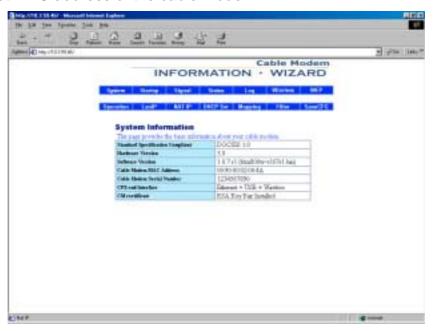


Step 4: Select the "OK" to close the IP Configuration window.

6. WEB SERVER

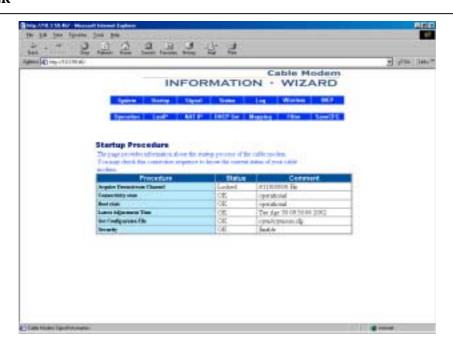
6.1 System

This page shows the basic information about your cable modem. You can get the H/W and S/W version of the cable modem. It also shows the Ethernet MAC address of the cable modem.



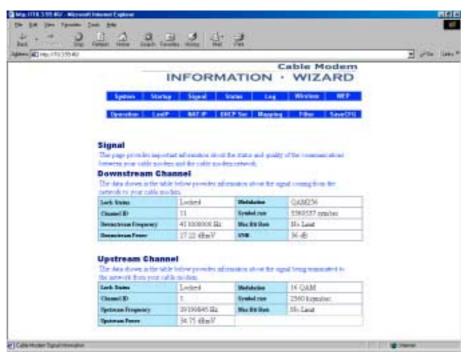
6.2 Startup

This page provides information about the startup process of the cable modem. You may check this connection sequence to know the current status of your cable modem. It will display the current downstream frequency the cable modem locks on.



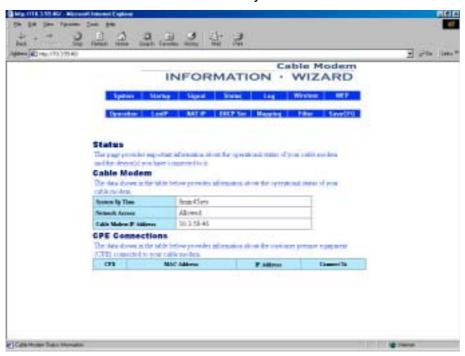
6.3 Signal

This page provides important information about the status and quality of the communications between your cable modem and the cable modem network.



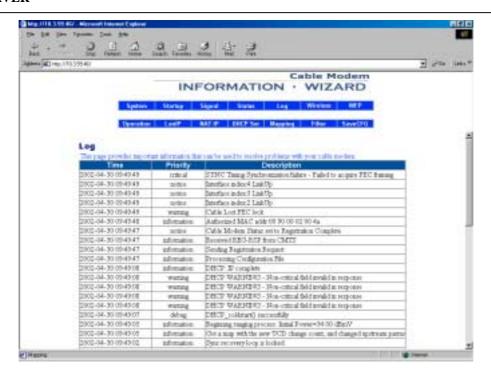
6.4 Status

This page provides important information about the operational status of your cable modem and the devices that you have connected to it.



6.5 Log

This page provides important information that can be used to resolve problems with your cable modem.

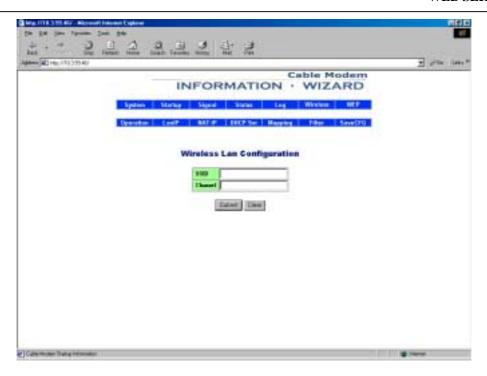


6.6 Wireless

This page provides wireless connectivity within a range of several hundreds feet and acts as a bridge between your wired LAN and wireless PCs. This section shows you how to configure the wireless LAN setting.

Wireless SSID (Service Set Identity): A name that uniquely identifies a wireless network. All clients that want to communicate with the Broadband Wireless Router (AP) must have the same SSID as it.

Desired Channel: The frequency in which the radio links are about to be established. Usually the clients will scan the whole operable channels and then select the desired communications channel automatically.



