Orion 2000

Cable Router

User's Guide

Rev. 1.2a

Firmware 2.59.2004

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Contents

1. Before You Begin

Your new cable modem provides high-speed access to the Internet by an active Internet Connection through your cable service provider. This user guide describes how to set up and use the cable modem. Before installing the cable modem, you should read this user guide to ensure proper cable modem operation.

Understand the Cable Modem's Features

Your cable modem has the following features to help you access and use the Internet:

- Two-way design allows the cable modem to send and receive data over the cable television network.
- Cable bandwidth allows data rates of up to 38 megabits per second (Mbps)*, which is faster than analog modems, integrated services digital network (ISDN), or asymmetric digital subscriber line (ADSL).
- Using your cable line means that the cable modem is always on, always connected, and does not tie up your phone line.
- Plug-and-play operation through universal serial bus (USB) ensures easy setup and installation.
- Data Over Cable Service Interface Specification (DOCSIS™) compliance ensures interoperability with DOCSIS compliant cable operators.

**NOTE: Speeds may vary based on the following factors:*

- *Computer equipment including available RAM and processor speed*
- *Software applications utilizing your computer's resources*
- *Network traffic depending on the time of day*
- *Limitations set by your Cable Service Provider*

Contact Your Local Cable Operator

Before installing you new cable modem, you must contact your local cable service provider to activate your Internet account. Be sure to have the cable modem's MAC address available, which can be found on the underside of the cable modem.

Prepare Your Area for Cable Modem Installation

Before installing your cable modem, you should first prepare your area. To do this:

1. Locate your cable outlet and ensure that it is located within proper distance of your cable modem and computer. Be sure not to bend the cable as this may strain the connector and cause damage.
2. Ensure that the temperature in the room where the cable modem will be operating is between 0 and 40°C (32 and 104°F)

Gather Supplied and Required Items

You will use a variety of items to install your cable modem. Some of the items are supplied with your cable modem.

Supplied

Verify that these items were included in the cable modem's package:

- cable modem
- Power adapter
- USB cable (1.5m)
- Ethernet cable (1.8m)
- CD containing USB drivers
- This user guide

Not Supplied

Verify that these items are available before beginning the installation:

- If using the cable modem's USB port:
  - A PC running Windows 98® Second Edition (SE), Windows Me, Windows 2000, or Windows XP. The cable modem's USB setup does not support the Macintosh ® operating system, Windows 98 First Edition, and NT.
  - Windows 98 SE, Windows Me, Windows 2000, or Windows XP CD or diskettes.
  - An active USB port on your PC.

- If using the cable modem's Ethernet port:
  - A PC running Windows 95 (or later) operating system or a Macintosh computer running system 7.6 (or later) operating system

- An active Ethernet port on your PC or Macintosh

Be sure to follow the instructions provided for the port that you want to use.

Using the USB port allows you to install the cable modem more quickly and easily than using the Ethernet port, because you do not have to install and configure a network interface card (NIC).

USB, however, only enables you to connect one computer to the cable modem. Using the Ethernet port allows you connect multiple computers to a cable modem through the use of additional equipment that is not included. Please contact your cable service provider for more information on using multiple computers.

Chapter 2 provides instructions for installing your cable modem using the USB port.
Chapter 3 provides instructions for installing your cable modem using the Ethernet port.

2. Installing the Cable Modem Using the USB Port

This chapter explains the process for installing your cable modem using the USB port. First, you will install the hardware (cable modem, USB cable, coax cable, and power adapter). You will then install the cable modem drivers and verify that the modem is functioning properly.

NOTE: The cable modem's USB setup does not support the Macintosh® operating system, Windows 95 & NT.

Using the USB port allows you to install the cable modem more quickly and easily than using the Ethernet port, because you do not have to install and configure a network interface card (NIC).

USB, however, only enables you to connect one computer to the cable modem. Using the Ethernet port allows to you connect multiple computers to a cable modem using additional equipment which is not included. Please contact your cable service provider for more information on using multiple computers.

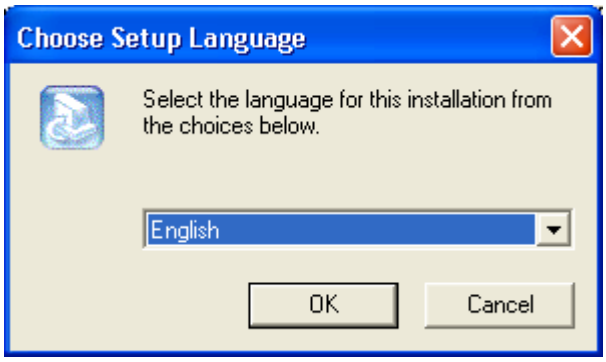
Installing the Software Drivers Before Hardware Connection

CAUTION: You should run the "Setup.exe" program first before you connect USB cable to PC.

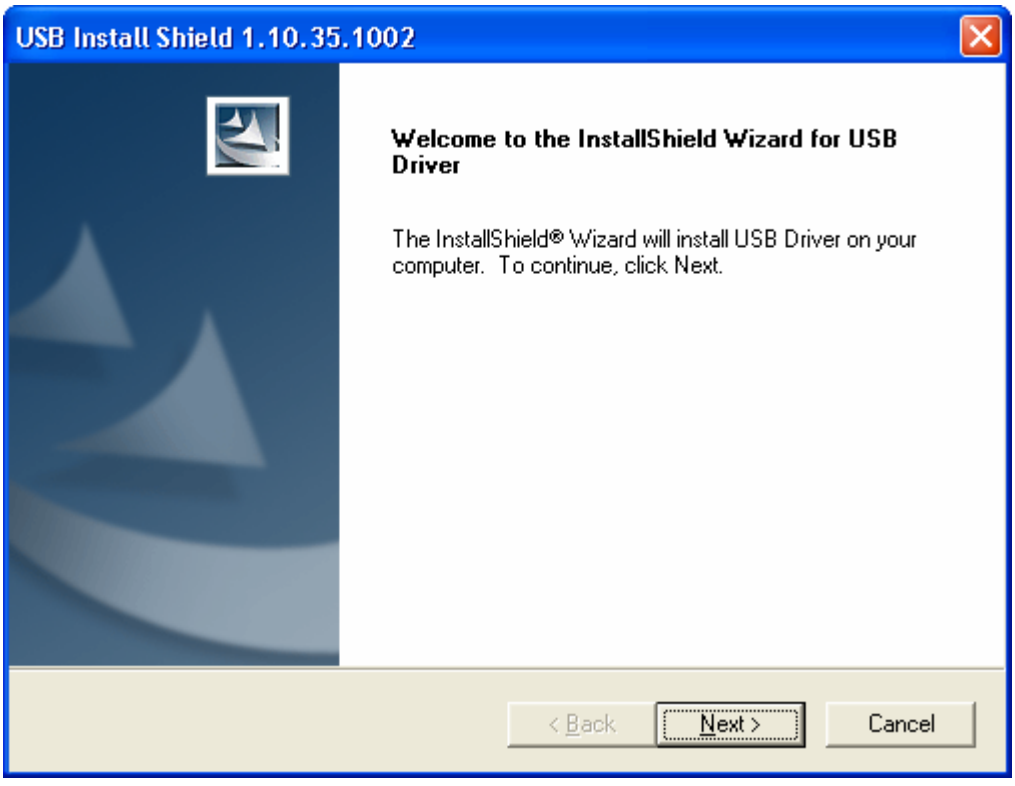
To install the cable modem software drivers using the Windows operating system:

1. Double click the “Setup.exe” program in the CD.

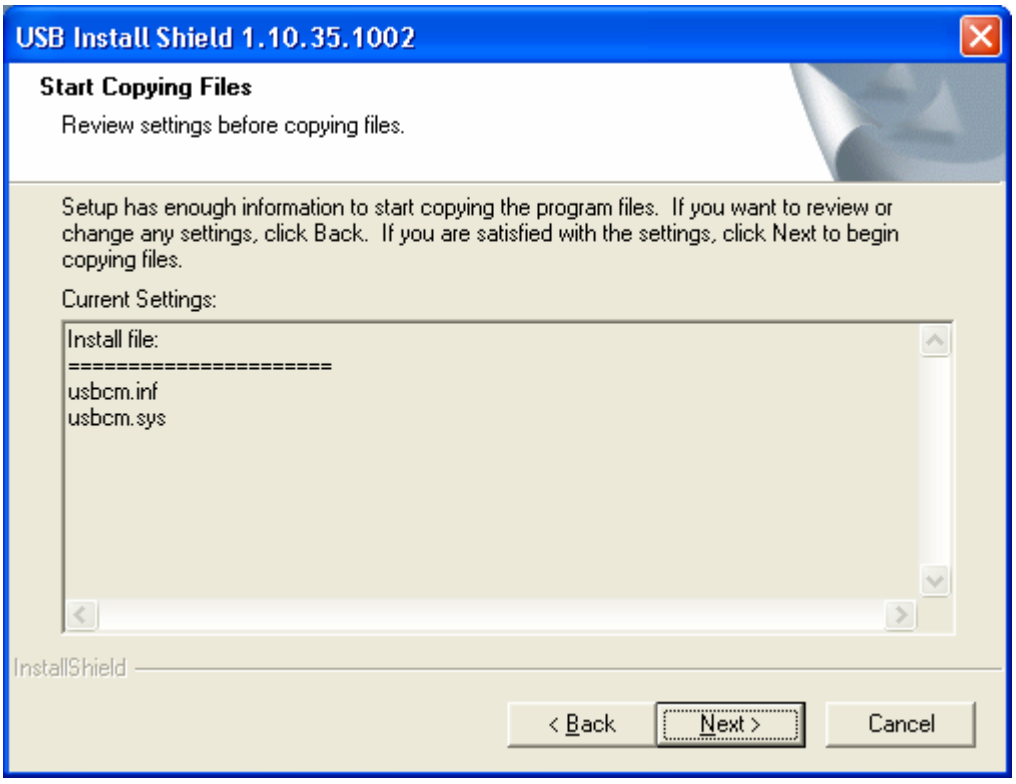
2. Then the “Choose Setup Language” screen appears. You can choose the language you need and click “OK”.



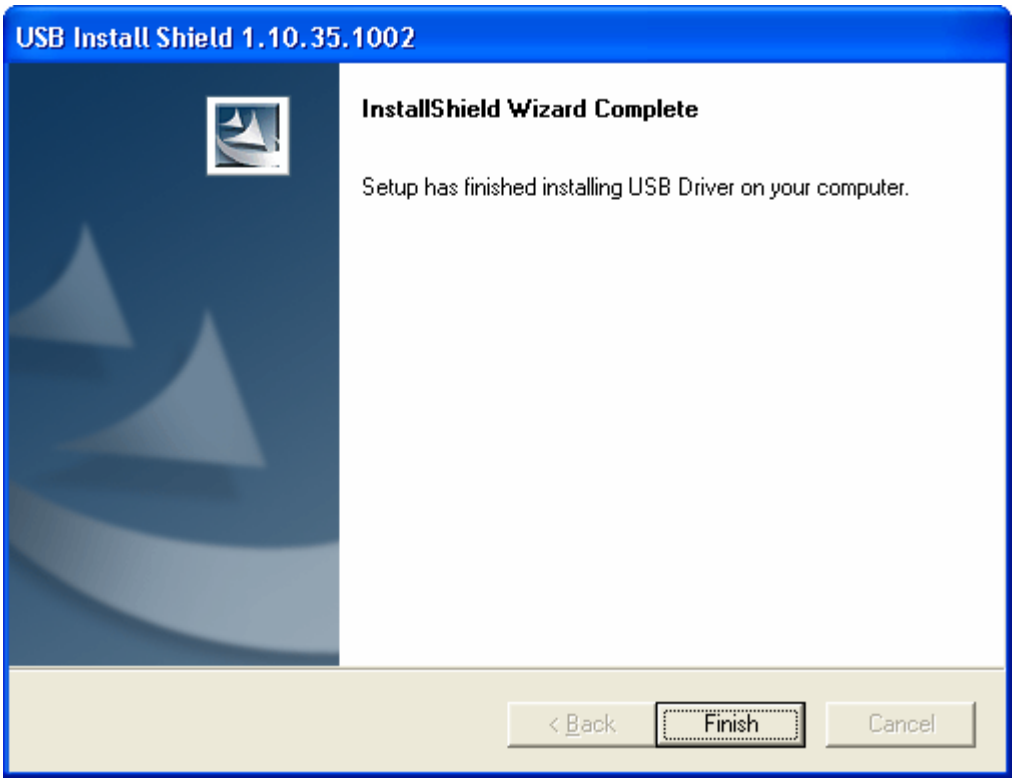
3. You will see the following Welcome screen.



4. Click “Next>”. You will see the following Start screen.



5. Click “Next>”. You will see the following ‘Complete’ screen.



6. Click "Finish". You will see below screen, and then select '*Yes.*' Now you can connect the USB cable to the PC by following next section instructions.

Installing the Hardware

This section explains how to connect the cable modem to the computer, wall outlet, and electrical outlet.

To install the hardware:

1. Power off the computer
2. Connect one end of the coaxial cable to the cable modem's cable connector. Connect the other end of the coaxial cable to the cable wall outlet. Be sure not to bend or over tighten the cables as this may strain the connector and cause damage. If you plan to connect the cable modem and television to the same wall outlet, you must use a cable line splitter (not included).
3. Connect one end of the USB cable to the cable modem's USB port and the other end of the cable to the USB port on the PC.
4. Plug the cable modem's power adapter into the cable modem's power jack and into a wall outlet

or surge protector.

5. You are now ready to install the software drivers.

Installing the Software Drivers

This section explains how to install the software drivers that your PC requires for the cable modem to operate.

Installing the Software Drivers in Windows 98 SE Operating System

CAUTION: You must install the drivers located on the CD that ships with your cable modem. If you use the default Windows-supplied software drivers, you will not be able to properly install the cable modem.

To install the cable modem software drivers using the Windows 98 operating system:

1. Power on your PC. After your computer boots, Windows detects the cable modem. The Found New Hardware screen appears, followed by the Add New Hardware Wizard screen.

2. Insert the CD into the PC's CD-ROM and click *Next*. You will see the following screen.

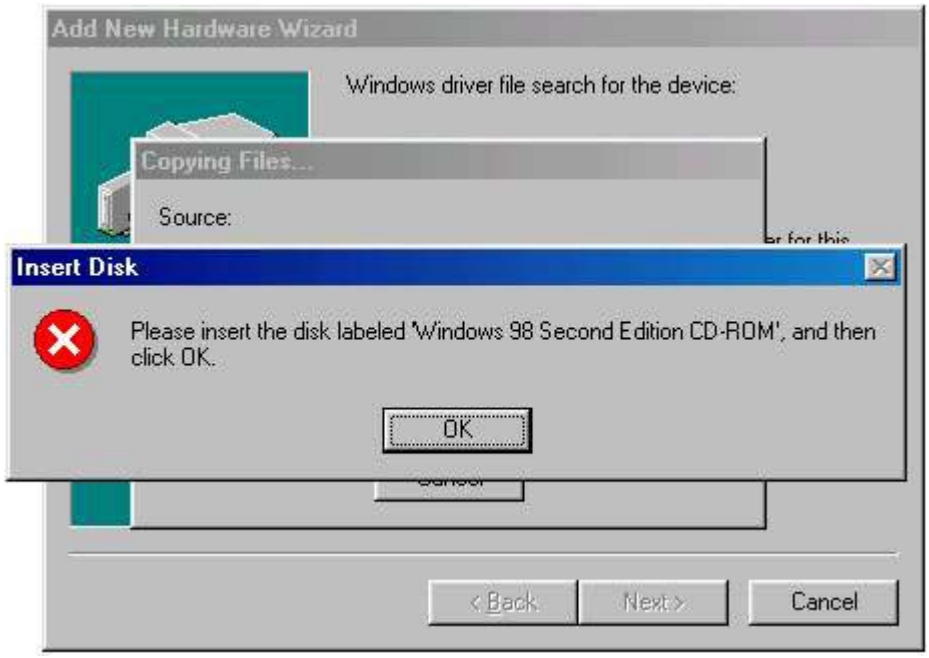
3. Select *Search for the best driver for your device (Recommended)*. Then select *Next*. You will see the following screen.

