

Touchstone™ TM402 Telephony Modem User's Guide

Get ready to experience the Internet's express lane! Whether you're checking out streaming media, downloading new software, checking your email, or talking with friends on the phone, the Touchstone TM402 Telephony Modem brings it all to you faster and more reliably. All while providing toll quality Voice over IP telephone service. Some models even provide a Lithium-Ion battery backup to provide continued telephone service during power outages.

The Touchstone Telephony Modem provides an Ethernet connection for use with either a single computer or home/office Local Area Network (LAN). The Touchstone Telephony Modem also provides a USB connection. You can connect two separate computers at the same time using both of these connections. In addition, the Touchstone Telephony Modem provides for up to two separate lines of telephone service.

Installation is simple and your cable company will provide assistance to you for any special requirements. The links below will provide more detailed instructions.

[Safety Requirements](#)

[Getting Started](#)

[Battery Installation and Replacement \(TM402G, TM402H, and TM402P models only\)](#)

[Installing and Connecting Your Telephony Modem](#)

[Installing the Telephony Modem USB Drivers](#)

[Configuring Your Ethernet Connection](#)

[Using the Telephony Modem](#)

[Troubleshooting](#)

[Glossary](#)



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Release 4 Standard 1.0 May 2005

Safety Requirements

ARRIS Telephony Modems comply with the applicable requirements for performance, construction, labeling, and information when used as outlined below:



CAUTION
 Connecting the Telephony Modem to the home's existing telephone wiring should only be performed by a professional installer. Physical connections to the previous telephone provider must be removed and the wiring must be checked; there must not be any voltages. Cancellation of telephone service is not adequate. Failure to do so may result in loss of service and/or permanent damage to the EMTA.

- The Telephony Modem is designed to be connected directly to a telephone.
- Connecting the Telephony Modem to the home's existing telephone wiring should only be performed by a professional installer.
- Do not use product near water (i.e. wet basement, bathtub, sink or near a swimming pool, etc.), to avoid risk of electrocution.
- Avoid using and/or connecting the equipment during an electrical storm, to avoid risk of electrocution.
- Do not locate the equipment within 6 feet (1.9 m) of a flame or ignition source, to avoid damage or injury from battery explosion (i.e. heat registers, space heaters, fireplaces, etc.).
- Use only power supply and power cord included with the equipment.
- Equipment should be installed near the power outlet and should be easily accessible. The RF drop cable's shield must be grounded at the building/residence either close to the point of entrance or at the point of attachment. It should be grounded as close as practical to the building/residence AC ground to minimize grounding connector length and thereby limit the poten-

tial voltage differences between the cable TV coaxial cable and other grounding systems. Refer to the individual country's National Electric Code for further details.

- In areas of high surge events or poor grounding situations and areas prone to lightning strikes, additional surge protection may be required (i.e. PF11VNT3 from American Power Conversion) on the AC, RF, Ethernet and Phone lines.
- When the embedded multimedia terminal adapter (EMTA) is connected to a local computer through USB or Ethernet cables, the computer must be properly grounded to the building/residence AC ground network. All plug-in cards within the computer must be properly installed and grounded to the computer frame per the manufacturer's specifications.

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European Compliance

This product complies with the provisions of the Electromagnetic Compatibility (EMC) Directive (89/336/EEC), the Amending Directive (92/31/EEC), the Low Voltage Directive (73/23/EEC), and the CE Marking Directive (93/68/EEC). As such, this product bears the CE marking in accordance with the above applicable Directive(s).

A copy of the Declaration of Conformity may be obtained from: ARRIS International, Inc., 3871 Lakefield Drive, Suite 300, Suwanee, GA 30024.

As indicated by the symbol below, disposal of this product or battery is governed by Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE). WEEE could potentially prove harmful to the environment; as such, upon disposal of the Telephony Modem the Directive requires that this product must not be disposed as unsorted municipal waste, but rather collected separately and disposed of in accordance with local WEEE ordinances.



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HARDWARE: ARRIS warrants the original purchaser ("Customer") that this product will be free from defects in workmanship and materials, under normal use, for one (1) year from the ship date of this product.

BATTERY PACK: ARRIS warrants the original purchaser ("Customer") that the battery pack, if included, will be free from defects in workmanship and materials, under normal use, for one (1) year from the ship date of this product.

SOFTWARE: ARRIS warrants to Customer that the Software and any ARRIS branded software will perform in substantial conformance to its specifications for a period of ninety (90) days from the date of invoice for the product in question. ARRIS warrants the media containing the Software against failure during the warranty period. ARRIS makes no warranty or representation that the operation of the Software will be uninterrupted or error free, or that all defects in the Software will be corrected.

EXCLUSIONS

This warranty excludes (1) physical damage to the surface of the product, including cracks or scratches on the casing; (2) damage caused by misuse, neglect, improper installation or testing, unauthorized attempts to open, repair or modify the product, or any other cause beyond the range of the intended use; (3) damage caused by accident, fire, power changes, other hazards, or acts of God; or (4) use of the product with any non-ARRIS approved device or service if such device or service causes the problem.

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Getting Started

About Your New Telephony Modem

The Touchstone TM402 Telephony Modem is DOCSIS or EuroDOCSIS compliant with the following features:

- Speed: much faster than dialup or ISDN service
- Convenience: supports USB and Ethernet; both can be used simultaneously
- Flexibility: provides two independent lines of telephone service as well as high speed data
- Security: a **Standby** button lets you isolate connected computer(s) from the Internet without turning off the Telephony Modem
- Compatibility: supports tiered data services (if offered by your cable company)

What's in the Box?

Make sure you have the following items before proceeding. Call your cable company for assistance if anything is missing.

- Telephony Modem
- AC Adapter or Power Cord
- Quick Installation Guide
- USB Cable
- Ethernet Cable
- CD-ROM
- Screws for Wall Mounting the Unit
- End User License Agreement

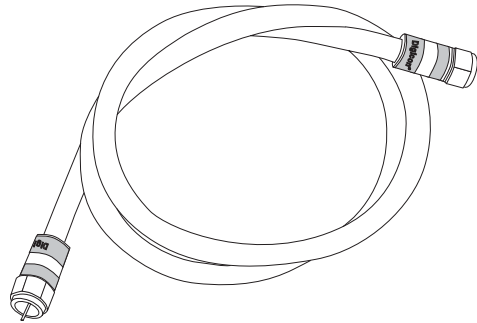
What's on the CD?

The CD provides the following items:

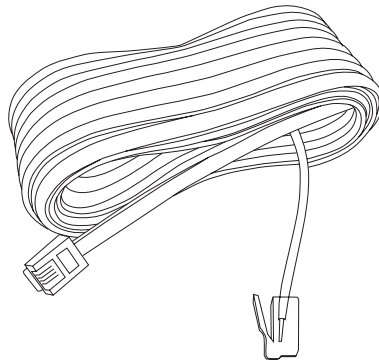
- Quick Install Guide
- User's Guide
- USB Drivers (Windows 98SE/ME/2000)
- USB Uninstall Utility

Items You Need

If you are installing the Telephony Modem yourself, make sure you have the following items on hand before continuing:



Coax Cable



Phone Cable

- **Telephony modem package:** see [What's in the Box?](#) for a list of items in the package.
- **Coaxial cable (coax):** as shown in the image to the left, this is a thin cable with a connector on each end. It is the same kind of wire used to connect to your television for cable TV. You can buy coax from any electronics retailer and many discount stores; make sure it has connectors on both ends. There are two types of connectors, slip-on and screw-on; the screw-on connectors are best for use with your Telephony Modem. The coax should be long enough to reach from your Telephony Modem to the nearest cable outlet.
- **Phone Cable:** as shown in the image to the left, this is a standard phone cable with standard phone connectors (RJ11 type) on both ends. You can buy phone cables from any electronics retailer and many discount stores.
- **Splitter (optional):** provides an extra cable connection by splitting a single outlet into two. You may need a splitter if you have a TV already connected to the cable outlet that you want to use. You can buy a splitter from any electronics retailer and most discount stores; you may also need a short piece of coaxial cable (with connectors); use it to connect the splitter to the cable outlet and then connect the Telephony Modem and TV to the splitter.
Note: A splitter effectively cuts the signal in half and sends each half to its two outputs. Using several splitters in a line may deteriorate the quality of your television, telephone, and/or internet connection.
- **Information packet:** your cable company should furnish you with a packet containing information about your service and how to set it up. Read this information carefully and contact your cable company if you have any questions.

System Requirements

The Touchstone Telephony Modem operates with most computers. The following describes requirements for each operating system; see the documentation for your system for details on enabling and configuring networking.

To use the Telephony Modem, you need DOCSIS high-speed Internet service from your cable company.

Windows

Ethernet connection: Windows 95, Windows 98, Windows 98 SE (Second Edition), Windows ME, Windows 2000, or Windows XP

USB connection: Windows 98 SE (Second Edition), Windows ME, Windows 2000, or Windows XP

MacOS

Ethernet connection only: System 7.5 to MacOS 9.2 (Open Transport recommended) or MacOS X

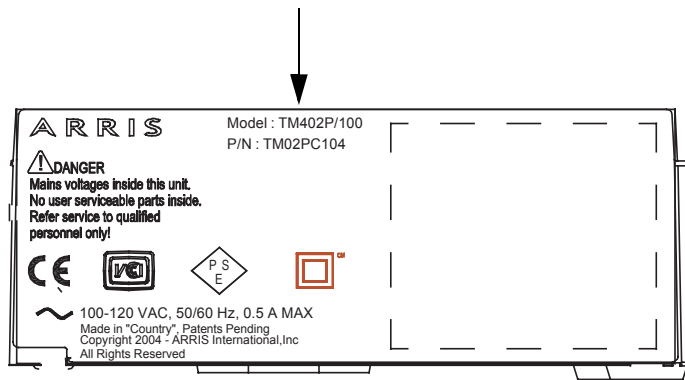
Linux/other Unix

Ethernet connection only: Hardware drivers, TCP/IP, and DHCP must be enabled in the kernel

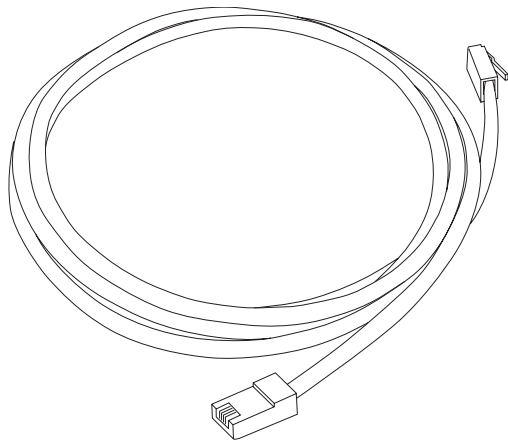
About this Manual

This manual is written to cover all of the different TM402 models. Your model may or may not have all of the capabilities outlined in this manual. To determine which model you have purchased, refer to the image at the left. The model number is on the label affixed to the Telephony Modem.

