CAUTION

Disconnect power before servicing.

This device is intended for indoor operation only. Telephone jacks Line 1 and Line 2 must not be connected to outside wiring.

CAUTION

To ensure reliable operation and to prevent overheating, provide adequate ventilation for this modem and keep it away from heat sources. Do not locate near heat registers or other heat-producing equipment. Provide for free air flow around the Wireless Voice Gateway and its power supply.

This symbol on the product ensures that the device complies with European legislation, Directive 89/336/EEC, 73/23/EEC, 93/68/EEC, which covers the EMC (electromagnetic compatibility), and safety aspects of marking.

This symbol means that your inoperative electronic appliance must be collected separately and not mixed with the household waste. The European Union has implemented a specific collection and recycling system for which producers' are responsible.

This appliance has been designed and manufactured with high quality materials and components that can be recycled and reused. Electrical and electronic appliances are liable to contain parts that are necessary in order for the system to work properly but which can become a health and environmental hazard if they are not handled or disposed of in the proper way. Consequently, please do not throw out your inoperative appliance with the household waste.

If you are the owner of the appliance, you must deposit it at the appropriate local collection point or leave it with the vendor when buying a new appliance.

- If you are a professional user, please follow your supplier's instructions.

- If the appliance is rented to you or left in your care, please contact your service provider.

Help us protect the environment in which we live!

NORTH AMERICAN CABLE INSTALLER:
This reminder is provided to call your attention to Article 820-40 of the National Electrical Code (Section 54 of the Canadian Electrical Code, Part 1) which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

Operating Information

Operating Temperature:	0˚ - 40˚ C	(32˚ - 104˚ F)
Storage Temperature:	-20˚ to 70˚ C	(-4˚ – 157˚ F)

If you purchased this product at a retail outlet, please read the following:

Product Information
Keep your sales receipt to obtain warranty parts and service and for proof of purchase. Attach it here and record the serial and model numbers in case you need them. The numbers are located on the back of the product.

Model No. _____Serial No _____

Purchase Date: _____Dealer/Address/Phone: _____

Safety Recommendations

REMEMBER SAFETY FIRST

Using equipment safely

Your Cable Modem has been manufactured to meet safety standards, but you must take care if you want it to perform properly and safely.

It is important that you read this booklet completely, especially the safety instructions below. If you have any doubts about the installation, operation or safety of decoder, please contact your supplier.

To avoid the risk of electric shock

- Disconnect the Cable Modem from the mains supply before you connect the Cable Modem to (or disconnect it from) any other equipment. Remember that contact with 110 Volt AC mains can be lethal or cause severe electric shock.
- Never remove the Cable Modem's cover. Should the Cable Modem fail, contact the Customer Service to arrange repair or service.
- Never allow anyone to push anything into holes, slots or any other opening in the case
- Do not block the Cable Modem's ventilation slots; never stand it on soft furnishings or carpets
- Do not put anything on the Cable Modem which might spill or drip into it (eg. Lighted candles or containers of liquids). Do not expose the Cable Modem to dripping or splashing. If an object or liquid enters inside the Cable Modem, unplug it immediately and contact the Customer Service.
- Do not store the Cable Modem in excessively hot, cold or damp conditions. The Cable Modem is intended to operate at an ambient temperature of less than 40 degrees Celsius and a maximum humidity level of 75%. In case of a storm, it is recommended that you unplug the Cable Modem from the mains and from the TV set.
- Leave the mains socket accessible so that you can unplug the set quickly

Connecting to the mains supply

- This Cable Modem is designed to operate at 110 ~ 240 VAC.
- If you are in any doubt about the mains lead, the plug or connection, please consult the Customer Service.
- Only the power adapter supplied with the decoder has to be used

Ensuring optimum performance

- Leave 7cm to 10cm around the Cable Modem to ensure that proper ventilation gets to the Cable Modem.
- Do not store your Cable Modem on its side (if not allowed)
- To clean the Cable Modem, use a dry, clean soft cloth with no cleaning solvent or abrasive products. Clean the ventilation openings regularly.

MAIN TECHNICALSPECIFICATIONS

General

Operating voltage	110 ~ 240 VAC
Typical Power consumption	18W max
Dimensions (W x H x D)	220mm x 166.7mm x 43mm
Operating temperature range	0 – 40 °C
Storage temperature range	-20 – 70 °C
AC adapter (or plug-in adapter) type	ADAPTER 18W 12VDC/1.5A

Connections

DC input	12V/ 1.5A
Cable input	1xCoaxial cable connector
Phone plugs	2xRJ11
Ethernet plugs	4xRJ-45

CE *This symbol on your set guarantees that your product complies with the European Directives 1999/5/ECand 2009/125/EC on Safety, Telecom, Electromagnetic Compatibility and Energy related Products.*

The Lightning Flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

CHAPTER 1: CONNECTIONS AND SETUP

Turning on the Wireless Voice Gateway

If there is no lighted LEDs on the front panel, check the power adapter plug-in the power jack and connect to CM correctly.

After installing the Wireless Voice Gateway and turn it on for the first time (and each time the modem is reconnected to the power), it goes through several steps before it can be used. Each of these steps is represented by a different pattern of flashing lights on the front of the modem.

Note: All indicators flash once before the initialization sequence.

If both DS and US LEDs are flashing, it means the Wireless Voice Gateway is automatically updating its system software. Please wait for the lights to stop flashing. Do not remove the power supply or reset the Wireless Voice Gateway during this process.

Introduction

Wireless Voice Gateway Features

- Full Band Capture Front End
- Increases performance with 50% increase in CPU speed.
- Adds Applications CPU to run Linux applications.
- Lowers Power with Advanced Power Management
- Advanced Processor architecture.
- High-Speed Memory architecture.
- Integrated IPTV solution.
- Excentis DOCSIS 1.0/1.1/2.0/3.0 Standard Compliant.
- PacketCable 1.0/1.5 Standard Compliant(must be upgradeable to PacketCable 2.0 version)
- Support Multiple Provisioning Mode.
- Four Standard RJ-45 connector for 10/100/1000BaseT Ethernet with auto-negotiation and MDIX functions; Support maximum Ethernet cable length up to 100m (Category 5).
- Two RJ-11 Foreign Exchange Station (FXS) port for IP telephony; Support a maximum line length between themselves and an end-receiver (handset, etc.) of up to 500 feet (AWG 26/0.4mm).
- Support simultaneous voice and data communications.
- One voice conversations in the FXS port with different CODEC:
  G.711-ulaw, G.711-alaw, G.723.1, BV16, ILBC, G.726-16, G.726-24, G.726-32, G.726-40, G.728, G.729, G.729E, G.729A, G.729B, TELEVENT, T.38 (disabled by default)
- Default codecs: G.711-ulaw, G.711-alaw, BV16, ILBC, TELEVENT, T.38 (disabled by default)
- Echo Cancellation.
- Voice Active Detection (VAD).
- DTMF detection and generation.
- Comfort Noise Generation (CNG).
- Support V.90 fax and modem services.
- 56 bits DES and 128 bits AES data encryption security.
- SNMP network management support.
- 802.11 b/g/n supported, 20/40Mhz bandwidth, 300Mbps Maximum data rate.
- BCM43227 support 2.4Ghz only.
- Support Web pages and private DHCP server for status monitoring.
- The NTP (Network Termination Point) should be able to operate with an LF (Loading Factors) of at least 5 REN.
- TEL 1 and TEL 2 port are not connected on Hardware side.
- Propane™ technology supported, enabling the connection of more Internet users without additional network bandwidth.
- Plug and Play.

What's on the CD-ROM

Insert the Wireless Voice Gateway CD-ROM into your CD-ROM drive to view troubleshooting tips, the internal diagnostics, and other valuable information.

CD-ROM Contents:

- Electronic copy of this user's guide in additional languages (PDF format)
- Adobe Acrobat Reader — application you can load to read PDF format, if you don't have it loaded already
- Links to Technicolor web site

DOCSIS and PacketCable are trademarks of Cable Television Laboratories, Inc.

Computer Requirements

For the best possible performance from your Wireless Voice Gateway, your personal computer must meet the following minimum system requirements (note that the minimum requirements may vary by cable companies):

	IBM PC COMPATIBLE	**MACINTOSH****
CPU	Pentium preferred	PowerPC or higher
System RAM	16MB (32MB preferred)	24MB (32MB preferred)
Operating System	Windows* NT / 2000 / Me / XP / Vista / Windows 7, Linux	Mac OS** 7.6.1 or higher
Video	VGA or better (SVGA preferred)	VGA or better (SVGA built-in preferred)
CD-ROM Drive	Required	Required
Ethernet	10BaseT , 100BaseT or 1000BaseT An Ethernet card makes it possible for your computer to pass data to and from the internet. You must have an Ethernet card and software drivers installed in your computer. You will also need a standard Ethernet cable to connect the Ethernet card to your Wireless Voice Gateway.	10BaseT , 100BaseT or 1000BaseT
Software	• A TCP/IP network protocol for each machine • Microsoft Internet Explorer 4.0 or later or Netscape Navigator 4.0 or later.	

* Windows is a trademark of Microsoft Corporation.

** Macintosh and the Mac OS are trademarks of Apple Computer, Inc.

Wireless Voice Gateway Overview

Front Panel

The following illustration shows the front panel:

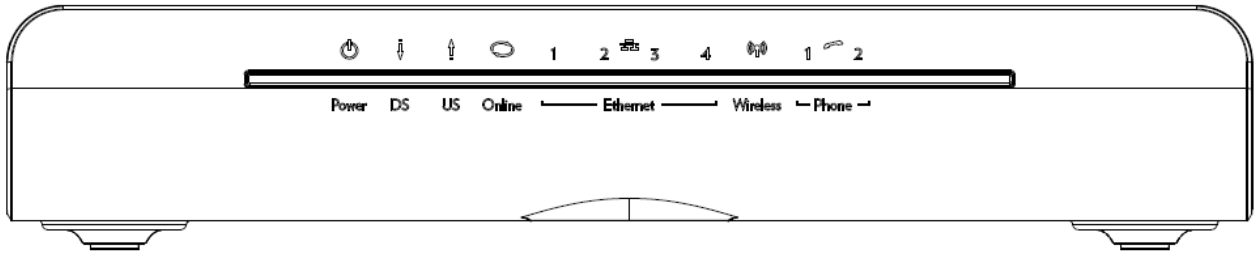

Fig. 1-1 Front Panel

POWER - Indicates the Power status.

