



Safety Instructions

Using equipment safely

Your Cable Modem product has been manufactured to meet European and local 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.

Equipment connected to the protective earth of the building installation through the mains connection or through other equipment with a connection to protective earth and to a cable distribution system using coaxial cable, may in some circumstances create fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11).

If you have any doubts about the installation, operation or safety of the product, please contact your supplier.

To avoid the risk of electric shock

- Disconnect the Cable Modem product from the mains supply before you connect it to (or disconnect it from) any other equipments. Remember that contact with Mains can be lethal or causes severe electric shock.
- Never remove the product cover. Should the product 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 ventilation slots; never stand it on soft furnishings or carpets
- Do not put anything on it which might spill or drip into it (e.g. Lighted candles or containers of liquids). Do not expose it 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 product in excessively hot, cold or damp conditions. It is intended to operate at an ambient temperature of less than 40 degrees Celsius and a maximum humidity level of 70%. In case of a storm, it is recommended that you unplug the product from the mains and from the PC set or other equipment.
- Leave the mains socket accessible so that you can unplug the set quickly

Connecting to the mains supply

- This appliance is designed to operate in the rated voltage 100 ~ 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 product has to be used.

Ensuring optimum performance

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

Limiting the Human Body Exposure to the Electromagnetic Fields

Under normal use condition the user shall keep at least 20cm distance from the Cable Modem product.



Environmental considerations

This symbol means that your inoperative electronic appliance, and used battery when applicable, 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

Please help us protect the environment in which we live

Energy savings - You have a role to play...

Learn how you can use and explore ways for using your electronic equipment



The user manual detailed useful information on all the features of your product but also on energy consumption performances.

We strongly encourage you to carefully read the notice before putting your equipment in service to get the best service it can offer you.

By working together, we can reduce the impact we have on our earth!

Main technical specifications

General

Operating voltage	100 ~ 240 VAC
Typical Power consumption	12 W max
Dimensions (W x H x D)	150mm x 150mm
Operating temperature range	0 – 40 °C
Storage temperature range	-20 – 70 °C
AC adapter (or plug-in adapter) type	ADAPTER 12W 12VDC/1A

Connections

DC input	12V/ 1A
Cable input	1xCoaxial cable connector
Ethernet plugs	1xRJ-45



Marking information



This symbol on your set guarantees that your product complies with the European Directive 1999/5/EC on Safety, Telecom, Electromagnetic Compatibility, with the 2009/125/EC Directive on Energy related Products and the Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. This equipment is intended to be used indoor in a residential or office environment. This equipment may be operating in Europe

The CE Declaration of Conformity is available on the Website www.technicolor.com

Responsible Party:	Technicolor Connected Home Rennes
	975, Avenue des Champs Blancs CS17616
	35576 Cesson-Sévigné Cedex
	France



Chapter 1: Connections and Setup	6
Turning on the Cable Modem	6
Introduction	6
Cable Modem Features	6
What's on the CD-ROM	7
Computer Requirements.....	7
Cable Modem Overview	8
Front Panel.....	8
Rear Panel	10
Wall Mounting	11
Relationship among the Devices	12
What the Modem Does	12
What the Modem Needs to Do Its Job.....	12
Contact Your Local Cable Company	12
Connecting the Cable Modem to a Single Computer	13
Attaching the Cable TV Wire to the Cable Modem	14
Installation procedure for connecting to the Ethernet interface.....	15
Chapter 2: WEB Configuration	16
Accessing the Web Configuration	16
Outline of Web Manager	17
Warning message to change the password	18
Status Web Page Group.....	19
Software.....	19
Connection.....	20
Password.....	21
Event Log	23
Initial Scan	24
Chapter 3: Networking.....	25
Communications	25
Type of Communication	25
Cable Modem (CM) Section	26
Networking Section	26
Cable Modem (CM) Mode.....	27



Chapter 4: Additional Information	29
Frequently Asked Questions	29
General Troubleshooting	30
Service Information	31
Glossary	32



CHAPTER 1: CONNECTIONS AND SETUP

Turning on the Cable Modem

After installing the Cable Modem 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.

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

Note: All indicators flash once before the initialization sequence.

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

Introduction

Cable Modem Features

- Full Band Capture Front End.
- Increases performance with 50% increase in CPU speed.
- Lowers Power with Advanced Power Management.
- Advanced Processor architecture.
- High-Speed Memory architecture.
- Integrated IPTV solution.
- Excentis EuroDOCSIS 1.0/1.1/2.0/3.0 Standard Compliant.
- Support Provisioning Mode.
- 1 ports Standard RJ-45 connector for 10/100/1000BaseT Ethernet with auto-negotiation and MDIX
- 56 bits DES and 128 bits AES data encryption security.
- SNMP network management support.
- Support Web pages and private DHCP server for status monitoring.
- Propane™ technology supported, enabling the connection of more Internet users without additional network bandwidth.



What's on the CD-ROM

Insert the Cable Modem 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

Computer Requirements

For the best possible performance from your Cable Modem, 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 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 Cable Modem.	
Software	<ul style="list-style-type: none"> • 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.

