

## Touchstone<sup>®</sup> TM502 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 TM502 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). Some Telephony Modems also provide 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 provide more detailed instructions.

[Safety Requirements](#)

[Getting Started](#)

[Battery Installation and Replacement \(TM502G/H Models Only\)](#)

[Installing and Connecting Your Telephony Modem](#)

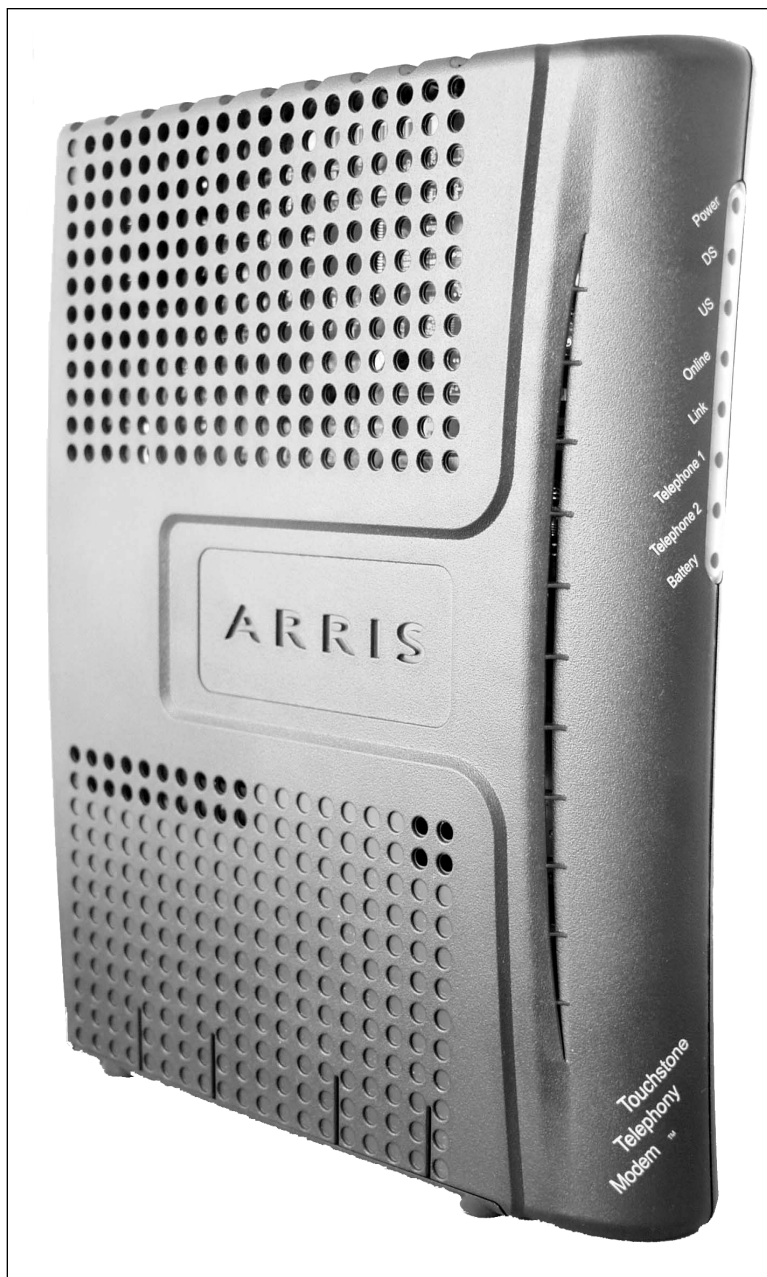
[Installing USB Drivers on Your PC](#)

[Configuring Your Ethernet Connection](#)

[Using the Telephony Modem](#)

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[Glossary](#)



## **Export Regulations**

This product may not be exported outside the U.S. and Canada without U.S. Department of Commerce, Bureau of Export Administration authorization. Any export or re-export by the purchaser, directly or indirectly, in contravention of U.S. Export Administration Regulation is prohibited.

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Release 5 Standard 3.0 August 2006

## 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 Telephony Modem.

- 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 coax 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 po-

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

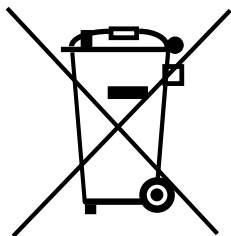
- In areas of high surge events or poor grounding situations and areas prone to lightning strikes, additional surge protection may be required (i.e. PF11VNT3 from American Power Conversion) on the AC, RF, Ethernet and Phone lines.
- When the Telephony Modem is connected to a local computer through USB 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.



## 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 this symbol, 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.

This product complies with directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment.



## End User License Agreement and Limited Warranty

This Standard License Agreement and Limited Warranty ("Agreement") applies to all ARRIS manufactured or otherwise ARRIS provided products ("Products") and the corresponding current and subsequently provided versions of software or firmware, if any, whether embedded in the Products or used in conjunction with the Products, ("Software"). The Product, without the Software, is referred to in this Agreement as the ("Hardware"). The Software and Hardware are ARRIS Products and may be referred to in this Agreement as the ("System").

If you ("You" or "Purchaser") and ARRIS International, Inc. ("ARRIS") have entered into a separate written agreement, then, inconsistent terms between this Agreement and the separate agreement shall be governed by such separate agreement.

If You do not agree to be bound by this Agreement, please return the Products to the Party from whom You acquired the Products. Use of the Products shall constitute acceptance of the terms hereof.

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<a href="#">Safety</a>	<a href="#">Getting Started</a>	<a href="#">Battery Installation</a>	<a href="#">Installation</a>	<a href="#">USB Drivers</a>	<a href="#">Ethernet Configuration</a>	<a href="#">Usage</a>	<a href="#">Troubleshooting</a>	<a href="#">Glossary</a>
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sent; (iv) export the Software or any of its underlying technology in contravention of U.S. and foreign export laws and regulations, or (v) if Products are included, use the Software other than in connection with the System.

### 3. USE

The right to use the Software, or any individual feature thereof, may be restricted by a measure of usage. An expansion beyond a commercially reasonable usage level may require payment of an additional fee to ARRIS.

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### 9. PATENT INDEMNIFICATION

9.1 ARRIS will indemnify, defend and hold You harmless against damages, liabilities and costs, excluding consequential and exemplary damages finally awarded against You and will, at ARRIS' expense, defend any claim, suit or proceeding ("Claim") brought against You insofar as such Claim is based on an allegation that the Products as provided to You directly infringe a United States patent or copyright. ARRIS will pay those costs and damages, including settlement costs awarded or agreed-upon, as applicable, as the result of the Claim, provided (i) You promptly notify ARRIS of the Claim (ii) You give ARRIS all applicable evidence in Your possession, custody or control, (iii) You give ARRIS reasonable assistance in and sole control of the defense and all negotiations for its settlement or compromise, and (iv) You have paid all fees due to ARRIS under this Agreement and continue to pay all such fees as such become due.



<a href="#">Safety</a>	<a href="#">Getting Started</a>	<a href="#">Battery Installation</a>	<a href="#">Installation</a>	<a href="#">USB Drivers</a>	<a href="#">Ethernet Configuration</a>	<a href="#">Usage</a>	<a href="#">Troubleshooting</a>	<a href="#">Glossary</a>
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9.2 In the event of an infringement allegation for which ARRIS is obligated to indemnify You, ARRIS may at its discretion: (i) obtain a license that allows You to continue to use the accused Products, (ii) replace or modify the accused Products with changes that reasonably meet the ARRIS specification, so as to be non-infringing, or (iii) if (i) and (ii) are not commercially reasonable, repurchase ARRIS' provided Products at its depreciated value based on a three-year amortization rate. If ARRIS provides any one of the options set forth in clauses (i) through (iii) above, ARRIS' indemnity obligation under this Agreement shall be entirely fulfilled. ARRIS liability for patent infringement indemnification in this section shall not exceed the amount You paid for the Products finally found to infringe a valid US patent.

## 10. LIMITED WARRANTY

IF YOU ACQUIRED THE PRODUCTS FROM ANYONE OTHER THAN ARRIS YOU DO NOT RECEIVE ANY OF THE WARRANTIES DIRECTLY FROM ARRIS. YOUR EXCLUSIVE WARRANTY, IF ANY, COMES FROM THE PARTY FROM WHOM YOU ACQUIRED THE PRODUCTS: IN WHICH CASE THE REMAINDER OF THIS DOCUMENT, EXCEPT FOR THE ARRIS TOUCHSTONE PRODUCTS SAFETY INFORMATION, DOES NOT APPLY TO YOU.

## 11. SOFTWARE WARRANTY

ARRIS warrants to the original purchaser that for ninety (90) days from the ship date of the original ARRIS branded Software (the "Software Warranty Period"), the Software will perform in substantial conformance with the technical specifications for such Software set forth in the Documentation. Your sole and exclusive remedy, and ARRIS' sole and exclusive liability under this Section 11 (Software Warranty) shall be, at ARRIS' option: (i) to use commercially reasonable efforts to correct any reproducible errors that You identify in writing during the Software Warranty Period which renders the Software non-conforming, (ii) to replace the Software with functionally equivalent software or (iii) to accept Your return of the Software, if applicable. ARRIS does not warrant that the Software will work in combination with any hardware or application software products provided by third parties not supplied or approved by ARRIS, that the operation of the Software will be uninterrupted or error free, or that all defects in the Software

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## 12. HARDWARE WARRANTY

12.1 ARRIS warrants to the original Purchaser of the hardware that under normal use and service, for twelve (12) months from the ship date (the "Hardware Warranty Period") of the Hardware, it will be free from defects in material and workmanship. Your sole and exclusive remedy and ARRIS' sole and exclusive liability under this Section 12 shall be, at ARRIS' option: (i) to use commercially reasonable efforts to correct any reproducible Hardware errors that You identify in writing during the Hardware Warranty Period which renders the Hardware non-conforming, (ii) to replace the Hardware or (iii) accept return of the Hardware from Purchaser. ARRIS shall not be responsible for any of Your or third party software, firmware, information or memory data contained in, stored on, or integrated with any Hardware Products returned to ARRIS pursuant to any Warranty provided under this Agreement.