DS - Indicates the status of Data reception by the cable modem from the Network (Downstream Traffic).

US - Indicates the status of Data transmission by the cable modem to the Network (Upstream Traffic).

Online - Displays the status of your cable connection. The light is off when no cable connection is detected and fully lit when the modem has established a connection with the network and data can be transferred.

Ethernet - Indicates the state of Ethernet ports.

Wireless - Indicates the traffic on the wireless network.

Phone - Indicates the status of the telephone Line.

The lights on the front panel LEDs are described in the table below (from left to right):
ON = the LED is light, OFF = the LED is gray, FLASH = the LED is blinking.

TC7300	Power	Internet			Ethernet				Wireless	TEL 1	TEL 2	Description
		DS	US	Online	1	2	3	4				
Boot-up Operation	ON	ON	ON	ON	ON	ON	ON	ON	X	ON	ON	Power on 0.25 sec
	ON	0.25 second										
	ON	FLASH	FLASH	FLASH	X	X	X	X	X	X	X	From power ON to system initialization complete
	ON	ON	ON	ON	X	X	X	X	X	X	X	Following system initialization complete to (before) DS scanning
		1 second										
DOCSIS Start-up Operation	ON	FLASH	OFF	OFF	X	X	X	X	X	X	X	During DS scanning and acquiring SYNC
	ON	ON	FLASH	OFF	X	X	X	X	X	X	X	From SYNC completed, receiving UCD to ranging completed
	ON	ON	ON	FLASH	X	X	X	X	X	X	X	During DHCP, configuration file download, registration, and Baseline Privacy initialization: DHCP status: 1 second ON and 1 second OFF, TFTP status: 0.25 second ON and 0.25 second OFF
	ON	ON	ON	ON	X	X	X	X	X	X	X	Operational (NACO=ON)
	ON	FLASH	FLASH	OFF	X	X	X	X	X	X	X	Operational (NACO=OFF)
Channel Bonding Operation	FLASH	FLASH	FLASH	FLASH	X	X	X	X	X	X	X	Wait registration with all DS and all US – Lights Flash sequentially from the right to left Minimum duration 3 seconds
	X	X	X	X	OFF	X	X	X	X	X	X	From 1 to 4 DS, from 1 to 4 LEDs are ON From 5 to 8 DS, From 1 to 4 LEDs are flashing Duration 3 seconds
	OFF	X	X	X	X	X	X	X	X	X	X	From 1 to 4 US, from 1 to 4 LEDs are ON.
	FLASH	FLASH	FLASH	FLASH	X	X	X	X	X	X	X	Wait registration with all DS and all US – Lights Flash sequentially from the left to right
MTA initialization	ON	ON	ON	ON	X	X	X	X	X	FLASH	OFF	MTA DHCP
	ON	ON	ON	ON	X	X	X	X	X	OFF	FLASH	MTA SNMP/TFTP
	ON	ON	ON	ON	X	X	X	X	X	ON	ON	RSIP for NCS/Register for SIP
CPE Operation	ON	X	X	X	OFF ON FLASH	OFF ON FLASH	OFF ON FLASH	OFF ON FLASH	OFF ON FLASH	X	X	No Ethernet / Wireless Link Ethernet / Wireless Link TX/RX Ethernet / Wireless Traffic
MTA Operation	ON	<CM Normal Operation>								ON	ON	Both Lines On-Hook
	ON									FLASH	ON	Tel1 Off-hook, Tel2 On-hook
	ON									ON	FLASH	Tel1 On-hook, Tel2 Off-hook
	ON									FLASH	FLASH	Both Lines Off-Hook
SW Download Operation	ON	FLASH	FLASH	ON	X	X	X	X	X	X	X	A software download and while updating the FLASH memory

Table 1-1 LED behavior

Rear Panel

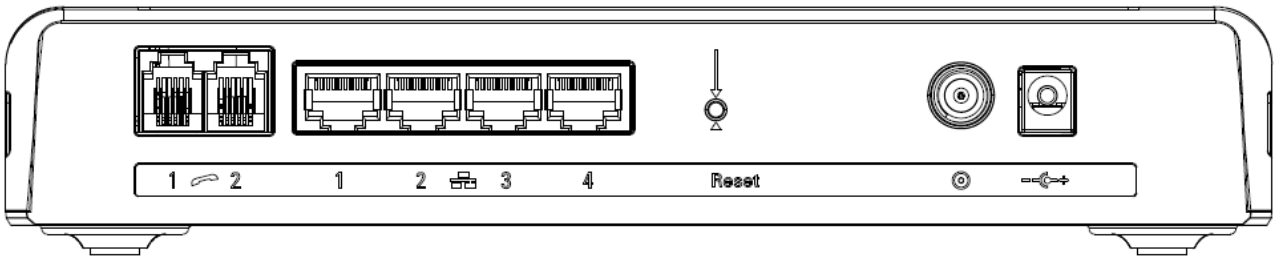

Fig. 1-2 Rear Panel

Connector	Description
Power Jack	Connector for DC12V
Cable	Connector for the cable network
Reset	To restart the modem or press over 5 seconds can default the modem.
Ethernet	Ethernet ports, RJ-45, 10/100/1000BaseT connector
Phone1/ Phone2	RJ11 Phone Connectors

Table 1-2 Rear Panel description

Side Panel for WPS

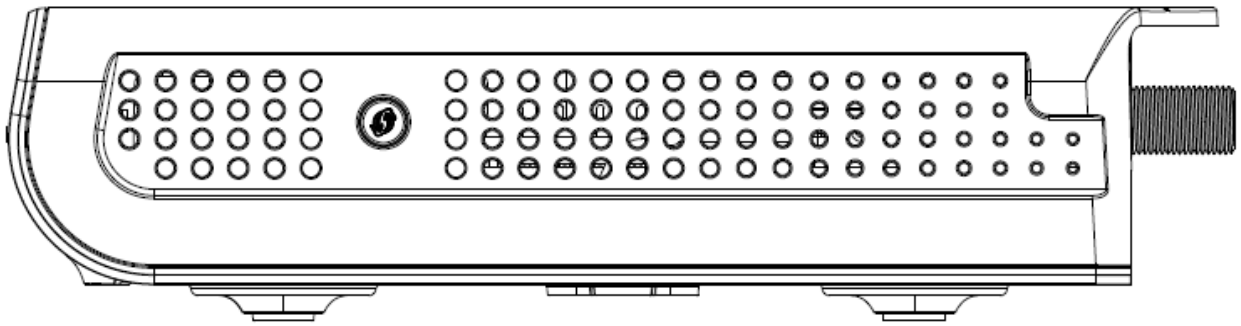

Fig. 1-3 Side Panel

WPS - Indicates the status of the WPS (Wi-Fi Protected Setup™) functionality.

WPS button: Wi-Fi Protected Setup™. This button can be used to:

Secure the connection with another device (PC for example) using WPS protocol. A long press on the button allows you to enable the association of the modem with a PC or other equipment.

After link establish. A short press on the button, switch on/off the wireless traffic.

Wall Mounting

This article will show the user through the process of wall-mounting the Wireless Voice Gateway

The Adapter has two wall-mount slots on its back panel.

Two screws are needed to mount the Adapter.