Cable Modem Overview

Front Panel

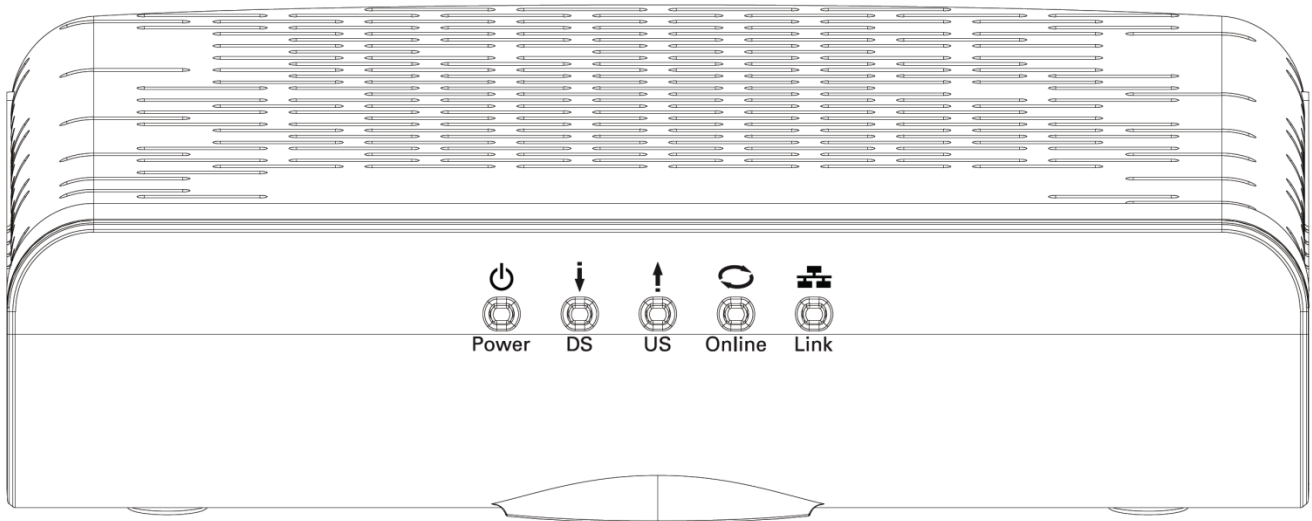


Fig. 1-1 Front Panel

The following illustration shows the 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.



Link - Indicates the state of Ethernet ports.



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.

TC4210	Power	DS	US	ONLINE	LINK	Description
Boot-up Operation	ON	ON	ON	ON	ON	Power on 0.25 sec
	X	FLASH	FLASH	FLASH	X	Following system initialization complete to (before) DS scanning
OCSIS Start-up Operation	ON	FLASH	OFF	OFF	X	During DS scanning and acquiring SYNC
	ON	ON	FLASH	OFF	X	From SYNC completed, receiving UCD to ranging completed
	ON	ON	ON	FLASH	X	During DHCP, configuration file download, registration, and Baseline Privacy initialization DHCP status, LED SHOULD be ON 1 sec, and OFF 1 sec Tftp status, LED SHOULD be ON 0.25 sec, and OFF 0.25 sec
	ON	ON	ON	ON	X	Operational (NACO=ON)
	ON	FLASH	FLASH	OFF	X	Operational (NACO=OFF)
	ON	FLASH	ON	ON	X	2s On, 2s Off
Partial Service (DS)	ON	FLASH	ON	ON	X	2s On, 2s Off
Partial Service (US)	ON	ON	FLASH	ON	X	2s On, 2s Off
CPE Operation	X	X	X	X	OFF ON FLASH	No Ethernet Link Ethernet Link TX/RX Ethernet Traffic
SW Download Operation	ON	FLASH	FLASH	ON	X	A software download and while updating the FLASH memory

Table 1-1 LED behavior

Rear Panel

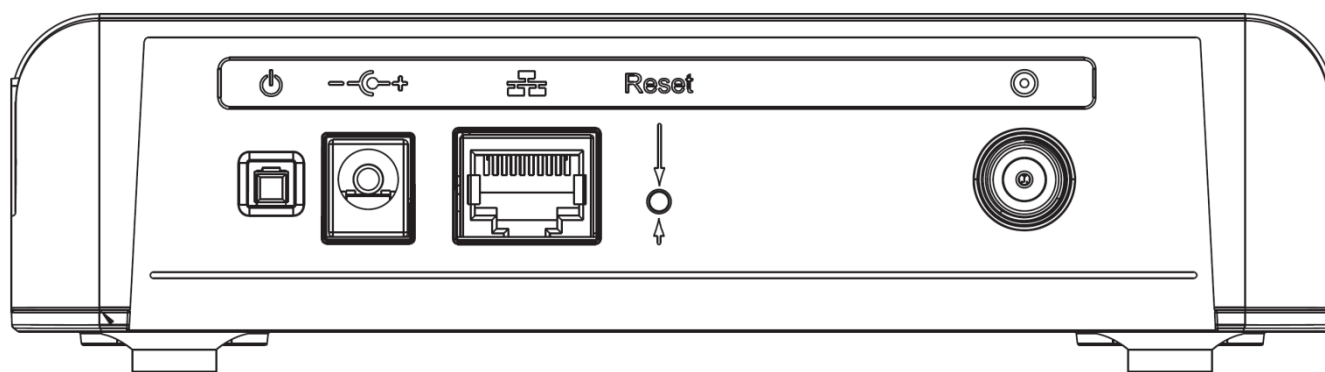


Fig. 1-2 Rear Panel

Connector	Description
Power Switch	Power on, off the Cable modem.
Power Jack	Connector for DC12V.
Etherent	Ethernet ports, 10/100/1000BaseT RJ-45 connector.
Reset	To restart the modem or press over 5 seconds can default the modem.
Cable	Connector for the cable network.

Table 1-2 Rear Panel description

Wall Mounting

The number of the screw 2 pcs.

Direction for wall mounting: Tuner downward or leftward or rightward.

Dimension for the screw: diameter: 3.5mm; length: 10mm.

There are 2 slots on the underside of the CABLE MODEM that can be used for wall mounting.

Note: When wall mounting the unit, ensure that it is within reach of the power outlet.