12.2 ARRIS does not warrant (1) physical damage to the surface of the products, 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 products, 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.

12.3 Battery Pack. If Your product has a battery pack, ARRIS warrants that the battery pack will be free from defects in workmanship and materials, under normal use, for twelve (12) months from its ship date. This warranty is void if the ARRIS battery pack is used in any other vendors equipment.

## 13. WARRANTY CLAIMS

To make a return under the Warranty above, You must contact the ARRIS Repair Services center within the applicable warranty period, in writing, by sending an email to support@arrisi.com to obtain an ARRIS Return Material Authorization number (RMA). The authorized RMA number You receive from ARRIS must be marked on the outside pack-



<a href="#">Safety</a>	<a href="#">Getting Started</a>	<a href="#">Battery Installation</a>	<a href="#">Installation</a>	<a href="#">USB Drivers</a>	<a href="#">Ethernet Configuration</a>	<a href="#">Usage</a>	<a href="#">Troubleshooting</a>	<a href="#">Glossary</a>
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age and sent prepaid and packaged appropriately for safe shipment. ARRIS will use commercially reasonable efforts to ship any repaired or replaced Product to You, at ARRIS' expense, not later than thirty (30) days after ARRIS receives the defective Product. ARRIS warrants the repaired or replaced Hardware or Software for the longer of the remainder of the unexpired applicable Warranty Period or 90 days. Notwithstanding the above, if any return is due to errors or defects for which ARRIS is not responsible or not otherwise covered by the Warranty, You shall be liable for and reimburse ARRIS for shipping and related expenses.

#### 14. DISCLAIMER OF WARRANTY

EXCEPT AS AGREED TO IN A SEPARATE WRITING BETWEEN THE PARTIES, THESE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES WITH RESPECT TO THE SOFTWARE AND/OR SYSTEM DELIVERED TO YOU HEREUNDER, WHETHER STATUTORY, BY OPERATION OF LAW, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, TITLE AND ANY WARRANTIES ARISING OUT OF USAGE OR TRADE. THIS WARRANTY IS APPLICABLE SOLELY TO YOU AND NOT TO ANY SUCCESSOR IN INTEREST OR ANY OTHER THIRD PARTY. NO WAIVER, ALTERATION, OR MODIFICATION OF THIS WARRANTY SHALL BE BINDING AGAINST ARRIS UNLESS IN WRITING AS A SEPARATE AMENDMENT HERETO AND SIGNED BY AN ARRIS AUTHORIZED EXECUTIVE.

#### 15. WARRANTY LIMITATIONS

ARRIS shall be relieved of all obligations and liability under the Warranty provisions set forth herein, if:

- The Hardware or Software is operated with, or the error or defect is due to, any accessory, equipment, software or part not approved or sold by ARRIS; or
- The Hardware or Software was not installed, operated and maintained in accordance with ARRIS' instructions and Documentation; or

c. The Hardware or Software has been repaired, altered or modified by someone other than ARRIS; or

d. You do not notify ARRIS in writing of the error or defect within the applicable Warranty Period with sufficient information for ARRIS to identify and reproduce such error or defect, or fail to return the defective Hardware or Software according to the terms of this Agreement; or

e. ARRIS demonstrates that the alleged error or defect in the Software or Hardware does not exist or was caused by Your or any third party's misuse, neglect, improper installation or testing, or negligent repair or any other cause beyond the range of the intended use, or by accident, fire, lightening or other hazard or act of God.

#### 16. MISCELLANEOUS

16.1 If any term, condition, or provision in this Agreement is found to be invalid, unlawful or unenforceable to any extent, the remaining terms, conditions and provisions will continue to be valid and enforceable to the fullest extent permitted by law.

16.2 You may not assign or transfer this Agreement nor any rights hereunder, in whole or in part, whether voluntary or by operation of law without ARRIS' prior written consent. Subject to the foregoing, this Agreement will be binding upon and will inure to the benefit of the parties and their respective successors and assigns.

16.3 This Agreement (including any addenda hereto signed by both parties) represents the entire agreement of the parties with respect to the subject matter of this Agreement and supersedes all previous communications, representations, understandings and agreements, either oral or written, between the parties with respect to said subject matter.

16.4 This Agreement may not be amended, except in writing, signed by both parties. No terms, provisions or conditions of any purchase order, acknowledgment or other business form that You may use in connection with the acquisition or licensing of the Software will have any effect on the rights, duties or obligations of the parties under, or oth-



<b>Safety</b>	<b>Getting Started</b>	<b>Battery Installation</b>	<b>Installation</b>	<b>USB Drivers</b>	<b>Ethernet Configuration</b>	<b>Usage</b>	<b>Troubleshooting</b>	<b>Glossary</b>
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erwise modify, this Agreement, regardless of any failure of ARRIS to object to such terms, provisions or conditions.

16.5 The laws of the State of Georgia, USA shall govern and construe this Agreement. Any suit brought in connection with this Agreement shall be subject to the exclusive jurisdiction of the State Court of Georgia or the Federal Courts for the Northern District of Georgia and You hereby agree and submit to the personal jurisdiction and venue thereof.

## 17. SAFETY INFORMATION FOR ARRIS TOUCHSTONE PRODUCTS

ARRIS telephony modems and cable modems comply with the applicable requirements for performance, construction, labeling, and information when used as outlined in this Section 17:

17.1 Caution: Only a professional installer may connect the telephony modem to the home's existing telephone wiring. 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 sufficient to ensure there is no power to the telephony modem. Failure to do so may result in loss of service and/or permanent damage to the telephony modem.

17.2 Do not use the product near water (e.g., wet basement, bathtub, sink or near a swimming pool), to avoid risk of electrocution.

17.3 Avoid using and/or connecting the equipment during an electrical storm, to avoid risk of electrocution.

17.4 Do not locate the product within 6 feet (2 m) of a flame or ignition source, to avoid damage or injury from battery explosion, or heat damage.

17.5 Use only the power supply and/or power cord included with the Product. Install the Product near and easily accessible to the power outlet. Ground the RF drop cable's shield at the building/residence either close to the point of entrance or at the point of attachment. Grounding as close as practical to the building/residence AC ground is

required to minimize grounding connector length and thereby limit the potential voltage differences between the cable TV coaxial cable and other grounding system. Refer to the individual country's National Electric Code for further details.

17.6 In areas of high AC power surge events or poor AC power grounding situations and areas prone to lightning strikes additional AC power surge protection may be required on the AC, RF, Ethernet, USB and phone lines.

17.7 If connecting the telephony modem or cable modem to a local computer through the Ethernet or USB cable 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.





## Getting Started

### About Your New Telephony Modem

The Touchstone TM502 Telephony Modem is DOCSIS or EuroDOCSIS compliant with the following features:

- Speed: much faster than dialup or ISDN service
- Convenience: supports USB (all but TM502C) and Ethernet; both can be used simultaneously
- Flexibility: provides two independent lines of telephone service as well as high speed data
- 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
- Power Cord
- Quick Installation Guide
- USB Cable (all but TM502C)
- Ethernet Cable
- CD-ROM
- Screws for Wall Mounting the Unit
- End User License Agreement

### What's on the CD?

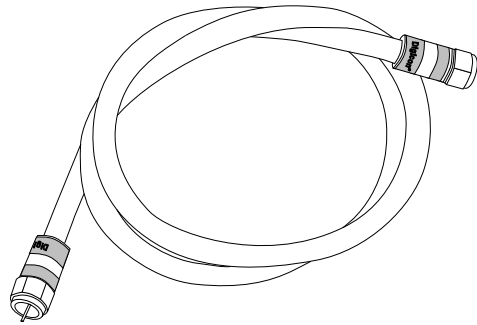
The CD provides the following items:

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

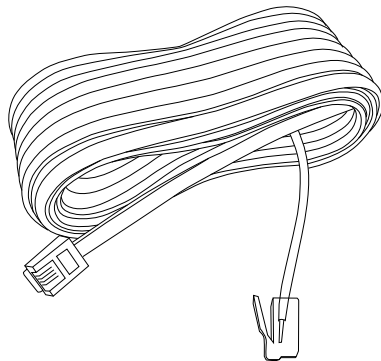


## Items You Need

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 coax 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.

## 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(s) change?
- What new calling features will I have and how do I use them?



## 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

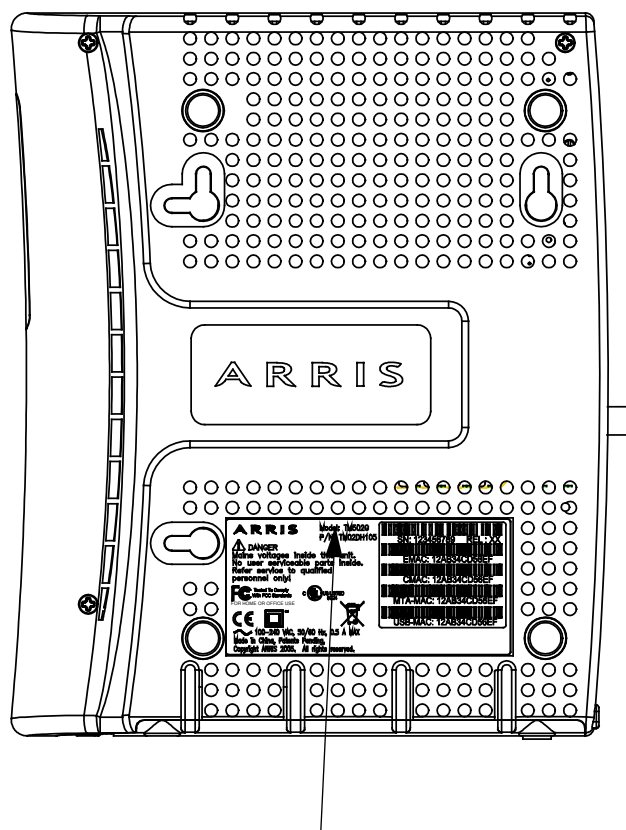
Ethernet connection only: System 7.5 to MacOS 9.2 (Open Transport recommended) or MacOS X