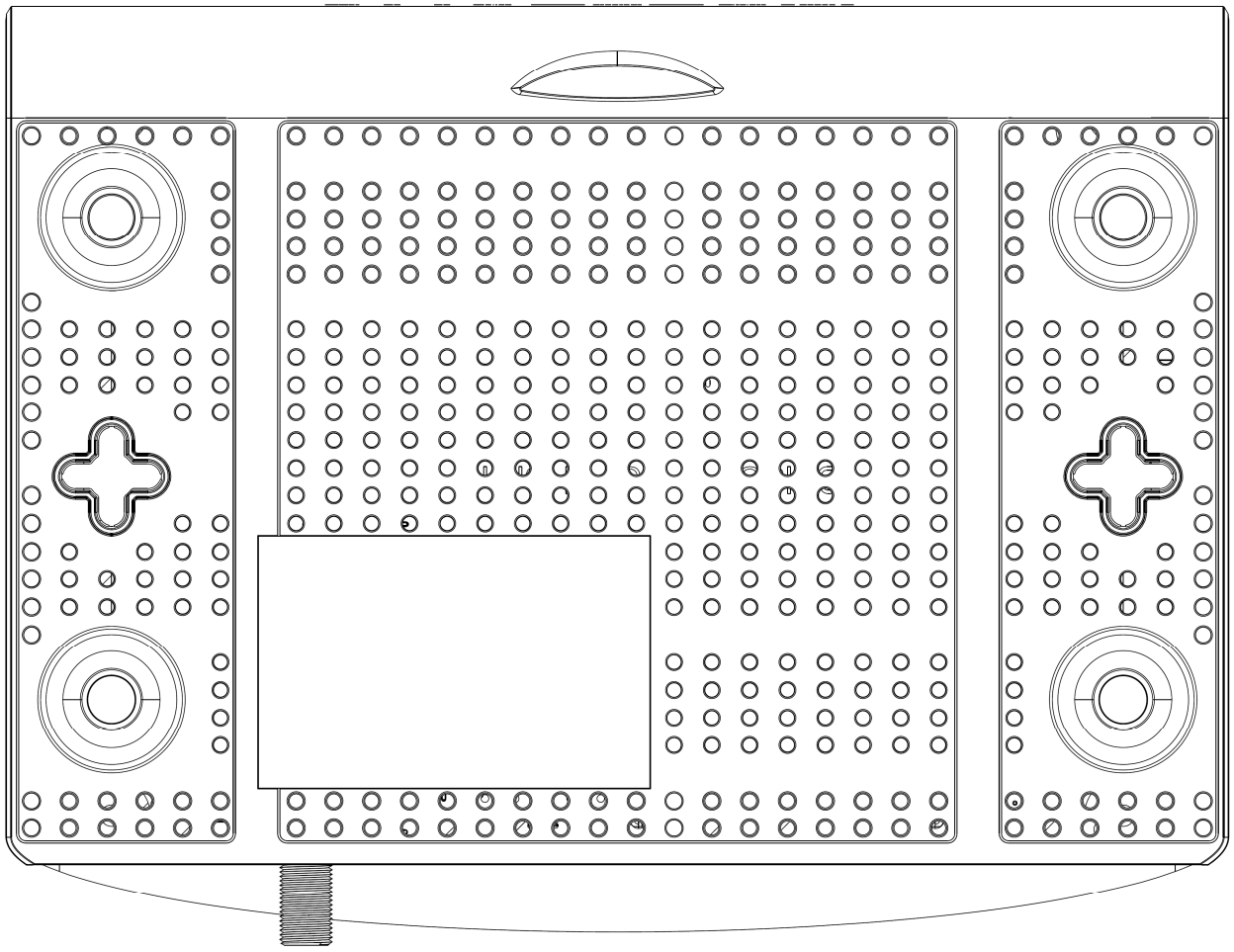

Fig. 1-4 Wall Mounting

To do this:

1. Ensure that the wall you use is smooth, flat, dry and sturdy and use the 2 screw holes which are 101.6 mm (4 inches) apart from each other.
2. Fix the screws into wall, leaving their heads 3 mm (0.12 inch) clear of the wall surface.
3. Remove any connections to the unit and locate it over the screw heads. When in line, gently push the unit on to the wall and move it downwards to secure.

Relationship among the Devices

This illustration shows a cable company that offers DOCSIS/Euro-DOCSIS and PacketCable/Euro-PacketCable compliant voice/data services.

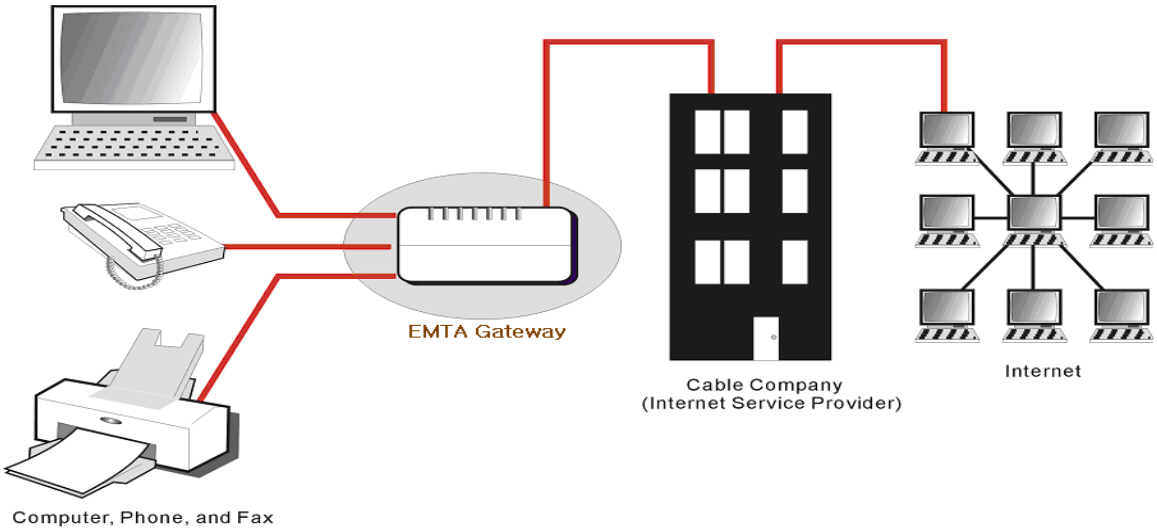

Fig. 1-5 Connection overview

What the Modem Does

The Wireless Voice Gateway provides high-speed Internet access as well as cost-effective, toll-quality telephone voice and fax/modem services over residential, commercial, and education subscribers on public and private networks via an existing CATV infrastructure. It can inter-operate with the PacketCable compliant head-end equipment and provide the IP-based voice communications. The IP traffic can transfer between the Wireless Voice Gateway and DOCSIS/Euro-DOCSIS compliant head-end equipment. The data security secures upstream and downstream communications.

What the Modem Needs to Do Its Job

- **The Right Cable Company:** Make sure your local cable company provides data services that use cable TV industry-standard DOCSIS/Euro-DOCSIS compliant and PacketCable/Euro-PacketCable compliant technology.
- **The Internet/Telephony Service Provider (ISP/TSP):** Your cable company provides you access to an Internet Service Provider (ISP) and Telephony Service Provider (TSP). The ISP is your gateway to the Internet and provides you with a pipeline to access Internet content on the World Wide Web (WWW). The TSP provides you with telephony access to other modems or other telephony services over the Public Switched Telephone Network (PSTN).

Check with your cable company to make sure you have everything you need to begin; they'll know if you need to install special software or re-configure your computer to make your cable internet service work for you.

Contact Your Local Cable Company

You will need to contact your cable company to establish an Internet account before you can use your gateway. You should have the following information ready (which you will find on the sticker on the gateway):

- The serial number
- The model number
- The Cable Modem (CM) Media Access Control (MAC) address
- The Terminal Adapter (EMTA) MAC address
- Security information: Service Set IDentifier (SSID), Encryption key / passphrase (WPA2-PSK by default), channel number. Default values are indicated underneath the modem on the sticker.

Please check the following with the cable company

- The cable service to your home supports DOCSIS/Euro-DOCSIS compliant two-way modem access.
- Your internet account has been set up. (The Media Terminal Adapter will provide data service if the cable account is set up but no telephony service is available.)
- You have a cable outlet near your PC and it is ready for Cable Modem service.

Note: It is important to supply power to the modem at all times. Keeping your modem plugged in will keep it connected to the Internet. This means that it will always be ready whenever you need.

Important Information

Your cable company should always be consulted before installing a new cable outlet. Do not attempt any rewiring without contacting your cable company first.

Please verify the following on the Wireless Voice Gateway

The Power LED should be lighted when plug-in the power supply.

Connecting the Wireless Voice Gateway to a Single Computer

This section of the manual explains how to connect your Wireless Voice Gateway to the Ethernet port on your computer and install the necessary software. Please refer to Figure 1-5 to help you connect your Digital Cable Modem for the best possible connection.

Attaching the Cable TV Wire to the Wireless Voice Gateway

1. Locate the Cable TV wire. You may find it one of three ways:
   a. Connected directly to a TV, a Cable TV converter box, or VCR. The line will be connected to the jack, which should be labeled either IN, CABLE IN, CATV, CATV IN, etc.
   b. Connected to a wall-mounted cable outlet.
   c. Coming out from under a baseboard heater or other location. See Figure 1-5 for the wiring example.

Notes: For optimum performance, be sure to connect your Wireless Voice Gateway to the first point the cable enters your home. The splitter must be rated for at least 1GHz.

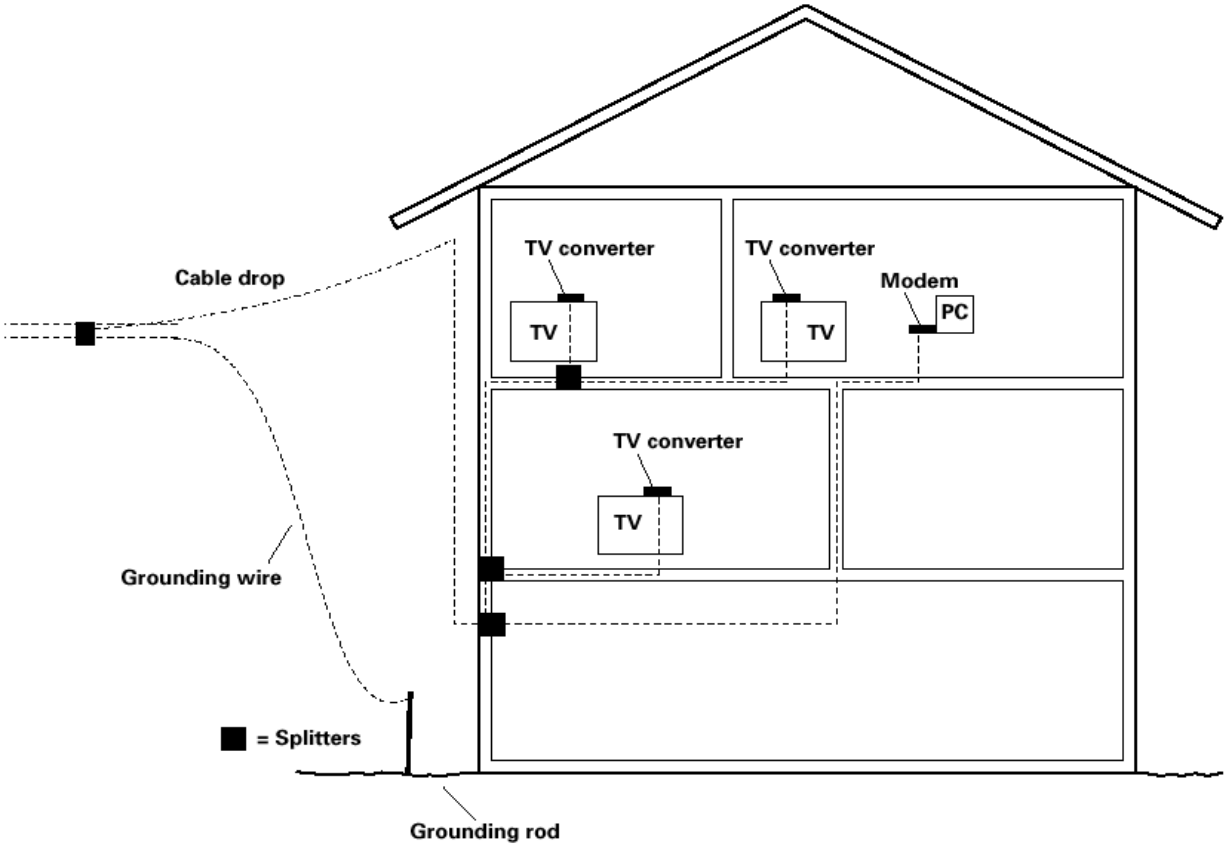

Fig. 1-6 Basic Home Wiring

Installation procedure for connecting to the Ethernet interface

Follow these steps for proper installation. Plug the coaxial cable to the cable wall outlet and the other end to the modem connector labeled "CABLE".