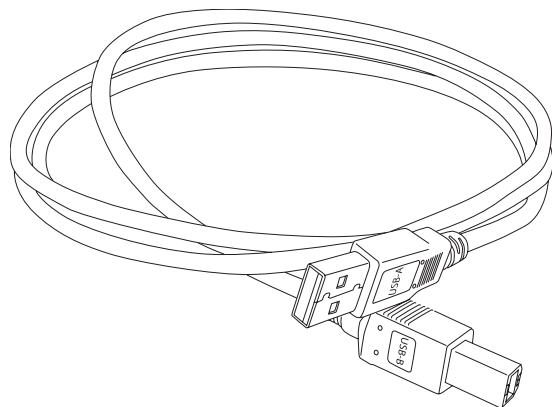
Model Number



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Ethernet Cable



USB Cable

Ethernet or USB?

There are two ways to connect your computer (or other equipment) to the Telephony Modem. The following will help you decide which is best for you:

Ethernet

Ethernet is a standard method of connecting two or more computers into a Local Area Network (LAN). Use the Ethernet connection if your PC has built-in Ethernet hardware, does not use Windows, or you want to share the Telephony Modem connection with several computers.

Note: To connect two or more computers to the Ethernet port, you will need a hub or broadband router (available at computer retailers).

The Telephony Modem package comes with a 6-foot (1.9m) Ethernet cable (the connectors look like wide telephone connectors); you can purchase more cables if necessary at a computer retailer. If you are connecting the Telephony Modem directly to a PC, or to an Ethernet hub or broadband router with a cross-over switch, ask for Category 5 (CAT5) straight-through cable. If you are connecting the Telephony Modem to an Ethernet hub or broadband router without a crossover switch, ask for a Category 5 crossover cable.

USB

USB (Universal Serial Bus) is meant for connecting a variety of accessories, such as keyboards, mice, printers, and communications devices (including Telephony Modems) to a single PC. Use the USB connection if you have only one computer, and the computer is using a Windows operating system (Windows 98 Second Edition or later), and has no built-in Ethernet hardware. The Telephony Modem package comes with a 5-foot (1.6m) USB cable.

Both

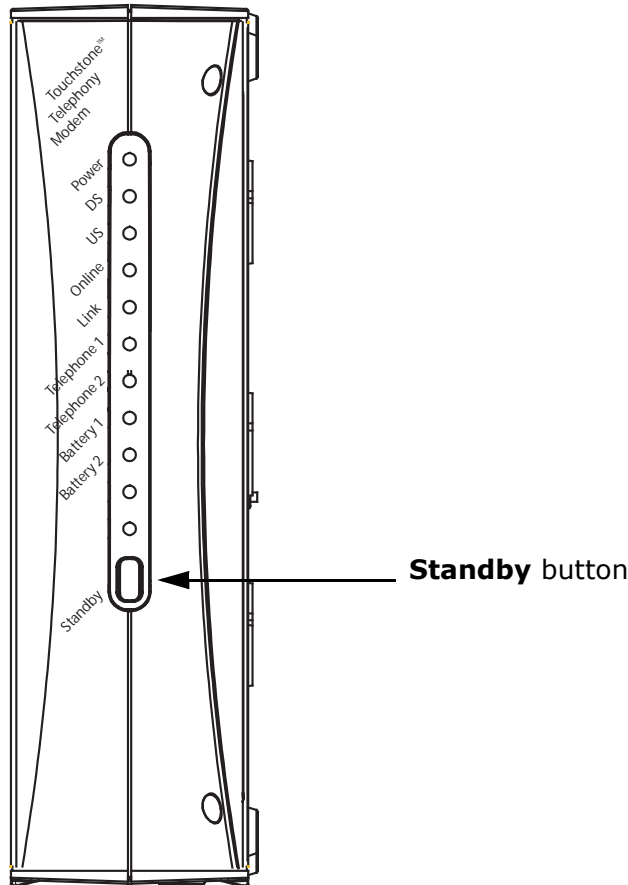
If you have two or more computers, you can connect one computer to the Telephony Modem's USB port and one or more other computers to the Ethernet port. To connect two or more computers to the Ethernet port, you will need a hub or broadband router (available at computer retailers).

For more information about connecting two or more computers, contact your cable service provider.

What About Security?

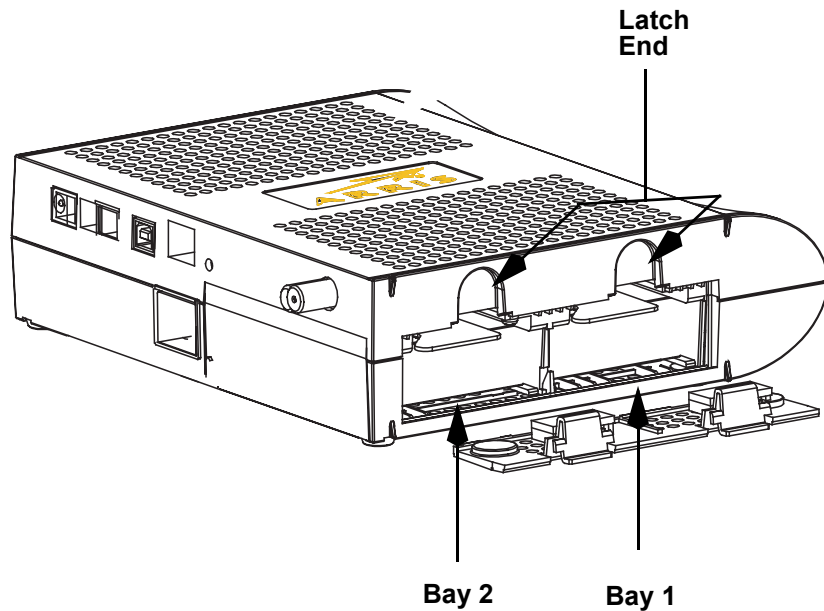
Having a high-speed, always-on connection to the Internet requires a certain amount of responsibility to other Internet users—including the need to maintain a reasonably secure system. While no system is 100% secure, you can use the following tips to enhance your system’s security:

- Keep your operating system updated with the latest security patches. Run the system update utility at least weekly.
- Keep your email program updated with the latest security patches. In addition, avoid opening email containing attachments, or opening files sent through chat rooms, whenever possible.
- Install a virus checker and keep it updated.
- Use the **Standby** button on your Telephony Modem to disconnect your PC from the cable system when you are not using the Internet. Telephone service is not affected by the Standby button; it is always on.
- Avoid providing web or file-sharing services over your Telephony Modem. Besides certain vulnerability problems, most cable companies prohibit running servers on consumer-level accounts and may suspend your account for violating your terms of service.
- Use the cable company’s mail servers for sending email.
- Avoid using [proxy](#) software unless you are certain that it is not open for abuse by other Internet users (some are shipped open by default). Criminals can take advantage of open proxies to hide their identity when breaking into other computers or sending spam. If you have an open proxy, your cable company may suspend your account to protect the rest of the network.
- If you connect your Telephony Modem to a wireless LAN, make sure you enable security and encryption on the wireless hub (for the same reason that you should run only secured proxies). Consult the documentation and technical support of the wireless equipment provider for help.



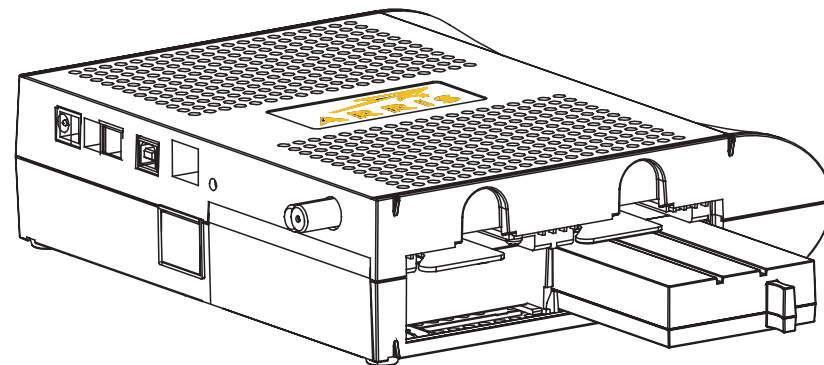
Battery Installation and Replacement (TM402G, TM402H, and TM402P models only)

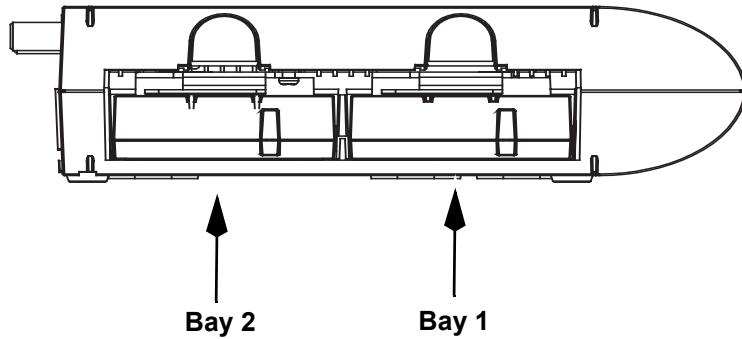
These models of the Telephony Modem have the ability to provide battery backup in the event of a local power loss. The battery backup is not intended to take the place of AC power. Depending on the model, one or two lithium-ion batteries can be inserted into the Telephony Modem. The TM402P (depicted at the left) supports two batteries. If you are only using one battery, it must be inserted into Bay 1. The TM402G and TM402H (not shown) only has support for one battery. Use this procedure to install and to replace the backup batteries.