### 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 TM502 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



## Ethernet or USB?

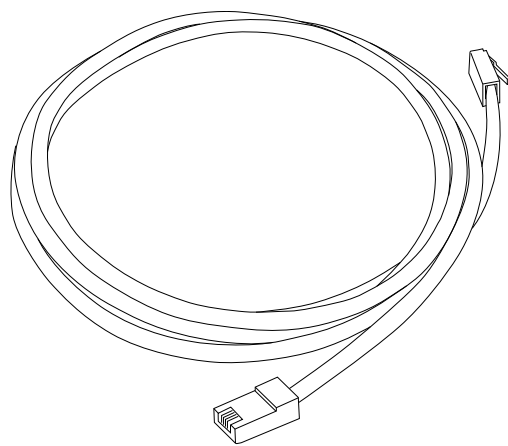
There are two ways to connect your computer (or other equipment) to the Telephony Modem. The following will help you decide which is best for you:

### Ethernet

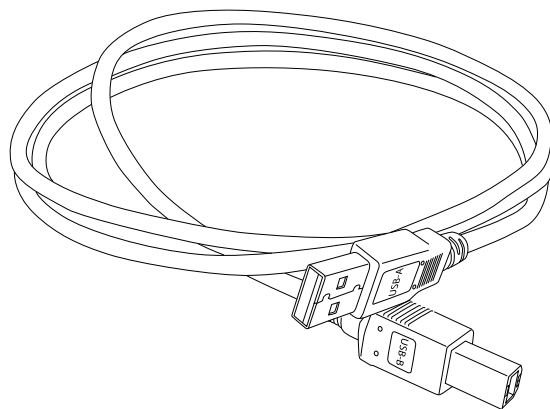
Ethernet is a standard method of connecting two or more computers into a Local Area Network (LAN). Use the Ethernet connection if your computer has built-in Ethernet hardware, does not use Windows, or you want to share the Telephony Modem connection with several computers.

**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 computer, 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.



**Ethernet Cable**



**USB 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 computer. 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.
- 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 reasons that you should run only secured proxies). Consult the documentation and technical support of the wireless equipment provider for help.



## Battery Installation and Replacement (TM502G/H Models Only)

### 2.2 Ah Battery



### 4.4 Ah Battery



TM502G and TM502H Telephony Modems may optionally include one of two types of Lithium-Ion batteries: a 2.2 [Amp-hour](#) (Ah) battery or a 4.4 Ah battery.

For safety and regulatory purposes, batteries are shipped outside of the Telephony Modem and must be installed.

Identify the battery type using the photos to the left and use the proper installation procedure:

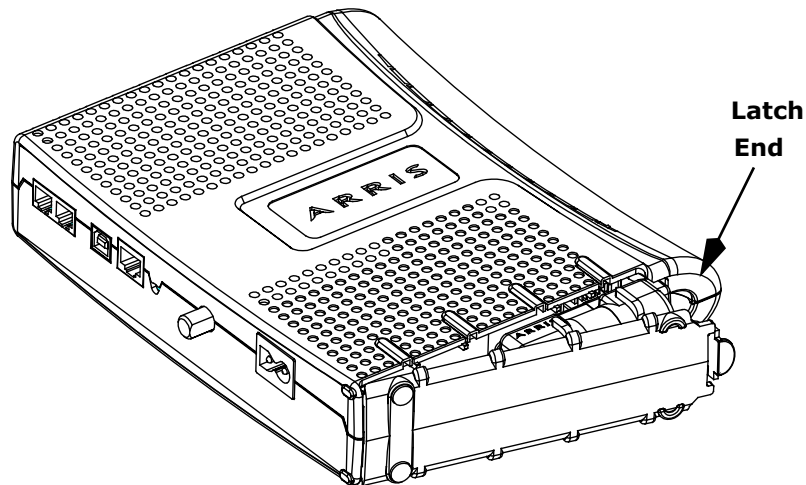
- [TM502G/H 2.2 Ah Battery Installation and Replacement](#)
- [TM502G/H 4.4 Ah Battery Installation and Replacement](#)

**Note:** The 4.4 Ah battery is longer and has a strap between the guides.



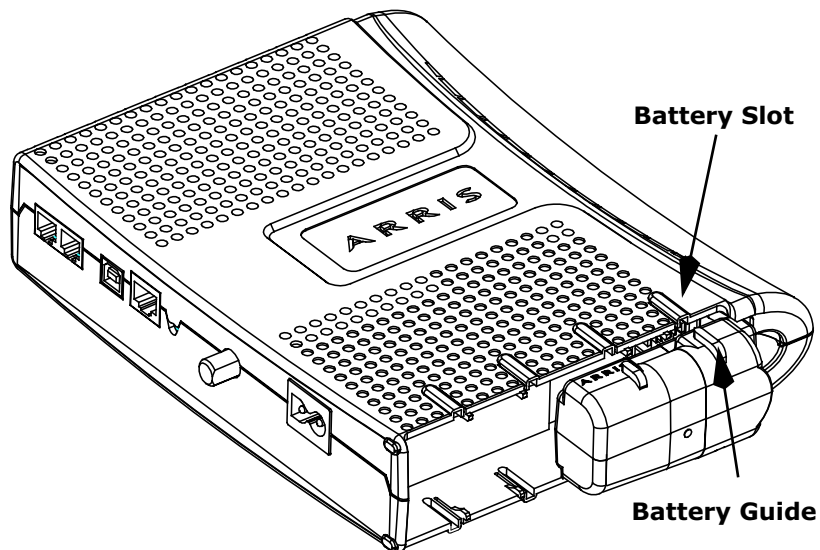
## TM502G/H 2.2 Ah Battery Installation and Replacement

This model of the Telephony Modem has 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. The 2.2Ah lithium-ion battery pack can be inserted into the Telephony Modem. Use this procedure to install and to replace the backup batteries.



### Action

- 1 Insert a finger into the latch opening, press down and pull back on the latch holding the battery door (on the bottom of the Telephony Modem). Pull the door toward you. Set the door aside in a safe place.

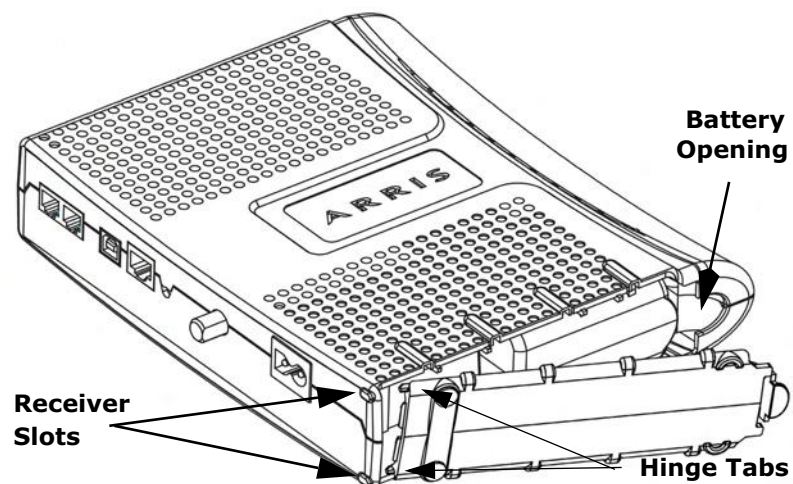


- 2 Hold the battery pack so that the guides on the battery align with the slots on the Telephony Modem and slide the battery into the bay. The diagram on the left shows the proper orientation.

**Note:** Batteries will not insert completely into the Telephony Modem if not oriented correctly. The battery should slide into the bay without significant force. Line up the slots in the battery bay with the guides on the battery.

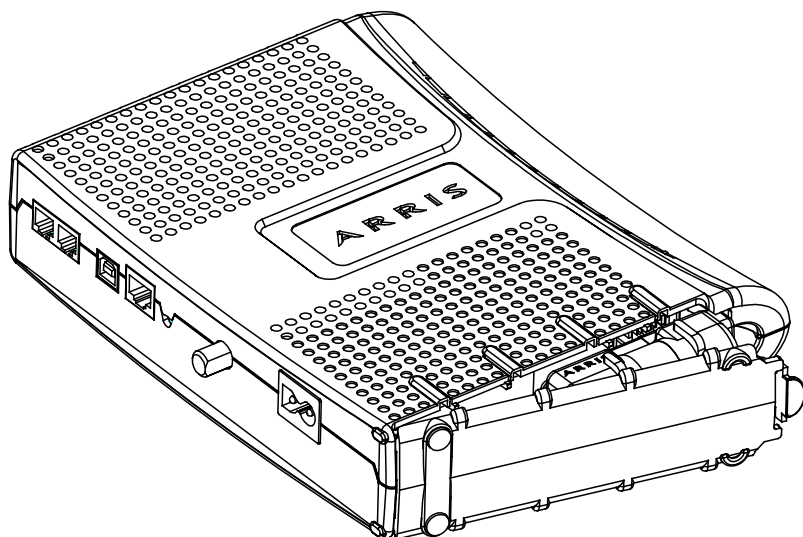






- 3 Push the battery pack into the bay until it seats into place. The following diagram shows a Telephony Modem with a 2.2Ah battery pack installed. **If you are taking the battery out of the unit, position your finger in the battery opening area and use leverage to dislodge the battery while pulling it straight back.**

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



- 4 Replace the door. To do so, place the hinge tabs of the battery door into the receiver slots inside the Telephony Modem battery compartment on the opposite end of the battery opening slot. Rotate the door toward the unit until the latch snaps 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.