4. Check the *CD-ROM drive* check box and verify that the CD is in the CD-ROM drive. Click *Next* to have Windows search for the necessary driver files. You will see the following

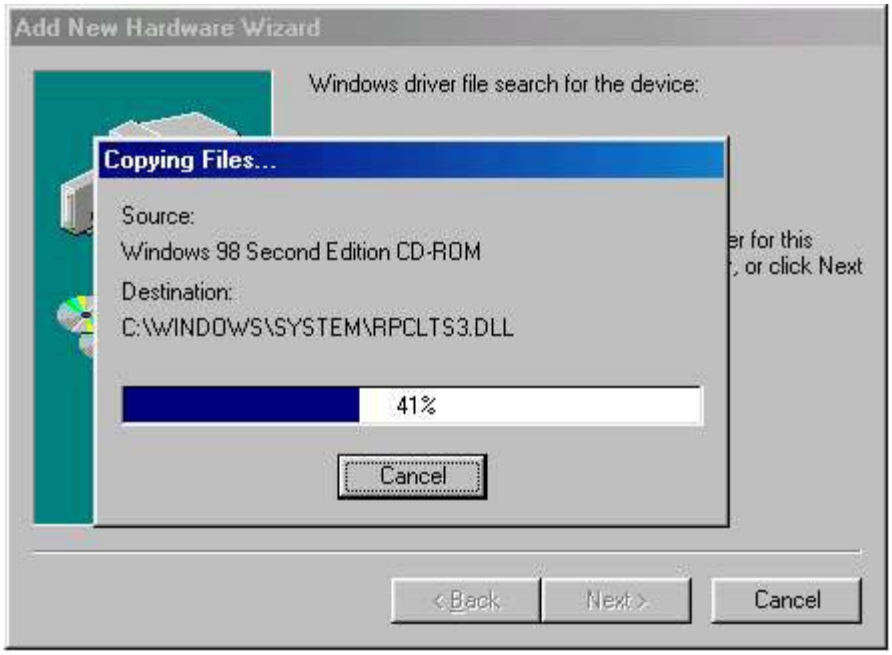
5. Select *the updated driver (Recommended) Ambit USB Cable Modem* and click next. You will see the following screen.

CAUTION: You must verify that Ambit USB Cable Modem appears on the screen. If USB Composite Device appears, you must click *Back* twice and specify the correct location of the driver files. DO NOT proceed if USB Composite Device is displayed in the above window. Contact your cable provider for further assistance.

6. Click *Next*. The computer automatically installs the necessary driver files. You may see the following screen



7. If the above screen appears, you must insert the Windows 98 CD so that Windows can copy the remaining files.



8. After files copying is done, you will see the following screen:

9. Click *Finish* to complete the installation. You will see the following screen.

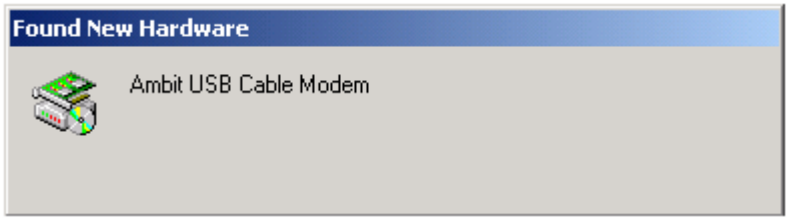
10. Choose *Yes* to restart your computer.

11. After the computer is rebooted, verify that the USB LED is lit on the front of you cable modem. If not, refer to the troubleshooting section later in this chapter.

Installing the Software Drivers in Windows Me Operating System

To install the cable modem software drivers using the Windows Me operating system:

1. Power on your PC. After your computer boots, Windows detects the cable modem. The Found New Hardware screen appears, followed by the Found New Hardware Wizard screen.



2. Insert the CD into the PC's CD-ROM and click *Next*. You will see the following screen.

3. Select *Automatic search for a better driver (Recommended)* and click *(Next)*. The computer automatically copies the necessary driver files from the CD. You will see the following screen.

4. Click *Next*. The computer automatically installs the necessary driver files.

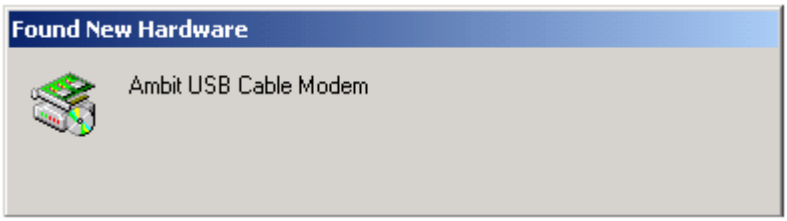
5. Click *Finish* after the computer has copied the necessary files. You will see the following screen.

6. Click *Yes* to restart the computer

Installing the Software Drivers in Windows 2000 Operating System

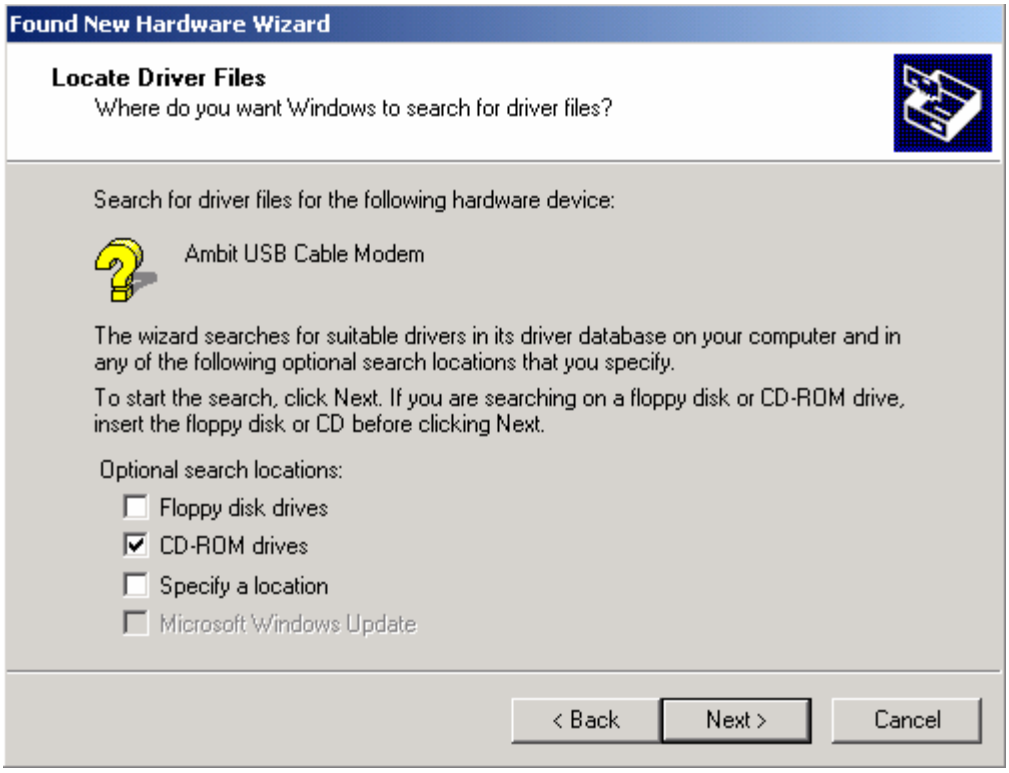
To install the cable modem software drivers using the Windows 2000 operating system:

1. Power on your PC. After your computer boots, Windows detects the cable modem. The Found New Hardware screen appears, followed by the Found New Hardware Wizard screen.



2. Insert the CD into the PC's CD-ROM Drive and click *Next*. You will see the following screen.

3. Select *Search for a suitable driver for my device (recommended*. Then select *Next*. You will see the following screen



4. Check the *CD-ROM drive* check box and verify that the CD is in the CD-ROM drive. Click *Next* to have Windows locate the necessary driver files. You will see the following screen.

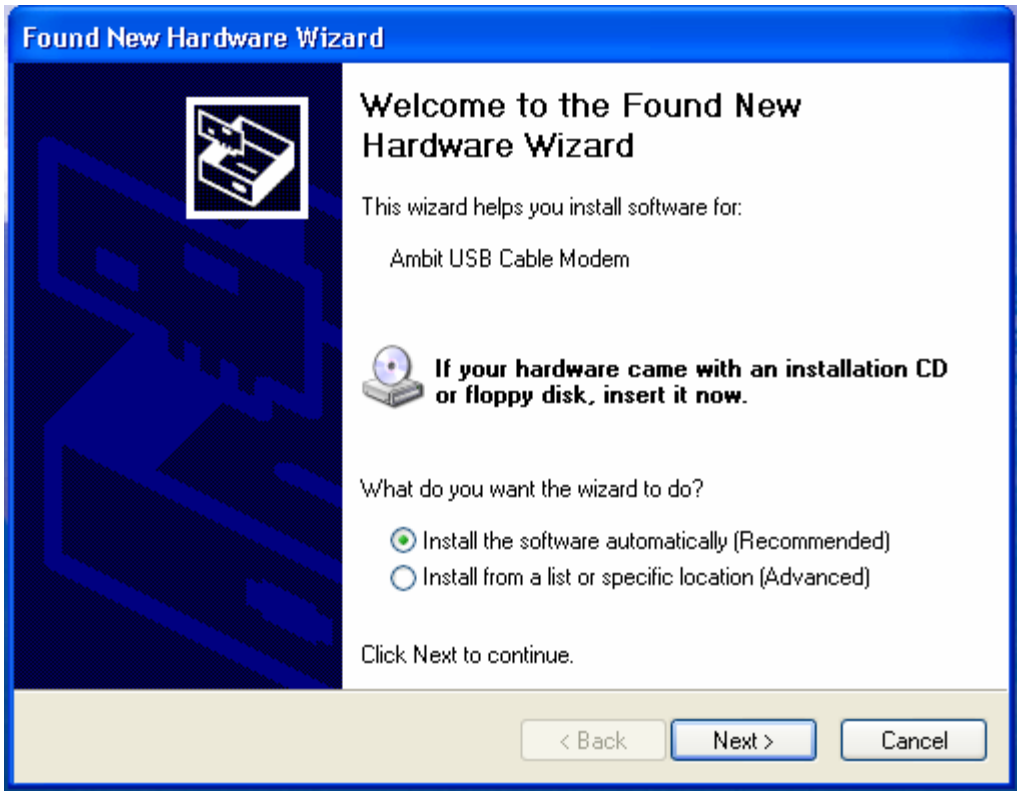
5. Click *Next* to install the driver files for the cable modem. You will see the following screen.

7. Click *Finish* to complete the installation.

8. After the installation is completed, verify that the USB LED is lit on the front of you cable modem. If not, refer to the troubleshooting section later in this chapter.

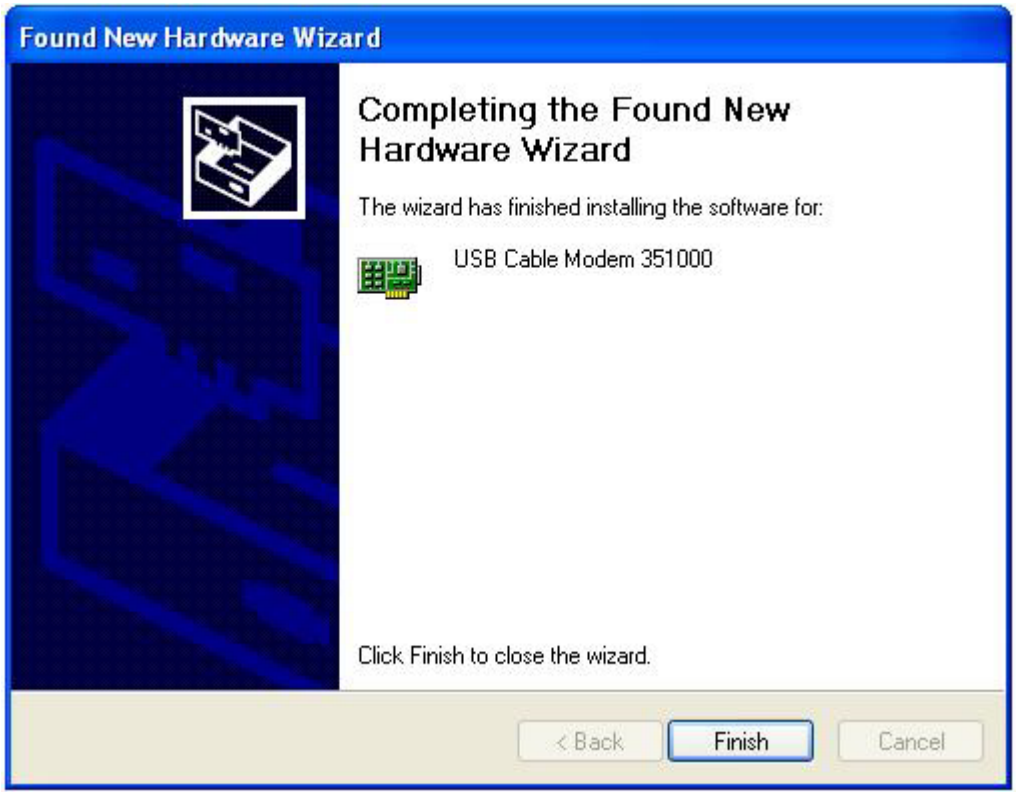
Installing the Software Drivers in Windows XP Operating System

1. Power on your PC. After your computer boots, Windows detects the cable modem. The Found New Hardware screen appears, followed by the Found New Hardware Wizard screen.



2. Choose *the software automatically (Recommended)*. Click *Next* to continue. You will see the following screen.


Found New Hardware Wizard
Please wait while the wizard installs the software...
USB Cable Modem 351000
usbcm.sys
To C:\WINDOWS\System32\DRIVERS
< Back
Next >
Cancel


Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
USB Cable Modem 351000
Click Finish to close the wizard.
< Back
Finish
Cancel

3. Click *Finish* to complete the installation.

Troubleshooting the USB Installation

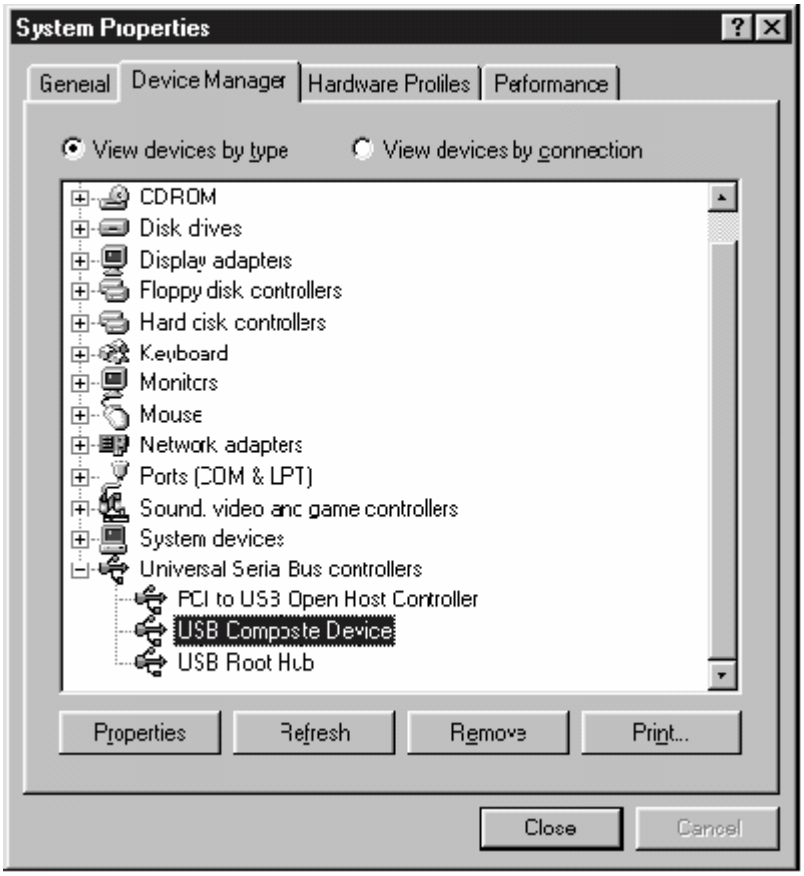
None of the LEDs is on when I power on the LAN Cable Modem.

Check the connection between the power adapter and the cable modem. Power off the LAN Cable Modem and wait for 5 Seconds and power on the modem again. If the problem still exists, you may have a hardware problem.

When attempting to install the USB driver in Windows 98 SE, I receive the following error message: Device not installed at this time. Driver not found.