Action

- 1 Pull down on the two latches holding the battery door (on the bottom of the Telephony Modem) and pull the door toward you. Set the door aside in a safe place.
- 2 Hold each battery by its pull tab and insert the batteries into the bay. The photo on the left shows the proper orientation. Batteries will not insert completely into the Telephony Modem if not oriented correctly. Remember, with the TM402P if only one battery is being used, it must be inserted into Bay 1 as shown on the left.





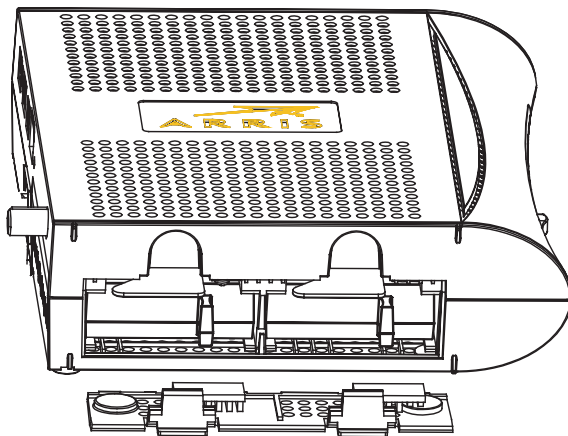
3 Push the battery into the bay until it latches into place. The following photo shows a Telephony Modem with both batteries installed.

Note: The Telephony Modem will not begin operating until you apply AC power.

4 Replace the door. To do so, place the tabs of the battery door into the slot on the Telephony Modem battery compartment. Rotate the door away from you until the two latches snap back into place.

Note: Some Telephony Modem models use a Lithium-Ion battery pack. The battery does contain precious material, there may be some benefit in recycling. Please dispose of the battery responsibly and in accordance with local ordinances.

—end—



Installing and Connecting Your Telephony Modem

Before you start, make sure that:

- You have contacted your cable company and verified that they provide data and telephone service using standard DOCSIS technology.
- You have all the [Items You Need](#).
- Cable, phone, and power outlets are available near the PC. If a cable outlet is not conveniently located, your cable company can install a new one.

Getting Service

Before trying to use your new Telephony Modem, contact your local cable company to establish an Internet account and telephone service. When you call, have the following information ready:

- the Telephony Modem serial number and MAC addresses of the unit (printed on a sticker on the bottom of the Telephony Modem)
- the model number of the Telephony Modem

Save this information for future use. In addition, you should ask your cable company the following questions:

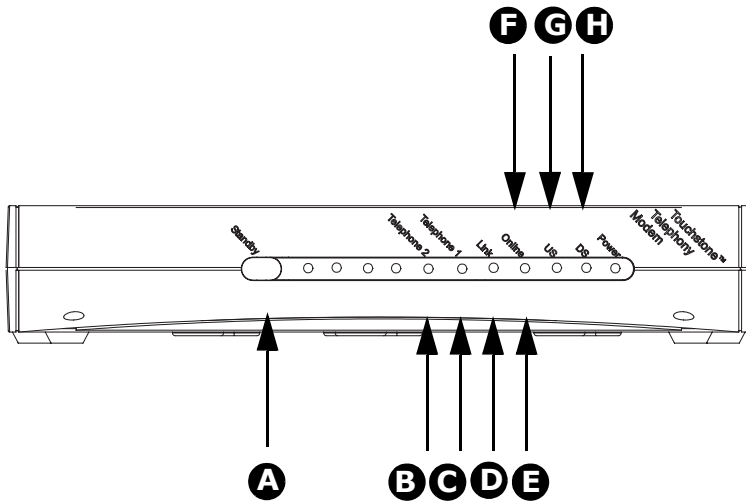
- Do you have any special system requirements or files that I need to download after I am connected?
- When can I start using my Telephony Modem?
- Do I need a user ID or password to access the Internet or my e-mail?
- Will my phone number change?
- What new calling features will I have and how do I use them?

Telephony Modem Front Panel

TM402A and TM402B

Front Panel TM402A and TM402B

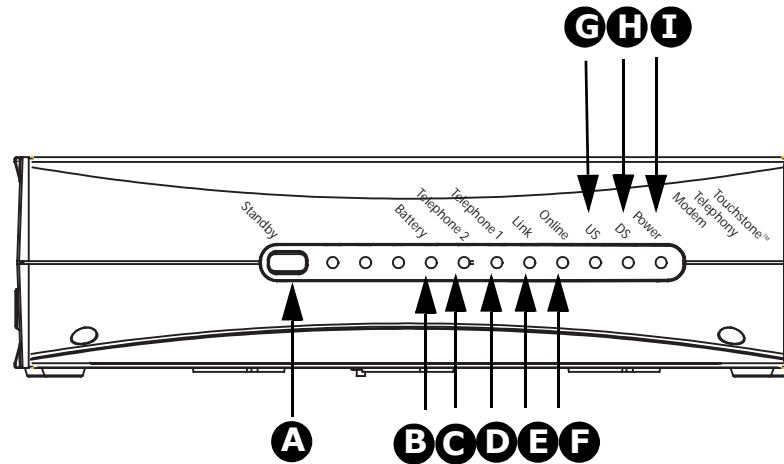
The front of the Telephony Modem has the following Light Emitting Diode (LED) indicators and controls:



- A Standby:** pressing this button isolates the Telephony Modem from the internet.
- B Telephone 2:** blinks when line 2 of the telephone is being used
- C Telephone 1:** blinks when line 1 of the telephone is being used
- D Link:** blinks when the Telephony Modem is connected to the internet
- E On-Line:** blinks during boot up or when data is being transmitted over the internet
- F US:** blinks during boot up or when data is being sent from the Telephony Modem
- G DS:** blinks during boot up or when data is being received by the Telephony Modem
- H Power:** lights when AC power is connected to the unit

Telephony Modem Front Panel

TM402G & TM402H



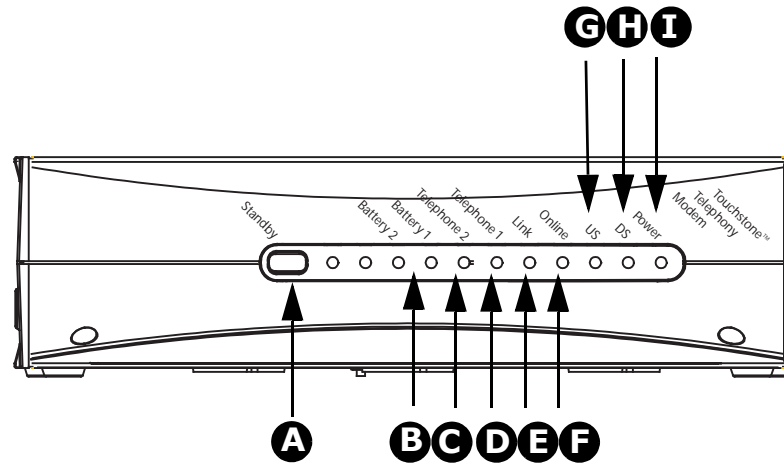
Front Panel TM402G and TM402H

The front of the Telephony Modem has the following Light Emitting Diode (LED) indicators and controls:

- A Standby:** pressing this button isolates the Telephony Modem from the internet.
- B Battery:** lights when the battery in the Telephony Modem is low
- C Telephone 2:** blinks when line 2 of the telephone is being used
- D Telephone 1:** blinks when line 1 of the telephone is being used
- E Link:** blinks when the Telephony Modem is connected to the internet
- F On-Line:** blinks during boot up or when data is being transmitted over the internet
- G US:** blinks during boot up or when data is being sent from the Telephony Modem
- H DS:** blinks during boot up or when data is being received by the Telephony Modem
- I Power:** lights when AC power is connected to the unit

Telephony Modem Front Panel

TM402P



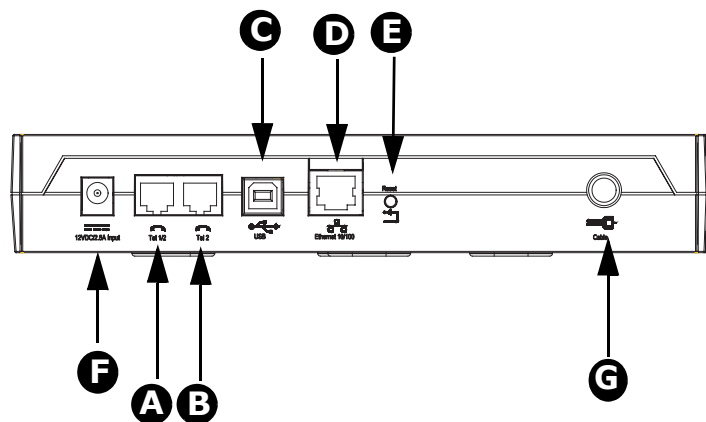
Front Panel TM402P

The front of the Telephony Modem has the following Light Emitting Diode (LED) indicators and controls:

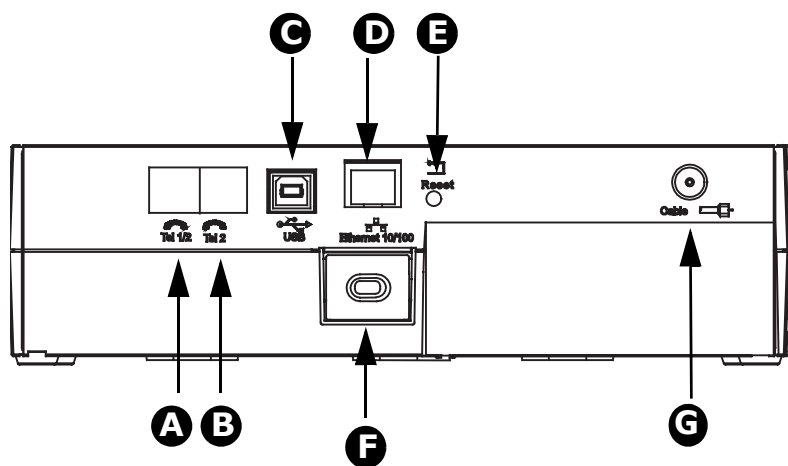
- A Standby:** pressing this button isolates the Telephony Modem from the internet.
- B Battery 1/Battery 2:** lights when the battery in the Telephony Modem is low
- C Telephone 2:** blinks when line 2 of the telephone is being used
- D Telephone 1:** blinks when line 1 of the telephone is being used
- E Link:** blinks when the Telephony Modem is connected to the internet
- F On-Line:** blinks during boot up or when data is being transmitted over the internet
- G US:** blinks during boot up or when data is being sent from the Telephony Modem
- H DS:** blinks during boot up or when data is being received by the Telephony Modem
- I Power:** lights when AC power is connected to the unit

Telephony Modem Rear Panel

TM402A and TM402B Models



TM402G, TM402H, and TM402P Models



Rear Panel

The rear of the Telephony Modem has the following connectors and controls:

- A** Tel 1 (Tel1/2 on TM402G, TM402H, and TM402P models): plug the first phone line in here.
- B** Tel 2: plug the second line in here
- C** [USB connector](#): for connecting the Telephony Modem directly to a PC.
- D** [Ethernet connector](#): for connecting the Telephony Modem to a PC or home network LAN.
- E** Reset button: resets the Telephony Modem as if you power cycled the unit. Use a pointed non-metallic object to press this button.
- F** Power: plug the AC adapter in here.
- G** Cable: plug the [coax cable](#) in here.

Mounting the Telephony Modem

You can either mount the Telephony Modem on a wall or place it on a desktop. For wall-mount applications, you can mount the Telephony Modem with the indicators facing upward (vertical) or to the side (horizontal).

Tools and Materials

For wall-mounted installations, make sure you have the following tools and materials before proceeding:

- for mounting on drywall: Two 1/4" (6mm) drywall anchors and a Drill with 1/4" (6mm) bit
- for mounting on plywood or studs: two #6 x 1.5" (38.1 mm) self tapping screws (included); the head diameter should be approximately 1/4" (6 mm) and a drill with a 1/8" (3mm) bit
- screwdriver (flat-blade or Phillips, depending on what kind of screws you use)
- wall-mount template (included with the Telephony Modem Quick Installation Guide)
- transparent tape (for temporarily securing the mounting template to the wall)

Location

Always position the Telephony Modem:

- within 4 feet (1.3 m) of an AC outlet. The power cord must reach the outlet without stretching and without adding extension cords.
- near a cable outlet (to avoid long cable runs).

Note: When mounting the Telephony Modem on drywall, try to position the Telephony Modem so at least one of the screws are fastened to a stud. This may prevent the Telephony Modem from pulling out of the wall in the future.

To prevent overheating your Cable Modem, do not block the ventilation holes on the sides of the unit.

Safety	Getting Started	Battery Installation	Installation	USB Drivers	Ethernet Configuration	Usage	Troubleshooting	Glossary
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Instructions

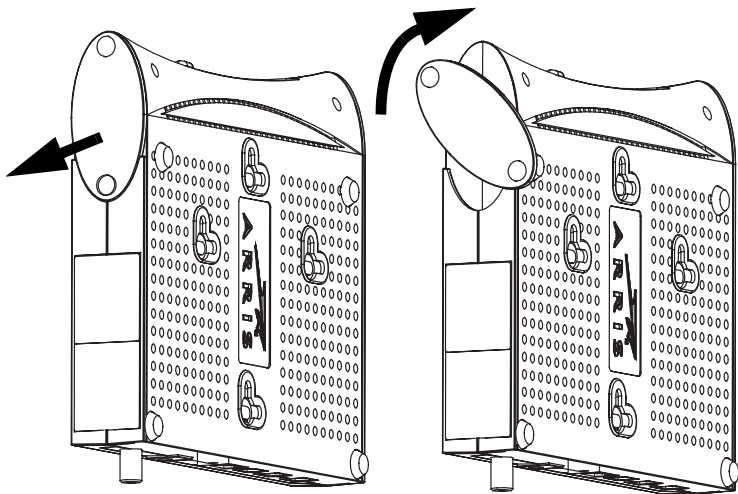


Wall-mounting instructions

- 1 Print out the Telephony Modem Wall Mounting Template.
- 2 Position the mounting template on the surface where you intend to mount the Telephony Modem and secure in place with transparent tape.
- 3 Drill holes through the template in the specified locations for the mounting screws. After drilling holes, remove the template from the surface.
- 4 If using drywall anchors, set them into the wall. Then, drive the screws into the wall leaving a gap of about 1/8" (3 mm) between the screw head and the wall. If not using anchors, just drive the screws.
- 5 Orient the Telephony Modem with the indicator lights facing up or right, as desired. Slip both mounting slots (in the back of the Telephony Modem) over the screws, then slide the case down until the narrow end of the keyhole slot contacts the screw shaft.
- 6 Proceed to [Connecting the Telephony Modem](#).

Desktop mounting instructions

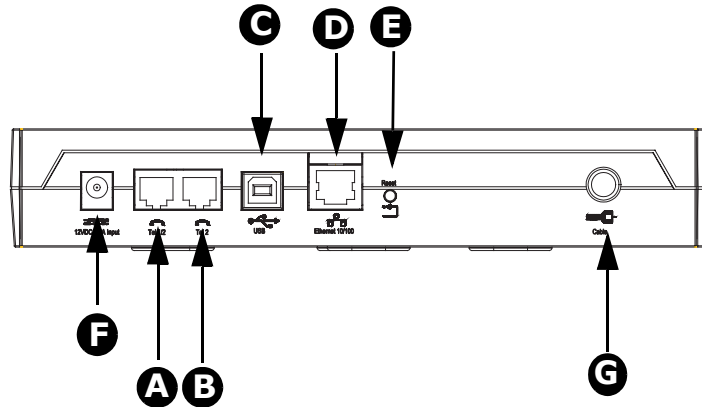
- 1 Position the Telephony Modem so that:
 - air flows freely around it
 - the back faces the nearest wall
 - it will not fall to the floor if bumped or moved
- 2 The TM402A and TM402B have an oval foot on the side to provide stability in the event that the Telephony Modem is positioned vertically on a surface. If you want to stand the Telephony Modem up on its side, pull the oval foot out slightly, twist the foot (as shown in the image to the left), and place the Telephony Modem in the desired location.
- 3 Proceed to [Connecting the Telephony Modem](#).



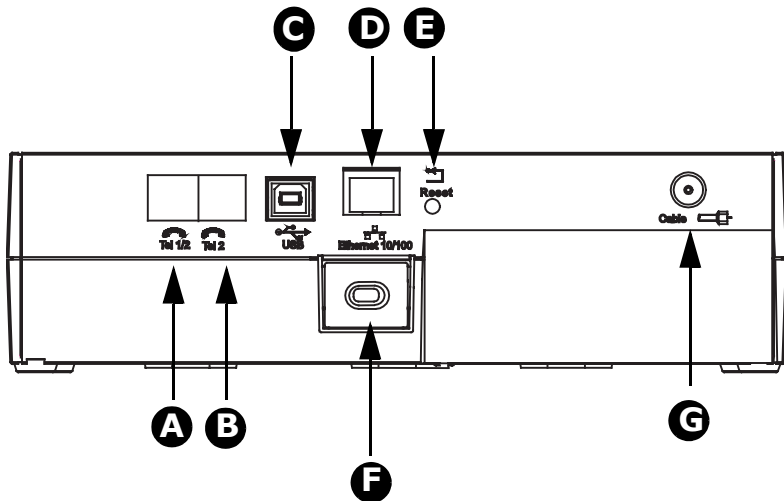
Rear Panel

Connecting the Telephony Modem

TM402A and TM402B Models



TM402G, TM402H, and TM402P Models



WARNING: Connecting the Telephony Modem to the home's existing telephone wiring should only be performed by a professional installer. Physical connections to the previous telephone provider must be removed and the wiring must be checked; there must not be any voltages. Cancellation of telephone service is not adequate. Failure to do so may result in loss of service and/or permanent damage to the EMTA.

- 1 Connect one end of the coaxial cable to the cable outlet or splitter, and the other end to the Telephony Modem's Cable connector (G). Tighten the connections by hand.
- 2 Connect one end of the telephone cable to the telephone port on the back of the Telephony Modem (A or B). Connect the other end to the telephone.

Note: If you have a TM402G, TM402H, or TM402P Telephony Modem and a phone with two separate lines on a single RJ-11 cord, it must be plugged into the port labeled "Tel 1/2".

- 3 Insert the plug from the AC adapter or the power cord into the Power connector on the Telephony Modem (F).

- 4 Insert the power cord into a convenient AC outlet.

The Power light on the front of the Telephony Modem should light up, then start flashing. See [Troubleshooting](#) if the Power light does not turn on.

- 5 After connecting the coax cable and power, proceed as needed:

- [Making Ethernet Connections](#) OR
- [Making USB Connections](#)

Note: Do not connect the same computer to both the Ethernet and USB ports.

Making Ethernet Connections

- 6 Connect one end of the Ethernet cable to the port on the back of the Telephony Modem labeled "Ethernet 10/100," (D) and the other end to the Ethernet port on a computer, hub, or broadband router.

Note: If you are connecting to a computer, use the Ethernet cable included in the Telephony Modem package.

Making USB Connections

- 7** Connect one end of the USB cable to the USB port on the computer, and the other end to the USB port on the back of the Telephony Modem (**C**).
Your PC should detect the Telephony Modem and begin installing the drivers. See [Installing USB Drivers on Your PC](#) for driver installation details.

Installing the Telephony Modem USB Drivers

Use this procedure to install USB drivers for the ARRIS Touchstone Telephony Modem on a Windows system.