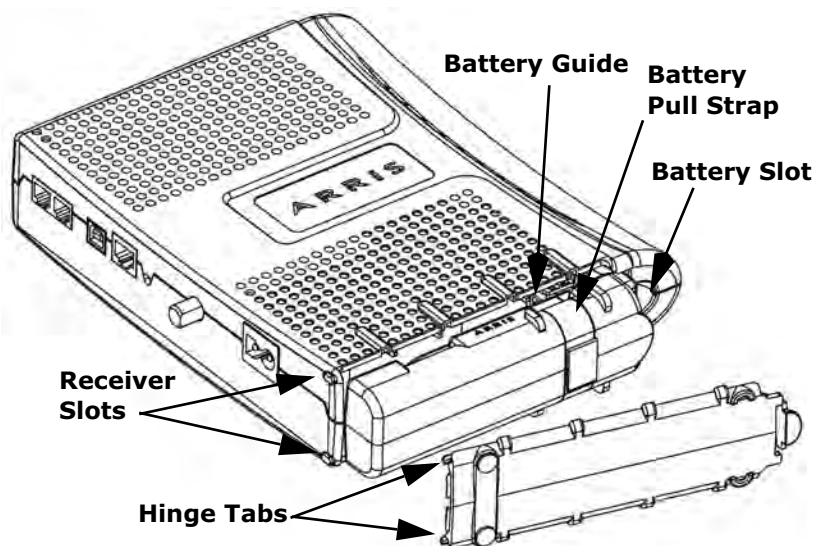
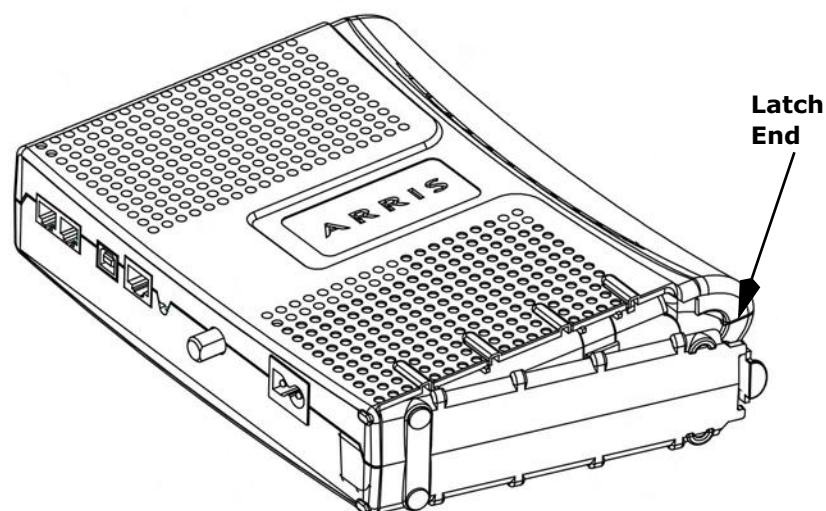


## TM502G/H 4.4 Ah Battery Installation and Replacement

The 4.4 Ah lithium-ion battery pack can be inserted into the Telephony Modem. Use this procedure to install and to replace the backup batteries.

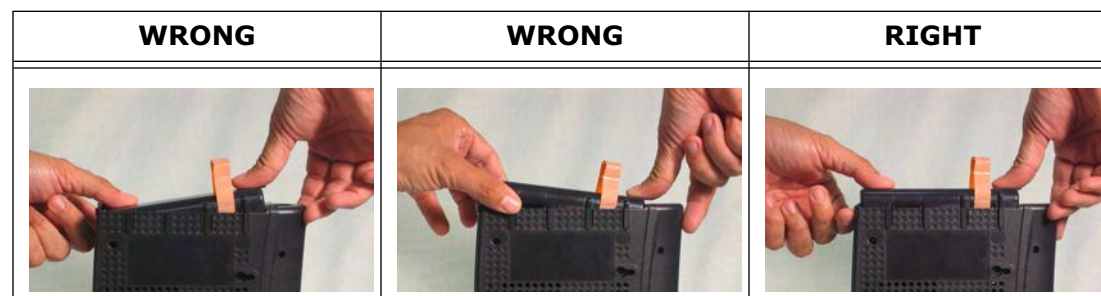
### Action

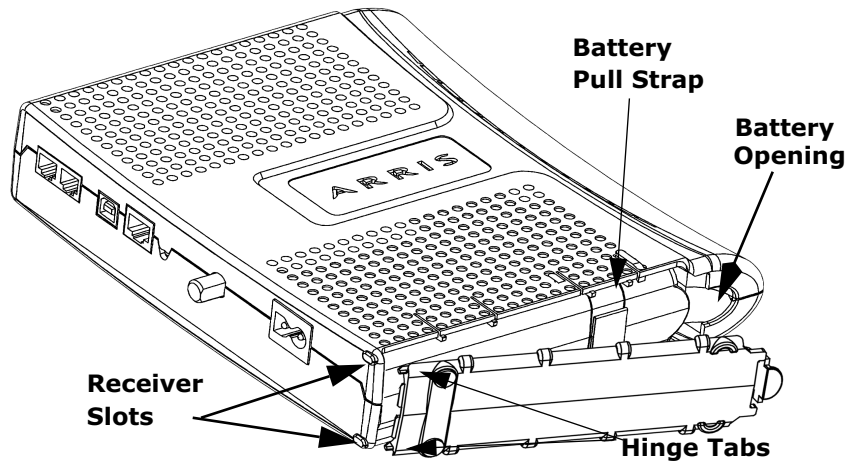
- 1 Insert a finger into the latch opening, press down and pull back on the latch holding the battery door (on the bottom of the Telephony Modem). Pull the door toward you. Set the door aside in a safe place.



- 2 Hold the battery pack so that the guides on the battery align with the slots on the Telephony Modem and slide the battery into the bay. The diagram on the left shows the proper orientation.

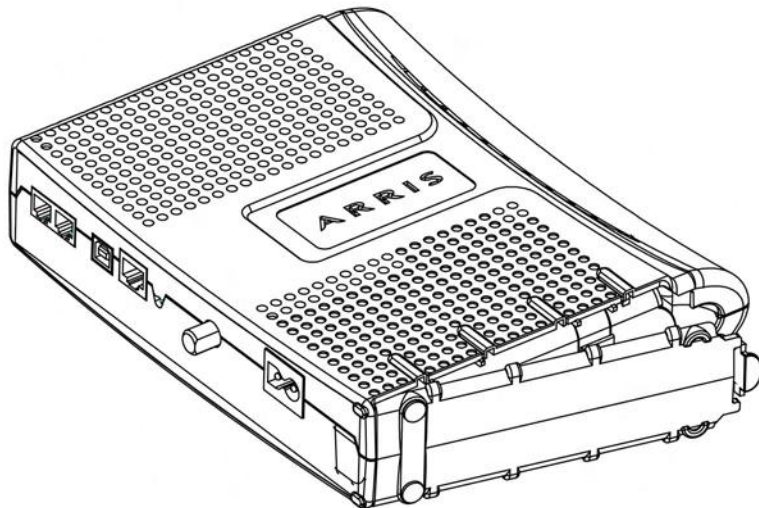
**Note:** Batteries will not insert completely into the Telephony Modem if not oriented correctly. The battery should slide into the bay without significant force. Line up the slots in the battery bay with the guides on the battery and apply even pressure on both ends of the battery.





- 3 Push the battery pack into the bay until it latches into place. The following diagram shows a Telephony Modem with a 4.4 Ah lithium - Ion battery pack installed. **If you are taking the battery out of the Telephony Modem, use the battery pull strap to dislodge the battery.**

**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 toward the front of the Telephony Modem until the latch snaps 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.

## 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 computer. If a cable outlet is not conveniently located, your cable company can install a new one.



### CAUTION

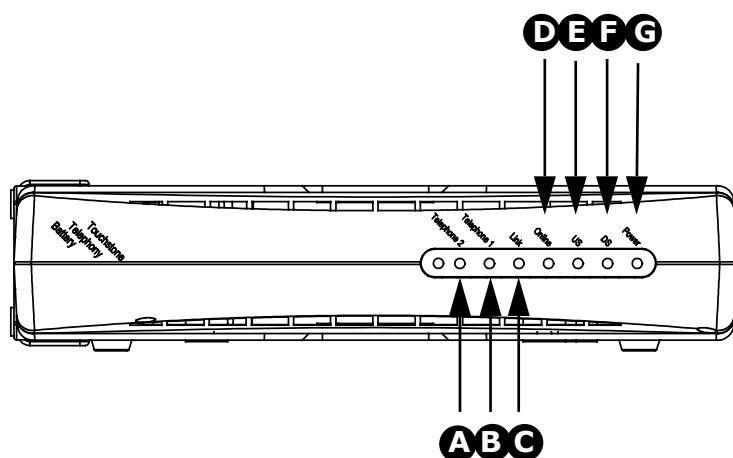
#### Risk of equipment damage

Only qualified installation technicians should connect the Telephony Modem to house wiring. Incumbent telephone service must be *physically* disconnected at the outside interface box before making any connections.