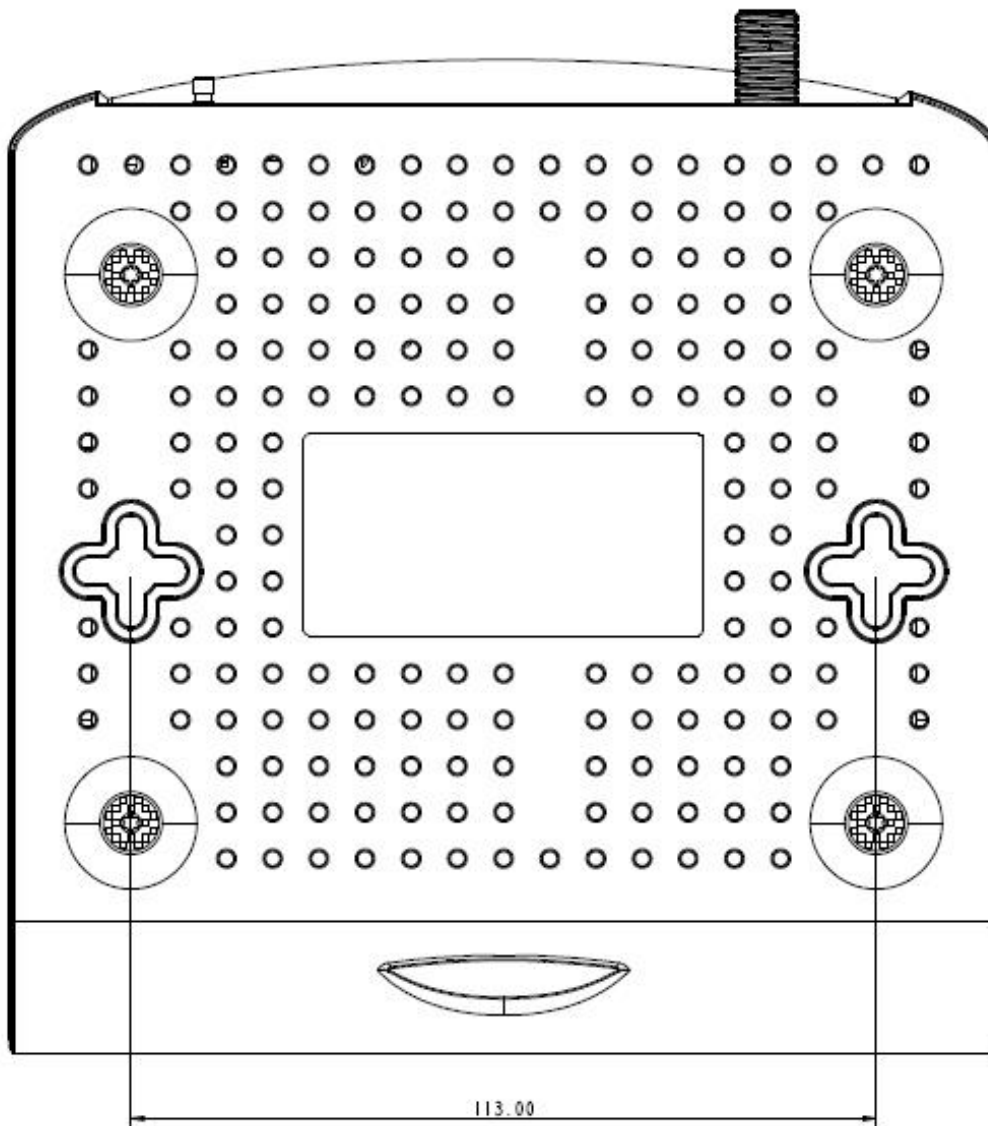


Fig. 1-3 Wall Mounting

To do this:

1. For THE CABLE MODEM, ensure that the wall you use is smooth, flat, dry and sturdy and use the 2 screw holes.
2. The unit can be to use solid concrete wall and/ or hard wood wall.

Relationship among the Devices

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

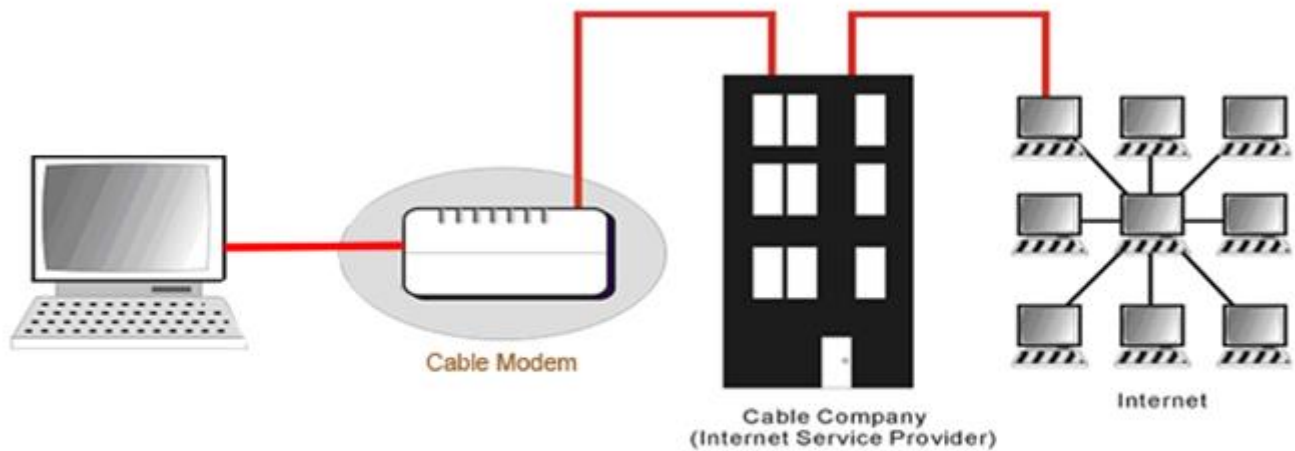


Fig. 1-4 Connection overview

What the Modem Does

The Cable Modem provides high-speed Internet access as well as cost-effective, commercial, and education subscribers on public and private networks via an existing CATV infrastructure. The IP traffic can transfer between the Cable Modem 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 technology.

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 cable modem. You should have the following information ready (which you will find on the sticker on the cable modem):

- The serial number
- The model number
- The Cable Modem (CM) Media Access Control (MAC) address

**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.
- 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 Cable Modem

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

Connecting the Cable Modem to a Single Computer

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

Attaching the Cable TV Wire to the Cable Modem

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 1-6 for the wiring example.