Note: To ensure a fast registration of the modem, the coaxial cable must be connected to the modem before it is powered on.

Plug the power supply into the socket of the cable modem and two-pin on the adatper plug into the AC outlet.

Note: Only use the power supply that comes with the modem. Using another power supply can cause damage to the product, and will void the warranty.

Connect an Ethernet cable (direct connection, see below) to the Ethernet port at the back of the computer, and the other end to the ETHERNET port on the rear panel of the cable modem. The modem will seek the appropriate cable signal on the cable television network and go through the initial registration process on its own. The modem is ready for data transfer after the green LED "ONLINE" is lit continuously.

Note: the button "reset" at the back of the modem is used primarily for maintenance.

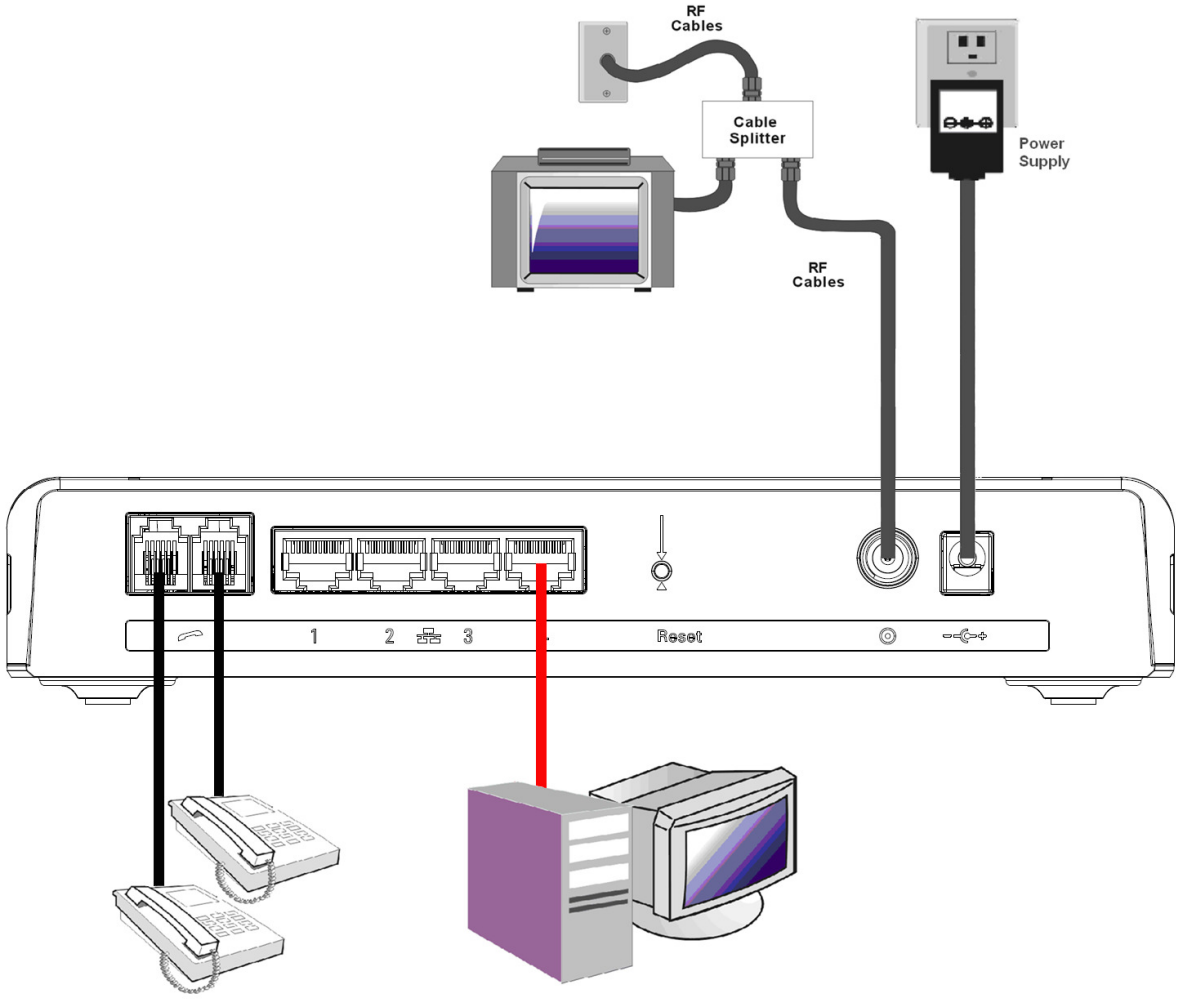

Fig. 1-7 Connect to the Modem

Connecting More Than one Computer to the Wireless Voice Gateway

If you need to connect more than two computers or if you need to connect two computers, you'll need the following additional equipment (if supported by your cable operator):

- Crossover-wired, or "null," category 5 Ethernet cable for the cable modem to be connected to the hub
- 10/100/1000BaseT Hub or Switch
- Straight through, or standard, category 5 Ethernet cable (one for each computer to be connected)

If you have a hub with an uplink port a straight through cable can be used in combination with that port in lieu of the crossover cable.

An uplink port has a small switch on it to change the polarity of the connection. It can accept either a crossover or a straight cable, depending on the setting.

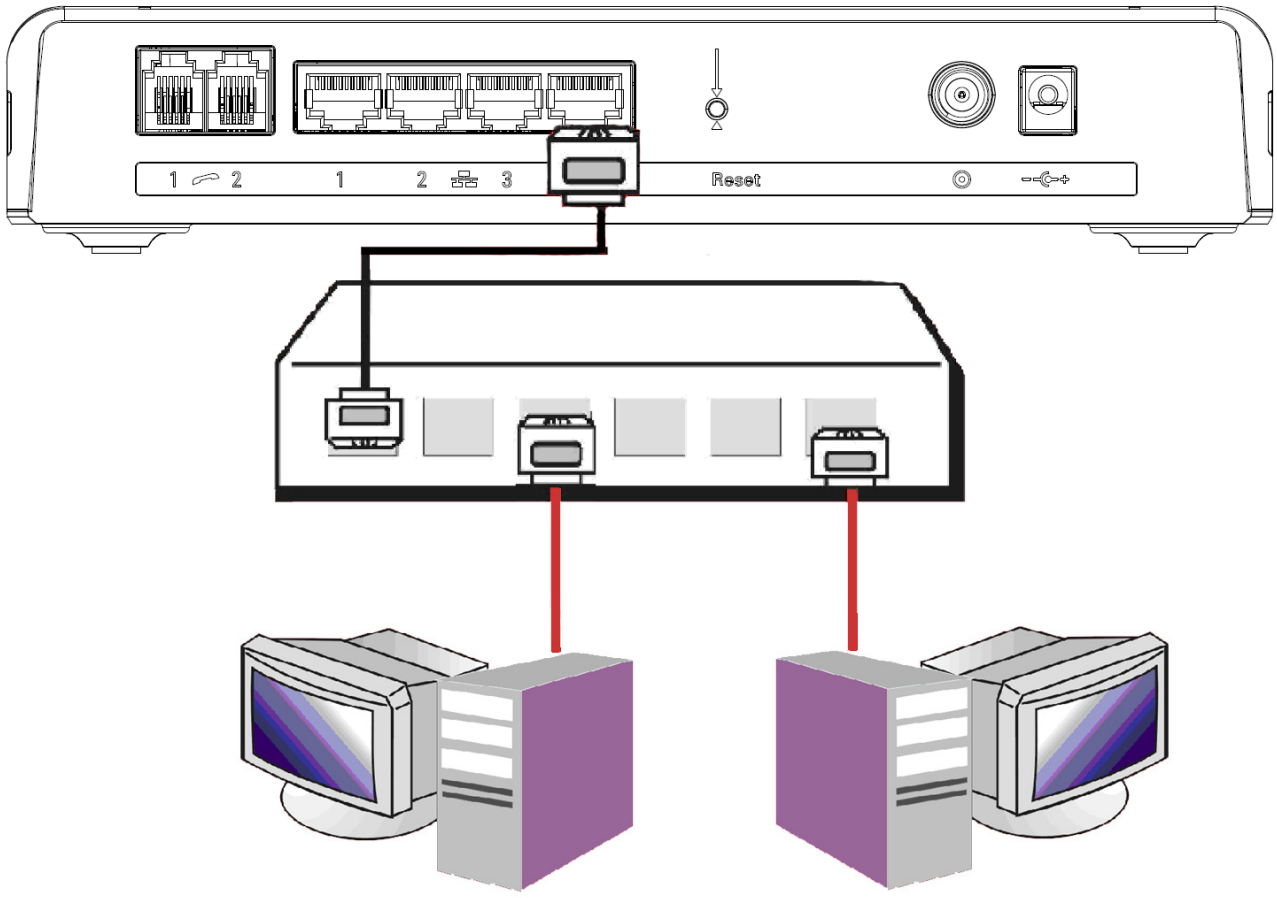

Fig. 1-8 Connect to two more computer

Telephone or Fax Connection

When properly connected, most telephony devices can be used with the Wireless Voice Gateway just as with a conventional telephone service. To make a normal telephone call, pick up the handset; listen for a dial tone, then dial the desired number. For services such as call waiting, use the hook switch (or FLASH button) to change calls. The following procedures describe some of the possible connection schemes for using telephony devices with the Wireless Voice Gateway.