6.7 WEP

The privacy security function can enhance media security by encryption technology. All clients must set the same encryption key to maintain the tightened communication with the Broadband Wireless Router (AP) properly. To turn on the privacy function:

Authentication Algorithm: Select **Enable WEP** as the authentication type.

Select Enable WEP: Open Key

If Open Key is selected as the authentication type, a wireless station can associate to any wireless network available in the air and receive any messages that are not encrypted.

Note: Open Key is also referred as Open System in some models.

Disable WEP: Shared Key

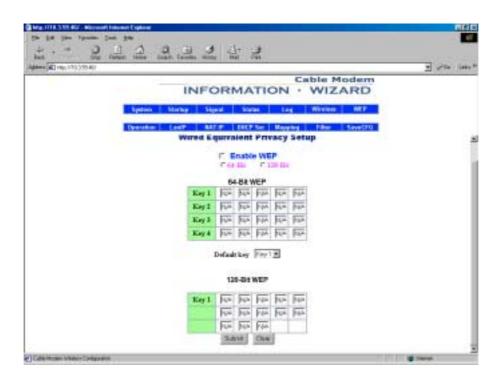
With shared key authentication, only those wireless stations that possess the correct WEP keys can join the wireless network.

WEP Encryption

To enable WEP encryption function, select your encryption length as 64-Bit or 128-Bit.

When entering your WEP keys, notice that your WEP keys must be comprised of hexadecimal characters (0-9, A-F, and a-f) and must contain 10 characters for 64-bit WEP Keys or 26 characters for 128-bit WEP keys.

Default Tx Key: Select one WEP key from the four keys to encrypt the data you transmit.



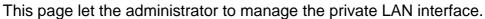
6.8 Operation

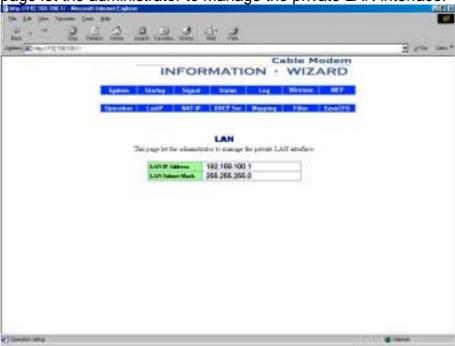
Setting the run mode, save configuration parameter and roboot.

Cable modem operation mode default is router mode.



6.9 LanIP

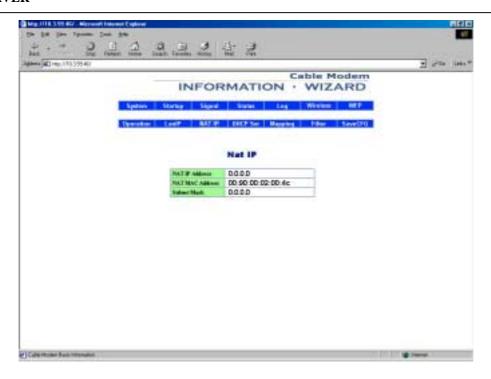




6.10 NAT IP

This page shows NAT IP Address, NAT MAC Address and Subnet Mask.

The LAN configuration allows you to set the private IP address and Subnet mask information of Ethernet side.

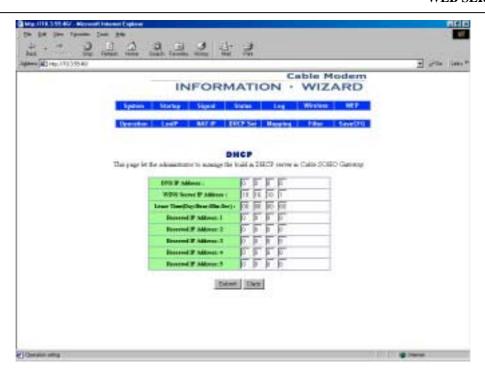


6.11 DHCP Svr

This page let the administrator to manage the build in DHCP server in Cable SOHO Gateway.

Dynamic Host Configuration Protocol (DHCP) dynamically assigns private IP addresses within its local network. It can lease the IP addresses for a user-defined amount of time.

In our DHCP server, we can provide the information with lease time, domain name, client, DNS, and WINS server IP for local CPEs. We can also reserve some specific IP for the use of internal servers.