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

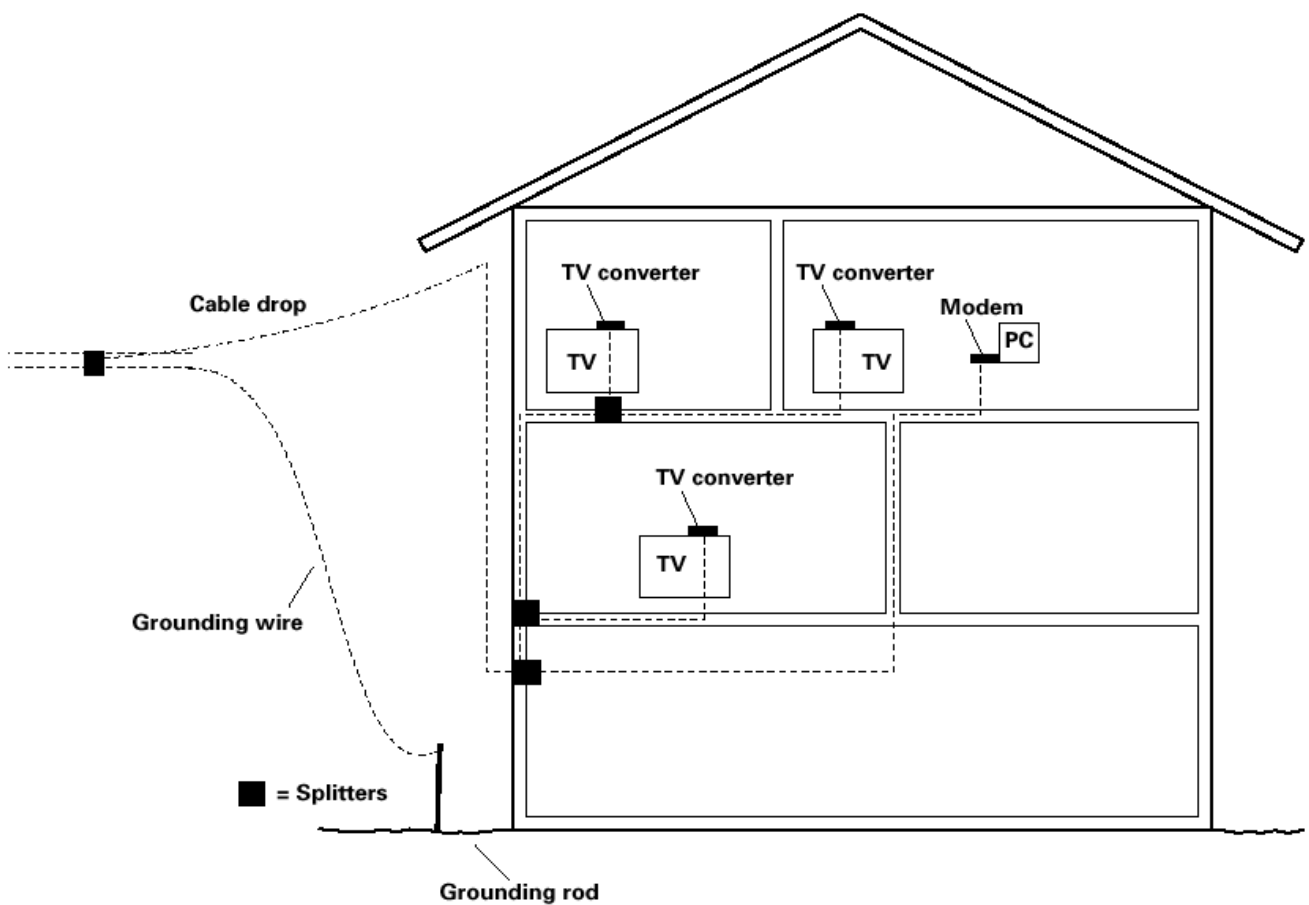


Fig. 1-5 Basic Home Wiring

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's cable connector.

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 plug in the AC outlet then press the Power Switch, power on the modem.

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.