---



## TM502A/B/C

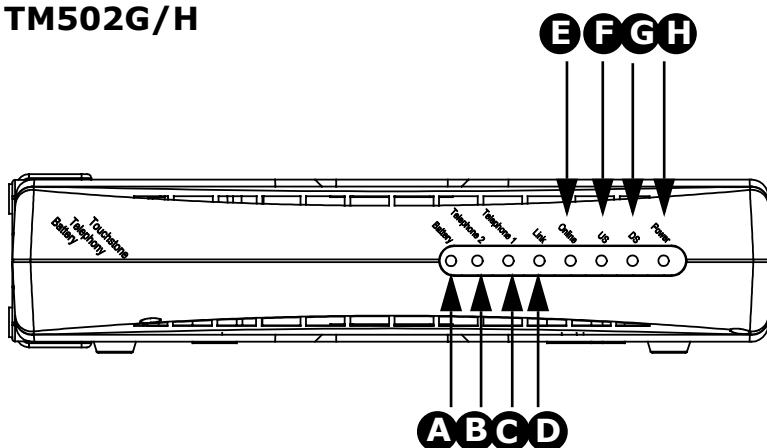


### Front Panel TM502A/B/C

The front of the Telephony Modem has the following indicators:

- A Telephone 2:** indicates the status of line 2
- B Telephone 1:** indicates the status of line 1
- C Link:** indicates Ethernet (all models) or USB (A/B models only) connectivity between the Telephony Modem and computer
- D On-Line:** indicates internet data transmission status
- E US:** indicates upstream connectivity
- F DS:** indicates downstream connectivity
- G Power:** indicates whether AC power is available to the unit

## TM502G/H



### Front Panel TM502G/H

The front of the Telephony Modem has the following indicators:

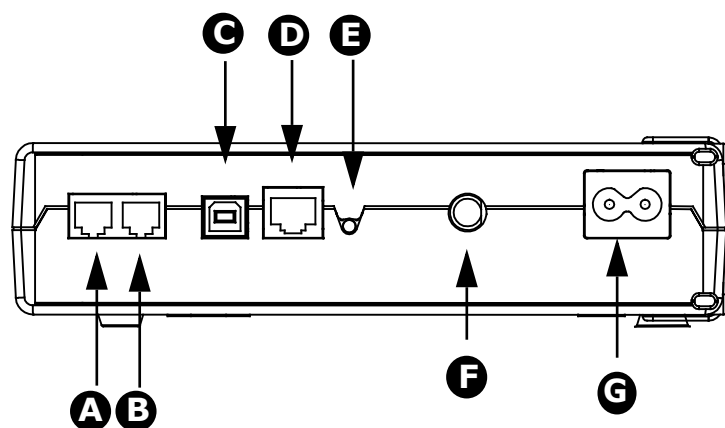
- A Battery:** indicates status of the battery in the Telephony Modem
- B Telephone 2:** indicates status of line 2
- C Telephone 1:** indicates status of line 1
- D Link:** indicates Ethernet or USB connectivity between the Telephony Modem and computer
- E On-Line:** indicates internet data transmission status
- F US:** indicates upstream connectivity
- G DS:** indicates downstream connectivity
- H Power:** indicates whether AC power is available to the unit



## Rear Panel

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

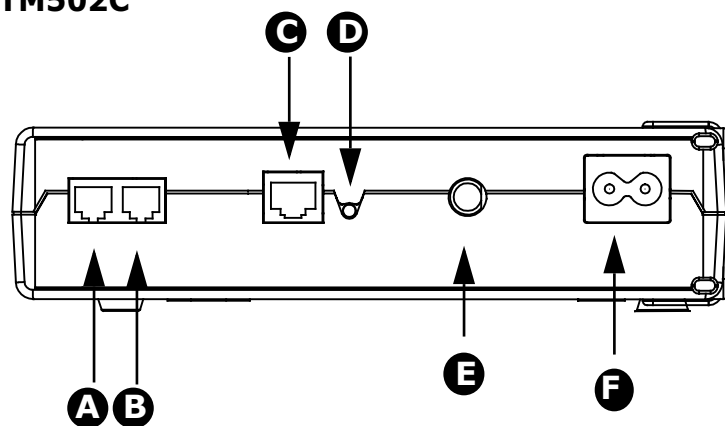
### TM502A/B



### TM502A/B Rear Panel

- A** Tel 1: connector for the first phone line
- B** Tel 2: connector for the second phone line
- C** [USB connector](#): for use with a computer USB port
- D** [Ethernet connector](#): for use with a computer or home network LAN port
- 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** Cable: connector for the [coax cable](#)
- G** Power: connector for the power cord

### TM502C

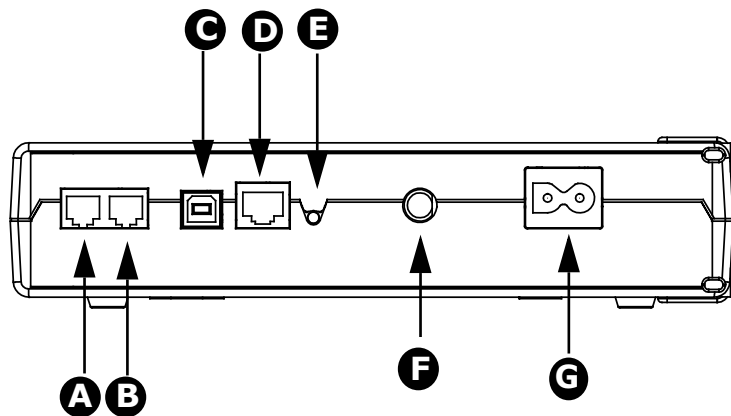


### TM502C Rear Panel

- A** Tel 1: connector for the first phone line
- B** Tel 2: connector for the second phone line
- C** [Ethernet connector](#): for use with a computer or home network LAN port
- D** Reset button: resets the Telephony Modem as if you power cycled the unit. Use a pointed **non-metallic** object to press this button.
- E** Cable: connector for the [coax cable](#)
- F** Power: connector for the power cord



## TM502G/H



## TM502G/H Rear Panel

- A** Tel 1/2 (TM502G only): connector for the first phone line (or both lines of a 2-line phone)  
Tel 1 (TM502H only): connector for the first phone line
- B** Tel 2: connector for the second phone line
- C** [USB connector](#): for use with a computer USB connection
- D** [Ethernet connector](#): for use with a computer or home network LAN connection
- 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** Cable: connector for the [coax cable](#)
- G** Power: connector for the power cord



## 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 (not included)
- for mounting on plywood or studs: two #6 x 1.5" (38.1 mm) self tapping screws (included)
- 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 reach 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 of the Telephony Modem, do not block the ventilation holes on the sides of the unit.





## Instructions

### Wall-mounting instructions

- 1 Position the mounting template on the surface where you intend to mount the Telephony Modem and secure in place with transparent tape.
- 2 Drill holes through the template in the specified locations for the mounting screws. After drilling holes, remove the template from the surface.
- 3 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.
- 4 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.
- 5 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 Proceed to [Connecting the Telephony Modem](#).



Step 1



Step 2

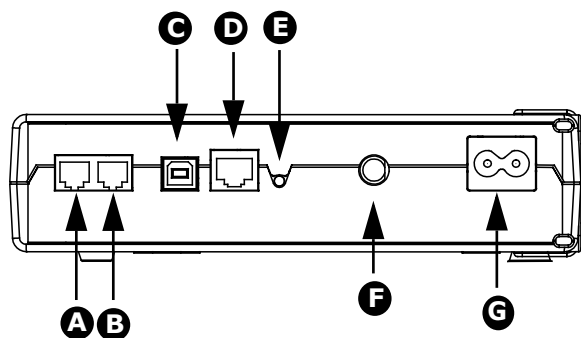


Step 3

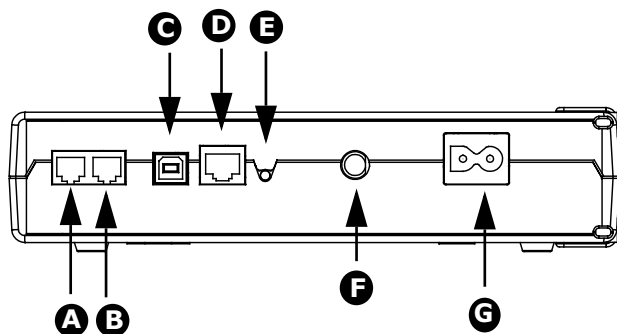


Step 4

TM502A/B/C



TM502G/H



## Connecting the Telephony Modem

**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 Telephony Modem.

- 1 Connect one end of the coax cable to the cable outlet or splitter, and the other end to the Telephony Modem's Cable connector (F). Tighten the connections by hand, then tighten an additional 1/8 turn with a wrench.

**Note:** For best performance, use high-quality coax cable and minimize or eliminate splitters between the cable jack and the Telephony Modem.

- 2 Insert the plug from the power cord into the Power connector on the Telephony Modem (G) and insert the power cord into a convenient AC outlet.

*The Power light on the front of the Telephony Modem lights up, then flashes once (refer to the LED table on page 44). See [Troubleshooting](#) if the Power light does not turn on.*

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

- [Making Ethernet Connections](#) OR
- [Making USB Connections](#) (all models except TM502C)

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

### Making Ethernet Connections

- 4 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

- 5 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 computer should detect the Telephony Modem and begin installing the drivers. See [Installing USB Drivers on Your PC](#) for driver installation details.*

### Making Telephone Connections

- 6 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 TM502G Telephony Modem and a phone with two separate lines on a single RJ-14 cord, it must be plugged into the port labeled "Tel 1/2".



## Installing USB Drivers on Your PC

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

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

**Note:** The TM502C does not have a USB port.

### 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, Windows ME, or Windows XP (Windows 95 and Windows NT are **not** supported)
  - ARRIS USB Driver CD
- USB [A/B Cable](#) of appropriate length (a cable is included in your Telephony Modem package)
- (Windows 98SE systems only): Windows 98 installation CD
- (for installations not using DHCP) IP address, subnet, gateway, and DNS information

### Installation Instructions

Select the link for your operating system to see the installation instructions.

- [Installing USB Drivers on Windows 98SE](#)
- [Installing USB Drivers on Windows 2000](#)
- [Installing USB Drivers on Windows XP](#)
- [Installing USB Drivers on Windows ME](#)



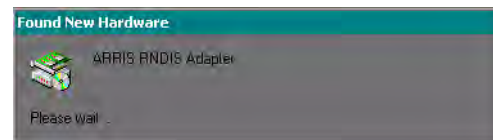
## Installing USB Drivers on Windows 98SE

Follow these steps to install USB drivers on Windows 98 Second Edition.

**Note:** Always perform these steps in the order shown to minimize possible problems. For example, if you plug in the USB cable before inserting the CD, Windows may install the wrong driver.

- 1 Make sure the Telephony Modem is on (the **Power** light should be on). If not, connect the AC adapter as described in [Connecting the Telephony Modem](#).
- 2 Insert the CD that came with the Telephony Modem package into the CD-ROM drive.
- 3 Plug the appropriate end of the USB cable into the Telephony Modem and the other end into the computer's USB port.