This procedure does not explain how to provision the Telephony Modem or otherwise initiate actual service.

When you plug the Telephony Modem into the PC's USB port, Windows automatically detects the hardware and attempts to install the drivers.

Requirements

Make sure you have the following before attempting to install the USB drivers:

- PC with:
 - CD-ROM drive
 - at least one free USB port
 - one of: Windows 98SE, Windows 2000, or Windows ME (Windows 95 and Windows NT are not supported)
 - ARRIS USB Driver CD
- USB A/B cable provided
- (for installations not using DHCP) IP address, subnet, gateway, and DNS information
- Windows XP does not require the installation of USB drivers from the CD

How to use this chapter

The following table lists the procedures for installing the USB drivers on the computer. The procedure is the same regardless of operating system used.

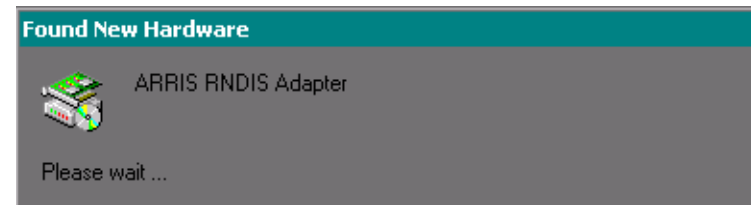
Installing USB Drivers

Follow these steps to install USB drivers on a supported Windows operating system.

Note: Depending on your operating system, the dialog boxes shown on your computer may differ slightly from those shown in this procedure.

- 1** Make sure the Telephony Modem is on (the Power light should be on). If not, connect the power supply as described in “Connecting the Telephony Modem” on page 22.
- 2** Insert the Touchstone USB Drivers CD.
- 3** Plug the appropriate end of the USB cable into the Telephony Modem and the other end into the computer’s USB port.

The PC displays the following window:



—continued—

- 4 Wait for the system to start the installation wizard and display the following window:

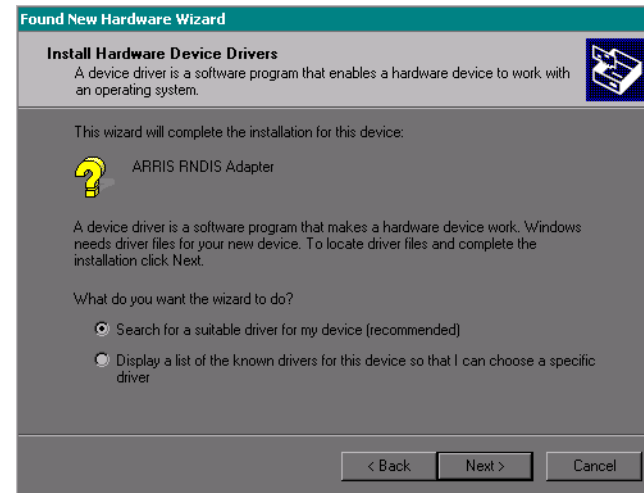


Note: Depending on system speed and other factors, it may take a minute or two to start the wizard.

—continued—

5 Click the **Next** button.

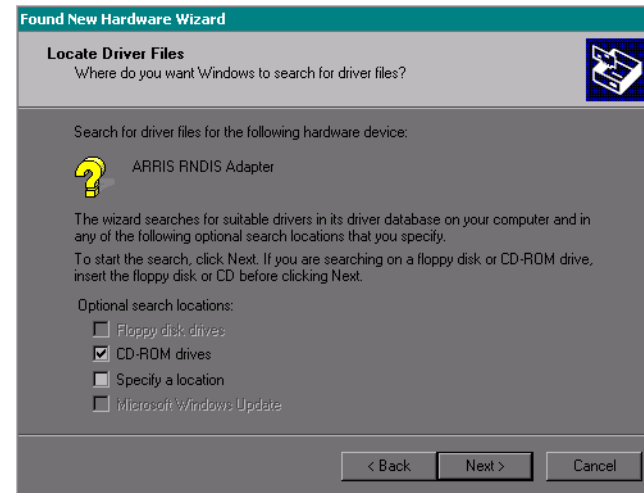
The wizard prompts you for the location of the drivers.



Note: The dialog indicates that the wizard is looking for the ARRIS RNDIS (Remote Network Device Interface Specification) driver for the Telephony Modem.

—continued—

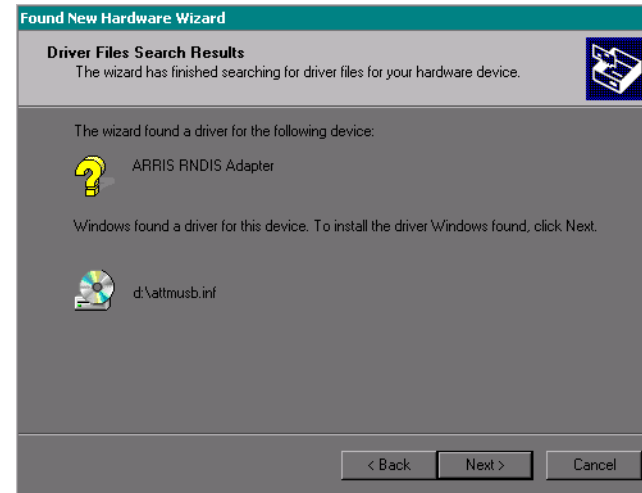
- 6 Select "Search for a suitable driver...", then click the **Next** button. *The wizard displays a list of search options.*



—continued—

7 Make sure the **CD-ROM** option is selected (checked), then click the **Next** button.

The wizard searches the specified locations, then displays the location and name of the appropriate driver.



Note: If the wizard can not find the CD drive, and the CD is inserted properly, follow these steps:

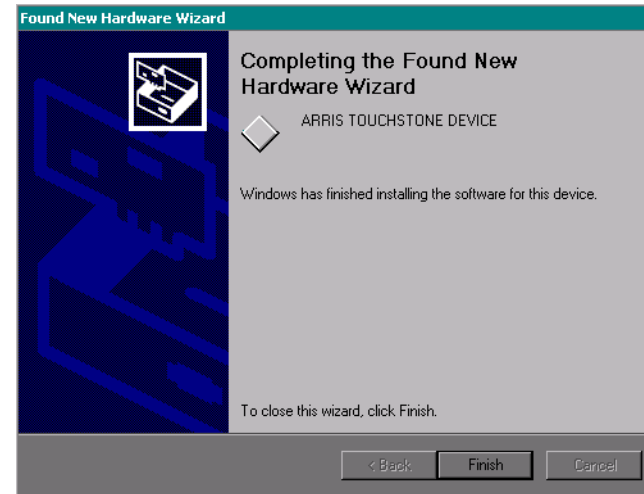
- a. On the Windows desktop, open "My Computer" and note the letter of the Compact Disc (or CD-ROM) drive (on most systems, the CD drive is at D: or E:)
- b. Return to the Found New Hardware Wizard, and click the **Back** button.
- c. Select "Specify a Location," then choose the drive letter that corresponds to the CD drive from the menu.
- d. Click the Next button.

The wizard displays the previous screen, shown in step 6.

You should now see the screen shown above. If not, contact your cable operator.

—continued—

- 8 Click the **Next** button.
The wizard installs the drivers, then displays a window indicating that the installation is complete.



- 9 Click the **Finish** button.

—end—

Configuring Your Ethernet Connection

If your computer is equipped with a LAN card providing an Ethernet connection, you may have to configure your computer's TCP/IP settings. The steps that follow will guide you through setting your computer's TCP/IP settings to work with the Telephony Modem.

Requirements

Make sure you have the following before attempting to configure your Ethernet connection:

- PC with:
 - one of: Windows 98SE, Windows 2000, Windows ME, or Windows XP (Windows 95 and Windows NT are not supported)
- Ethernet cable of appropriate length
- IP address, subnet, gateway, and DNS information for installations not using DHCP

How to use this chapter

The following table lists the procedures for modifying the TCP/IP settings on the computer. The procedure is slightly different depending on the operating system that you are using. Please ensure you are using the correct steps for the operating system on your computer. Follow the links below for instructions to configure your ethernet connection on your operating system.

- [TCP/IP Configuration for Windows 98SE](#)
- [TCP/IP Configuration for Windows 2000](#)
- [TCP/IP Configuration for Windows ME](#)
- [TCP/IP Configuration for Windows XP](#)

TCP/IP Configuration for Windows 98SE

Follow these steps to configure the TCP/IP settings on a Windows 98SE operating system.

Note: Dialog boxes shown on your computer may differ slightly from those shown in this procedure.

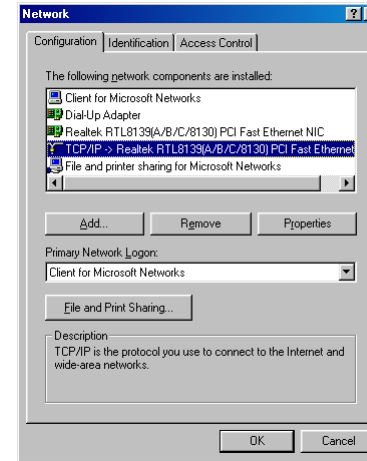
10 From the computer, select **Start > Settings > Control Panel**.