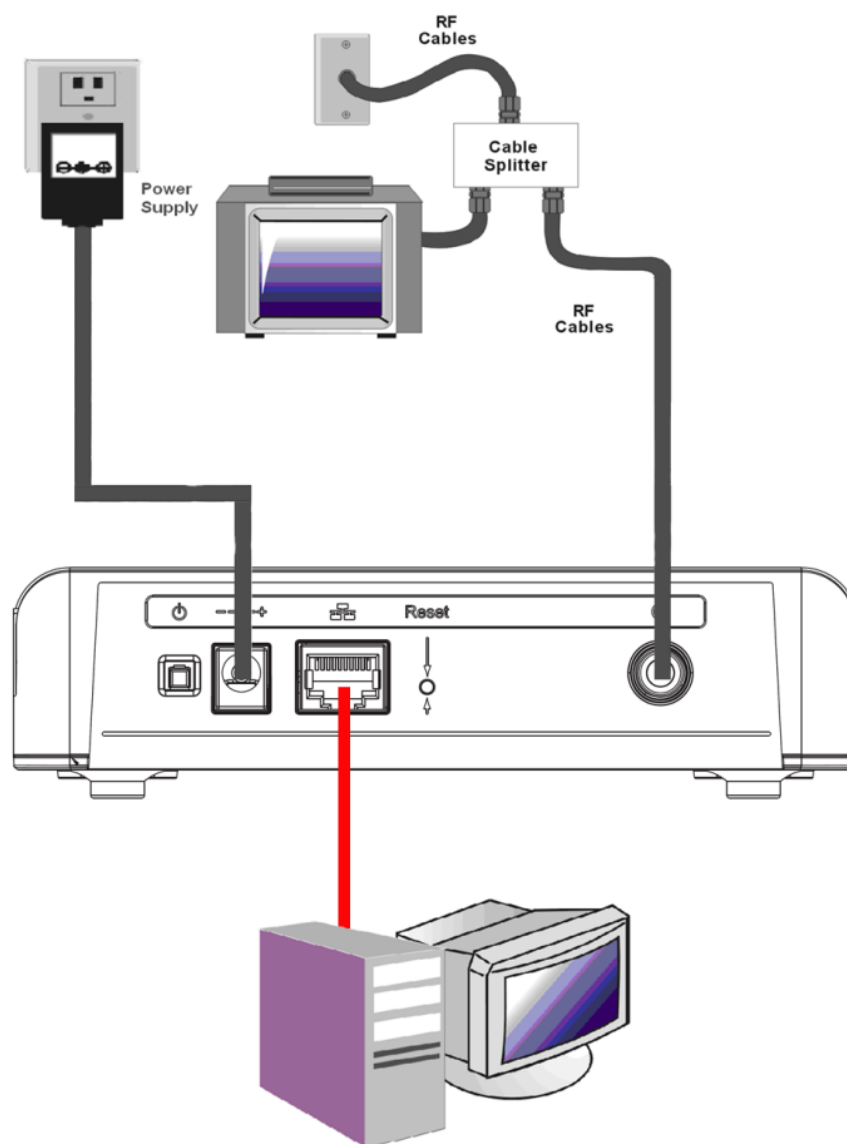


Fig. 1-6 Connect to the Modem

CHAPTER 2: WEB CONFIGURATION

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

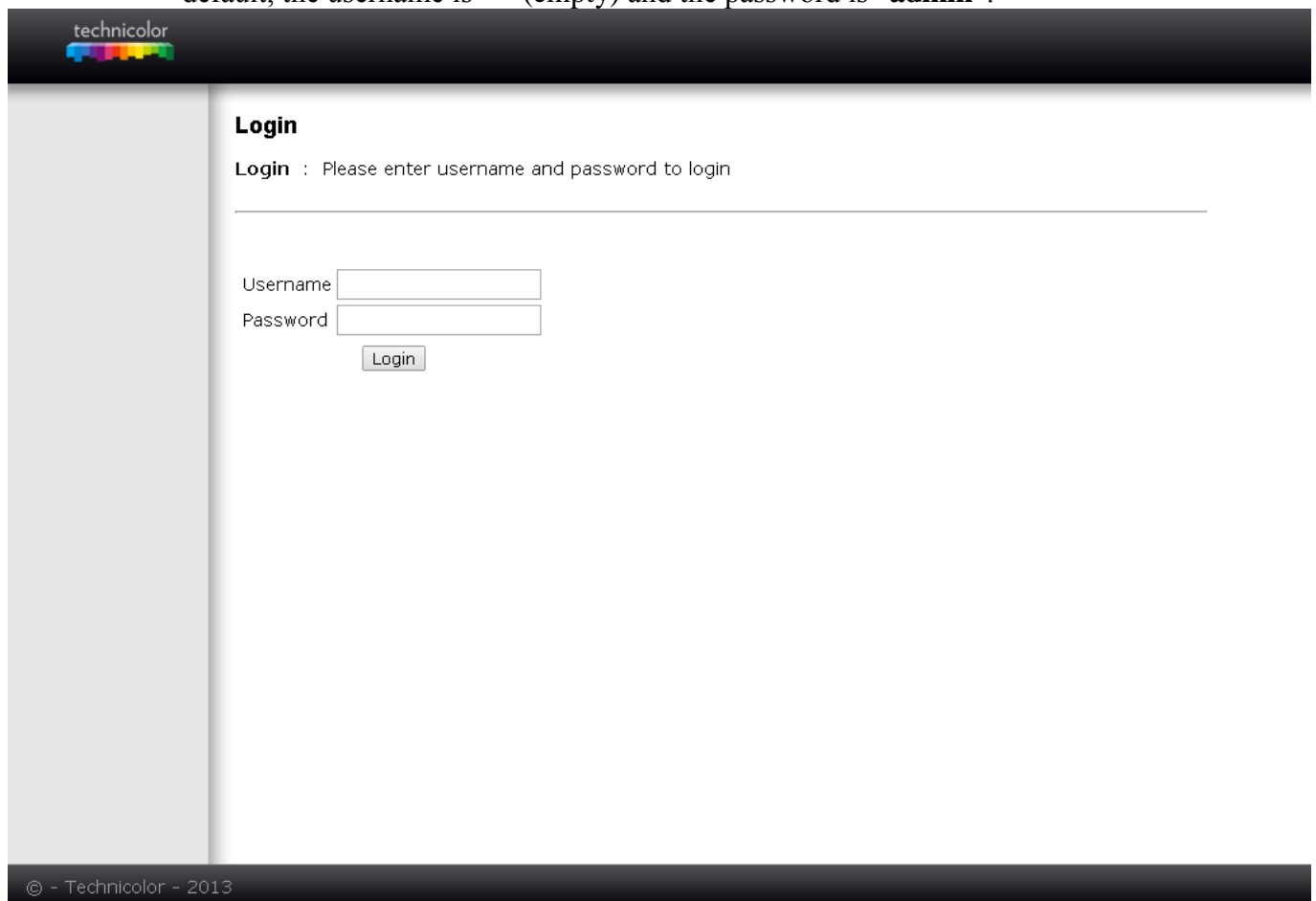
1. Make sure the connection (through Ethernet) between the Cable Modem and your computer is OK.
2. Make sure the TCP/IP protocol is set properly.
3. Subscribe to a Cable Company.

Accessing the Web Configuration

The **Cable Modem** 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 Cable Modem on the URL field: **192.168.100.1**
2. After connecting to the device, you will be prompted to enter username and password. By default, the username is “ ” (empty) and the password is “**admin**”.



technicolor

Login

Login : Please enter username and password to login

Username

Password

Login

© - Technicolor - 2013

Fig2-1 Login dialogue

If you login successfully, the main page will appear.

Outline of Web Manager

The main screen will be shown as below.