6.12 Mapping

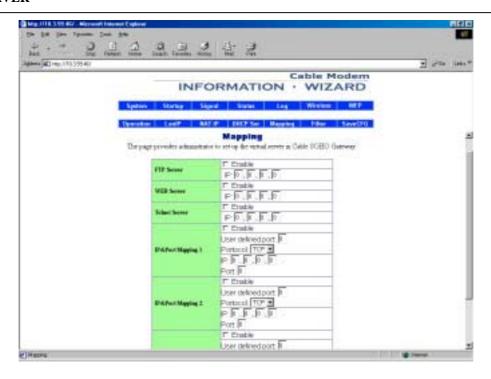
The page provides the administrator to set up the virtual server in the Cable SOHO Gateway. It provides the user of public network to access the certain service (such as FTP, Web, Telnet by utilizing application view) within private network.

It also provides the function of IP and Port redirection. For example, we set up web server in internal server (IP: 192.168.100.5) and redirect the web server from TCP/8080 port as following setting:

User defined port (8080) is virtual port.

IP (192.168.100.5) is internal server IP.

Port (80) is internal server port.

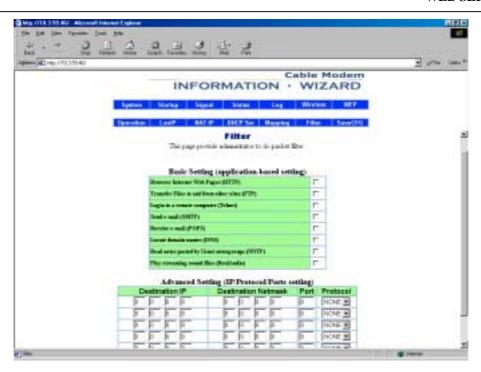


6.13 Filter

The IP packet filters allow you to filter outbound packets that leave from the Cable SOHO Gateway.

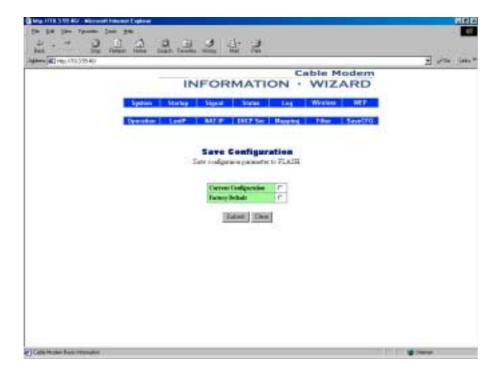
Basic Setting can let you do the filtering according to application protocol types, such as HTTP, FTP, Telnet, SMTP, POP3, DNS, NNTP, and RealAudio.

Advance Setting can be set to check packets according to the combination of destination IP, netmask, port, and protocol type.



6.14 SaveCFG

You can save configuration parameter to FLASH.



7. FAQ

Q1.Can I switch between a notebook and PC using the same cable modem? Will there be a problem to obtain a DHCP IP address?

A. This issue depends on how your cable modem service provider manages the modems. If you are using one of the cable modem service providers that register your PC based on the MAC address of the Ethernet card in the PC, then you will have to call them and have them change that entry every time you switch between the two. Ask them if you have problem on this issue.

Q2.Can I use the same cable line for TV and cable modem?

A. Yes, the TV and cable modem uses the cable line. You need a splitter to use them at the same time. Ask Cable Company to install the splitter for you to avoid signal degradation.

Q3. My cable modem cannot get a solid green light on the Status LED when I connect the cable back.

A. The cable modem lost the signal during the disconnection period and it will keeps scanning other available signal. When you connect the cable back, it might take a while to find the correct channel. You can power cycle the modem to speedup the process since modem will remember the channel last time and it will start from that channel at startup.

Q4. Which port of the Ethernet hub should I connect to the modem if I need to connect multiple PC to the modem?

A. You should connect the modem to the up-link port of the hub. The link LED of the hub will be on.

Q5. How do I see my IP address?

A. If you are using Windows 95/98/Me, the winipcfg command will show you to IP address of the PC connected to the cable modem. Notice that even though you seem get the same address all the time, it may still be a dynamic address.

Q6. Can I just connect the cable modem and two computers to a hub?

A. Yes. You need to make sure you can get two IP addresses from your cable modem service provider. Connect the modem to the up-link port of the hub.

Q7. I have a cable modem. How can I make it work?

A. Basically, modem is plug and play. You can just connect the modem and you are ready to go if you have the subscription. For ensure good signal for your cable modem, you should ask your cable provider to install the cable modem for you.

FCC Caution

- **1.**The 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.
 - (2) This device must accept any interference received, including interference that may cause undesired operation.
- 2. FCC RF Radiation Exposure Statement: The equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
- **3.** This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- 4. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.