This usually occurs when the wrong driver has been installed. To remove the wrong driver and install the correct driver:

1. Right-click on the *My Computer* icon on your desktop and choose *Properties*.
2. Click the *Device Manager* tab
3. Click the plus sign next to *Universal Serial Bus controllers* to view the list of installed USB

device drivers 

4. Select *USB Composite Device* and click *Remove*
5. Click *Refresh*

The Add New Hardware Wizard window appears, displaying the device name *USB Composite Device*. Refer to the proper operating system instructions in this chapter for information on reinstalling the driver properly.

All of the LEDs on the front of my modem look correct, but I cannot access the Internet.

- If the POWER, USB, SYNC, and READY are solidly lit, the cable modem is working properly. Use the following procedures to verify connectivity between the PC and the cable modem:
  - Launch Your PC's Internet Browser (e.g., Netscape, IE)
  - Enter http://192.168.100.1 into your browser. This URL connects you directly to the web server within your cable modem. A successful connection indicates that the PC is able to communicate with the cable modem. The next step is to enter a public URL to ensure connectivity between the cable modem and your cable service provider. If this fails, please contact your cable service provider for further assistance.

- Try restarting the computer so that it could re-establish a connection with the cable modem.
- Power cycle the cable modem by removing the power adapter from the electrical outlet and plugging it back in. Wait several minutes for the cable modem to re-establish communications with your cable service provider.
- Remove any other USB devices from your computer and connect the cable modem's USB cable directly to the USB port on your computer.
- If you are using a cable splitter, try removing the splitter and connect the cable modem directly to the cable wall outlet. Wait several minutes for the cable modem to re-establish communications with your cable service provider.
- Your USB or coaxial cable may be damaged. Try using another cable.
- If none of these suggestions work, contact your cable service provider for further assistance.

Uninstalling the USB Driver

1. Insert the supplied CD into your CD-ROM drive
2. Click on the *My Computer* icon on your desktop. Then click on the icon that belongs to your CD-ROM Drive.
3. Locate the file called "Uninstall" and click on the file. This program will remove all the necessary files from you computer.

3. Installing the Modem Using the Ethernet Port

This chapter explains the process for installing your cable modem using the Ethernet port. Using the Ethernet port allows to you connect multiple computers to a cable modem using additional equipment which is not included. Please contact your cable service provider for more information on using multiple computers.

See Chapter 2 "Installing the Cable Modem Using the USB Port" for instructions on installing the cable modem using the USB port.

You can use the cable modem's Ethernet port if you have:

- A PC running Windows 95 (or later) operating system or a Macintosh computer running system 7.6 (or later) operating system
- An active Ethernet port on your PC

Before you begin, verify that your Network Interface Card (NIC) has been installed and configured

for use with your cable modem. The cable modem requires TCP/IP to be installed. Contact your cable service provider for assistance with installing and configuring TCP/IP. After installed the hardware, your computer can connect the cable modem directly by using Network Interface Card. Unlike USB installation, there is no needed for software installation for the Ethernet connection.

Installing the Hardware

This section explains how to connect the cable modem to the computer, wall cable outlet, and electrical outlet.

To install the hardware:

1. Power off the computer
2. Connect one end of the coaxial cable to the cable modem's cable connector. Connect the other end of the coaxial cable to the cable wall outlet. Be sure not to bend or over tighten the cables as this may strain the connector and cause damage. If you plan to connect the cable modem and television to the same wall outlet, you must use a cable line splitter (not included).
3. Connect one end of the Ethernet cable to the cable modem's Ethernet port and the other end of the cable to the Ethernet port on the PC or network interface card (NIC).
4. Plug the cable modem's power adapter into the cable modem's power jack and into a wall outlet or surge protector.
5. If the POWER, ENET, SYNC, and READY LEDs are solidly lit, the cable modem is working properly.

Troubleshooting the Ethernet Installation

None of the LEDs are on when I power on the Cable Modem.

Check the connection between the power adapter and the cable modem. Power off the Cable Modem and wait for 5 seconds and power on the modem again. If the problem still exists, you may have a hardware problem.

The ENET LED on my cable modem is not lit.

- Try restarting the computer so that is could re-establish a connection with the cable modem.
- Check for a resource conflict (Windows users only). To do this:
    1) Right-click on the *My Computer* icon on your desktop and choose *Properties.*

2) Click the *Device Manager* tab and look for a yellow exclamation point or red X over the NIC in the *Network Adapters* field. If you see either one, you may have an IRQ conflict. Refer to the manufacturer's documentation or you cable service provider for further assistance.

- Verify that TCP/IP is the default protocol for your network interface card (NIC)
- Power cycle the cable modem by removing the power adapter from the electrical outlet and plugging it back in. Wait several minutes for the cable modem to re-establish communications with your cable service provider.
- Your Ethernet cable may be damaged. Try another cable.

All of the LEDs on the front of my modem look correct, but I cannot access the Internet.

- If the POWER, ENET, SYNC, and READY LEDs are solidly lit, the cable modem is working properly. Try restarting the computer so that is could re-establish a connection with the cable modem.
- Power cycle the cable modem by removing the power adapter from the electrical outlet and plugging it back in. Wait several minutes for the cable modem to re-establish communications with your cable service provider.
- If your PC is connected to a hub or gateway, try connecting the PC directly into the cable modem.
- If you are using a cable splitter, try removing the splitter and connect the cable modem directly to the cable wall outlet. Wait several minutes for the cable modem to re-establish communications with your cable service provider.
- Your Ethernet or coaxial cable may be damaged. Try using another cable.
- If none of these suggestions work, contact your cable service provider for further assistance.

4. Cable Modem LEDs and Connectors

This chapter describes the functions of the cable modem's LEDs and connectors.
When the PWR, SYNC, and READY LEDs are lit, the cable modem is working properly. The USB or ENET LED should also be lit depending on what port is being used.
The following provides an overview of the LED indicator lights on the front of the cable modem and what the LEDs mean.

LEDs on the Front of the Modem

- **power**: Indicates that the cable modem has successfully completed internal power-on tests.
- **usb**: Indicates connectivity between the USB port on the cable modem and the PC's USB port
- **enet**: Indicates connectivity between the ethernet port on the cable modem and the PC's ethernet port.
- **send**: Indicates that data is being transmitted from the cable modem to the cable network.
- **recv**: Indicates that data is being received from the cable network.
- **sync**: Indicates the connection status between the cable modem and the cable network. The LED is lit when the cable modem has established a downstream channel with the cable service provider's Cable Modem Termination System (CMTS).
- **ready**: Indicates that the cable modem has completed the ranging/registration process and is ready to send/receive data.

Installation problems with the cable modem are commonly due to the cable network and its topography. LEDs on the front panel of the cable modem reveal operational status and help you determine problem areas.

Connectors on the Back of the Modem

This list of connectors describes where to connect the cables and power adapter when installing the cable modem.

1. **power**: This is where you plug the include power adapter. Remember to use only the power adapter that came with the cable modem.
2. **usb**: This is where you plug the included USB cable. The other end connects to the USB port on your PC. It is not required when using the Ethernet port.
3. **enet**: This is where you plug the included Ethernet cable. The other end connects to the Ethernet Jack on the PC or NIC. It is not requires when using the USB.
4. **cable**: This is where you connect the coaxial cable (not included) that leads to the cable splitter (not included) or the cable wall outlet.

5. Telnet commands

The Cable Router telnet Login and Password:

Login:

Password:

** *Note: Cable Modem Router Telnet IP address is 192.168.100.1*

Getting Help

Entering a question mark (**?**) at the system prompt displays a list of commands for each command mode. To list keywords or arguments, enter a question mark (**?**) in place of a keyword or argument. Include a space before the **?**. This form of help is called command syntax help, because it reminds you which keywords or arguments are applicable based on the command, keywords, and arguments you already have entered.

CM>**?**

debug	Debugging functions
undebug	Disable debugging functions
image	Image commands
ping	Ping specified IP address
pwd	Change password
user-level	Change User's access right
show	Show commands
nvram	NVRAM command
tftp	Display/Set TFTP information
dhcp	NAT DHCP commands
nat	NAT commands
interface	Interface commands
ip	IP commands
rip	RIP commands
web-access	Web access control command
access-list	Access list command
pppoe-forwarding	PPPoE forwarding command
copy	copy command
cpe-limit	Limit CPE number command
write	Write configuratoin to nvram
reset	Reboot Cable Modem
quit	Disconnect

To list keywords or arguments, enter a question mark (**?**) in place of a keyword or argument. Include a space before the **?**. This form of help is called command syntax help, because it reminds you which keywords or arguments are applicable based on the command, keywords, and arguments you already have entered. This example shows what the **show ?** command displays on an Ambit Cable router:

CM>**show ?**

config-file	Display all options in Configuration file
dhcp	Display all options in DHCP response
version	Display system version information
arp	Display ARP table
ip	Display IP configuration
interface	Display interface information
running-config	Display Cable Router configuration
cpe-info	Display CPE information
downstream	Display current downstream information
upstream	Display current upstream information
rip	Display RIP information
nat	Show NAT commands
user	List login user(s)
access-list	Display access list information
cpe-limit	Display CPE limit information
pppoe-forwarding	Show PPPoE forwarding function status

To complete a partial command, keyword, or argument use the <**Tab**> key. This example shows what how <Tab> key works:

CM**>show inter**<**Tab**>
CM**>show interface**

Redisplaying a command

To redisplay a command you previously entered, press the up-arrow key. You can continue to press the up-arrow key for more commands.

Debug

- **debug**

  Display corresponding message, the protocol debug just show packet information send to or receive from RF interface.

  CM>**debug ?**

console	Display console message
ip	IP information
dhcp	DHCP protocol information
arp	ARP information
l2	Layer 2 information
nat	NAT translation information

  CM>**debug ip ?**

tcp	TCP information
udp	UDP information
icmp	ICMP information
rip	RIP protocol information

  Example:

  CM>**debug ip tcp**

```
TCP:    rcvd src:10.0.0.3(1150)   dst:172.17.100.134(23)   chksum:F368
TCP:    Seq#:1711689473   Ack#:1591494822   dataOffset:20   Flags:10(h)
TCP:    rcvd src:172.17.100.134(23)   dst:10.0.0.3(1150)   chksum:7587
TCP:    Seq#:1591494822   Ack#:1711689473   dataOffset:20   Flags:18(h)
TCP:    rcvd src:10.0.0.3(1150)   dst:172.17.100.134(23)   chksum:F368
TCP:    Seq#:1711689473   Ack#:1591494977   dataOffset:20   Flags:10(h)
TCP:    rcvd src:172.17.100.134(23)   dst:10.0.0.3(1150)   chksum:DC13
```

Undebug

- **undebug**

  Disable debug function

  CM>**undebug ?**

console	Disable console message
ip	IP information
dhcp	DHCP protocol information
arp	ARP information
l2	Layer 2 information
nat	NAT translation information

all Disable all debugging functions

Image

- **image upgrade** *{1|2}*

Download the specified firmware image name from TFTP server and store in as “image 1” or “image 2”. If *{1|2}* is not specified, cable modem will upgrade the other image. (If cable modem boot with image 2, it will upgrade image 1)

Example:

CM>**image upgrade 1**
Downloading ram.compress from 172.146.1.177
.....
Download file size=596407
Board ID is U10C005.00.01_JP01
Compatible list is U10C005.00.01_US01
Match compatible list
Update image 1...
Reboot Cable Modem...

- **image use** *{1|2}*

Activate and boot with the firmware stored in “image 1” or “image 2”.

Ping

- **ping** *{IP address} [-t]*

Ping specified IP address. When [–t] parameter is specified, continually ping until Ctrl-C or Ctrl-Z is pressed. The Ctrl-C key ceases ping and display summery results of ping test. The Ctrl-Z key pauses ping test and display summery results collect from the beginning of ping test.

Example:

CM>**ping 92.146.1.254 -t**
Pinging 92.146.1.254 with 64 bytes of data:
Reply from 92.146.1.254: bytes=64 time=10ms TTL=255 seq=0
Reply from 92.146.1.254: bytes=64 time=10ms TTL=255 seq=1
Reply from 92.146.1.254: bytes=64 time=10ms TTL=255 seq=2
Reply from 92.146.1.254: bytes=64 time=10ms TTL=255 seq=3
Reply from 92.146.1.254: bytes=64 time=20ms TTL=255 seq=4
Reply from 92.146.1.254: bytes=64 time=10ms TTL=255 seq=5
Control-C Pressed...

Ping statistics:
Packets sent: 6; received: 6; Lost: 0 (0% loss)
Round trip time in milli-seconds:
Minimum time: 0ms; Maximum time: 20ms; Average time: 11ms

Password

- **pwd** *{user name}*

Change the password of accessing Telnet command.

Example:

CM>**pwd admin**
Old password:
New password:
Reconfirm:
Change password successfully.

User-Level

- **user-level [user name]** *{1-90}*

Change the password of accessing Telnet command.

Example:

CM>**user-level admin 90**

password:

Change user admin access level to 90.

Change user access level successfully.

Show

- **show config-file**

Display all options declared in DOCSIS that apply to modem configuration file.

Example:

CM>**show config-file**
Network Access: ON
DOCSIS 1.0 Class of Service:
Class ID: 1
Maximum Upstream Channel Transmit Burst : 1600
CM MIC: F1 70 FC 50 47 29 B1 63 E1 93 C4 D1 81 16 2E EC
CMTS MIC: 74 EC 20 12 3F F1 27 89 B7 C6 EE A8 0D B2 6E 68

- **show dhcp**

Display all options provided in DHCP response.

Example:

CM>**show dhcp**
TFTP Server IP address: 92.146.1.250
Cable Modem IP address: 10.146.1.31
Configuration file: chard.cfg
Lease time: 18000 (secs)
UTC time offset: 28800 (secs)
System Log Server IP address: 92.146.1.254
Router IP address: 10.146.1.254
Subnet Mask: 255.255.0.0

- **show version**

Display hardware and software reversion and board ID.