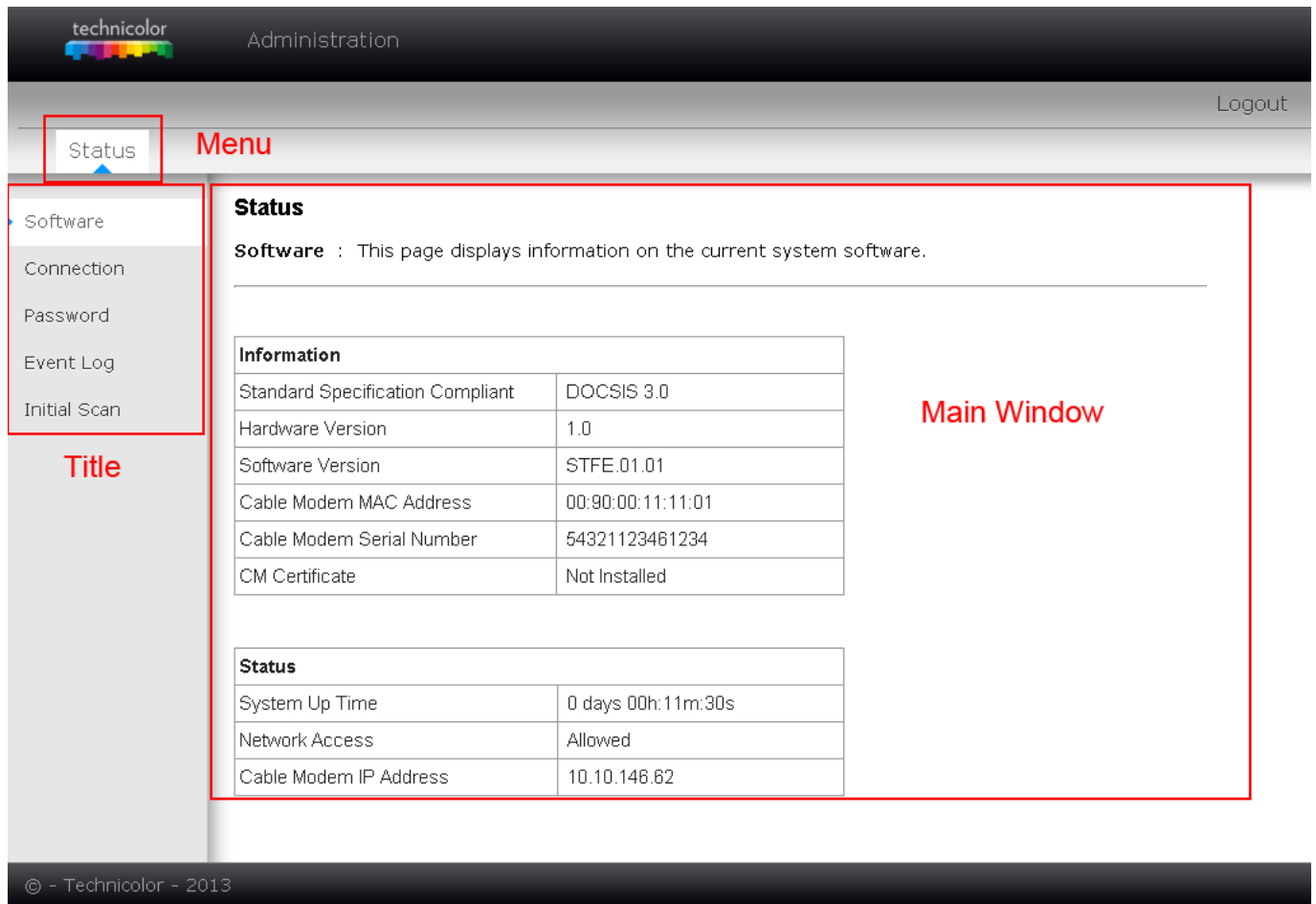


Fig. 2-2 Outline of Web Manager

- **Menu:** For entering 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 cable modem's internal web pages. In such cases, the information field appears blank. This is normal.



Warning message to change the password

At your first connection or while the password is the default one, a warning message is displayed on the top banner of each Web configuration page. We want to encourage you to change the password in order to enforce the security of your modem. Please refer to the chapter **Password** on page 21 for more information.

The screenshot shows the Technicolor Administration web interface. At the top, there is a dark header with the Technicolor logo and the word "Administration". Below this is a navigation bar with a "Logout" link on the right. A left sidebar contains a menu with the following items: "Status" (highlighted with a blue arrow), "Software", "Connection", "Password" (indicated with a blue triangle), "Event Log", and "Initial Scan". The main content area is titled "Status" and contains a section for "Password". This section includes a descriptive text: "Password : This page allows configuration of administration access privileges and the ability to restore factory defaults to the system." Below the text are three input fields: "User Name", "Password", and "Re-enter Password". At the bottom of the form, there is a "Restore Factory Defaults" section with two radio buttons: "Yes" and "No" (which is selected). An "Apply" button is located below the radio buttons. The footer of the page displays "© - Technicolor - 2013".

Fig. 2-3 Status\Password

To change the password: type the original password, and re-enter it again.



Status Web Page Group

Software

The information section shows the hardware and software information about your cable modem.

The status section of this page shows how long your cable modem 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 cable modem to have Internet connectivity. If not, you may not have Internet access, and should contact your cable company to resolve this.

The screenshot shows the Technicolor Administration web interface. The top navigation bar includes the Technicolor logo, the word "Administration", and a "Logout" link. A "Status" tab is selected in the main navigation area. On the left, a sidebar menu lists "Software" (selected), "Connection", "Password", "Event Log", and "Initial Scan". The main content area is titled "Status" and contains a description: "Software : This page displays information on the current system software." Below this, there are two tables. The first table, titled "Information", lists system details. The second table, titled "Status", lists operational metrics.

Information	
Standard Specification Compliant	DOCSIS 3.0
Hardware Version	1.0
Software Version	STFE.01.01
Cable Modem MAC Address	00:90:00:11:11:01
Cable Modem Serial Number	54321123461234
CM Certificate	Not Installed

Status	
System Up Time	0 days 00h:11m:30s
Network Access	Allowed
Cable Modem IP Address	10.10.146.62

© - Technicolor - 2013

Fig.2-4 Status\Software

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.

technicolor

Administration

Logout

Status

Software

Connection

Password

Event Log

Initial Scan

Status

Connection : This page displays information on the status of the cable modem's HFC and IP network connectivity.