11 Double click on the **Network** icon in the Control Panel.

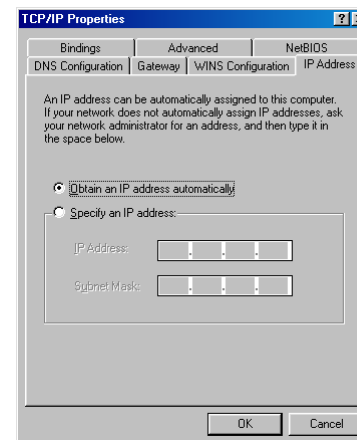


12 Click the **Configuration** tab in the Network window to display the list of Network Adapters.

13 Highlight **TCP/IP** by clicking on it one time, then click on **Properties**.



14 Click the **IP Address** tab, click **Obtain an IP address automatically**, then click **OK**.



15 Click **OK** to accept the new settings, and **OK** again to close the Configuration window.

16 You may have to restart your computer in order for your computer to obtain a new IP address from the network.

—end—

TCP/IP Configuration for Windows 2000

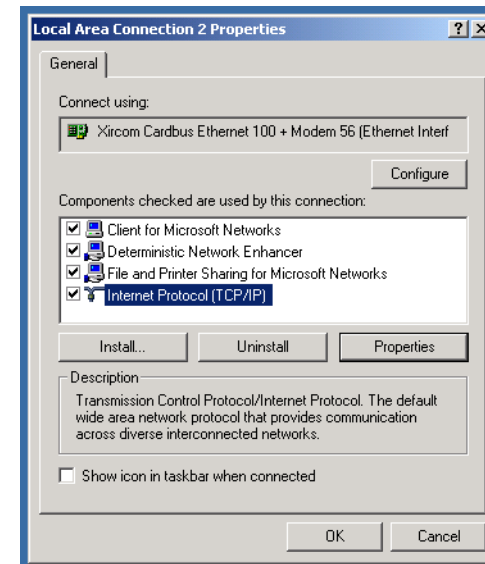
Follow these steps to configure the TCP/IP settings on a Windows 2000 operating system.

Note: Dialog boxes shown on your computer may differ slightly from those shown in this procedure.

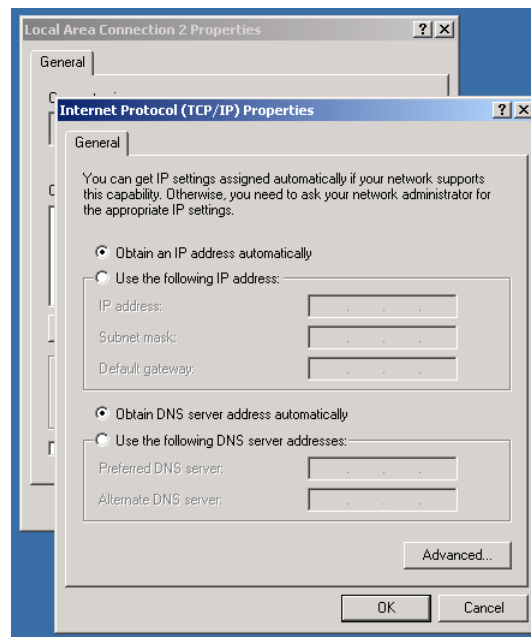
17 From the computer, select **Start > Settings > Network and Dial-up Connections > Local Area Connection**.

18 In the Local Area Connections Properties window, highlight **TCP/IP** by clicking on it one time, then click on **Properties**.

Note: If your computer has more than one Ethernet card, you may have to select the appropriate Ethernet card in the **Connect using:** area of the Local Area Connection Properties window.



- 19** Click **Obtain an IP address automatically** and **Obtain DNS server address automatically**, then click **OK**.



- 20** Click **OK** to accept the new settings, and **OK** again to close the Configuration window.

- 21** You may have to restart your computer in order for your computer to obtain a new IP address from the network.

—end—

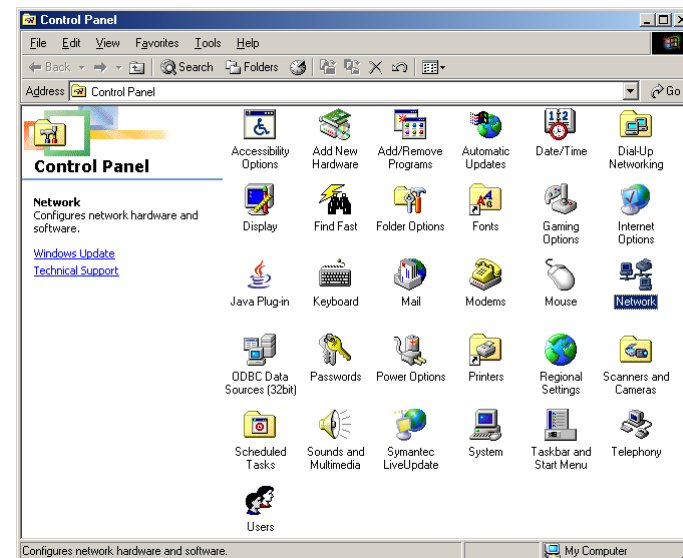
TCP/IP Configuration for Windows ME

Follow these steps to configure the TCP/IP settings on a Windows ME operating system.

Note: Dialog boxes shown on your computer may differ slightly from those shown in this procedure.

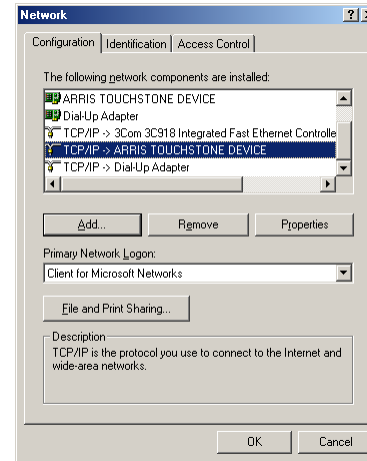
22 From the computer, select **Start > Settings > Control Panel**.

23 Double click on the **Network** icon in the Control Panel.

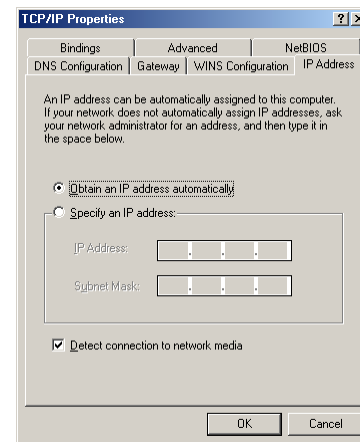


24 Click the **Configuration** tab in the Network window to display the list of Network Adapters.

25 Highlight **TCP/IP** by clicking on it one time, then click on **Properties**.



26 Click the **IP Address** tab, then click **OK**.



27 Click **OK** to accept the new settings, and **OK** again to close the Configuration window.

28 You may have to restart your computer in order for your computer to obtain a new IP address from the network.

—end—

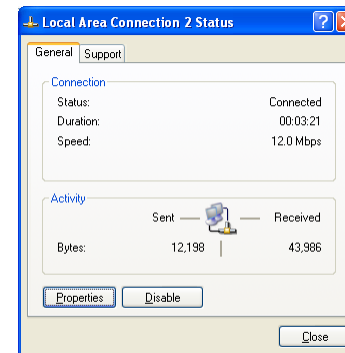
TCP/IP Configuration for Windows XP

Follow these steps to configure the TCP/IP settings on a Windows XP operating system.

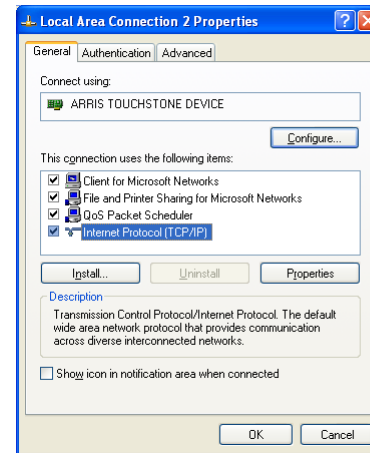
Note: Dialog boxes shown on your computer may differ slightly from those shown in this procedure.

29 From the computer, select **Start > Settings > Control Panel** and double click on the **Network Connections** icon in the Control Panel.

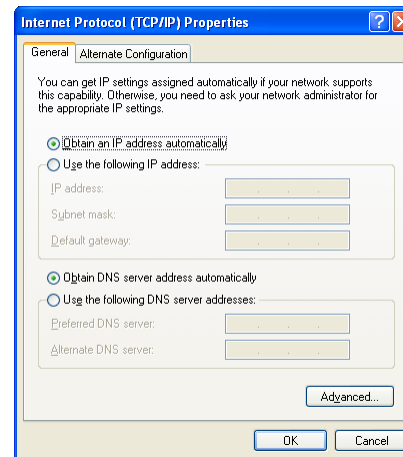
30 Click the **Configuration** tab in the Network window to display the list of Network Adapters.



31 Highlight **TCP/IP** by clicking on it one time, then click on **Properties**.



32 Click the **IP Address** tab, click **Obtain an IP address automatically**, then click **OK**.



33 Click **OK** to accept the new settings, and **OK** again to close the Configuration window.

34 You may have to restart your computer in order for your computer to obtain a new IP address from the network.

—end—

Using the Telephony Modem

This chapter describes the controls and features available on the Touchstone Telephony Modem, and covers basic troubleshooting procedures.

- [Setting up Your Computer to Use the Telephony Modem](#)
- [Indicator Lights for the TM402A and TM402B Models](#)
- [Indicator Lights for the TM402G and TM402H Models](#)
- [Indicator Lights for the TM402P Model](#)
- [Using the Reset Button](#)
- [Using the Standby Button](#)

Setting up Your Computer to Use the Telephony Modem

Follow the instructions in the information packet supplied by your cable company. Contact your cable company if you need help setting up your computer.

Indicator Lights for the TM402A and TM402B Models

The Touchstone Telephony Modem has seven LEDs to assist in troubleshooting.

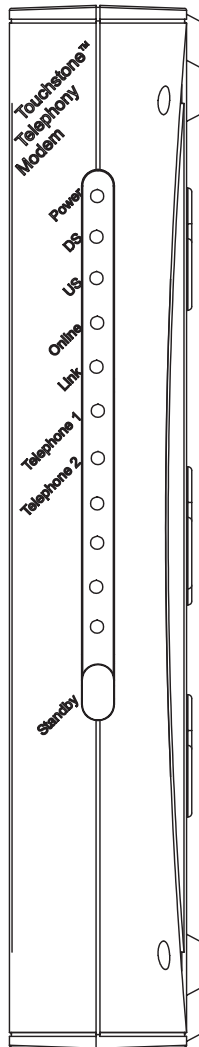
Patterns: Normal Operation

The following table shows light patterns during normal operation.