*The following windows appear in order, indicating that the PC has detected a new USB device:*



- 4 Click **Next**.



- 5 Wait for the system to start the Add New Hardware Wizard and display the following window (there may be a short delay):



- 6 Select "Search for the best driver" and click the **Next** button. *The wizard displays a list of search options:*



- 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.*



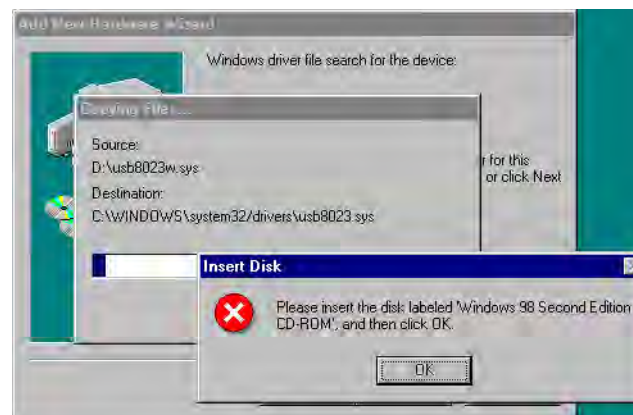
**Note:** If the wizard can not find the CD drive, and the CD is inserted properly, follow these steps:

- 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.  
*The wizard displays the previous screen, shown in step 5.*
- c. Select "Specify a Location," then choose the drive letter that corresponds to the CD drive from the menu.
- d. Click the Next button.

*You should now see the screen shown above. If not, contact your cable company for help.*



- 8 If you see the following window, insert your Windows 98 CD when prompted and click OK.



**Note:** After inserting the CD, Windows 98 may revert to searching for networking DLL files on the C: drive, then prompt you for the location of those files. If you see such a prompt, enter **D:\win98** (replace **D:** with the drive letter of your CD-ROM drive, if necessary) to continue the installation.

- 9 Click the **Next** button.

*The wizard installs the drivers, then displays a window indicating that the installation is complete.*



- 10 Remove your Windows 98 CD if you had to insert it.  
11 Restart your computer when prompted.



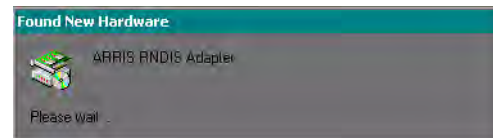


## Installing USB Drivers on Windows 2000

Follow these steps to install USB drivers on Windows 2000.

- 1 Make sure the Telephony Modem is on (the **Power** light should be on). If not, connect the AC adapter as described in [Connecting the Telephony Modem](#).
- 2 Insert the CD that came with the Telephony Modem package into the CD-ROM drive.
- 3 Plug the appropriate end of the USB cable into the Telephony Modem and the other end into the computer's USB port.

*The following window appears, indicating that the PC has detected a new USB device:*

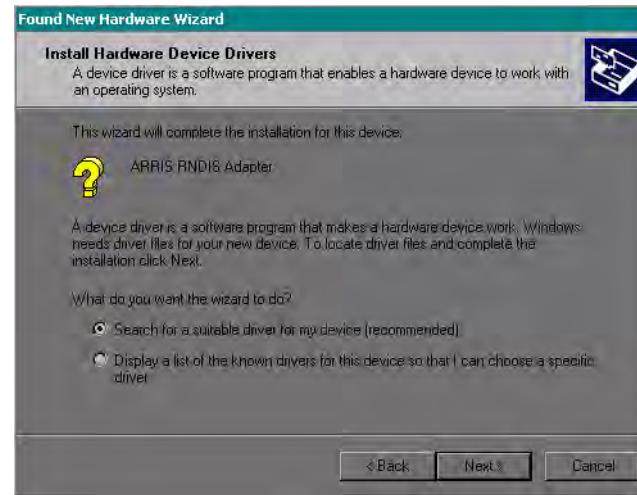


- 4 Wait for the system to start the installation wizard and display the following window (there may be a short delay):



5 Click the **Next** button.

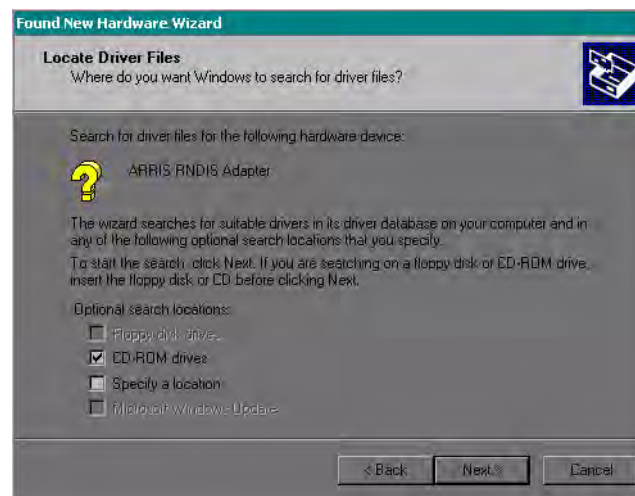
*The wizard prompts you for the location of the drivers.*



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

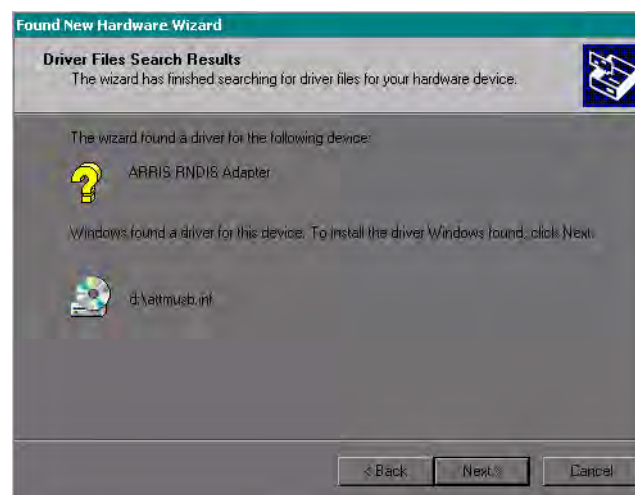


- 6 Select "Search for a suitable driver for my device", unless you want to use the second option to choose a specific driver, then click the **Next** button.  
*The wizard displays a list of search options.*



- 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.  
*The wizard displays the previous screen, shown in step 6.*
- c. Select "Specify a Location," then choose the drive letter that corresponds to the CD drive from the menu.
- d. Click the Next button.

*You should now see the screen shown above. If not, contact your cable company for help.*



- 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.



## Installing USB Drivers on Windows XP

Follow these steps to install USB drivers on Windows XP.

- 1 Make sure the Telephony Modem is on (the **Power** light should be on). If not, connect the AC adapter as described in [Connecting the Telephony Modem](#).
- 2 Insert the CD that came with the Telephony Modem package into the CD-ROM drive.
- 3 Plug the appropriate end of the USB cable into the Telephony Modem and the other end into the computer's USB port.

*The following window appears, indicating that the PC has detected a new USB device:*



- 4 Click the **Next** button.

*The wizard begins searching for and installing the drivers, then displays a window indicating that the installation is complete.*



- 5 Click the **Finish** button.



## Installing USB Drivers on Windows ME

Follow these steps to install USB drivers on Windows Millennium Edition.

- 1 Make sure the Telephony Modem is on (the **Power** light should be on). If not, connect the AC adapter as described in [Connecting the Telephony Modem](#).
- 2 Insert the CD that came with the Telephony Modem package into the CD-ROM drive.
- 3 Plug the appropriate end of the USB cable into the Telephony Modem and the other end into the computer's USB port.

*The following window appears, indicating that the PC is installing drivers for a new USB device:*



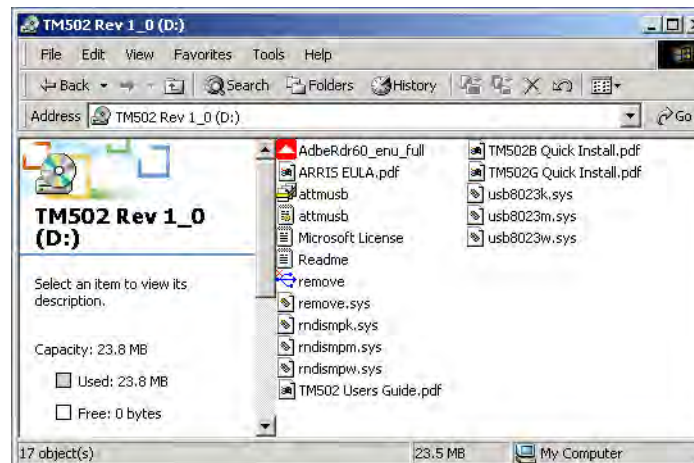
- 4 When the window disappears, installation is complete. Contact your cable company if you see an error message of any kind.



## Removing USB Drivers

If you connect the Telephony Modem USB to your computer before inserting the ARRIS driver installation CD, Windows may install a “composite” USB driver that does not properly support the Telephony Modem. To correct this problem, you must first remove the composite driver using the Remove utility on the ARRIS driver installation CD. Follow these steps to use the Remove utility:

- 1 Insert the ARRIS driver installation CD.
- 2 Navigate to the CD drive:

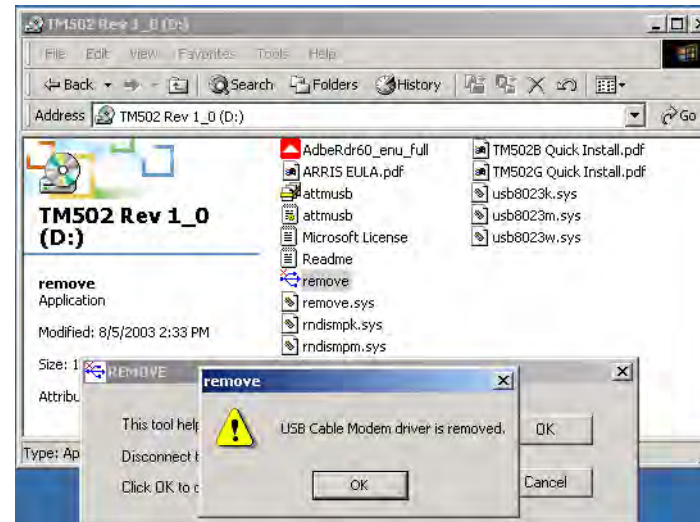


- 3 Start the Remove utility by double-clicking it in the window.  
*The Remove utility prompts you to click OK to remove the USB driver, or Cancel to quit.*



- 4 Click the OK button.