Example:

CM>**show version**

Hardware revision: 1.13
Board ID: U10C009.00.01_US01
Serial number: U10C0090EE672

Bootcode revision: 3.14.1
Software revision: 2.59.2004
Web Page revision: 1.0.1
Software build time: Jan 24 2003 19:28:44

- **show ip route**

Display routing table

Example:

CM>**show ip route**
Route Table:

Index	Destination	Net Mask	Gateway	Metric	Static
1	10.0.0.0	255.0.0.0	172.17.100.254	3	RIP
2	172.17.0.0	255.255.0.0	172.17.100.134	1	connected
3	92.0.0.0	255.0.0.0	172.17.100.254	1	RIP
4	30.0.0.8	255.255.255.248	30.0.0.9	1	connected
5	30.0.0.0	255.0.0.0	30.0.0.9	1	connected

- **show interface**

Display interface information

Example:

CM>**show interface ?**

ethernet	Display ETHERNET interface information
cable	Display CABLE interface information
usb	Display USB interface information

- **show interface ethernet**

Display ethernet interface configuration

Example:

CM>**show interface ethernet**

Interface Ethernet
MAC address: 00D0.5904.5E16
IP address 30.0.0.9 subnet-mask 255.255.255.248
Link status: link
Mode: 10Mbps, half-duplex
RIP status: Enable
RIP send version: 2

- **show interface cable**

Display cable interface information

Example:

CM>**show interface cable**

Interface Cable
MAC address: 0008.0E86.1118
IP address 10.71.135.99 subnet-mask 255.255.240.0

Downstream information
FEC Lock : Locked
Downstream Frequency : 561000000 Hz
Downstream Modulation : 64 QAM
Downstream Interleave Depth : 32
Downstream Receive Power Level : -1.18 dBmv
Downstream SNR : 33.28 dB

Upstream information
Upstream Channel ID : 2
Upstream Transmit Power Level : 36.00 dBmv

Upstream Symbol Rate : 2560 ksym/sec
Upstream Frequency : 28688000 Hz
Upstream Mini-Slot Size : 8

Upstream Burst Descriptor :

	Initial request(1)	Periodic Ranging(3)	Ranging(4)	shortData(5)	longData(6)
Modulation Type	QPSK	QPSK	QPSK	QPSK	QPSK
Differential	off	off	off	off	off
Preamble Length	64	128	128	72	80
Preamble Value	952	896	896	944	936
FEC Error	no FEC	5	5	5	8
FEC Codeword	16	34	34	75	220
Scrambler Seed	338	338	338	338	338
Maximum Burst Size	0	0	0	6	0
Guard Time Size	8	48	48	8	8
Last Codeword	fixed	fixed	fixed	fixed	fixed
Scrambler on/off	on	on	on	on	on

- **show interface usb**

Display ethernet interface configuration

Example:

CM>**show interface usb**
Interface USB
USB-Host MAC address: 0002.8A0E.ECCA
Speed: 12Mbps
Link status: disconnect

- **show running-configuration**

Display system running information

Example:

CM>**show running-configuration**
CM>**show running-config**
Hardware revision:1.13
Board ID: U10C009.00.01_US01

Bootcode revision: 3.14.1
Software revision: 2.59.2004

System up time is 0 days 00:13:50
System time is 2003-1-30 23:49:44

Interface Cable
MAC address: 0002.8A32.4101
IP address 10.54.5.186 subnet-mask 255.255.252.0

RIP status: Enable
RIP send version: 2

Downstream information
FEC Lock : Locked
Downstream Frequency : 741000000 Hz
Downstream Modulation : 64 QAM
Downstream Interleave Depth : 32
Downstream Receive Power Level : -11.44 dBmv
Downstream SNR : 30.03 dB

Upstream information
Upstream Channel ID : 1
Upstream Transmit Power Level : 46.00 dBmv
Upstream Symbol Rate : 2560 ksym/sec
Upstream Frequency : 32784000 Hz
Upstream Mini-Slot Size : 8

Upstream Burst Descriptor :

	Initial request(1)	Periodic Ranging(3)	Ranging(4)	shortData(5)	longData(6)
Modulation Type	QPSK	QPSK	QPSK	QPSK	QPSK
Differential	off	off	off	off	off
Preamble Length	64	128	128	72	80
Preamble Value	952	896	896	944	936
FEC Error	no FEC	5	5	5	8
FEC Codeword	16	34	34	75	220
Scrambler Seed	338	338	338	338	338
Maximum Burst Size	0	0	0	6	0
Guard Time Size	8	48	48	8	8
Last Codeword	fixed	fixed	fixed	fixed	fixed
Scrambler on/off	on	on	on	on	on

Interface Ethernet
MAC address: 0002.8A32.4102
IP address 24.196.57.13 subnet-mask 255.255.255.252
Link status: link
Mode: 100Mbps, full-duplex
RIP status: Enable
RIP send version: 2
Interface USB
USB-Host MAC address: 0002.8A32.4103
Speed: 12Mbps
Link status: disconnect

Cable Modem mode : Router
RIP parameter
Routing protocol: RIPv2
RIP update time: 15 seconds
RIP response time: 30 secconds

RIP expire time: 180 seconds
RIP garbage time: 120 seconds

TFTP Server IP address : 24.196.48.38
Cable Modem IP address : 10.54.5.186
Configuration file : cbn-2000-512-3cpe.cm
Lease time : 604800 (secs)
UTC time offset : 14400 (secs)
Router IP address : 10.54.4.1
SubnetMask : 255.255.252.0

DHCP server : enable
Router DHCP server IP range from 24.196.57.13 to 24.196.57.14

DNS server(1) 24.196.48.39

DNS server(2) 24.196.48.40
DHCP server lease time : 1800
DHCP Domain Name option : disable.

Web access control
CPE interface web access enable.
Cable interface web access enable.

Access List is empty

PPPoE forwarding disable.

Number of CPE limitation
MAC address limit: unlimited
IP address limit: unlimited

- **show cpe-info**

Display CPE information

Example:

CM>**show cpe-info**

MAC	IP	Port
0002.8A0E.E674	0.0.0.0	USB
0800.465B.69B2	192.168.100.2	Ethernet

- **show downstream**

Display downstream information

Example:

CM>**show downstream**

FEC Lock : Locked
Downstream Frequency : 561000000 Hz
Downstream Modulation : 64 QAM
Downstream Interleave Depth : 32
Downstream Receive Power Level : -1.48 dBmv
Downstream SNR : 33.28 dB

- **show upstream**

Display current upstream information

Example:

CM>**show upstream**

Upstream Channel ID : 2
Upstream Transmit Power Level : 36.00 dBmv
Upstream Symbol Rate : 2560 ksym/sec
Upstream Frequency : 28688000 Hz
Upstream Mini-Slot Size : 8

Upstream Burst Descriptor :

	Initial request(1)	Periodic Ranging(3)	Ranging(4)	shortData(5)	longData(6)
Modulation Type	QPSK	QPSK	QPSK	QPSK	QPSK
Differential	off	off	off	off	off
Preamble Length	64	128	128	72	80
Preamble Value	952	896	896	944	936
FEC Error	no FEC	5	5	5	8
FEC Codeword	16	34	34	75	220
Scrambler Seed	338	338	338	338	338
Maximum Burst Size	0	0	0	6	0
Guard Time Size	8	48	48	8	8
Last Codeword	fixed	fixed	fixed	fixed	fixed
Scrambler on/off	on	on	on	on	on

- **show nat config**

Display all settable NAT/PAT information

Example:

CM>**show nat config**

NAT : Enable

WAN SETUP :
NAT public IP configuration : Automatically
NAT public IP address : 68.4.103.29 Subnet Mask : 255.255.254.0
NAT public Gateway IP address : 68.4.102.1

LAN SETUP :
Sub Ethernet interface IP address 192.168.100.1 subnet-mask 255.255.255.0
NAT DHCP Server Pool Table :
NAT DHCP server support 20 IP pools
NAT DHCP server support 512 IP, Created 20 IP
Pool Index Begin IP End IP
1 192.168.100.1 192.168.100.21

Provision assigned DNS 68.4.16.25

Provision assigned DNS 68.4.16.30

Provision assigned DNS 68.13.16.30
DHCP server lease time : 1800

- **show nat time**

Display all settable NAT/PAT information

Example:

CM>**show nat timer**
Aging Timer (second)
ICMP protocol : 5 (secs)
UDP protocol : 1800 (secs)
TCP protocol : 3600 (secs)
GRE protocol : 3600 (secs)
Default Time OUT : 5 (secs)

- **show user**

Display all telnet user information

Example:

CM>**show user**

Index	User Name	From	Alive(sec)	Idle(sec)
1	admin	192.168.100.2	221	1

- **show access-list**

Display access list information

Example:

CM>**show access-list**

Access List

ID	Control	Address
41	Permit	00D0.5900.0000, hardware address mask FFFF.FF00.0000
42	Permit	0008.0E00.0000, hardware address mask FFFF.FF00.0000
1	Permit	192.168.100.0, wildcard bits 0.0.0.16
21	Permit	64.168.39.0, wildcard bits 0.0.0.8

- **show cpe-limit**

Display maximum of IP and MAC addresses are allowed behind the cable router

Example:

CM>**show cpe-limit**

MAC address limit: 29 MAC address
IP address limit: 29 IP address

- **show pppoe-forwarding**

Display PPPoE enable or disable.

Example:

CM>**show pppoe-forwarding**

PPPoE-forwarding disable.

NVRAM

- **nvram factory-default**

Restore cable modem to factory default.

TFTP

- **tftp filename** *{file name}*

Set the file name of the firmware image to download.

Example:

CM>**tftp filename ram.cpr**

Set TFTP filename to "ram.cpr"

- **tftp server** *{Server IP address}*

Establishes the IP address of the TFTP server for firmware download

Example:

CM>**tftp server 92.146.1.250**

Set TFTP Server to 92.146.1.250

DHCP

- **dhcp** *{enable/disable}*

Enable/disable dhcp server

- **dhcp lease-time** *{ 30-2147483647 seconds}*

Set dhcp server ip lease time

- **dhcp dns add** *{1~4} {ip address}*

Set dhcp server dns ip address, it allows maximum 4 dns setting.

- **dhcp dns delete** *{1~4/all}*

Remove dhcp server dns ip address setting.

Note: if NAT is enabled, the following DHCP command can bet set

- **dhcp ip-pool add** *{start IP} {end ip}*

Set dhcp server ip pool range

Example:

CM> **dhcp ip-pool add 192.168.100.2 192.168.100.4**
CM>**show dhcp**
TFTP Server IP address : 172.19.89.19
Cable Modem IP address : 10.71.135.99
Configuration file : DEF001.cfg
Lease time : 86400 (secs)
UTC time offset : -28800 (secs)
SystemLog Server IP address : 172.19.89.19
Router IP address : 10.71.128.1
SubnetMask : 255.255.240.0

DHCP server enable
NAT DHCP Server Pool Table :
NAT DHCP server support 20 IP pools
NAT DHCP server support 512 IP, Created 3 IP
Pool Index Begin IP End IP
1 192.168.100.2 192.168.100.4
Provision assigned DNS 68.4.16.30
Provision assigned DNS 68.6.16.30
DHCP server lease time : 1800
Provision assigned DHCP Domain Name : oc.cox.net

- **dhcp ip-pool delete** *{1-20/all}*

Delete dhcp server ip-pool

- **dhcp gateway** *{ip address}*

Set DHCP gateway ip address

- **dhcp reserve-mac add** *{ip address} {mac address}*

Reserve the specific ip address for specific mac address

Example:
CM>**dhcp reserve-mac add 192.168.100.4 0002.8A25.251D**
CM>**show dhcp**
TFTP Server IP address : 172.19.89.19
Cable Modem IP address : 10.71.135.99
Configuration file : DEF001.cfg
Lease time : 86400 (secs)
UTC time offset : -28800 (secs)
SystemLog Server IP address : 172.19.89.19
Router IP address : 10.71.128.1
SubnetMask : 255.255.240.0

DHCP server enable
NAT DHCP Server Pool Table :
NAT DHCP server support 20 IP pools
NAT DHCP server support 512 IP, Created 3 IP
Pool Index Begin IP End IP

1 192.168.100.2 192.168.100.4

NAT DHCP Server MAC reserved Table :
NAT DHCP Server support 16 reserved MAC address:
Index Begin IP MAC address
1 192.168.100.4 0002.8A25.251D

Provision assigned DNS 68.4.16.30
Provision assigned DNS 68.6.16.30
DHCP server lease time : 1800
Provision assigned DHCP Domain Name : oc.cox.net

- **dhcp reserve-mac delete** *{1-16|all}*

Delete one reserved mac address or all

NAT

Network Address Translation/Port Address Translation (NAT/PAT) gateway is designed for IP address simplification and conservation, as it enables private IP network that uses no registered IP addresses to connect to the Internet. NAT/PAT operates on a cable modem router, connecting to Internet, and translates the private (not globally unique) addresses in the internal network into legal addresses before packets are forwarded onto the Internet. As part of this functionality, NAT can be configured to advertise only one address for the entire network to the outside world. This provides additional security, effectively hiding the entire internal network from the world behind that address. NAT has the dual functionality of security and address conservation, and is typically implemented in remote access environments.

- **ip nat** *{enable/disable}*
  Enable/disable NAT/PAT gateway function

- **nat timer** *{tcp/udp/gre/icmp} {1~86400 sec}*
  Set aging time for different protocol session

<u>One to one mapping</u>

- **nat static ipmapping add** *{ private ipaddress} { global ipaddress}*
  Set NAT one to one mapping table

  Example:

  CM>**nat static ipmapping add 68.5.203.16 192.168.100.22**

  Set global IP 68.5.203.16 to private IP 192.168.100.22

  CM>**show nat config**
  NAT : Enable
  WAN SETUP :
  NAT public IP configuration : Automatically
  NAT public IP address : 68.5.203.15 Subnet Mask : 255.255.254.0
  NAT public Gateway IP address : 68.5.202.1

LAN SETUP :
Ethernet interface IP address 192.168.100.1 subnet-mask 255.255.255.224
NAT DHCP Server Pool Table :
NAT DHCP server support 20 IP pools
NAT DHCP server support 512 IP, Created 20 IP
Pool Index Begin IP End IP
1 192.168.100.1 192.168.100.21

Provision assigned DNS 68.4.16.30

Provision assigned DNS 68.6.16.30
DHCP server lease time : 1800

IP Mapping Table:
Index Global IP Local IP
1 68.5.203.16 192.168.100.22

- **nat static ipmapping delete** *{index/*all*}*

  Remove NAT one to one mapping entry from the IP Mapping Table

  index: The index number IP Mapping Table (see "show nat config"command)

Port forwarding setting

- **nat static portmapping add** *{index }{ private ipaddress} {port}{protocol}*

  Set NAT/PAT Port forwarding table

  Example:

  CM>**nat static portmapping add 21 192.168.100.23 ftp**
  CM>**show nat config**
  NAT : Enable
  WAN SETUP :
  NAT public IP configuration : Manually
  Static NAT public IP address : 68.5.203.15 Subnet Mask : 255.255.254.0
  Static NAT public Gateway IP address : 68.5.202.1

  LAN SETUP :
  Ethernet interface IP address 192.168.100.1 subnet-mask 255.255.255.224
  NAT DHCP Server Pool Table :
  NAT DHCP server support 20 IP pools
  NAT DHCP server support 512 IP, Created 20 IP
  Pool Index Begin IP End IP
  1 192.168.100.1 192.168.100.21

  DNS server(1) 68.6.16.30
  DHCP server lease time : 1800

IP Mapping Table:

Index	Global IP	Local IP
1	68.5.203.16	192.168.100.22

Port Mapping Table:

Index	Port	Local IP	Protocol
1	21	192.168.100.23	ftp

- **nat static portmapping delete** *{index/all}*

Remove the entry from the Port Mapping Table

index: The index number in Port Mapping Table (see "show nat config" command)

CM>**nat static portmapping delete 1**

Delete static portmapping index 1 from Port Mapping Table

NAT static ip

- **nat static ip** *{enable|disable|ipaddress}*

Enable/disable NAT/PAT gateway function or assign global ip

CM>**nat static ip disable**

Static IP will be disabled after "reset" command.

CM>**nat static ip enable**

Static IP will be enabled after "reset" command.

- **nat static ip** *{ipaddress}* **mask** *(mask)*

Set static IP and network mask for NAT/PAT

Example:

CM>**nat static ip 68.5.203.15 mask 255.255.254.0**

Set NAT public IP to 68.5.203.15, subnet mask to: 255.255.254.0

NAT static gateway

- **nat static gateway** *{ipaddress}*

Set static router address

CM>**nat static gateway 68.5.202.1**

Set NAT public Gateway IP to 68.5.202.1

CM>**show nat config**
NAT : Enable
WAN SETUP :
NAT public IP configuration : Manually
Static NAT public IP address : 68.5.203.15 Subnet Mask : 255.255.254.0
Static NAT public Gateway IP address : 68.5.202.1

Interfaces

- **interface ethernet address** *{ip address}* **mask** *{subnet netmask}*

Set ethernet interface IP address

Example:
CM>**interface ethernet address 192.168.100.1 mask 255.255.255.224**
CM>**show interface ethernet**
Interface Ethernet
MAC address: 0002.8A0E.ECC8
IP address 192.168.100.1 subnet-mask 255.255.255.224
Link status: link
Mode: 100Mbps, full-duplex

- **interface ethernet dhcp-relay** *{ip address|enable|disable}*

Ethernet interface dhcp-relay

- **interface ethernet mac-address** *{mac address}*

Assign MAC address to ethernet interface

Example:
CM**>interface ethernet mac-address 0008.0E86.1118**
CM**>show interface ethernet**
Interface Ethernet
MAC address: 0008.0E86.1118
IP address 192.168.100.1 subnet-mask 255.255.255.224
Link status: link
Mode: 100Mbps, full-duplex

- **interface ethernet rip** *{enable|disable}*

Enable/disable RIP on ethernet interface

- **interface ethernet rip send-version** *{1|2}*

Set RIP version 1 or version 2 on ethernet interface

- **interface ethernet rip key-chain** *{1|2|none}*

Set RIP key-chain to 1, 2, or non

- **interface ethernet rip auth-mode** *{ none| md5| text}*

Set RIP authentication mode to none, md5, or text

- **interface ethernet shutdown**

Stop transmitting traffic on the ethernet interface

- **interface ethernet startup**

Start transmitting traffic on the ethernet interface

- **interface cable upstream channel** *{id}*

Change upstream channel ID

- **interface cable downstream preset** *{frequency}*

Add frequency to downstream frequency preset table

- **interface cable shutdown**

Stop transmitting traffic on the cable interface

- **interface cable startup**

Start transmitting traffic on the cable interface

IP

- **ip route** *{enable/disable}*
  Enable/disable routing with RIP. Default routing mode is RIPv2.
  Reference Mode of Operation section for example.