1. Connect a standard phone line cord directly from the phone (fax machine, answering machine, caller ID box, etc.) to one of the LINE jacks on the Wireless Voice Gateway.
2. If there is a phone line in your home which is NOT connected to another telephone service provider, connect a standard phone line cord from a jack on this line to one of the LINE jacks of the Wireless Voice Gateway. Connect a standard phone line cord directly from the phone (fax machine, answering machine, caller ID box, etc.) to one of the other jacks in the house that uses that line.
3. If you have a multi-line telephone, connect a standard phone line cord (not an RJ-14 type line cord) from the phone to the LINE jacks on the Wireless Voice Gateway. (Other phones can be added to each line by using standard phone line splitters.)

CHAPTER 2: WEB CONFIGURATION

To make sure that you can access the Internet successfully, please check the following first.

1. Make sure the connection (through Ethernet) between the Wireless Voice Gateway and your computer is OK.
2. Make sure the TCP/IP protocol is set properly.
3. Subscribe to a Cable Company.

Accessing the Web Configuration

The **Wireless Voice Gateway** offers local management capability through a built-in HTTP server and a number of diagnostic and configuration web pages. You can configure the settings on the web page and apply them to the device.

Once your host PC is properly configured; please proceed as follows:

1. Start your web browser and type the private IP address of the Wireless Voice Gateway on the URL field: **192.168.0.1**, the main page will appear.

Outline of Web Manager

The main screen will be shown as below.

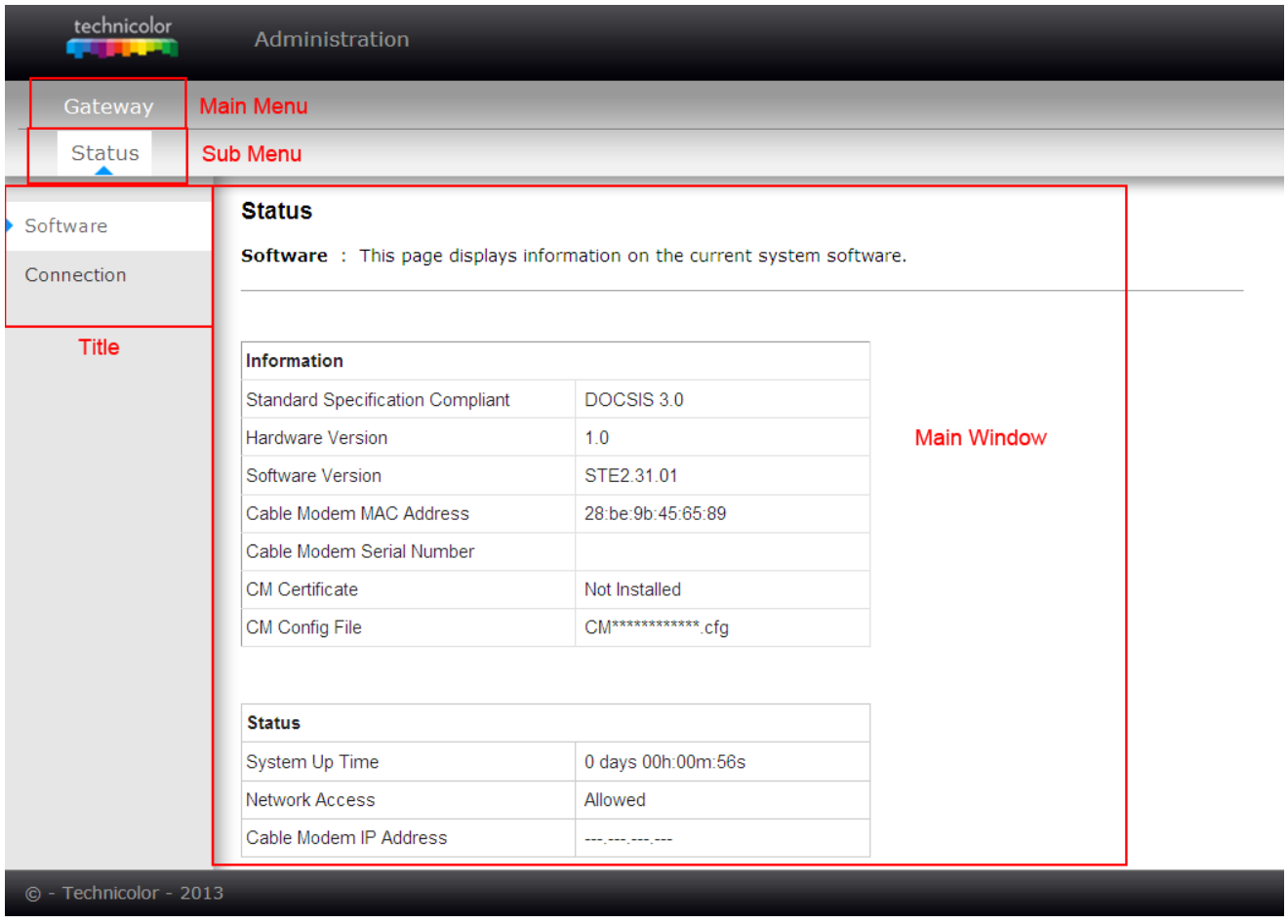

Fig. 2-1 Outline of Web Manager

- **Main Menu**: the hyperlinks on the top of the page, including Gateway and several sub-menu items
- **Sub Menu**: under the main menu, sub menu use to enter each function, e.g., Status
- **Title**: the sidebar on the left side of the page indicates the title of this management interface, e.g., Software in this example
- **Main Window**: the current workspace of the web management, containing configuration or status information

For easy navigation, the pages are organized in groups with group in names main menu. Individual page names within each group are provided in the sub menu and sidebar. So to navigate to a page, click the group hyperlink at the top, then the sub menu for the function, finally choose the title on the sidebar.

Your cable company may not support the reporting of some items of information listed on your gateway's internal web pages. In such cases, the information field appears blank. This is normal.

Gateway – Status Web Page Group

1. Software

The information section shows the hardware and software information about your gateway.

The status section of this page shows how long your gateway has operated since last time being powered up, and some key information the Cable Modem received during the initialization process with your cable company. If Network Access shows "Allowed," then your cable company has configured your gateway to have Internet connectivity. If not, you may not have Internet access, and should contact your cable company to resolve this.

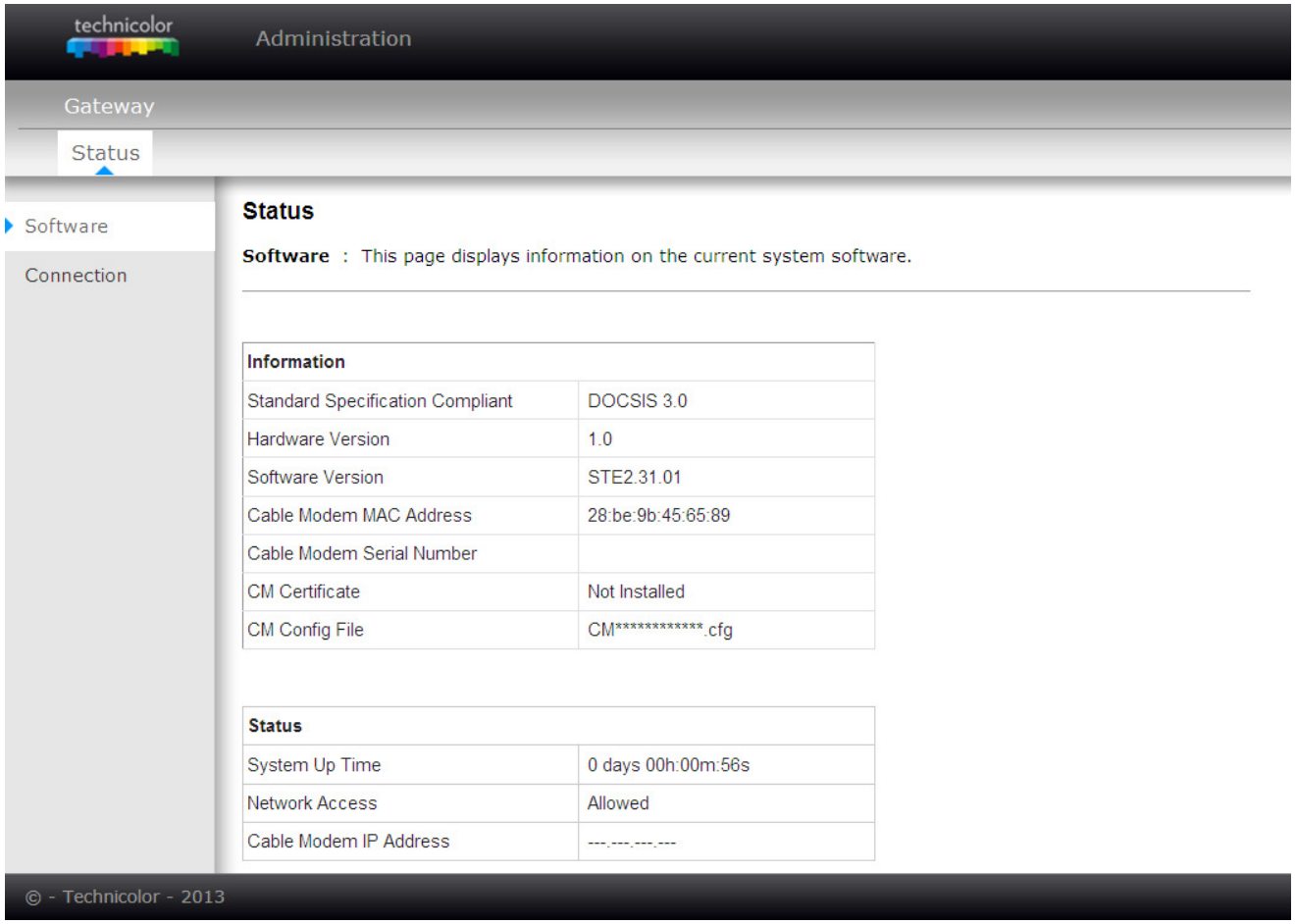

Fig.2-2 Gateway\Status\Software

2. Connection

This page reports current connection status containing startup procedures, downstream and upstream status, CM online information, and so on. The information can be useful to your cable company's support technician if you're having problems.