*The Remove utility displays the following message:*



- 5 Leave the CD in the drive, reconnect the Telephony Modem, and install the USB driver as appropriate for your operating system.

## 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:

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

### How to use this chapter

The following list shows 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.

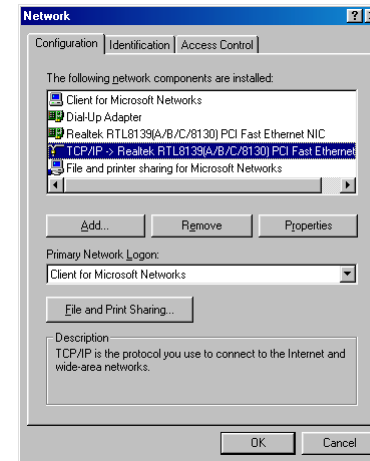
- 1 From the computer, select **Start > Settings > Control Panel**.
- 2 Double click on the **Network** icon in the Control Panel.



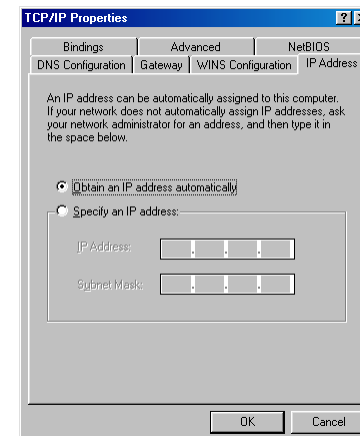
- 3 Click the **Configuration** tab in the Network window to display the list of Network Adapters.



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



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



- 6 Click **OK** to accept the new settings, and **OK** again to close the Configuration window.
- 7 You may have to restart your computer in order for your computer to obtain a new IP address from the network.

—end—



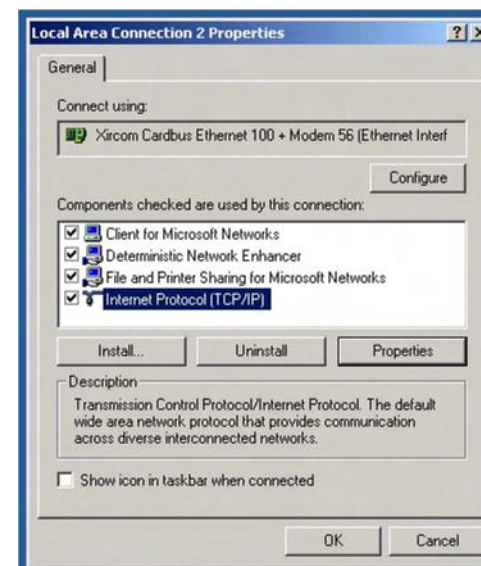
## TCP/IP Configuration for Windows 2000

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

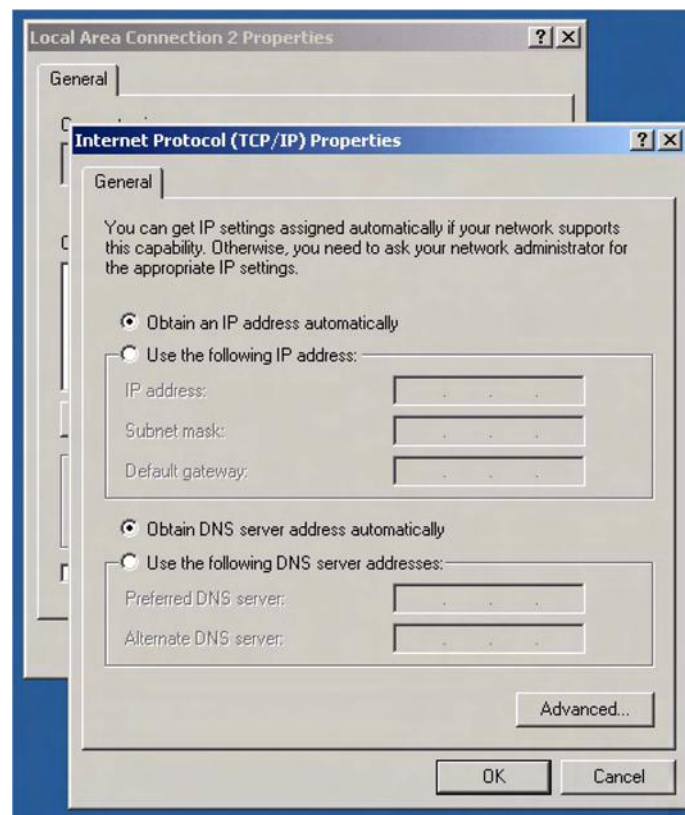
**Note:** Dialog boxes shown on your computer may differ slightly from those shown in this procedure.

- 1 From the computer, select **Start > Settings > Network and Dial-up Connections > Local Area Connection**.
- 2 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.



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



- 4 Click **OK** to accept the new settings, and **OK** again to close the Configuration window.
- 5 You may have to restart your computer in order for your computer to obtain a new IP address from the network.

—end—



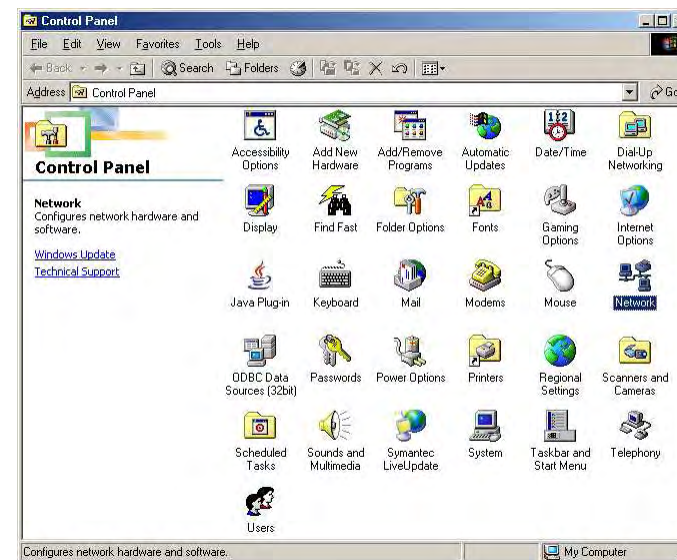


## TCP/IP Configuration for Windows ME

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

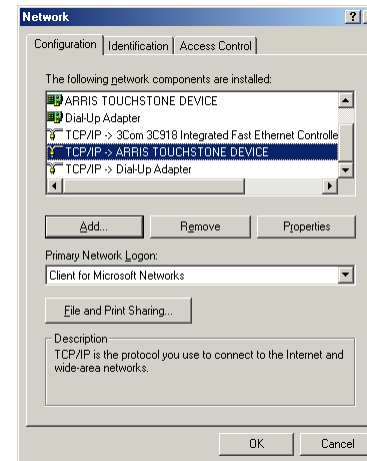
**Note:** Dialog boxes shown on your computer may differ slightly from those shown in this procedure.

- 1 From the computer, select **Start > Settings > Control Panel**.
- 2 Double click on the **Network** icon in the Control Panel.

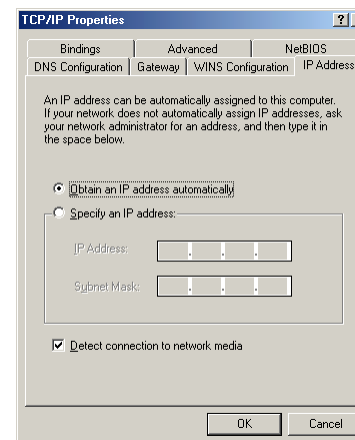


- 3 Click the **Configuration** tab in the Network window to display the list of Network Adapters.

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



- 5 Click the **IP Address** tab, then click **OK**.



- 6 Click **OK** to accept the new settings, and **OK** again to close the Configuration window.
- 7 You may have to restart your computer in order for your computer to obtain a new IP address from the network.

—end—

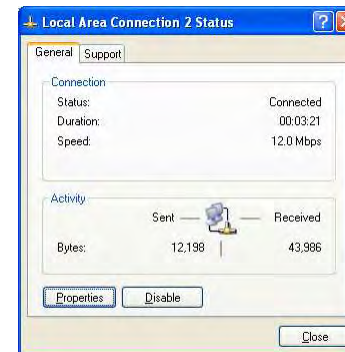


## TCP/IP Configuration for Windows XP

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.

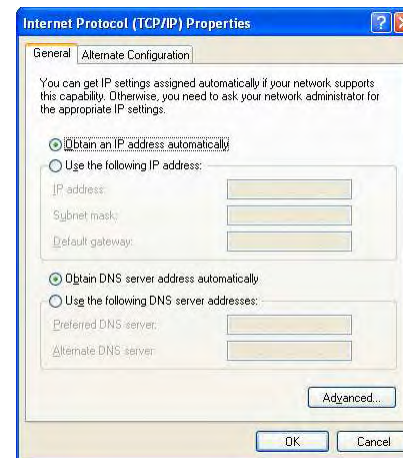
- 1 From the computer, select **Start > Settings > Control Panel** and double click on the **Network Connections** icon in the Control Panel.
- 2 Click the **Configuration** tab in the Network window to display the list of Network Adapters.