- **ip natroute** *{enable/disable}*
  Enable/disable NAT and routing function simultaneously.
  Reference Mode of Operation section for example.

- **ip nat** *{enable/disable}*
  Enable/disable NAT/PAT function.
  Reference Mode of Operation section for example.

RIP

- **rip version** *{1/2/2b}*
  Version number : **1** for RIPv1, **2** for RIPv2, **2b** for RIPv2-broadcast mode

- **rip timer update** *{second}*
  Set routing table update time

- **rip timer response** *{second}*
  Set interval between RIP response message send out

- **rip timer expire** *{second}*
  Set routing entry expire time

  Set garbage collection time
- **rip timer garbage** *{second}*
  Set garbage collection time

- **rip timer default**

Set garbage collection time

- **rip silence-mode** *{enable/disable}* -- default value is disable
  Enable/disable silence mode, the cable router just listen RIP message, don't send any RIP message out.

- **rip key-chain** *{key-chain number(1| 2)}{ 0..32767}{key-string}*
  Set RIP authentication key string for key-chain & Key ID
  key-chain number: select key-chain1 or key-chain2
  key-id: Key ID number, range between 0~32767.
  key-string: Key content, the key length must not exceed 16 bytes.

- **rip key-chain** *{key-chain number(1|2)}{ 1..32767}{start-time}{yyyy-mm-dd}{hh:mm:ss}*
  Set RIP authentication start time

  Example:
  CM**>rip key-chain 1 10 start-time 2002-4-20 15:30:00**
  Set key-chain to 1, key ID equal to 10, start time to 2002/4/20 15:30:00

- **rip key-chain** *{key-chain number(1|2)}{0..32767}{expire-time}[{yyyy-mm-dd}{hh:mm:ss}|infinite]*
  Set key expire time, default value is infinite.

  Example:
  CM**>rip key-chain 1 5 key-string abcdefg**
  CM**>rip key-chain 1 5 start-time 2002-5-1 00:00:00**
  CM**>rip key-chain 1 5 expire-time 2002-6-1 18:00:00**
  CM**> interface ethernet key-chain 1**
  CM**> interface ethernet auth-mode md5**
  Set a key string "**abcdefg**" in key-chain 1 with key ID 5 using MD5 authentication on the ethernet interface, start time at 2002-5-1 00:00:00 and expire time at 2002-6-1 18:00:00

- **rip default**
  Set all RIP parameter to default

Web-access

- **web-access cpe** *{enable|disable}*

Enable|disable the CM web access via CPE interface

- **web-access cable** *{enable|disable}*

Enable|disable the CM web access via Cable interface

Access-list

- **access-list** *{1~20|21~40|41~60} {deny|permit} {any|source IP|mac address} [wildcard bit]*

The standard access list performs packet filtering based on source IP address from the CPE host(s). The management access list performs packet filtering based on destination IP address matching the Cable Router IP address. The standard MAC access list performs frame filtering based on source MAC address from the CPE host(s). Basically, the access list works as a source address packet filter, if the access list is empty, the cable router will forward any packet, if access list is not empty, packet filtering will be enforced according to the access list(s).

1~20, access list ID, for standard IP access list
21~40, access list ID, for management access list
41~60, access list ID, for standard MAC access list

Example:
1) Set the access list to permit source IP 192.168.100.xxx to access network.
CM>**access-list 1 permit 192.168.100.1 0.0.0.255**
Note: 0.0.0.255 means 192.168.100.1~192.168.100.255

2) Set the access list to permit source IP 192.168.100.10 to access cable router (telnet, web-page, snmp)
CM>**access-list 21 permit 192.168.100.10 0.0.0.0**
Note: No network packet will be filtered

3) Set the access list to permit source MAC 00D0.5921.3354 to access network
CM>**access-list 41 permit 00d0.5921.3354 ffff.ffff.ffff**
Note: The cable router only forward packet with this source MAC, all other packet will be discarded.

- **access-list delete** *{list ID|all}*

Delete a specific access-list or delete all access-list

PPPoE-Forwarding

- **pppoe-forwarding** *{enable|disable}* (Optional)

To enable|disable PPPoE packet pass-through the NAT gateway

Copy

- **copy tftp:config** *{tftp server ip address} {configuration filename}*

Download the Cable Router configuration from remote tftp server. The configuration file must be text file.

Example:

CM>**copy tftp:config 68.5.203.15 4ips.txt**

Download the **4ips.tx** Cable Router configuration from TFTP server 68.5.203.15

Cpe-limit

- **cpe-limit ip** *{1-256|unlimited}*

Limit the number of CPEs based on IPs, or unlimited

- **cpe-limit mac** *{1-256|unlimited}*

Limit the number CPEs based on MACs, or unlimited

Wirte

- **write**

Write configuration to NVRAM

Reset

- **reset**

Reboot cable modem

Quit

- **quit**

Disconnect telnet.

6. Mode of Operation

Bridge mode

Bridge mode is the factory default setting.

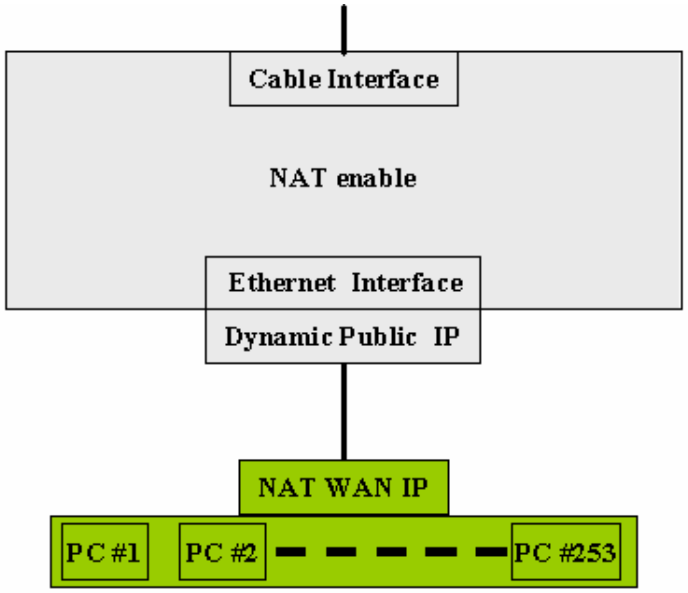
NAT mode

- **ip nat enable**

Enable NAT will also enable DHCP server on NAT-private subnet automatically.

Example:

- NAT-Private subnet 192.168.100.0/24 (default is 192.168.100.0/27)
  - (253) Dynamic Private IPs 192.168.100.2~192.168.100.254
  - Gateway IP address 192.168.100.1
  - Dynamic public WAN IP address from Head-end DHCP server



Dynamic Private IPs 192.168.100.2 to 192.168.100.254

Telnet commands:

CM>**interface ethernet address 192.168.100.1 mask 255.255.255.0 nat-private**

CM>**ip nat enable**

CM>**reset**

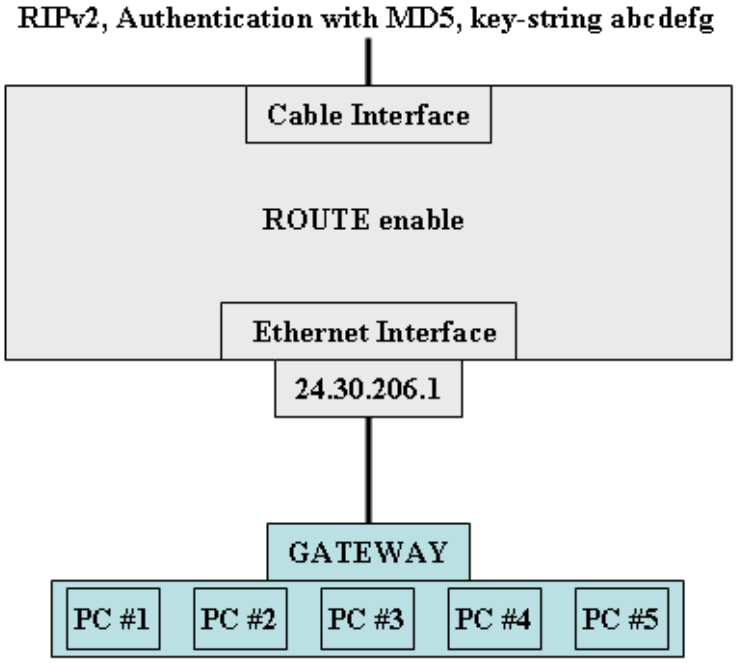
Routing mode

- **ip route enable**

Default setting for routing mode is RIPv2 with DHCP disabled automatically.

Example:

- RIPv2 with MD5 authenication mode enable, key-string "abcdefg"
- Public subnet 24.30.206.0/29
  - (5) Static Public IPs 24.30.206.2~24.30.206.6
  - Gateway IP address 24.30.206.1



Static public IPs 24.30.206.2 to 24.30.206.6

Telnet commands:

CM>**interface ethernet address 24.30.206.1 mask 255.255.255.248**

CM>**interface cable rip key-chain 1**

CM>**interface cable rip auth-mode md5**

CM>**rip key-chain 1 1 key-string abcdefg**

CM>**ip route enable**

CM>**reset**

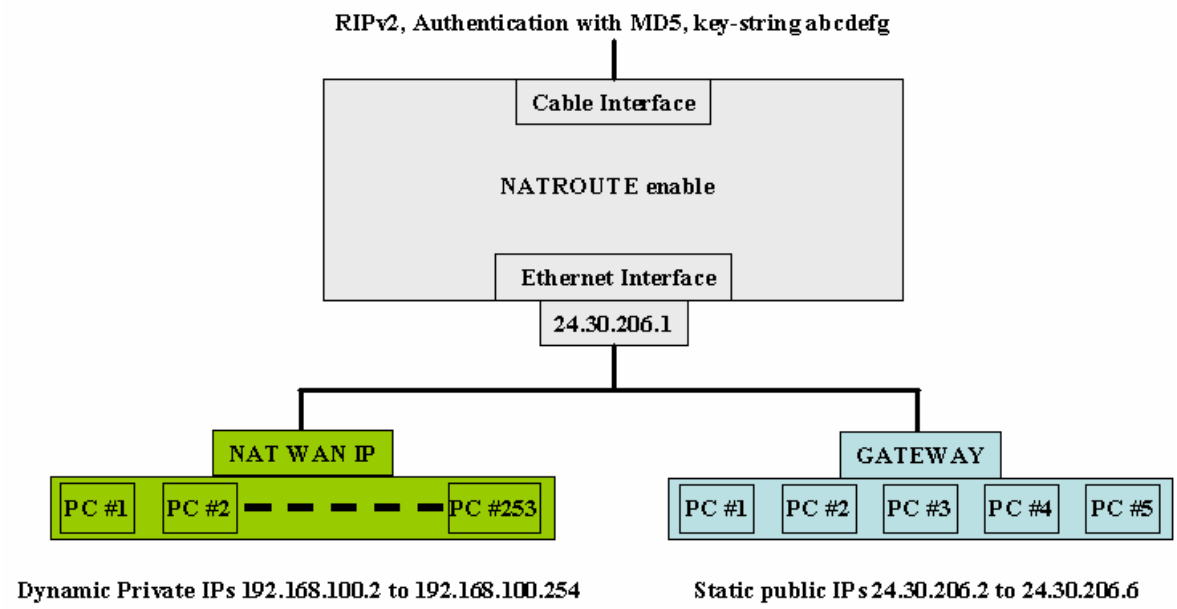
NAT/Routing mode

- **ip natroute enable**

Enable NAT and Routing simultaneously. Enable natroute will also enable DHCP automatically for NAT-private subnet. Default NAT-private subnet is 192.168.100.0/27. DHCP is disabled automatically on public subnet.

Example:

- RIPv2 with MD5 authentication mode enable, key-string "abcdefg"
- Public subnet 24.30.206.0/29
  - (5) Static Public IPs 24.30.206.2~24.30.206.6
  - Gateway IP address 24.30.206.1
- NAT-Private subnet 192.168.100.0/24
  - (253) Dynamic Private IPs 192.168.100.2~192.168.100.254
  - Gateway IP address 192.168.100.1
  - NAT-Private subnet WAN IP address 24.20.206.1



Telnet commands:

CM>**interface ethernet address 24.30.206.1 mask 255.255.255.248**

CM>**interface ethernet address 192.168.100.1 mask 255.255.255.0 nat-private**

CM>**interface cable rip key-chain 1**

CM>**interface cable rip auth-mode md5**
CM>**rip key-chain 1 1 key-string abcdefg**
CM>**ip natroute enable**
CM>**reset**

7. Web User Interface

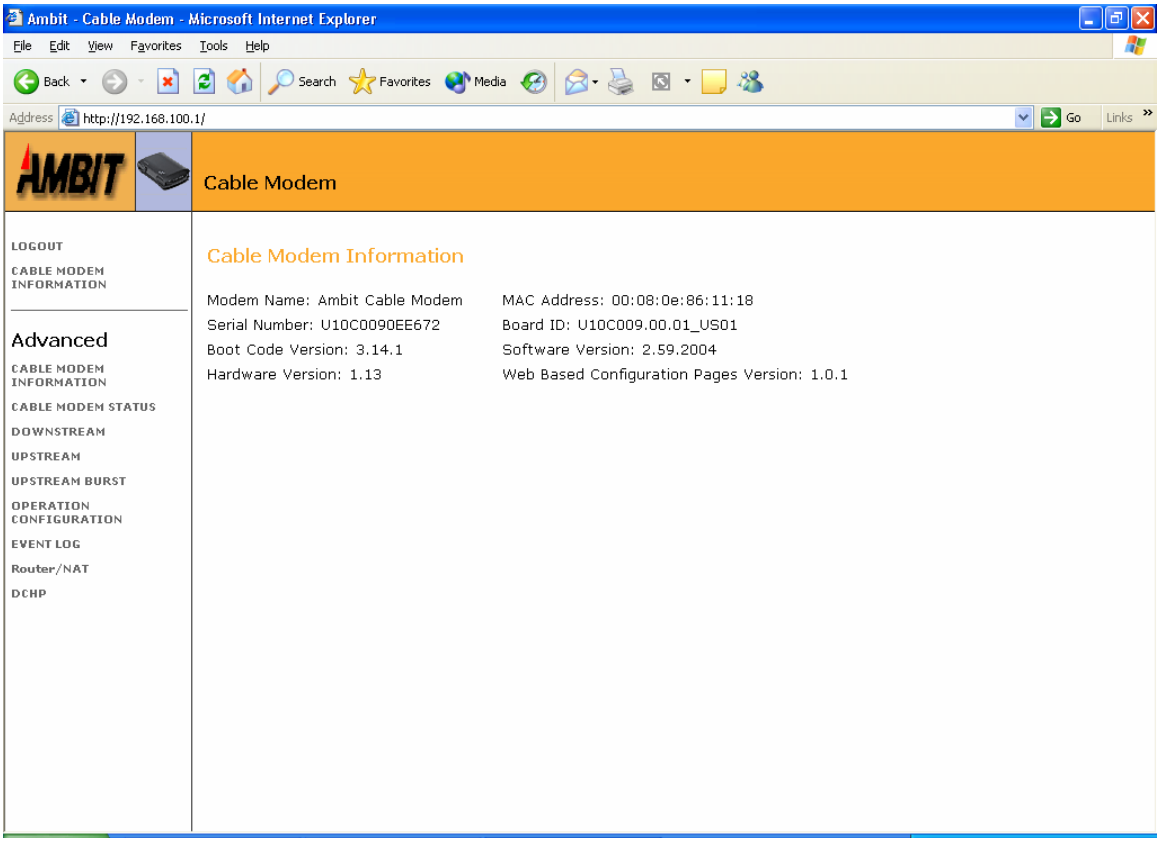
Accessing the Web User Interface

1. The PC connected to the cable modem must support TCP/IP connection and dynamic DHCP IP address acquisition, and must have a web browser installed.
2. Open the web browser and set the URL location as: http://192.168.100.1