Startup Procedure		
Procedure	Status	Comment
Acquire Downstream Channel		Locked
Connectivity State	OK	Operational
Boot State	OK	Operational
Configuration File	OK	
Security	Disabled	Disabled

Downstream Channel							
Channel	Lock Status	Modulation	Channel ID	Symbol Rate	Frequency	Power	SNR
1	Locked	QAM256	2	6952000		3.2 dBmV	44.7 dB
2	Locked	QAM256	1	6952000		3.5 dBmV	44.4 dB
3	Locked	QAM256	3	6952000		3.0 dBmV	44.4 dB
4	Locked	QAM256	4	6952000		2.6 dBmV	42.5 dB
5	Locked	QAM256	5	6952000		2.4 dBmV	41.8 dB
6	Locked	QAM256	6	6952000		2.2 dBmV	43.7 dB
7	Locked	QAM256	7	6952000		2.1 dBmV	43.7 dB
8	Locked	QAM256	8	6952000		2.0 dBmV	42.5 dB
9	Not Locked	Unknown	0	Unknown		0.0 dBmV	0.0 dB
10	Not Locked	Unknown	0	Unknown		0.0 dBmV	0.0 dB
11	Not Locked	Unknown	0	Unknown		0.0 dBmV	0.0 dB
12	Not Locked	Unknown	0	Unknown		0.0 dBmV	0.0 dB
13	Not Locked	Unknown	0	Unknown		0.0 dBmV	0.0 dB
14	Not Locked	Unknown	0	Unknown		0.0 dBmV	0.0 dB
15	Not Locked	Unknown	0	Unknown		0.0 dBmV	0.0 dB
16	Not Locked	Unknown	0	Unknown		0.0 dBmV	0.0 dB

Upstream Channel						
Channel	Lock Status	Modulation	Channel ID	Symbol Rate	Frequency	Power
1	Locked	QAM64	3	5120 Ksym/sec		48.8 dBmV
2	Locked	QAM64	2	5120 Ksym/sec		48.5 dBmV
3	Locked	QAM64	1	2560 Ksym/sec		48.0 dBmV
4	Locked	QAM64	4	5120 Ksym/sec		49.0 dBmV

CM IP Address	Duration	Expires
10.10.146.62	D: 00 H: 23 M: 46 S: 10	Sat Feb 07 14:00:24 2015

Current System Time: Fri Feb 06 14:16:14 2015

© - Technicolor - 2013

Fig. 2-5 Status/Connection



Password

By default, the username is empty (“”) and the password is “**admin**”.

This is set by different actions (non exhaustive list):

- following a reset to factory default on the modem
- following a reset from the Cable Operator
- following a change by the user who wants to come back to the default setting after using its own settings

When the current password is the default one, the user is strongly encouraged to change the default web password.

At your first connection or while the password is the default one, a warning message is displayed on the top banner of each Web configuration page. We want to encourage you to change the password in order to enforce the security of your modem.

The password can be a maximum of 8 characters and is case sensitive. In addition, this page can be used to restore the cable modem to its original factory settings. Use this with caution, as all the settings you have made will be lost. To perform this reset, set **Restore Factory Defaults** to **Yes** and click **Apply**. This has the same effect as a factory reset using the rear panel reset switch, where you hold on the switch for 5 seconds, then release it.

Note: We are always suggesting you to modify the password. This is a basic protection against wrongful access to the Cable modem Web pages.

The screenshot shows the Technicolor Administration web interface. The top header includes the Technicolor logo and the word "Administration". A "Logout" link is in the top right. A left sidebar contains a menu with "Status" (selected), "Software", "Connection", "Password", "Event Log", and "Initial Scan". The main content area is titled "Status" and contains a description of the Password page: "Password : This page allows configuration of administration access privileges and the ability to restore factory defaults to the system." Below this, there are three input fields: "User Name", "Password", and "Re-enter Password". At the bottom, there is a "Restore Factory Defaults" section with radio buttons for "Yes" and "No" (selected), and an "Apply" button. The footer of the interface shows "© - Technicolor - 2013".

Fig. 2-6 Status\Password



To change the password: type the password, and re-enter it again.

If the password is not accepted, an error message is displayed:

Error converting one or more entries:

Password confirmation failure

Error: TXOP Max Rate must be in the range 0 to 65535.

[TRY AGAIN](#)

Please press "TRY AGAIN", then typing the correct username and password again.



Event Log

This page displays the contents of the SNMP event log. Press “**Clear Log**” button to clear the logs.

Administration

Logout

Status

Software
Connection
Password
Event Log
Initial Scan

Status

SNMP Event Log : This page displays the contents of the SNMP event log.

Time	Priority	Description
Time Not Established	Warning (5)	DHCP WARNING - Non-critical field invalid in response ;CM-MAC...
Time Not Established	Notice (6)	Honoring MDD; IP provisioning mode = IPv4

Clear Log

© - Technicolor - 2013

Fig. 2-7 Status\Event Log



Initial Scan

To speed up the modem's first time connection, enter known downstream frequency and/or upstream channel ID information here. Then click “**Apply and Reboot**” button to start scanning the cable network beginning with the values supplied here.

The value is provided in Hertz. So, for 611 MHz, you must type: 611000000

The screenshot shows the Technicolor Administration web interface. At the top, there is a header with the Technicolor logo and the word "Administration". On the right side of the header is a "Logout" link. Below the header is a navigation bar with a "Status" tab selected. On the left side, there is a sidebar menu with the following items: Software, Connection, Password, Event Log, and Initial Scan (which is highlighted with a blue arrow). The main content area is titled "Status" and contains the following text: "Initial Scan : To speed up the modem's first time startup, enter known downstream frequency and/or upstream channel ID information here. Then click the 'Apply' button. The modem will start scanning the cable network beginning with the values supplied here." Below this text are two input fields: "Initial DS Frequency :" with the value "611000000" and "Upstream Channel ID:" with the value "3". Below these fields is an "Apply" button. At the bottom of the page, there is a footer that reads "© - Technicolor - 2013".

Fig. 2-8 Status\Initial Scan

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 AP Router.