Table 1:

Mode	Power	DS	US	Online	Link	Tel. 1/Tel. 2
A/C Power	On	On = Online Flash = Off-line	On = Online Flash = Off-line	On = network available Off = network not available	On = Computer Connected Off = Computer disconnected Flash = Computer Activity	On = On-hook Flash = Off-hook Off = disabled
AC Power Fail	Flash	Off	Off	Off	Off	On = On-hook Flash = Off-hook Off = disabled

See [Using the Standby Button](#) for more information about the standby mode.



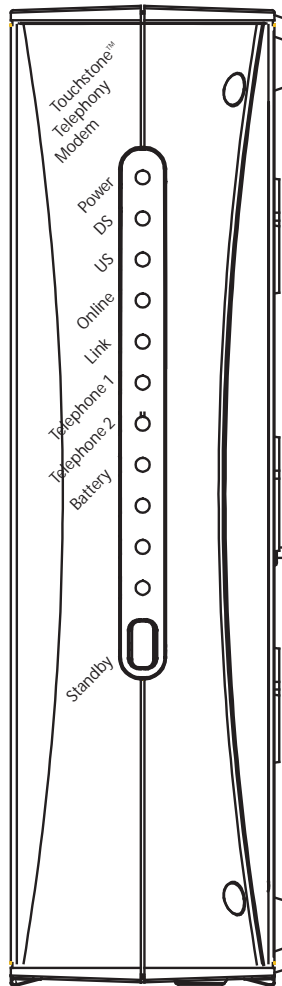
Indicator Lights for the TM402G and TM402H Models

The Touchstone Telephony Modem has eight LEDs to assist in troubleshooting

Patterns: Normal Operation

The following table shows light patterns during normal operation.

Table 2:



Mode	Power	DS	US	Online	Link	Tel. 1/ Tel. 2	Battery
A/C Power	On	On = Online Flash = Off-line	On = Online Flash = Off-line	On = network available Off = network not available	On = Computer Connected Off = Computer disconnected Flash = Computer Activity	On = On-hook Flash = Off-hook Off = disabled	On = Battery good Off = Battery bad or missing Flash = Battery low
AC Power Fail	Flash	Off	Off	Off	Off	On = On-hook Flash = Off-hook Off = disabled	On = Battery good Off = Battery bad or missing Flash = Battery Low

See [Using the Standby Button](#) for more information about the standby mode.

Indicator Lights for the TM402P Model

The Touchstone Telephony Modem has nine LEDs to assist in troubleshooting

Patterns: Normal Operation

The following table shows light patterns during normal operation.

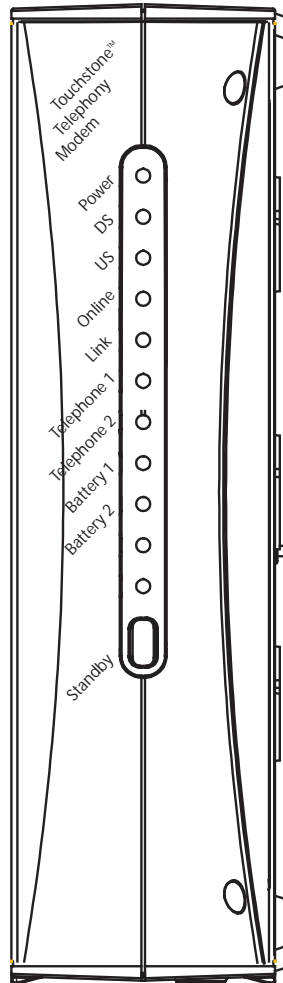


Table 3:

Mode	Power	DS	US	Online	Link	Tel. 1/ Tel. 2	Batt.1/ Batt.2
A/C Power	On	On = Online Flash = Off- line	On = Online Flash = Off-line	On = network available Off = network not available	On = Computer Connected Off = Computer disconnected Flash = Computer Activity	On = On-hook Flash = Off-hook Off = disabled	On = Battery good Off = Battery bad or missing Flash = Battery low
AC Power Fail	Flash	Off	Off	Off	Off	On = On-hook Flash = Off-hook Off = disabled	On = Battery good Off = Battery bad or missing Flash = Battery Low

See [Using the Standby Button](#) for more information about the standby mode.

LED Indicators: Startup Sequence

The following table shows the Telephony Modem light patterns during each phase of the startup sequence. There are two phases of startup; the Telephony phase and the cable modem phase. Both are outlined below.

Power, DS, US, Online	Link	Telephone		Battery*		Description
		1	2	1	2	
Off	Off	Off	Off	Off	Off	No power to Cable Modem
Flash	Flash	Flash	Flash	Flash	Flash	Power-on Self Test**
See "Cable Modem Start Up Sequence" Below						
On	On	Flash	Off	Off	Off	Retrieving telephone network information
On	On	Off	Flash	Off	Off	Retrieving telephone line information
ON	On	Flash	Flash	Off	Off	Activating telephone service
Normal Operation * = Battery LED only applies to those models with battery backup ** = If this pattern of all LEDs flashing persists, the Telephony Modem has detected foreign voltage on the telephone line. Disconnect the telephone connection and call a qualified telephone installer to troubleshoot.						

Cable Modem Start Up Sequence

Power	DS	US	Online	Description
On	Flash	Off	Off	Downstream search
On	On	Flash	Off	Downstream found, upstream search
On	On	On	flash	Downstream and Upstream found, retrieving setup information from cable operator
CM Normal Operation				

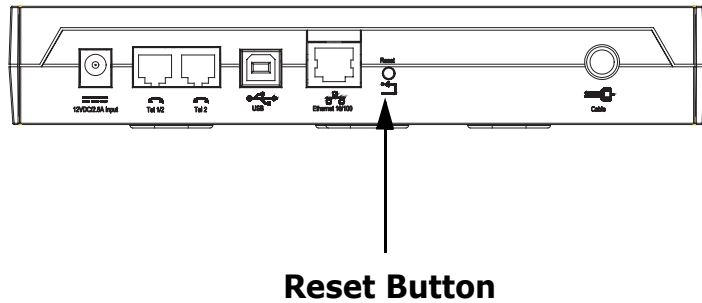
Using the Reset Button

Use the **Reset** button, on the back of the Telephony Modem, to reset the modem as if you power cycled the unit. You may need to reset the Telephony Modem if you are having problems connecting to the Internet. Using this button will be rare.

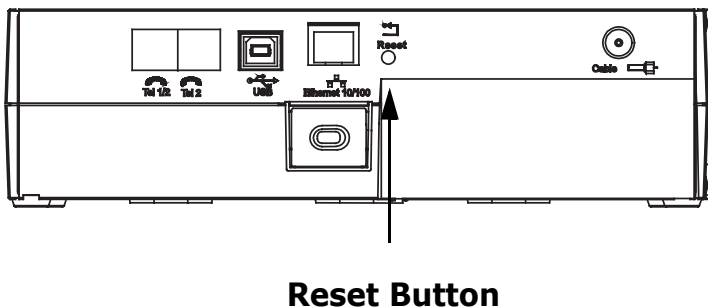
Use a pointed **non-metallic** object to press this button. The photo to the left shows the location of the **Reset** button.

The **Reset** button is recessed to prevent accidental resets.

TM402A and TM402B Models



TM402G, TM402H, and TM402P Models



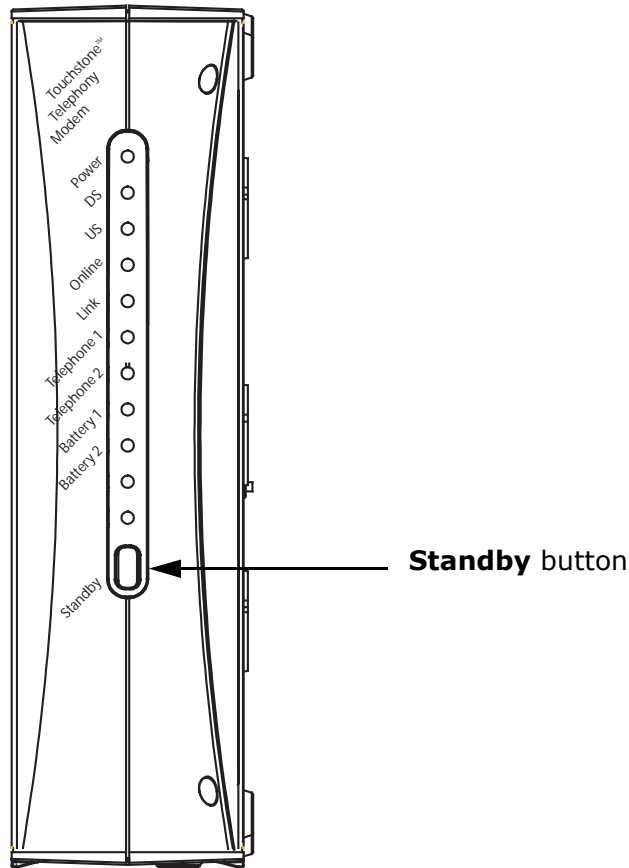
Using the Standby Button

The Telephony Modem has a **Standby** button on top of the unit. Press the **Standby** button to switch between:

- **Inactive (normal) mode:** the Ethernet and USB interfaces are connected to the Internet. The **Online** light stays on to indicate normal mode.
- **Active (standby) mode:** the Ethernet and USB interfaces are disconnected from the Internet. Computers connected to the Ethernet and USB interfaces can still communicate with each other, but not with the Internet. The **Online** light blinks to indicate active mode.

The Telephony Modem remembers the standby setting when you reset the Telephony Modem or turn it off. The Standby button does not affect telephony service; telephony service will work regardless of the status of the internet connection.

The **Standby** button has no effect while the **Power** light is blinking.



Troubleshooting

Problems and Solutions

The Telephony modem is plugged in, but the Power light is off.

Check all power connections. Is the AC adapter plugged in firmly at both ends?

If you plugged the AC adapter into a power strip, make sure the strip is switched on.

Avoid using an outlet controlled by a wall switch, if possible.

Finally, check the fuse or circuit breaker panel.

I'm not getting on the Internet.

It may take up to 30 minutes to establish a connection the first time you power up your Telephony Modem, especially when many people are online. Always leave your Telephony Modem plugged in and connected; use the **Standby** button to disconnect your PC from the Internet.