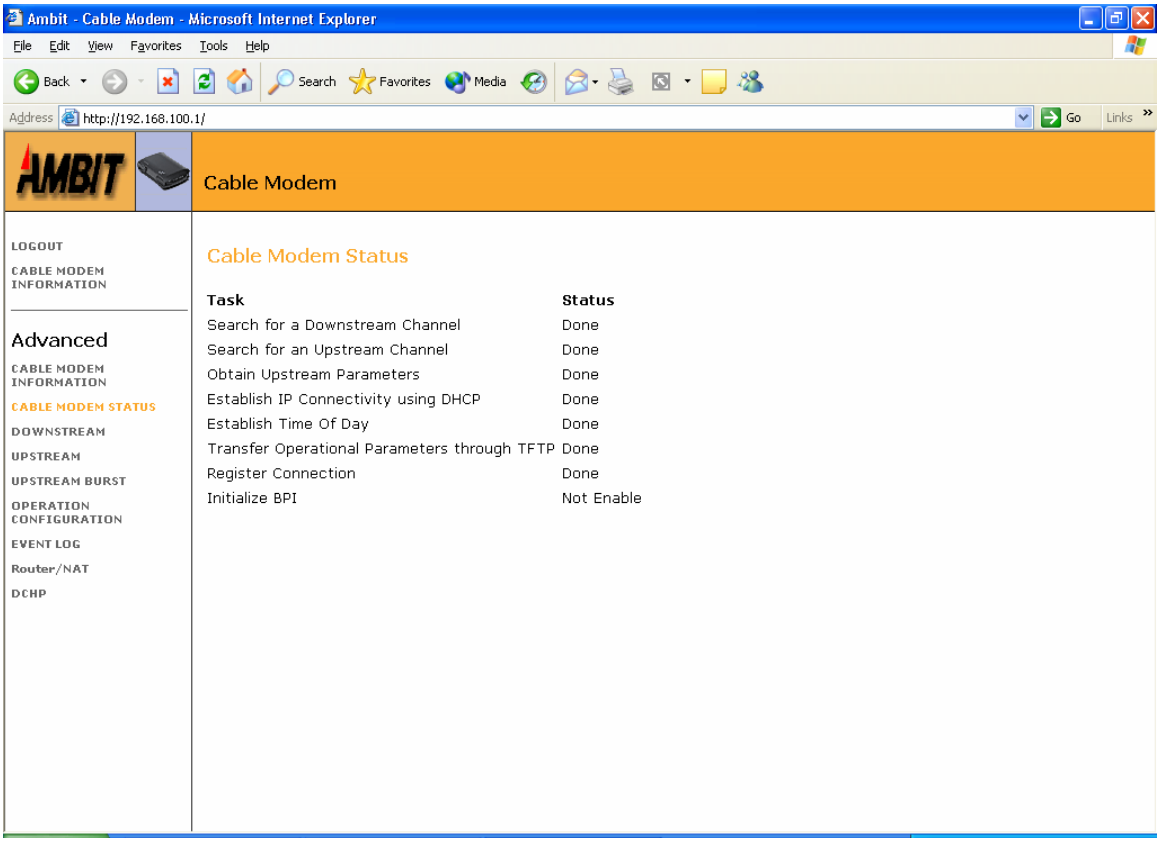
Web User Interface Home Page

A main menu is shown at the top of the pages and the user can select different options to view cable modem information. The main menu contains nine categories of cable modem menu information. They include:

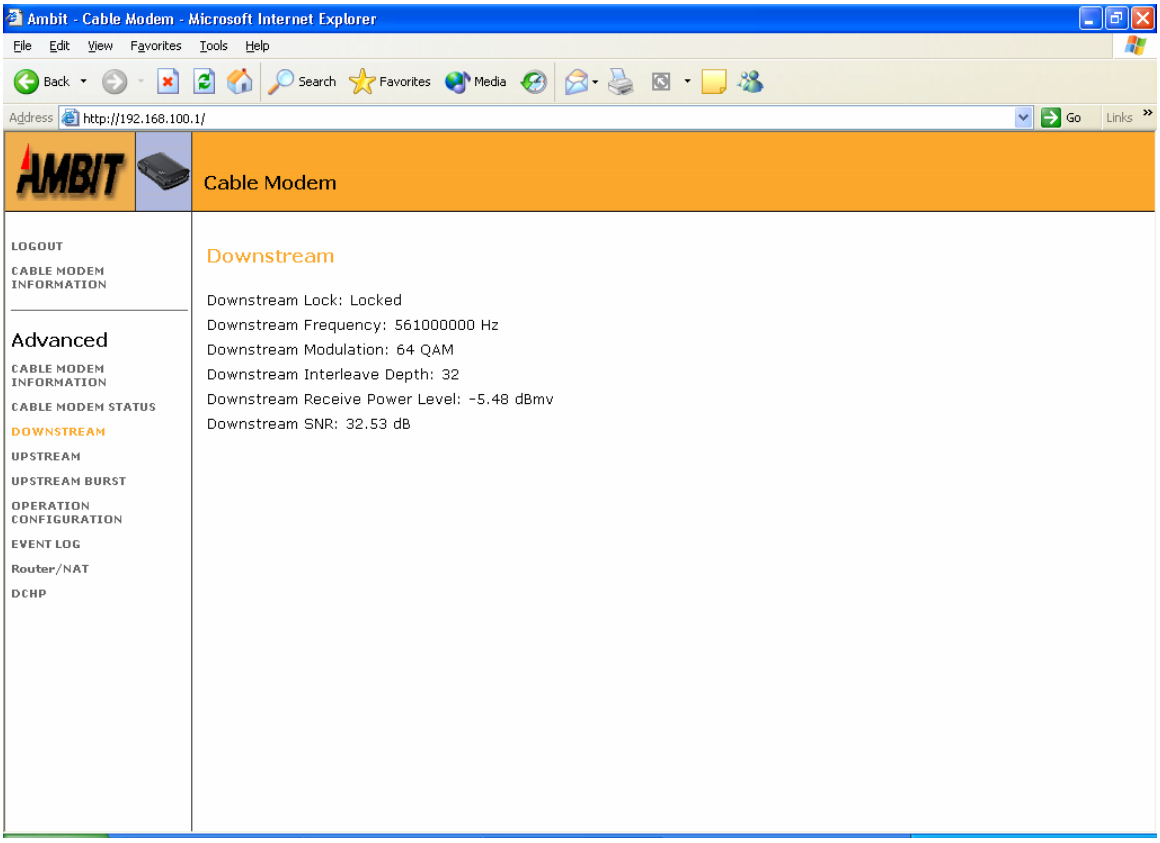
Cable Modem Information



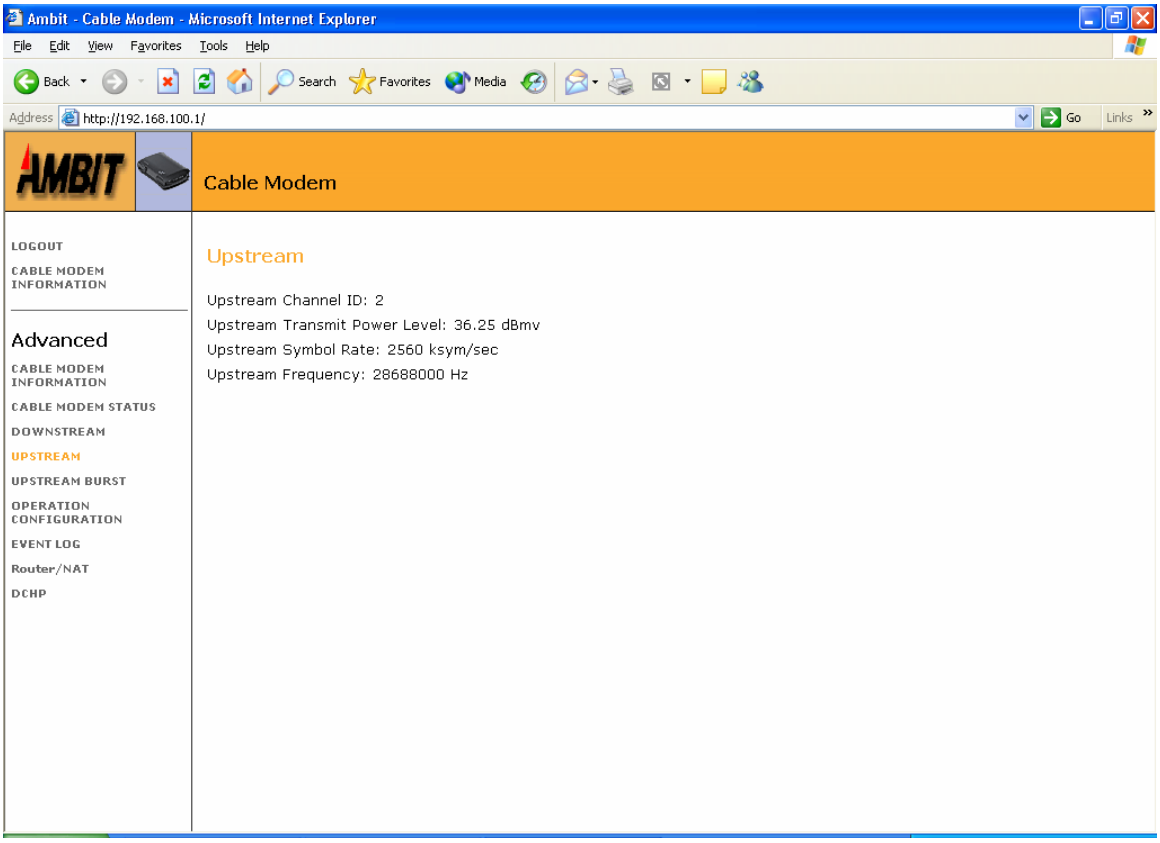
Cable Modem Status



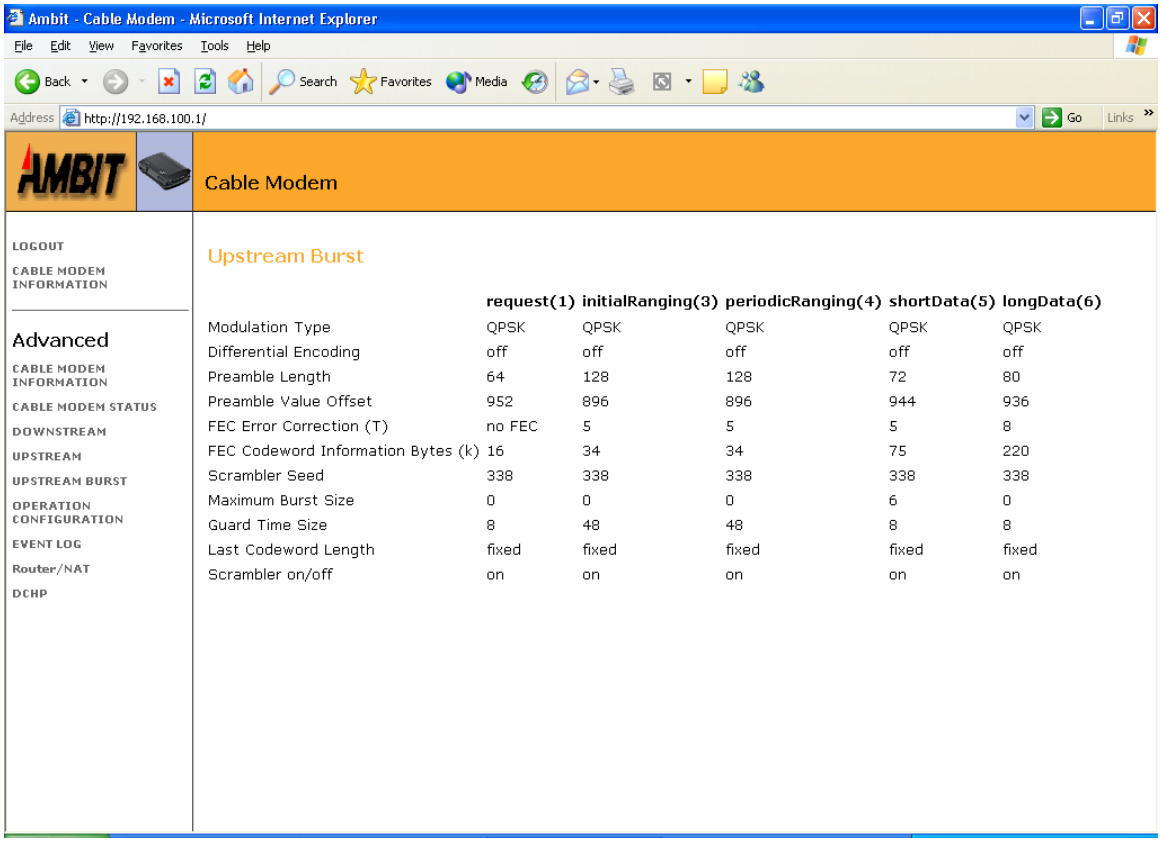
Downstream


Ambit - Cable Modem - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.100.1/
Go Links
AMBIT
Cable Modem
LOGOUT
CABLE MODEM INFORMATION
Advanced
CABLE MODEM INFORMATION
CABLE MODEM STATUS
DOWNSTREAM
UPSTREAM
UPSTREAM BURST
OPERATION CONFIGURATION
EVENT LOG
Router/NAT
DCHP
Downstream
Downstream Lock: Locked
Downstream Frequency: 561000000 Hz
Downstream Modulation: 64 QAM
Downstream Interleave Depth: 32
Downstream Receive Power Level: -5.48 dBmv
Downstream SNR: 32.53 dB

Upstream

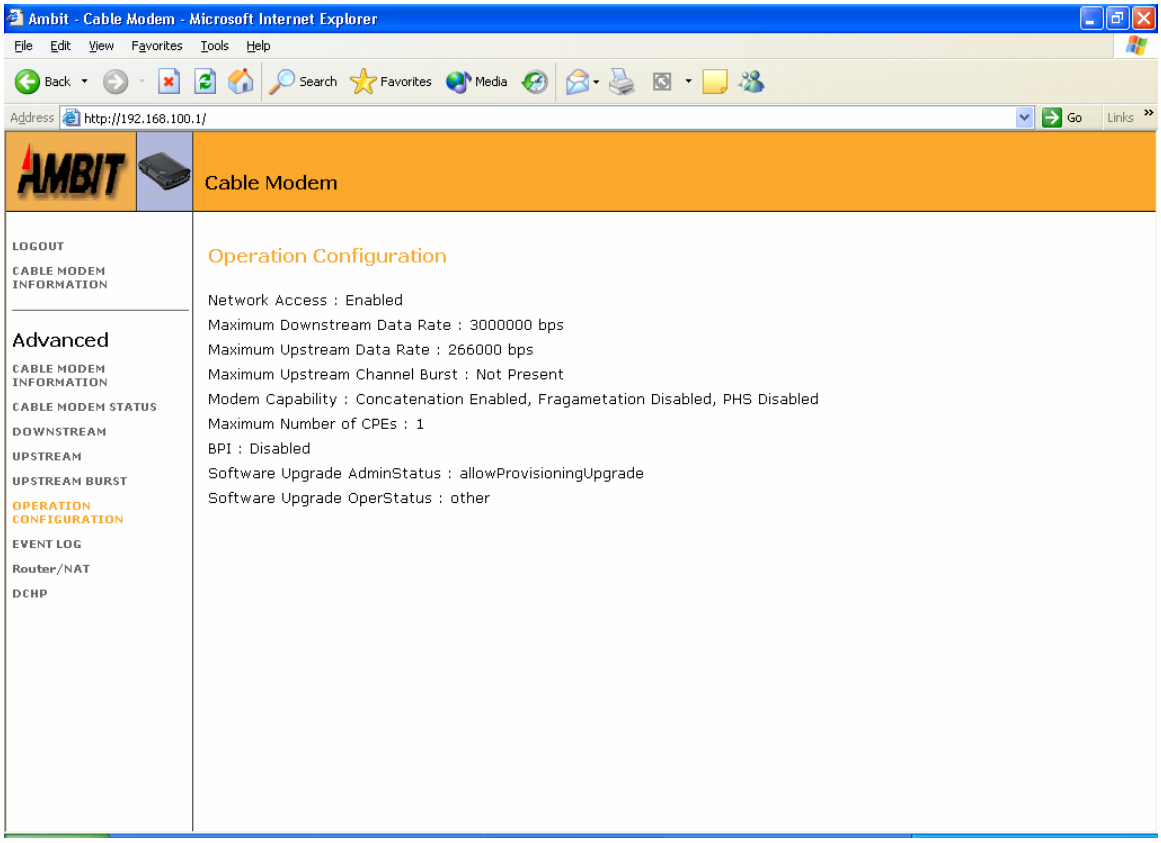

Ambit - Cable Modem - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.100.1/
Go Links
AMBIT
Cable Modem
LOGOUT
CABLE MODEM INFORMATION
Advanced
CABLE MODEM INFORMATION
CABLE MODEM STATUS
DOWNSTREAM
UPSTREAM
UPSTREAM BURST
OPERATION CONFIGURATION
EVENT LOG
Router/NAT
DCHP
Upstream
Upstream Channel ID: 2
Upstream Transmit Power Level: 36.25 dBmv
Upstream Symbol Rate: 2560 ksym/sec
Upstream Frequency: 28688000 Hz