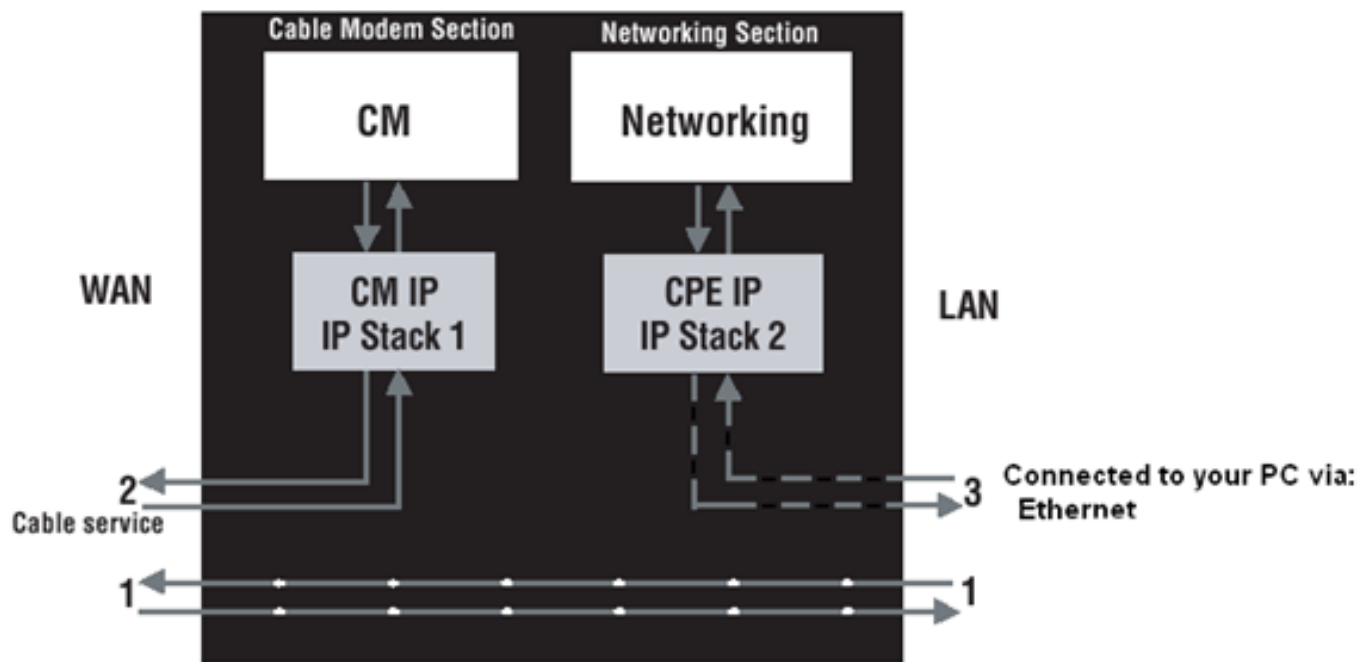


Fig.3-1 Communication between your PCs and the network side

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 Cable Modem 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 downstream on the cable company's system to the WAN side of your Cable Modem. 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 cable modem 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 cable modem 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 Cable Modem 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 Cable Modem offers Ethernet interface 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.

Cable Modem (CM) Mode

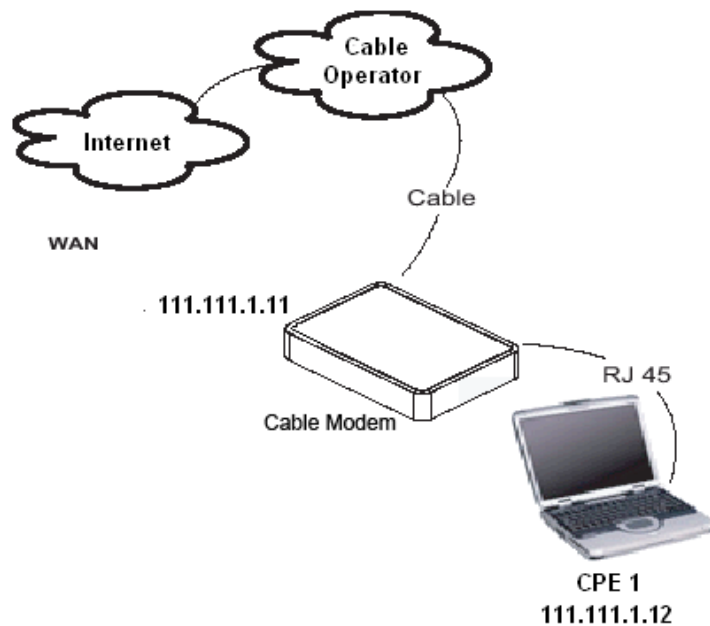


Fig. 3-2 Cable Modem Mode

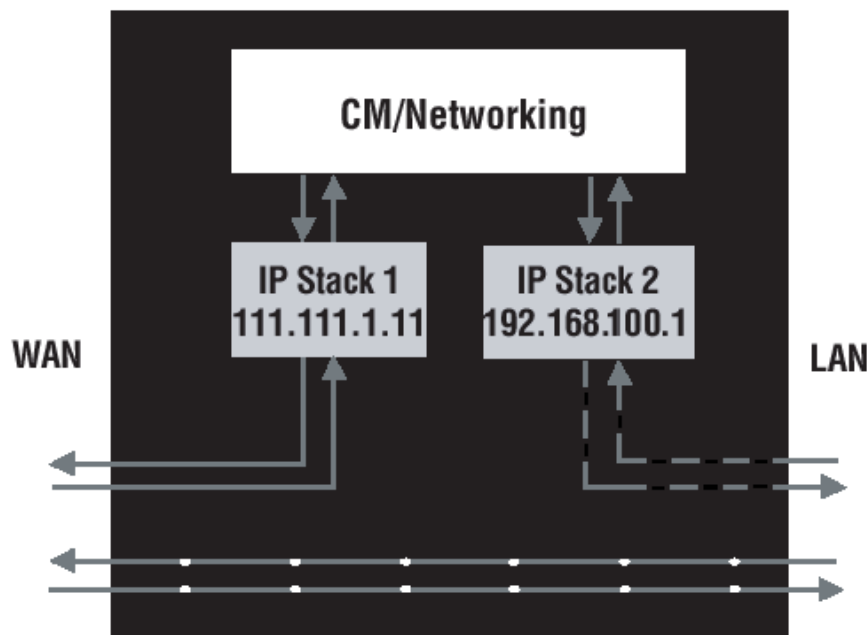


Fig. 3-3 Two IP stacks are activated in cable modem mode

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 Cable Modem.
- 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.



CHAPTER 4: ADDITIONAL INFORMATION

Frequently Asked Questions

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 Cable Modem 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. Can I watch TV, surf the Internet, and talk to my friends through the Cable Modem 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 Euro-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 Cable Modem will work with all upgraded cable systems that are Euro-DOCSIS-compliant.

* 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 Cable Modem.
- 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 Euro-DOCSIS compliant by calling your cable provider.

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 Cable Modem 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 Cable Modem 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 Cable Modem 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.

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.

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

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 Cable Modem’s configuration data file is downloaded.