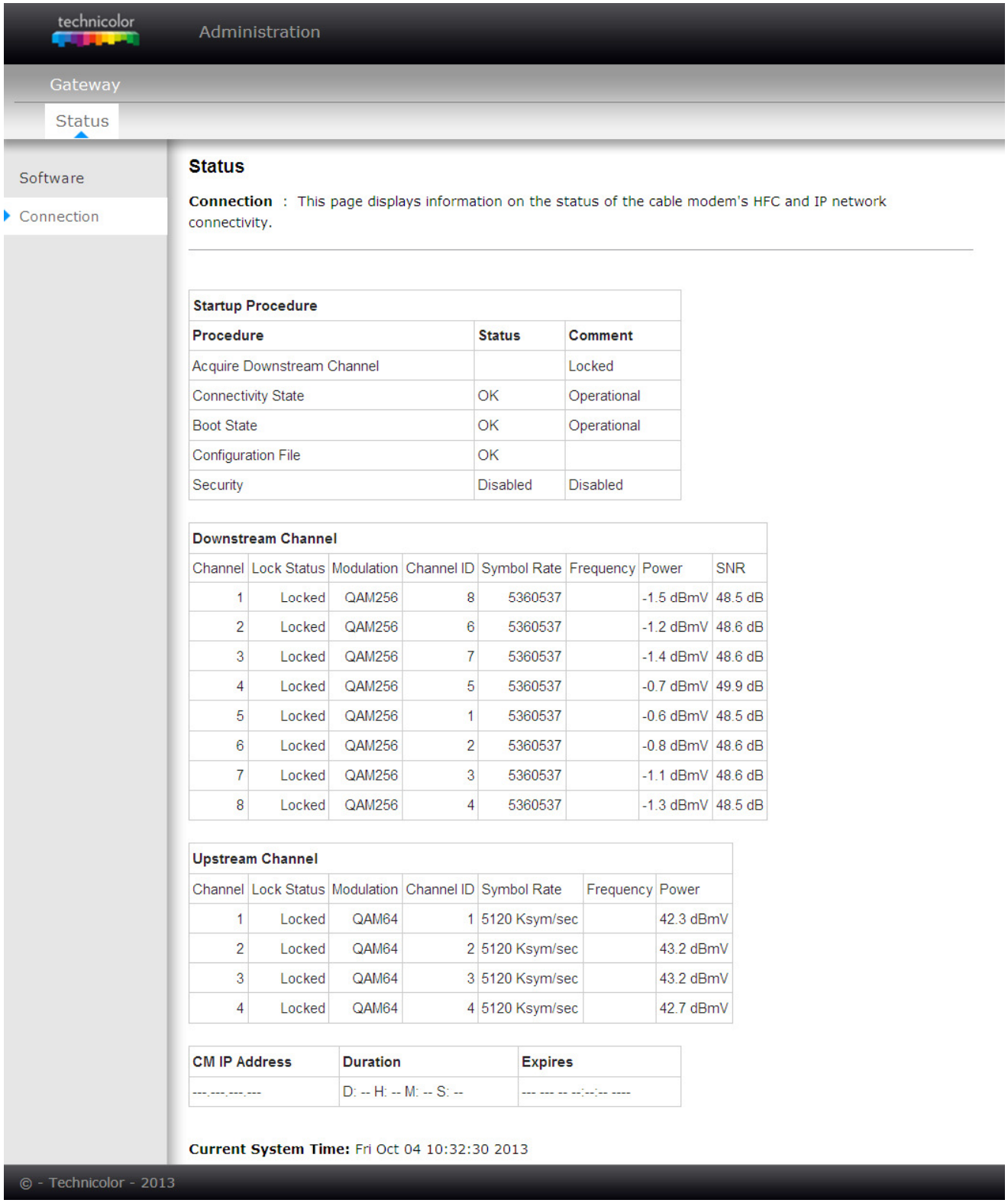

Fig. 2-3 Gateway\Status\Connection

CHAPTER 3: NETWORKING

Communications

Data communication involves the flow of packets of data from one device to another. These devices include personal computers, Ethernet, cable modems, digital routers and switches, and highly integrated devices that combine functions, like the Wireless Cable Gateway.

The gateway integrates the functionality often found in two separate devices into one. It's both a cable modem and an intelligent wireless voice gateway networking device that can provide a host of networking features, such as NAT and firewall. Fig.3-1 illustrates this concept, with the cable modem (CM) functionality on the left, and networking functionality on the right. In this figure, the numbered arrows represent communication based on source and destination, as follows:

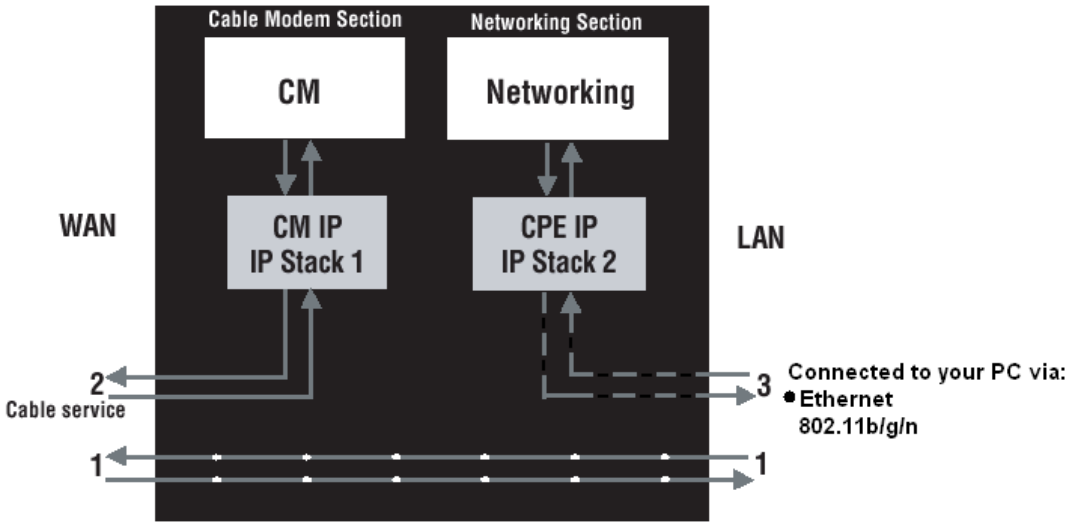

Fig.3-1 Communication between your PCs and the network side

Type of Communication

1. Communication between the Internet and your PCs
   Example: The packets created by your request for a page stored at a web site, and the contents of that page sent to your PC.
2. Communication between your cable company and the cable modem side
   Example: When your cable modem starts up, it must initialize with the cable company, which requires the cable company to communicate directly with the cable modem itself.
3. Communication between your PCs and the networking side

Example: The Wireless Cable Gateway offers a number of built-in web pages which you can use to configure its networking side; when you communicate with the networking side, your communication is following this path. Each packet on the Internet addressed to a PC in your home travels from the Internet down- stream on the cable company's system to the WAN side of your Wireless Cable Gateway. There it enters the Cable Modem section, which inspects the packet, and based on the results, proceeds to either forward or block the packet from proceeding on to the Networking section. Similarly, the Networking section then decides whether to forward or block the packet from proceeding on to your PC. Communication from your home device to an Internet device works similarly, but in reverse, with the packet traveling upstream on the cable system.

Cable Modem (CM) Section

The cable modem (or CM) section of your gateway uses DOCSIS or EURO-DOCSIS Standard cable modem technology. DOCSIS or EURO-DOCSIS specifies that TCP/IP over Ethernet style data communication be used between the WAN interface of your cable modem and your cable company.

A DOCSIS or EURO-DOCSIS modem, when connected to a Cable System equipped to support such modems, performs a fully automated initialization process that requires no user intervention. Part of this initialization configures the cable modem with a CM IP (Cable Modem Internet Protocol) address, as shown in Figure 3-2, so the cable company can communicate directly with the CM itself.

Networking Section

The Networking section of your gateway also uses TCP/IP (Transmission Control Protocol/ Internet Protocol) for the PCs you connected on the LAN side. TCP/IP is a networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems.

TCP/IP requires that each communicating device be configured with one or more TCP/IP stacks, as illustrated by Fig.3-2. On a PC, you often use software that came with the PC or its network interface (if you purchased a network interface card separately) to perform this configuration. To communicate with the Internet, the stack must also be assigned an IP (Internet Protocol) address. 192.168.100.1 is an example of an IP address. A TCP/IP stack can be configured to get this IP address by various means, including a DHCP server, by you directly entering it, or sometimes by a PC generating one of its own.

Ethernet requires that each TCP/IP stack on the Wireless Cable Gateway also have associated with it an Ethernet MAC (Media Access Control) address. MAC addresses are permanently fixed into network devices at the time of their manufacture. 00:90:64:12:B1:91 is an example of a MAC address.