Upstream Burst

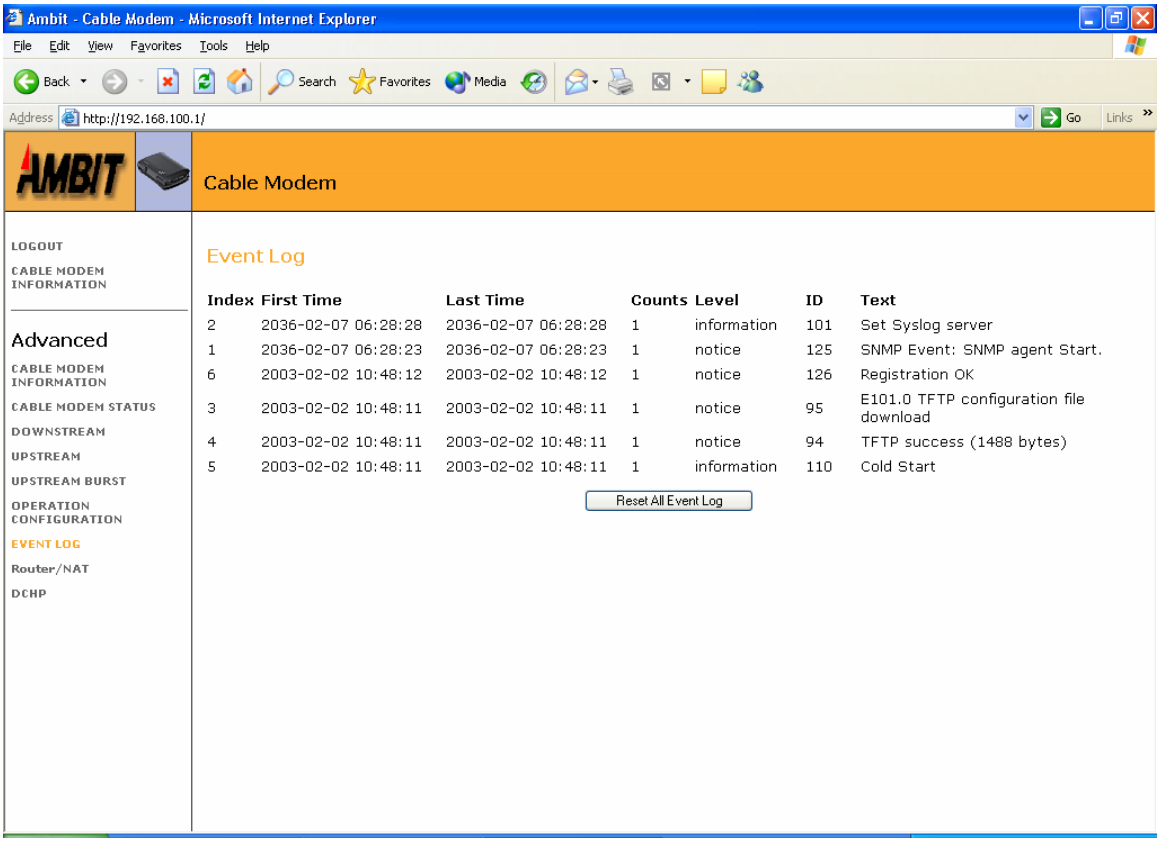


	request(1)	initialRanging(3)	periodicRanging(4)	shortData(5)	longData(6)
Modulation Type	QPSK	QPSK	QPSK	QPSK	QPSK
Differential Encoding	off	off	off	off	off
Preamble Length	64	128	128	72	80
Preamble Value Offset	952	896	896	944	936
FEC Error Correction (T)	no FEC	5	5	5	8
FEC Codeword Information Bytes (k)	16	34	34	75	220
Scrambler Seed	338	338	338	338	338
Maximum Burst Size	0	0	0	6	0
Guard Time Size	8	48	48	8	8
Last Codeword Length	fixed	fixed	fixed	fixed	fixed
Scrambler on/off	on	on	on	on	on

Operation Parameters



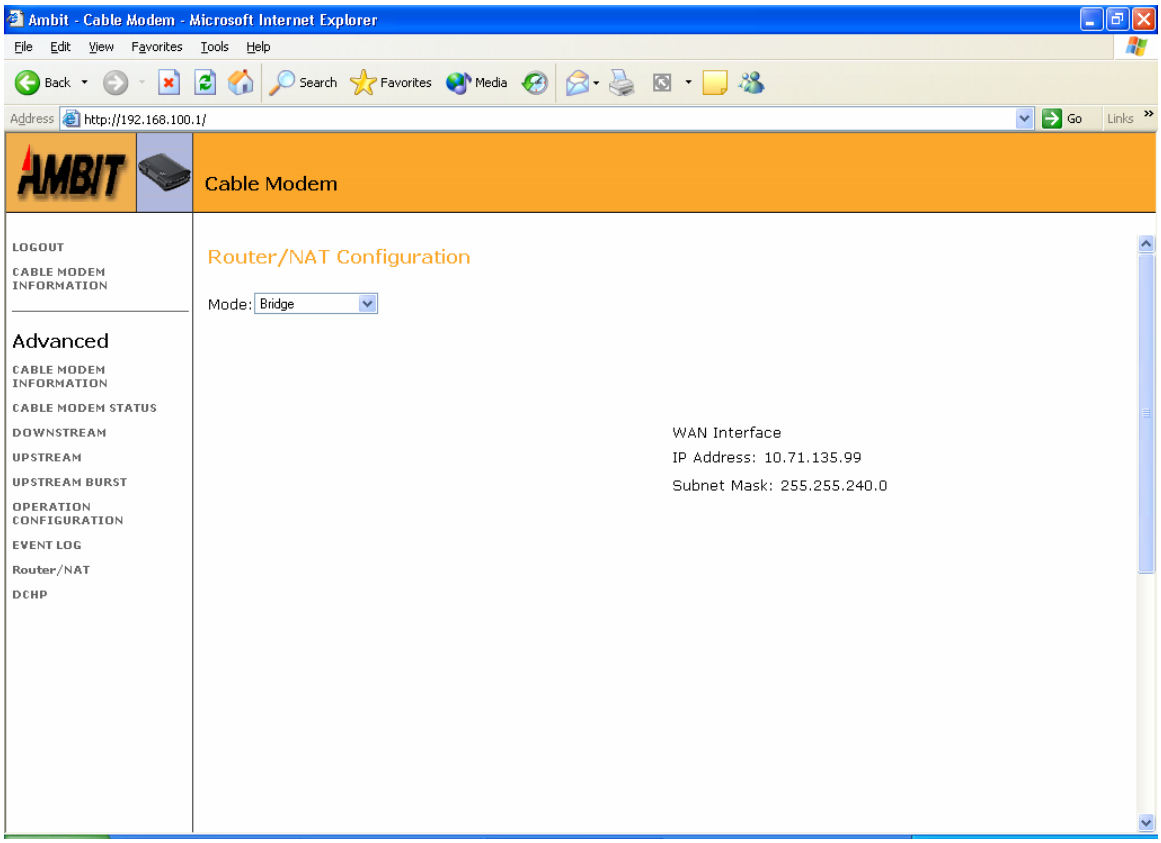
Event Log


Ambit - Cable Modem - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.100.1/
Go Links
AMBIT
Cable Modem
LOGOUT
CABLE MODEM INFORMATION
Advanced
CABLE MODEM INFORMATION
CABLE MODEM STATUS
DOWNSTREAM
UPSTREAM
UPSTREAM BURST
OPERATION CONFIGURATION
EVENT LOG
Router/NAT
DCHP
Event Log
Index First Time Last Time Counts Level ID Text
2 2036-02-07 06:28:28 2036-02-07 06:28:28 1 information 101 Set Syslog server
1 2036-02-07 06:28:23 2036-02-07 06:28:23 1 notice 125 SNMP Event: SNMP agent Start.
6 2003-02-02 10:48:12 2003-02-02 10:48:12 1 notice 126 Registration OK
3 2003-02-02 10:48:11 2003-02-02 10:48:11 1 notice 95 E101.0 TFTP configuration file download
4 2003-02-02 10:48:11 2003-02-02 10:48:11 1 notice 94 TFTP success (1488 bytes)
5 2003-02-02 10:48:11 2003-02-02 10:48:11 1 information 110 Cold Start
Reset All Event Log

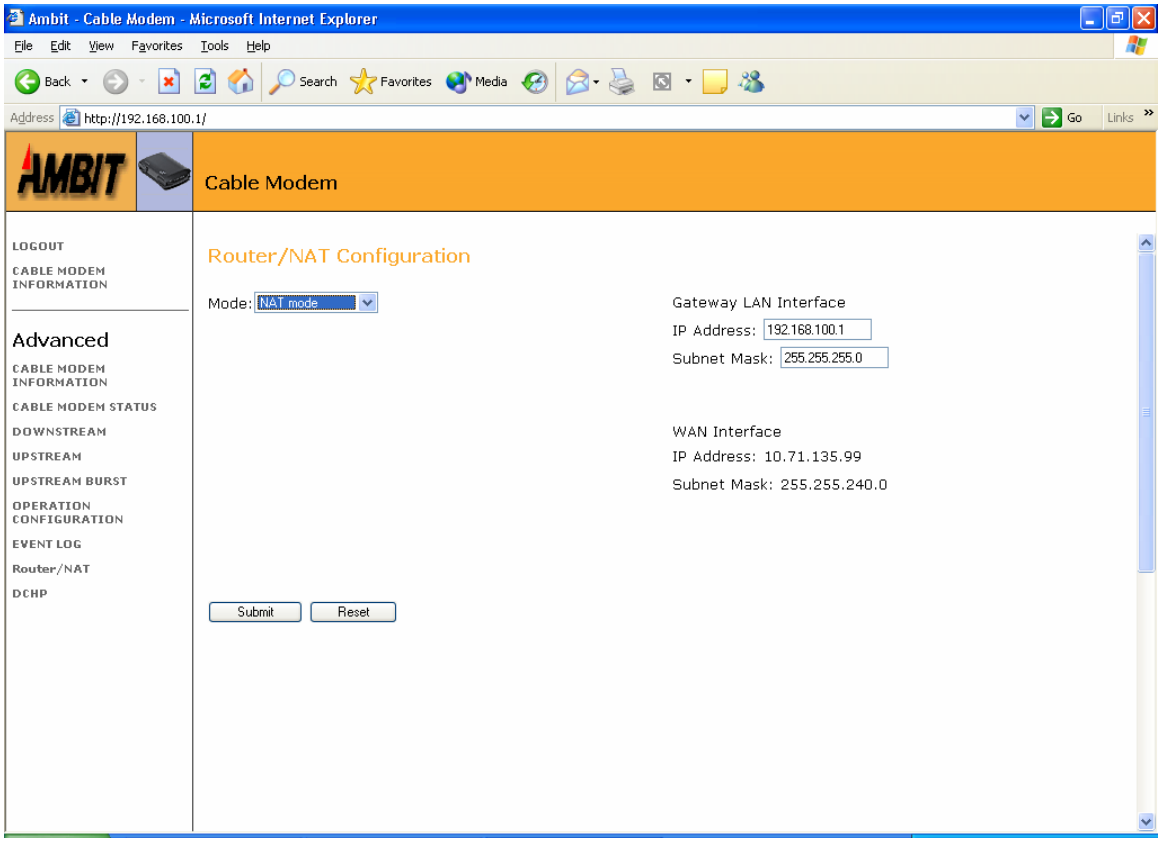
NAT/Router configuration

Bridge Mode

In Bridge mode, no configuration is required. The Orion 2000 Cable Router is in Bridge Mode by factory default.



NAT Mode



Gateway LAN Interface

- IP Address

  Gateway private NAT IP address
- Subnet

  Gateway private NAT subnet mask

WAN Interface

- IP Address

  Cable Modem IP address (private Cable RF network)
- Subnet

  Cable Modem IP subnet mask

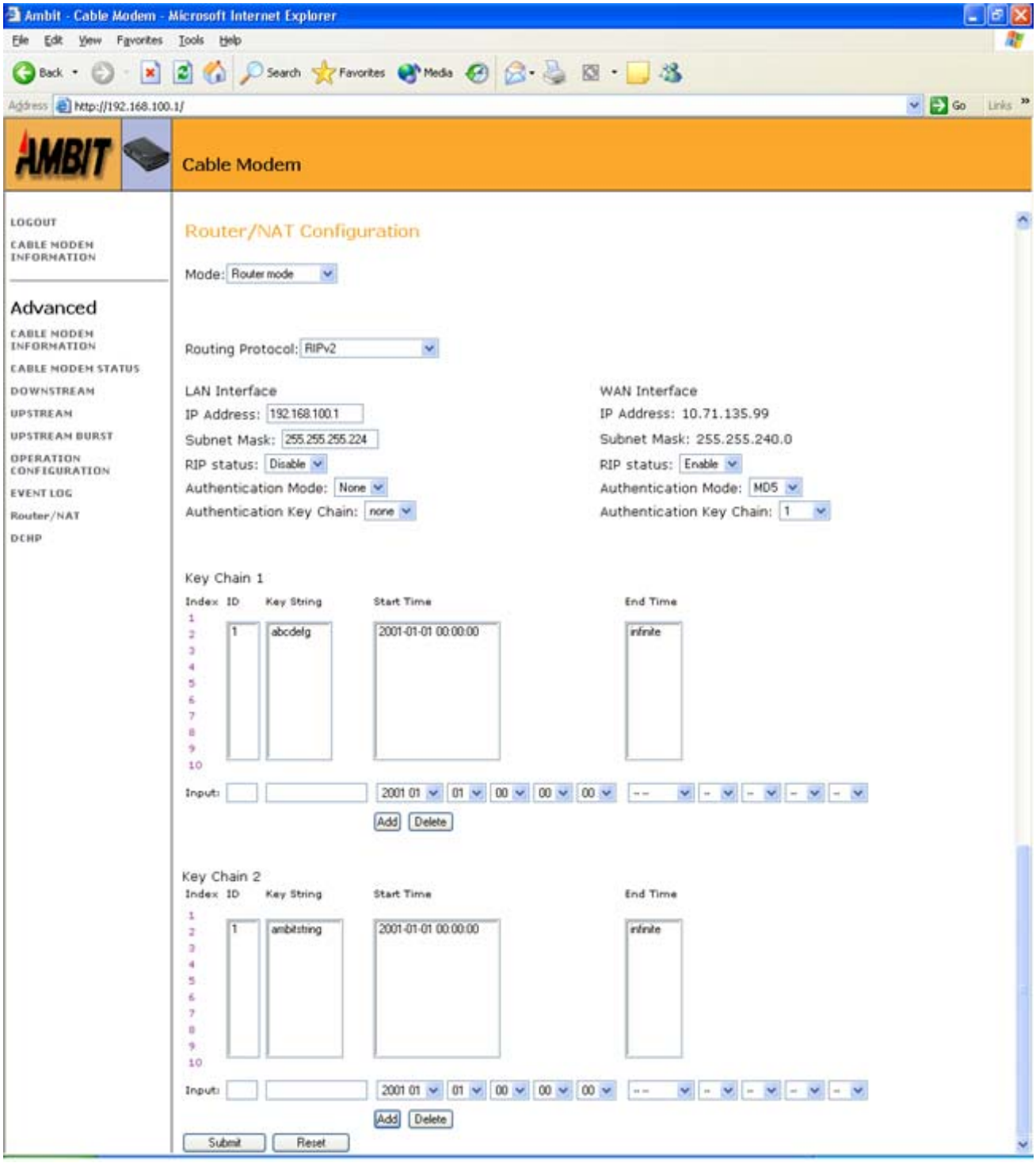
Submit

- Click "**Submit**" to change displayed parameters

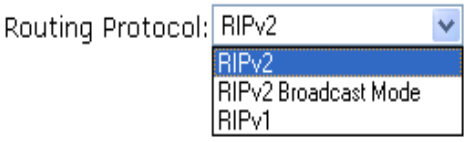
Reset

- Click "**Reset**" to use displayed parameters, cable modem will reset.