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



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



- 5 Click **OK** to accept the new settings, and **OK** again to close the Configuration window.
- 6 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 TM502A/B/C Models](#)
- [Indicator Lights for the TM502G/H Models](#)
- [Using the Reset 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 TM502A/B/C Models

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

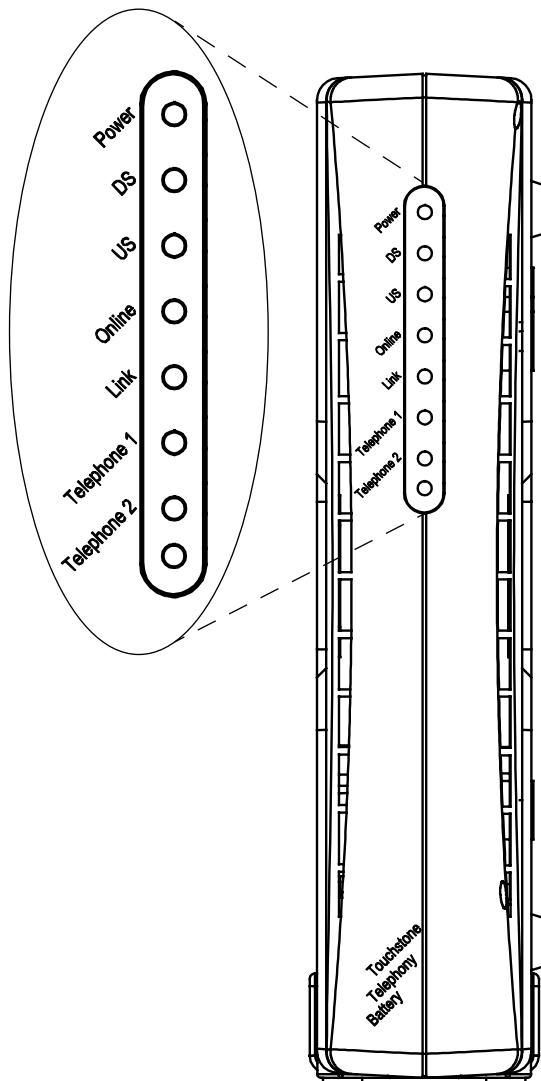
### Wiring Problems

If the Telephony Modem begins flashing all its lights for more than 10 seconds, this indicates a problem with the telephone wiring — the red and green wires may be shorted (touching), or there may be undesired voltage on the lines. If this pattern persists for more than 10 seconds, disconnect the telephone lines from the Telephony Modem, then call a wiring technician for assistance.

### Patterns: Normal Operation

The following table shows light patterns during normal operation.

Mode	Power	DS	US	Online	Link	Tel. 1/Tel. 2
AC Power	<b>On</b>	<b>On</b> = Connected to the Internet  <b>Flash</b> = Not connected to the Internet	<b>On</b> = Connected to the Internet  <b>Flash</b> = Not connected to the Internet	<b>On</b> = Internet Available  <b>Off</b> = Internet not available	<b>On</b> = Computer Connected  <b>Off</b> = Computer not connected  <b>Flash</b> = Computer Activity	<b>On</b> = On-hook  <b>Flash</b> = Off-hook  <b>Off</b> = disabled
No AC Power	Off	Off	Off	Off	Off	Off
Firmware Upgrade	<b>On</b>	Flash	Flash	<b>On</b>	(normal operation)	(normal operation)





## Indicator Lights for the TM502G/H Models

The Touchstone Telephony Modem has eight indicator lights to assist in troubleshooting. Note that not all models have a Battery light.

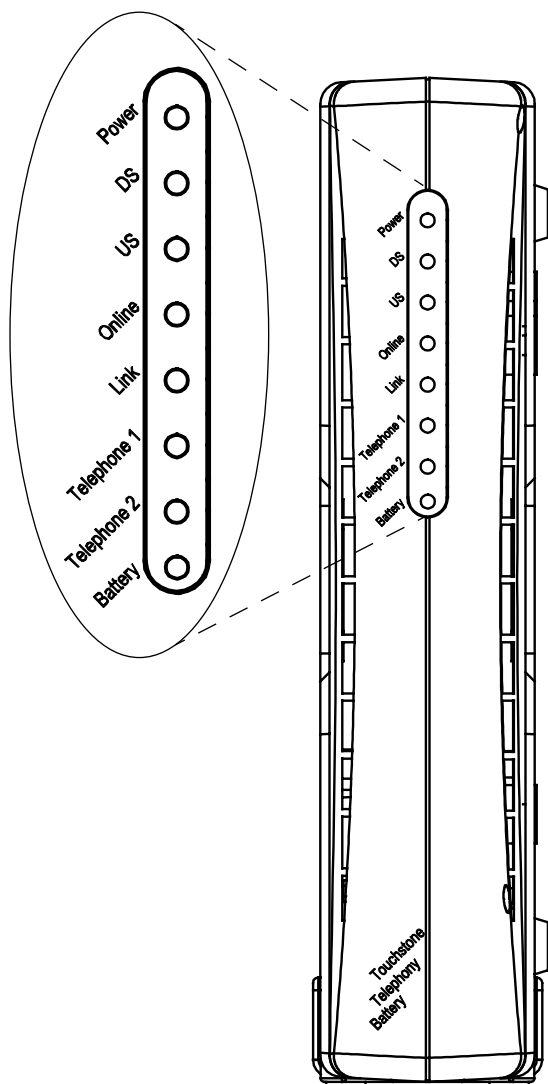
### Wiring Problems

If the Telephony Modem begins flashing all its lights for more than 10 seconds, this indicates a problem with the telephone wiring — the red and green wires may be shorted (touching), or there may be undesired voltage on the lines. If this pattern persists for more than 10 seconds, disconnect the telephone lines from the Telephony Modem, then call a wiring technician for assistance.

### Indicator Lights: Normal Operation

The following table shows light patterns during normal operation.

Mode	Power	DS	US	Online	Link	Tel. 1/Tel. 2	Battery
AC Power Good	On	On = Connected to the Internet Flash = Not connected to the Internet	On = Connected to the Internet Flash = Not connected to the Internet	On = Internet Available Off = Internet not available	On = Computer Connected Off = Computer not connected Flash = Computer Activity	On = On-hook Flash = Off-hook Off = disabled	On = Battery good or low Off = Battery missing or MTA not registered Flash = Battery bad
No AC Power Battery Installed	Flash	Off	Off	Off	Off	On = On-hook Flash = Off-hook Off = disabled	Off = Battery power Flash = Battery bad or low
No AC Power No Battery	Off	Off	Off	Off	Off	Off	Off
Firmware Upgrade	On	Flash	Flash	On	(normal operation)	(normal operation)	(normal operation)



### Indicator Lights: 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.

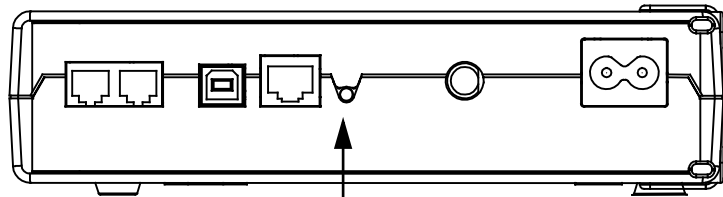
Power, DS, US, Online	Link	Telephone		Battery*	Description
		1	2		
Off	Off	Off	Off	Off	No power to Cable Modem
Flash	Flash	Flash	Flash	Flash	Power-on Self Test
See "Cable Modem Start Up Sequence" Below					
<b>On</b>	<b>On</b>	Flash	Off	Off	Retrieving telephone network information
<b>On</b>	<b>On</b>	Off	Flash	Off	Retrieving telephone line information
<b>On</b>	<b>On</b>	Flash	Flash	Off	Activating telephone service
Normal Operation * = Battery LEDs only apply to those models with battery backup					

### Cable Modem Start Up Sequence

DS	US	Online	Link	Description
Flash	Off	Off	Off	Downstream search
<b>On</b>	Flash	Off	Off	Downstream found; upstream search
<b>On</b>	<b>On</b>	Flash	Off	Downstream and Upstream found; retrieving setup information from cable operator

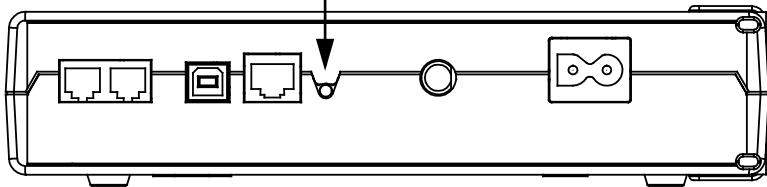


### TM502A/B/C



Reset Button

### TM502G/H



### 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.



# Troubleshooting

## Problems and Solutions

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

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

If you plugged the power cord 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 over 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 into AC power and connected to the cable system.

Check the front panel lights:

- The **Power** and **Online** lights should be on.
- 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](#)? Use the supplied cable for direct connection to a computer; use a cross-over cable for connection to a hub or home router.

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 computer.

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 computer and the Telephony Modem.
- Use the ARRIS Remove utility (see [Removing USB Drivers](#)) to remove the improperly-installed driver.
- Reboot the computer.
- Reinstall the drivers as described in [Installing USB Drivers on Your PC](#).

**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 computers 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" (TM502G) or "Tel 1" (TM502A/B/H) 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 computer 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 USB Drivers on Your PC](#).
- The cable company has set up your account. Call your cable company if you're not sure.

### Instructions

- 1** Be sure that your computer is running either Windows 98SE, Windows 2000, Windows ME, or Windows XP (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 computer and reconnect it.
- 5** Restart the computer.
- 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 Remove 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 USB Drivers on Your PC](#).
- 7** Replace the USB cable.
- 8** Call your cable company for help.





## Glossary

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

### **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.

### **Amp-hour (Ah)**

A measure of battery capacity. For example, a 1.0Ah battery can nominally supply one Ampere of current for one hour.

### **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 coax 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.

**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 computer.



## WHQL

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





## **Touchstone TM502 Telephony Modem User's Guide**

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