Data packets enter and exit a device through one of its network interfaces. The gateway offers Ethernet and 802.11b/g/n wireless network interfaces on the LAN side and the DOCSIS network interface on the WAN side.

When a packet enters a network interface, it is offered to all the TCP/IP stacks associated with the device side from which it entered. But only one stack can accept it — a stack whose configured Ethernet address matches the Ethernet destination address inside the packet. Furthermore, at a packet's final destination, its destination IP address must also match the IP address of the stack.

Each packet that enters a device contains source MAC and IP addresses telling where it came from, and destination MAC and IP addresses telling where it is going to. In addition, the packet contains all or part of a message destined for some application that is running on the destination device. IRC used in an Internet instant messaging program, HTTP used by a web browser, and FTP used by a file transfer program are all examples of applications. Inside the packet, these applications are designated by their port number. Port 80, the standard HTTP port, is an example of a port number.

The Networking section of the router performs many elegant functions by recognizing different packet types based upon their contents, such as source and destination MAC address, IP address, and ports.

Three Networking Modes

Your gateway can be configured to provide connectivity between your cable company and your home LAN in any one of three Networking Modes: CM, RG, and CH. This mode setting is under the control of your cable company, who can select the mode to match the level of home networking support for which you have subscribed. All units ship from the factory set for the RG mode, but a configuration file which the cable company sends the cable modem section during its initialization can change it.

Cable Modem (CM) Mode

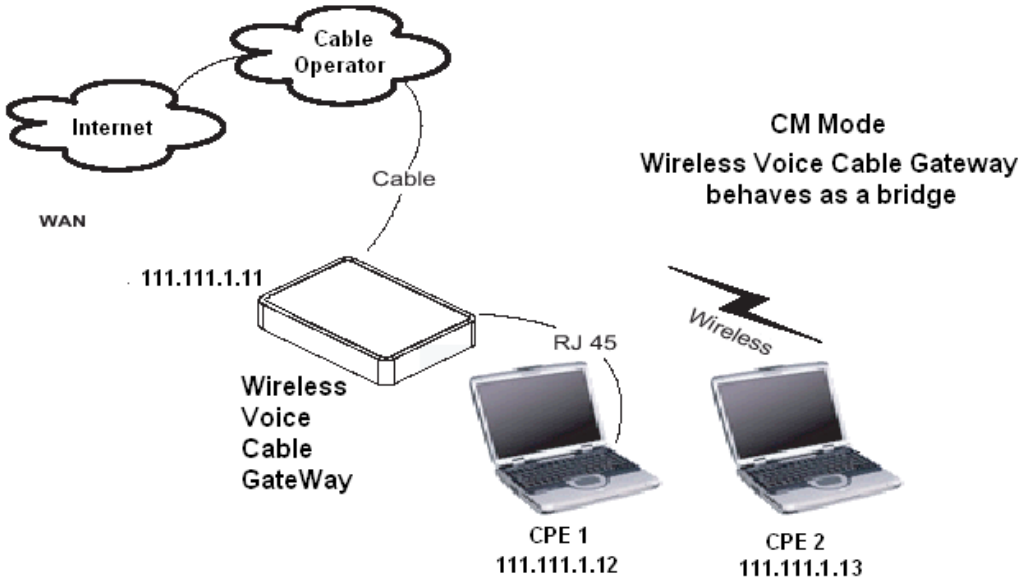

Fig. 3-2 Cable Modem Mode

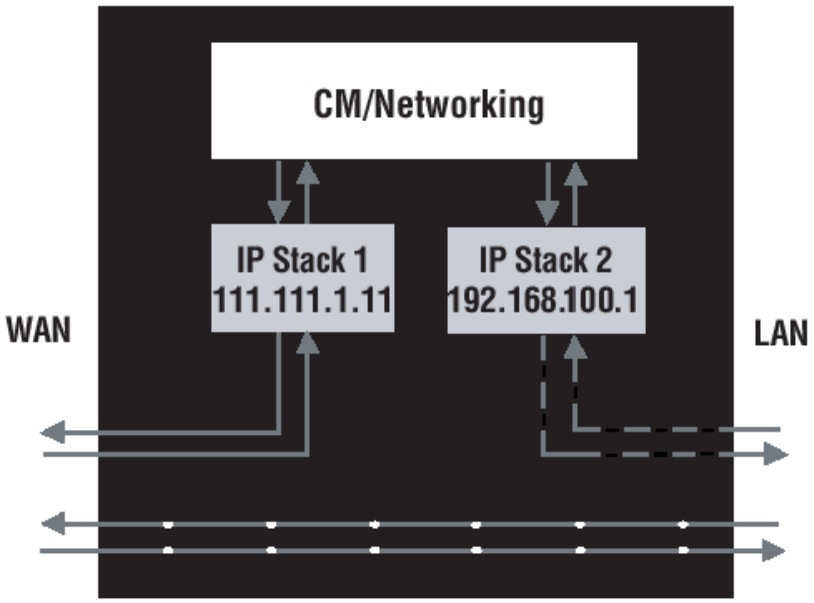

Fig. 3-3 Two IP stacks are activated in cable modem mode

CM (Cable Modem) Mode provides basic home networking. In this mode, two IP stacks are active:

- IP Stack 1 - for use by the cable company to communicate with the cable modem section only. This stack receives its IP address from the cable company during CM initialization. It uses the MAC address printed on the label attached to the Wireless Cable gateway.
- IP Stack 2 - for use by you, the end user, to communicate with the cable modem and Networking sections, to access the internal web page diagnostics and configuration. This stack uses a fixed IP address: 192.168.100.1. It uses a MAC address 00:10:95:FF:FF:FE.

With CM Mode, your cable company must provide one IP address for the CM section, plus one for each PC you connect from their pool of available addresses. Your cable company may have you or your installer manually enter these assigned addresses into your PC, or use a DHCP Server to communicate them to your PCs, or use a method that involves you entering host names into your PCs.

Note that in CM Mode, packets passing to the Internet to/from your PCs do not travel through any of the IP stacks; instead they are directly bridged between the WAN and LAN sides.

Residential Gateway (RG) Mode

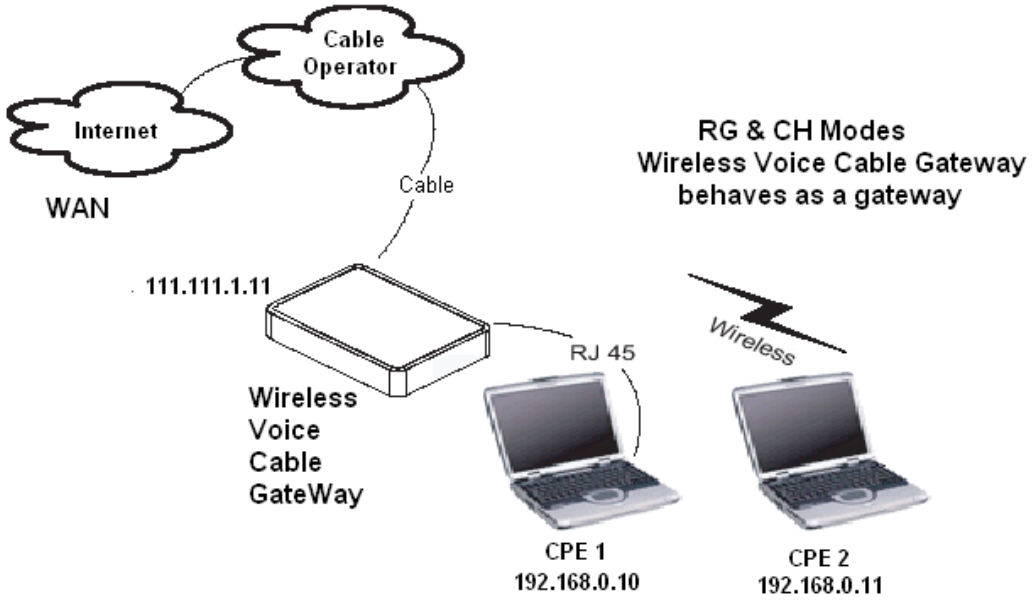

Fig. 3-4 Residential Gateway Mode

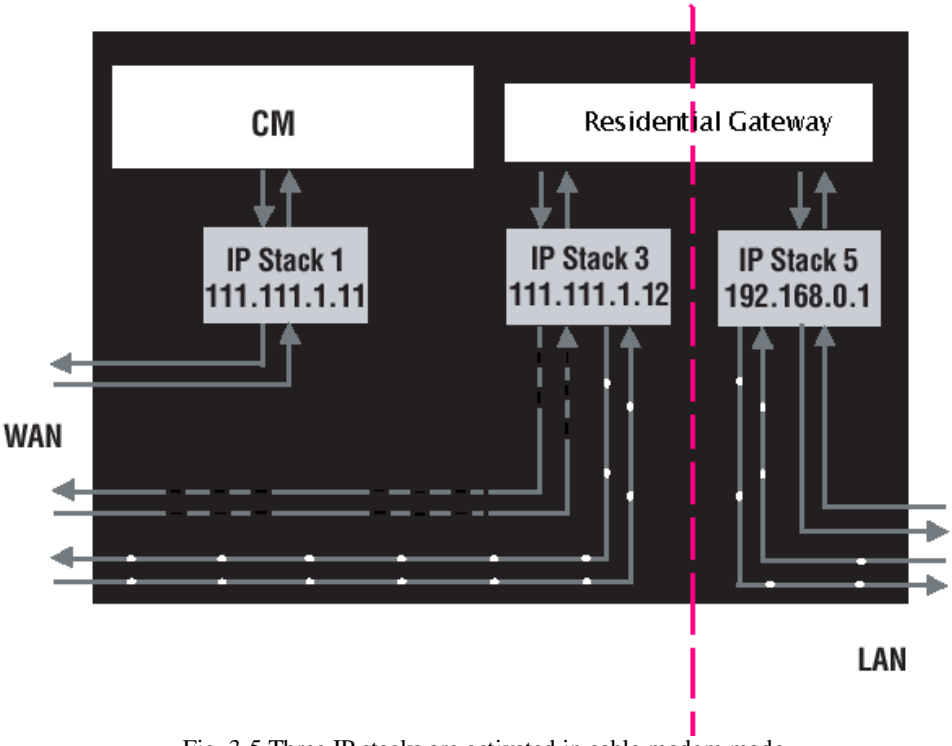

Fig. 3-5 Three IP stacks are activated in cable modem mode

RG (Residential Gateway) Mode provides basic home networking plus NAT (Network Address Translation). In this mode, three IP stacks are active:

- IP Stack 1 - for use by the cable company to communicate with the Cable Modem section only. This stack receives its IP address from the cable company during CM initialization. It uses the MAC address printed on the label attached to the Wireless Cable Gateway.
- IP Stack 3 - for use by you to remotely (i.e. from somewhere on the WAN side, such as at your remote workplace) communicate with the Cable Modem and Networking sections, to remotely access the internal web page diagnostics and configuration. This stack is also used by your cable company to deliver packets between the Internet and the gateway's networking section so they can be routed to/from your PCs. This stack requires an IP address assigned by the cable company from their pool of available addresses. Your cable company may have you or your installer manually enter assigned addresses into your gateway, or use a DHCP Server to communicate them, or use a method that involves you entering host names. This stack uses a MAC address of MAC label + 2 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00:90:64:12:B1:93.
- IP Stack 5 - for use by you to locally (i.e. from somewhere on the LAN side in your home) communicate with the Cable Modem and Networking sections, to access the internal web page diagnostics and configuration. This stack is also used by the gateway's networking section to route packets between the gateway's Networking section and your PCs. This stack uses a fixed IP address: 192.168.0.1. It uses a MAC address of MAC label + 4 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00:90:64:12:B1:95.

With RG Mode, your cable company must provide one IP address for the CM section, plus one for the Networking section, from their pool of available addresses. With RG Mode, each PC you connect gets an IP address from a DHCP Server that is part of the Networking section of the gateway.

CHAPTER 4: ADDITIONAL INFORMATION

Frequently Asked Questions

Q. What if I don't subscribe to cable TV?

A. If cable TV is available in your area, data and voice service may be made available with or without cable TV service. Contact your local cable company for complete information on cable services, including high-speed internet access.

Q. How do I get the system installed?

A. Professional installation from your cable provider is strongly recommended. They will ensure proper cable connection to the modem and your computer. However, your retailer may have offered a self installation kit, including the necessary software to communicate with your cable ISP.

Q. Once my Wireless Voice Gateway is connected, how do I get access to the Internet?

A. Your local cable company provides your internet service*, offering a wide range of services including email, chat, and news and information services, and a connection to the World Wide Web.

Q. It seems that the wireless network is not working

A. Check the Wireless LED on the front panel. If it is no lighted, press on the WPS button shortly, less than 1 second, on the side of the modem, and then check again the Wireless LED. If it is lighted, then the Wireless transmission is enabled.

Q. Can I watch TV, surf the Internet, and talk to my friends through the Wireless Voice Gateway at the same time?

A. Absolutely!

Q. What do you mean by "Broadband?"

A. Simply put, it means you'll be getting information through a "bigger pipe," with more bandwidth, than a standard phone line can offer. A wider, "broader" band means more information, more quickly.

Q. What is DOCSIS and what does it mean?

A. "Data over Cable Service Interface Specifications" is the industry standard that most cable companies are adopting as they upgrade their systems. Should you ever decide to move, the Wireless Voice Gateway will work with all upgraded cable systems that are DOCSIS-compliant.

Q. What is PacketCable and what does it mean?

A. PacketCable is the industry standard for telephony services that most cable companies are adopting as they upgrade their systems. Should you ever decide to move, the Wireless Voice Gateway will work with all upgraded cable systems that are PacketCable compliant.

Q. What is Xpress Technology and what does it mean?

A. It is one of the popular performance-enhancing WiFi technologies, designed to improve wireless network efficiency and boost throughput. It is more efficient in mixed environments, and it can work with 802.11a/b/g networks. When Xpress is turned on, aggregate throughput (the sum of the individual throughput speeds of each client on the network) can improve by **up to** 27% in 802.11g-only networks, and **up to** 75% in mixed networks comprised of 802.11g and 802.11b standard equipment. The

technology achieves higher throughput by re-packaging data, reducing the number of overhead control packets, so that more useful data can be sent during a given amount of time.

* Monthly subscription fee applies.

** Additional equipment required. Contact your cable company and ISP for any restrictions or additional fees.

General Troubleshooting

You can correct most problems you have with your product by consulting the troubleshooting list that follows.

I can't access the internet.

- Check all of the connections to your Wireless Voice Gateway.
- Your Ethernet card may not be working. Check each product's documentation for more information.
- The Network Properties of your operating system may not be installed correctly or the settings may be incorrect. Check with your ISP or cable company.

I can't get the modem to establish an Ethernet connection.

- Even new computers don't always have Ethernet capabilities – be sure to verify that your computer has a properly installed Ethernet card and the driver software to support it.
- Check to see that you are using the right type of Ethernet cable.

The modem won't register a cable connection.

- If the modem is in Initialization Mode, the INTERNET light will be flashing. Call your Cable Company if it has not completed this 5-step process within 30 minutes, and note which step it is getting stuck on.
- The modem should work with a standard RG-6 coaxial cable, but if you're using a cable other than the one your Cable Company recommends, or if the terminal connections are loose, it may not work. Check with your Cable Company to determine whether you're using the correct cable.
- If you subscribe to video service over cable, the cable signal may not be reaching the modem. Confirm that good quality cable television pictures are available to the coaxial connector you are using by connecting a television to it. If your cable outlet is "dead", call your Cable Company.
- Verify that the Cable Modem service is DOCSIS compliant and PacketCable compliant by calling your cable provider.

I don't hear a dial tone when I use a telephone.

- Telephone service is not activated. If the rightmost light on the Wireless Voice Gateway stays on while others flash, check with your TSP or cable company. If the Wireless Voice Gateway is connected to existing house telephone wiring, make sure that another telephone service is not connected. The other service can normally be disconnected at the Network Interface Device located on the outside of the house.
- If using the second line on a two-line telephone, use a 2-line to 1-line adapter cable.

For more Usage and Troubleshooting Tips use the web site links provided on the CD-ROM:

www.technicolor.com

Service Information

If you purchased or leased your Wireless Voice Gateway directly from your cable company, then warranty service for the Digital Cable Modem may be provided through your cable provider or its authorized representative. For information on 1) Ordering Service, 2) Obtaining Customer Support, or 3) Additional Service Information, please contact your cable company. If you purchased your Wireless Voice Gateway from a retailer, see the enclosed warranty card.

Glossary

10/100/1000 BaseT – Unshielded, twisted pair cable with an RJ-45 connector, used with Ethernet LAN (Local Area Network). "10/100/1000" indicates speed (10/100/1000 BaseT), "Base" refers to baseband technology, and "T" means twisted pair cable.

Authentication - The process of verifying the identity of an entity on a network.

DHCP (Dynamic Host Control Protocol) – A protocol which allows a server to dynamically assign IP addresses to workstations on the fly.

Ethernet adapters – A plug-in circuit board installed in an expansion slot of a personal computer. The Ethernet card (sometimes called a Network Interface Card , network adapter or NIC) takes parallel data from the computer, converts it to serial data, puts it into a packet format, and sends it over the 10/100/1000 BaseT LAN cable.

DOCSIS (Data Over Cable Service Interface Specifications) – A project with the objective of developing a set of necessary specifications and operations support interface specifications for Cable Modems and associated equipment.

F Connector – A type of coaxial connector, labeled CABLE IN on the rear of the Wireless Voice Gateway that connects the modem to the cable system.

HTTP (HyperText Transfer Protocol) – Invisible to the user, HTTP is used by servers and clients to communicate and display information on a client browser.

Hub – A device used to connect multiple computers to the Wireless Voice Gateway.

IP Address – A unique, 32-bit address assigned to every device in a network. An IP (Internet Protocol) address has two parts: a network address and a host address. This modem receives a new IP address from your cable operator via DHCP each time it goes through Initialization Mode.

Key exchange - The swapping of mathematical values between entities on a network in order to allow encrypted communication between them.

MAC Address – The permanent "identity" for a device programmed into the Media Access Control layer in the network architecture during the modem's manufacture.

NID - Network Interface Device, the interconnection between the internal house telephone wiring and a conventional telephone service provider's equipment. These wiring connections are normally housed in a small plastic box located on an outer wall of the house. It is the legal demarcation between the subscriber's property and the service provider's property.

PacketCable – A project with the objective of developing a set of necessary telephony specifications and operations support interface specifications for Wireless Voice Gateways and associated equipment used over the DOCSIS based cable network.

PSTN (Public Switched Telephone Network) – The worldwide voice telephone network which provides dial tone, ringing, full-duplex voice band audio and optional services using standard telephones.

Provisioning - The process of enabling the Media Terminal Adapter (MTA) to register and provide services over the network.

TCP/IP (Transmission Control Protocol/Internet Protocol) – A networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems.

TFTP - Trivial File Transfer Protocol, the system by which the Media Terminal Adapter's configuration data file is downloaded.

TSP - Telephony Service Provider, an organization that provides telephone services such as dial tone, local service, long distance, billing and records, and maintenance.

Universal Serial Bus (USB) – USB is a "plug-and-play" interface between a computer and add-on devices, such as a Wireless Voice Gateway.

Xpress Technology - One of the popular performance-enhancing WiFi technologies, designed to improve wireless network efficiency and boost throughput. It is more efficient in mixed environments, and it can work with 802.11a/b/g networks.