Check the front panel lights:

- The **Power** and **Online** lights should be on.
- If the **Online** light is blinking, press the **Standby** button.
- The **Link** light should be either on or blinking.
- If the **Power** light blinks for more than 30 minutes, call your cable company for assistance.

Check your cable connections. Connectors should be finger-tight. The [coax cable](#) should not be pinched, kinked, or bent sharply—any of these can cause a break or short in the cable (you may have to replace the cable). If you have one or more splitters between the Telephony Modem and CATV outlet, remove the splitters and connect the Telephony Modem directly to the outlet.

Proceed to the Ethernet or USB solutions (next page) if necessary.

I'm not getting on the Internet. (Ethernet)

If you are using a hub, is the hub turned on?

Are you using the right type of [Ethernet cable](#)? (Straight cable for direct connection to a PC, cross-over cable for connection to a hub.)

Press the **Reset** button on the back of the Telephony Modem.

I'm not getting on the Internet. (USB)

Did you [load the USB drivers](#)?

If you are using a powered USB [hub](#), is the hub turned on?

Check the USB cable connections. Disconnect and reconnect the USB cable.

Restart the PC.

Press the **Reset** button on the back of the Telephony Modem.

I'm not getting on the Internet. (USB, Windows 98)

In some cases, Windows may install a "composite" USB driver instead of the ARRIS Telephony modem driver. To correct this:

- Disconnect the USB cable between the PC and the Telephony Modem.
- Use the ARRIS Uninstall utility (on the ARRIS driver CD) to remove the improperly-installed driver.
- Reboot the PC.
- Reinstall the drivers as described in [Troubleshooting USB Problems](#).

I can get on the Internet, but everything is slow.

If the Web site you are visiting is very popular, that site may be having trouble servicing all the requests. If other sites download quickly, wait for a few minutes and try again. Usage during peak hours may also affect the connection speed.

If your Telephony Modem is connected to a LAN (Local Area Network), either directly or through a firewall, other communications on the LAN may slow down your connection.

I have two PCs connected to the Telephony Modem, but only one can get on the Internet.

Check your cable company's terms of service: they may allow only one computer to connect directly to the Telephony Modem.

I don't have dial tone when I pick up my phone, why?

In order for telephone service to be functional on the Telephony Modem, telephone service must have been purchased from the service provider and configured on your Telephony Modem. The following steps should help in identifying the source of the problem.

- Is the Power LED lit?
 - If not, check to make sure the Telephony Modem is plugged in and the outlet has power.
 - If the LED is lit, go to the next step.
- Is the Online LED lit?
 - If not, check the coax connection at the Telephony Modem and the wall. Ensure they are connected and tight. If they are and you do not have dial tone, contact your service provider.
 - If the Online LED is lit, go to the next step.
- Is the Telephone (Telephone 1 or Telephone 2) LED lit?
 - If not, phone service has not been provisioned on that line. Contact your service provider.
 - If it is blinking, there is a phone off hook somewhere in the house. Find that phone and hang it up.
 - If it is lit, go to the next step
- Is the Phone plugged directly into the Telephony Modem?
 - Make sure the phone is plugged into the port on the back of the Telephony Modem labeled "Tel 1/2" for line 1 and "Tel 2" for line 2.
 - If so, try a different phone. Make sure the new phone is a working phone.
 - If a known good phone is used and you still don't have dial tone, try a different phone cable. If a new phone and cable do not restore dial tone, call your service provider.

- Is the Telephony Modem plugged into a wall outlet?
 - If so, unplug the RJ-11 connector at the back of the Telephony Port and plug in a known working phone. If you now have dial tone, the problem is with the house wiring. Contact your MSO or a qualified wiring technician to correct the house wiring. If you still do not have dial tone, contact your service provider.

Troubleshooting USB Problems

Follow these steps if the PC does not auto-detect the Telephony Modem using a USB connection.

Before you start, make sure that:

- You have properly installed and configured the Telephony Modem as shown in [Installing and Connecting Your Telephony Modem](#).
- You have installed the USB drivers as shown in [Installing the Telephony Modem USB Drivers](#).
- The cable company has set up your account. Call your cable company if you're not sure.

Instructions

- 1** Be sure that your PC is running either Windows 98SE, Windows 2000, or Windows ME (Windows 95 and Windows NT are **not** supported).
- 2** Be sure the Telephony Modem has power. The **Power** light should be on.
- 3** Push the **Reset** button on the back panel of the Telephony Modem, using a pen tip or other sharp non-metallic object.
- 4** Disconnect the USB cable from the PC and reconnect it.
- 5** Restart the PC.
- 6** Do the following to uninstall and the reinstall your USB drivers:
 - a.** Disconnect the USB cable to the Telephony Modem.
 - b.** Insert the Telephony Modem CD-ROM into you computer.
 - c.** Start the uninstall utility on your CD-ROM. Follow the on-screen instructions carefully.
 - d.** Reconnect the USB cable.
 - e.** Re-install the USB driver as shown in [Installing the Telephony Modem USB Drivers](#).
- 7** Replace the USB cable.
- 8** Call your cable company for help.

Safety

**Getting
Started**

**Battery
Installation**

Installation

**USB
Drivers**

**Ethernet
Configuration**

Usage

Troubleshooting

Glossary

Glossary

The following is a list of common cable and networking terms.

Terms and Abbreviations

A/B Cable

A USB cable that has a narrow rectangular connector on one end (A) and a notched square connector (B) on the other end.

Category 5 (Cat5)

A high-quality type of cable, used for Fast Ethernet (100BaseT) connections. When purchasing Ethernet cables, always look for Category 5 cable.

Coaxial cable (coax)

A thin wire, used to connect your television and Telephony Modem to the cable TV system. You can buy coax from any electronics retailer and many discount stores.

CPE

Customer Premise Equipment. This is the equipment that is plugged in to the telephony modem; typically a computer, hub, or router.

Cross-over

An Ethernet cable used to connect two hubs (or a hub and a cable modem) together. Also, some Ethernet hubs may have built-in cross-over on one or more ports (which eliminates the need for a cross-over cable).

DHCP

Dynamic Host Configuration Protocol. An IP protocol used to provide an IP address and location of services (such as DNS and TFTP) needed by a device connecting to the network. DHCP allows the cable company to configure your computer's networking software for you.

DNS

Domain Name Service (Server). An IP service that associates a domain name (such as www.example.com) with an IP address.

Downstream

In an HFC network, the direction from the head-end to the subscriber. Some older cable documentation may refer to this as the forward path.

DOCSIS

Data Over Cable System Interface Specification. The interoperability standards used for data communications equipment on an HFC network.

EMTA

Embedded Multimedia Terminal Adapter. An MTA device that is integrated with a cable modem.

Ethernet

A standard method of connecting two or more computers into a Local Area Network (LAN).

EuroDOCSIS

The European version of DOCSIS.

Event

An informational message used for monitoring network status.

F-connector

The type of connector used on coaxial cable. There are two common types of F-connector, slip-on and screw-on. Use coax with screw-on connectors for connecting your Telephony Modem.

Gateway

The device, usually a router, that connects devices on a given IP subnet to other IP subnets.

Headend

The "central office" in an HFC network. The headend houses both video and data equipment. In larger cable networks, a "master" headend often feeds several "remote" headends to provide distributed services.

HTTP

HyperText Transfer Protocol.

Hub

A box with several Ethernet or USB connectors. Ethernet hubs provide a common point of contact for all connected devices; USB hubs allow you to add peripherals without installing a USB card in your computer.

IP address

A number assigned to your computer by your cable company, used to identify your computer to other systems on the Internet.

ISDN

Integrated Services Digital Network. A digital telephony standard that provides communication speeds about twice as fast as standard dialup.

LAN

Local Area Network. A network that allows computers in a single location (such as a building) to communicate with one another.

LED

Light Emitting Diode. A semi-conductor diode that emits light when current is passed through it.

MAC address

A number that uniquely identifies any device connected to a network. Your cable company uses your Telephony Modem's MAC address to authorize access to the Internet. The MAC address is printed on a label on the bottom of your Telephony Modem.

Protocol

A set of rules and formats that determines the communication behavior of network entities at a given layer.

Proxy

A device or program that stands in between a server (for example, a web site) and a client (your browser), providing a way to relieve some of the burden from the server. For example, your cable company may have a web proxy that keeps copies of popular web pages; the proxy can send you those pages instead of fetching them directly from the web site, resulting in faster page loading and less network congestion.

RF

Abbreviation for Radio Frequency. Some literature refers to coax as "RF cable" and the connectors as "RF connectors."

RJ-11

A standard 4-pin modular connector, commonly used in North America for connecting telephones.

RJ-45

A standard 6-pin modular connector, commonly used on Ethernet cable. An RJ-45 connector looks like a wide RJ-11 (telephone) connector.

Splitter

A small box with three cable connectors: one input and two outputs. You may need a splitter if you have a TV already connected to the cable outlet that you want to use for your Telephony Modem. You can buy a splitter from any electronics retailer and most discount stores.

Standby mode

A Telephony Modem operating mode that disconnects the Ethernet and USB interfaces from the Internet. The Telephony Modem's **Online** light blinks while the modem is in Standby mode.

Switched outlet

A power outlet that may be turned on and off using a wall switch. Usually intended for lamps. Avoid plugging your computer or Telephony Modem into a switched outlet to avoid disruptions.

TCP/IP

Transmission Control Protocol/Internet Protocol. The protocols used to facilitate communications across one or more connected networks.

TDMA

Time Division Multiple Access. A method used by DOCSIS-compliant cable modems for sending upstream data with minimal interference.

Upstream

The path from a subscriber device to the headend. Some older cable documentation may refer to this as the return path or reverse path.

USB

(Universal Serial Bus) An interface used for connecting a variety of accessories, such as keyboards, mice, printers, and communications devices (such as cable modems) to a single PC.

WHQL

Windows Hardware Qualification Labs. A division of Microsoft that certifies hardware as being compatible with Windows operating systems.



Touchstone TM402 Telephony Modem User's Guide

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