Router Mode

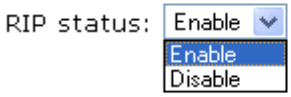

Ambit - Cable Modem - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.100.1/
Go Links
AMBIT
Cable Modem
LOGOUT
CABLE MODEM INFORMATION
Advanced
CABLE MODEM INFORMATION
CABLE MODEM STATUS
DOWNSTREAM
UPSTREAM
UPSTREAM BURST
OPERATION CONFIGURATION
EVENT LOG
Router/NAT
DCHP
Router/NAT Configuration
Mode: Router mode
Routing Protocol: RIPv2
LAN Interface
IP Address: 192.168.100.1
Subnet Mask: 255.255.255.224
RIP status: Disable
Authentication Mode: None
Authentication Key Chain: none
WAN Interface
IP Address: 10.71.135.99
Subnet Mask: 255.255.240.0
RIP status: Enable
Authentication Mode: MD5
Authentication Key Chain: 1
Key Chain 1
Index ID Key String Start Time End Time
1 1 abcdelg 2001-01-01 00:00:00 infinite
Input: 2001 01 01 00 00 00 -- - - - - -
Add Delete
Key Chain 2
Index ID Key String Start Time End Time
1 1 ambitstring 2001-01-01 00:00:00 infinite
Input: 2001 01 01 00 00 00 -- - - - - -
Add Delete
Submit Reset

Routing Protocol

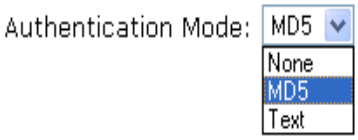


LAN Interface

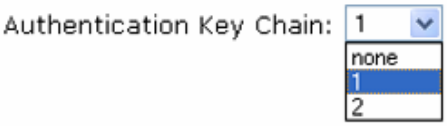
- Public IP Address Gateway(same as the Cable Modem's ethernet interface)
- Public IP Address subnet mask
- RIP status



- Authentication mode

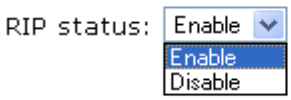


- Authentication Key Chain

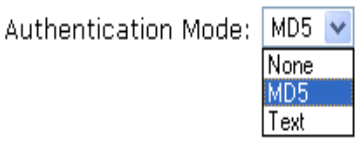


WAN Interface

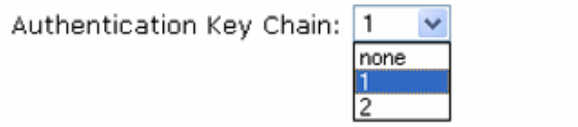
- Private IP Address (private Cable RF network)
- Private IP Address subnet mask
- RIP status



- Authentication mode



- Authentication Key Chain



Key Chain 1

- Listing of key

- Input key Index ID, Key String, Start time, and End time

Add

- Click "**Add**" to add the input index ID, Key String, Start Time, and End Time. If End Time is empty, it equals to infinite End Time.

Delete

- Select from the list and click "**Delete**" to remove the input index ID, Key String, Start Time, and End Time.

Key Chain 2

- Listing of key Chain 2

- Input key Index ID, Key String, Start time, and End time

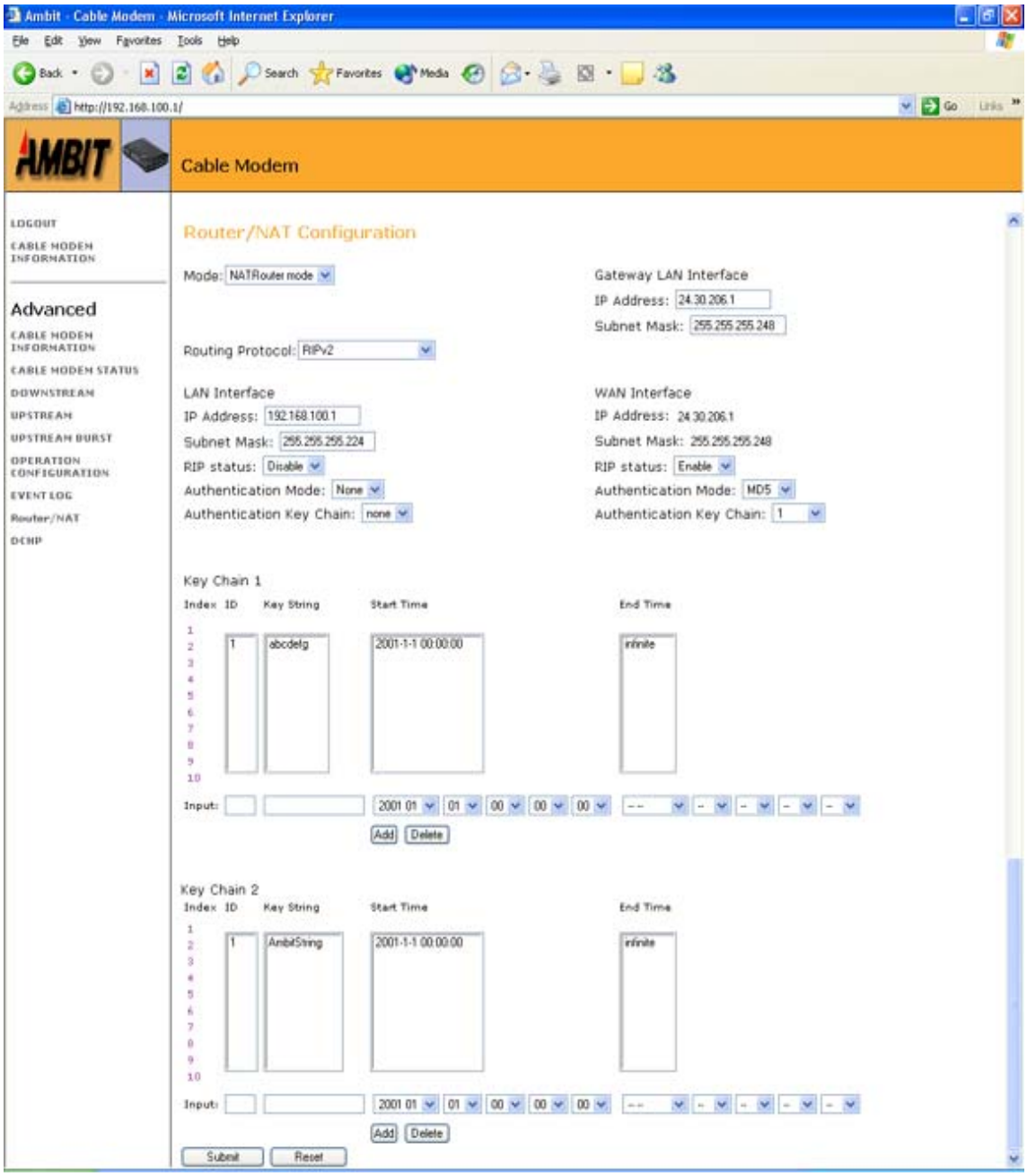
Submit

- Click "**Submit**" to change displayed parameters

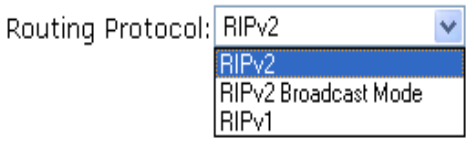
Reset

- Click "**Reset**" to use displayed parameters, cable modem will reset.

NAT Router Mode



Routing Protocol

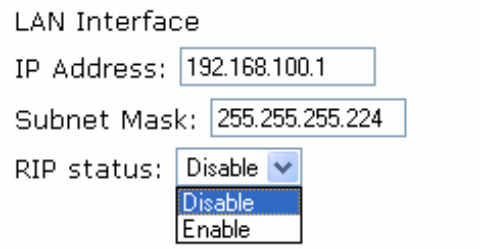


Gateway LAN Interface

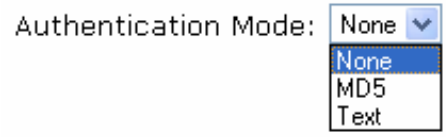
- Gateway Public IP Address for LAN Interface subnet and NAT-private subnet (same as the Cable Modem's ethernet interface)
- Public IP Address subnet mask

LAN Interface

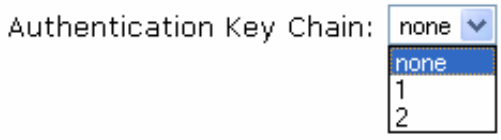
- NAT-Private IP Address subnet Gateway
- NAT-private IP Address subnet mask
- RIP status



- Authentication mode

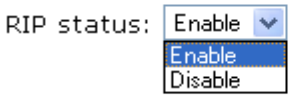


- Authentication Key Chain

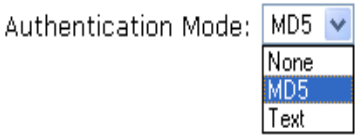


WAN Interface

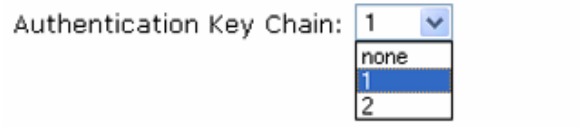
- Public IP Address subnet Gateway
- Public IP Address subnet mask
- RIP status



- Authentication mode



- Authentication Key Chain



Key Chain 1

- Listing of key

- Input key Index ID, Key String, Start time, and End time

Add

- Click "**Add**" to add the input index ID, Key String, Start Time, and End Time. If End Time is empty, it equals to infinite End Time.

Delete

- Select from the list and click "**Delete**" to remove the input index ID, Key String, Start Time, and End Time.

Key Chain 2

- Listing of key Chain 2

- Input key Index ID, Key String, Start time, and End time

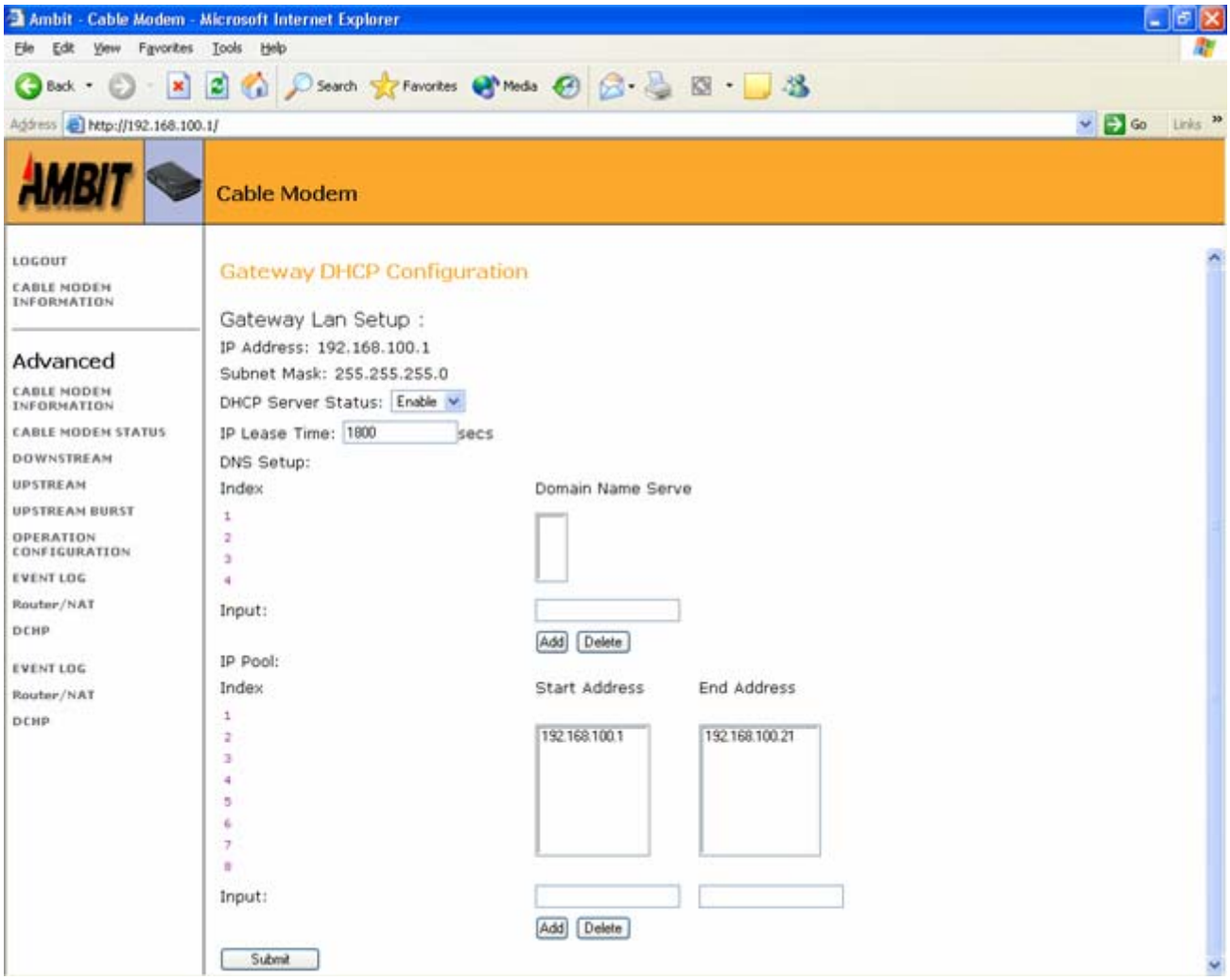
Submit

- Click "**Submit**" to change displayed parameters

Reset

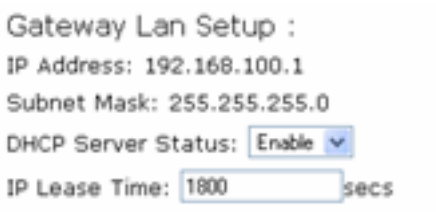
- Click "**Reset**" to use displayed parameters, cable modem will reset.

DHCP



Gateway LAN Setup

- IP Address
  (Gateway for private IP subnet in NAT mode)
  (Gateway for Public IP subnet in NAT/Router mode)
- Subnet Mask
- DHCP Server Status
  Enable/disable
- IP Lease Time
  Default lease time is 1800 secs



- Domain Name Service
  Supports up to four DNSs by clicking "**Add**" or "**Delete**" to insert or remove DNS.
- IP-pool
  Default IP-pool 1 supports 192.168.100.2~192.168.100.21
  IP-pool can be added or deleted by clicking the "**Add**" or "**Delete**" button.

9. DOCSIS configuration file VSIF tag support

This feature allows downloading Cable Router configuration from remote TFTP server via DOCSIS configuration file VSIF assignment. The router text based command lines configuration file can be downloaded from specified remote TFTP server. After the download of DOCSIS configuration file, it will also download Router configuration file and configure the router.

Example:

0x2b 0x31 0x08 0x03 0x00 0xd0 0x59 0x01 0x2a 0x63 0x6f 0x70 0x79 0x20 0x74 0x66
0x74 0x70 0x3a 0x63 0x6f 0x6e 0x66 0x69 0x67 0x20 0x31 0x37 0x32 0x2e 0x32 0x31
0x2e 0x31 0x2e 0x32 0x35 0x30 0x20 0x63 0x6d 0x63 0x6f 0x6e 0x66 0x69 0x67 0x2e
0x74 0x78 0x74

Meaning:

0x2b 0x31	VSIF tag number 43 (0x2b), total length is 49 bytes(0x31), the length does not include this two bytes.
0x08 0x03 0x00 0xd0 0x59	Vendor ID sub-type 08(0x08), ID length 3 (0x03), Ambit vendor ID is 0x00 0xd0 0x59
0x01 0x2a	0x01 mean configuration download, command length 42 bytes (0x2a)
0x63 0x6f …… 0x78 0x74	Command string, as following
copy tftp:config *172.21.1.250* ***cmconfig.txt*** 172.21.1.250 is the TFTP server ip address, which is changeable. "***cmconfig.txt***" is the text file containing the router configuration, which is changeable.	

Example:

Change the telnet password "cableroot" to "abcdefg" and key-1 key string to "cablerouter".
The cmconfig.text file should contain the following:

Pwd admin
Cableroot
abcdefg
rip key-chain1 1key-string cablerouter