



56K/V.92

External Modem

User Manual

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Introduction

1


Thank you for purchasing the *Actiontec V.92 External Modem*. The Modem is also compatible with the V.90 and K56Flex™ standards.

 **Important:** Please read this entire chapter. It contains important safety information.

Features

Among the features of the V.92 External Modem:

- **Quick Connect**
Reduces the time it takes for the Modem to connect to the Web by remembering the characteristics of the phone lines.
- **V.44 Data Compression**
Enables faster browsing and faster downloads.
- **48Kbps Upload Speed**
Up from 33.6Kbps (depending on line condition).
- **Modem On Hold**
Generates a Caller ID window when a phone call comes in while online. The call can be ignored while remaining online, or it can be answered, putting the Internet session on hold. The Internet session can be resumed after the call is completed.

 **Note:** Modem On Hold will function correctly only if the ISP supports this feature, and if call waiting is activated. For updates and instructions relating to the Modem On Hold feature, go to www.actiontec.com.

Other features include:

- Conformance to the ITU-T V.92 and V.90 specifications, with auto-negotiation of V.44, V.42bis, V.34, V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell 212A, and Bell 103 protocols
- Group 3: class 1 fax protocols support

- V.80 video standard support for videophone and video conferencing
- Controller-based, with support for Windows 98, Me, NT, 2000, and XP
- Simple “Plug-N-Play” installation

Package Contents

- Actiontec V.92 External Modem
- Installation CD-ROM
- Quick start guide and user manual (pdf version on Installation CD)
- Telephone cable (RJ-11)
- Modem cable (serial)
- Power adapter
- Phone adapter RJ11 – RJ6 (for United Kingdom users only)

Firmware Updates

Firmware updates are made available on a regular basis for this product. To check for updates, visit the *Actiontec* Web site at www.actiontec.com. Follow the instructions on the Web page to upgrade the modem with the latest firmware.

Reset Button

The Reset button is used to reset the Modem. Holding the button down for less than 10 seconds causes the Modem to restart, with all settings remaining intact. If the Reset button is held for more than 10 seconds, the default settings will be reloaded onto the Modem, and any changes made to the settings must be reinstalled on the Modem.



Caution: The Modem is for use with computers that have installation instructions detailing the installation of this type of peripheral device.

Safety Information

Shock Hazard

To avoid shock hazard:

- The power cord and any other equipment to which this product is attached must be connected to properly wired receptacles. Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- When using telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electrical shock, and injury. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface. Use caution when installing or modifying telephone lines. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning. Do not use the telephone to report a gas leak in the vicinity of the leak.

Connecting the Modem

- Do not connect the Modem to a digital PBX (switchboard) system, as damage to the Modem can occur. Modems are designed to function with analog telephone lines, such as residential lines.
- Do not connect the Modem to an ISDN line. In some areas, ISDN (digital) lines are provided for residences and businesses. These lines may damage the Modem.



Note: The Modem is fully compatible with analog telephone lines connected to a Digital Exchange. Digital Exchanges are used in some areas to supply analog lines to homes and businesses.

Technical Support

Actiontec Electronics, Inc., prides itself on making durable, high-quality, high-performance products. If you need assistance, the Actiontec Technical Support Department is always available, 24 hours a day, seven days a week, to provide professional support.



Actiontec Electronics, Inc.

760 N. Mary Avenue
Sunnyvale, CA 94085

Technical Support


Phone: 1.888.436.0657
Email: techsupp@actiontec.com
Internet: www.actiontec.com/support

Connecting the Modem

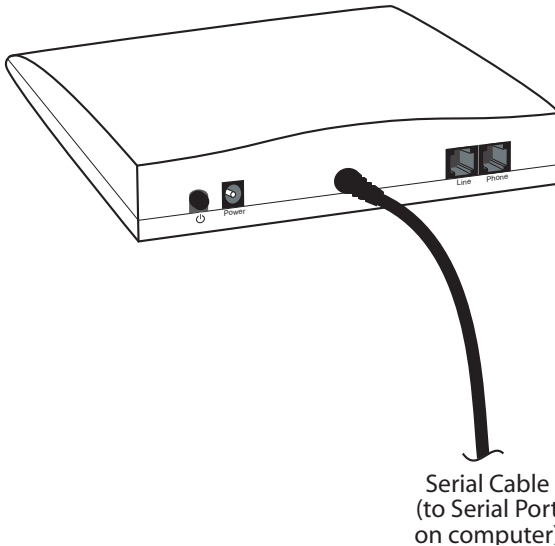
2

To connect the Modem:

1. Ensure the computer is powered down.
2. Plug the serial cable connected to the rear panel of the Modem in the serial port on the computer.
3. Plug one end of the phone cable to the “Line” port on the rear panel of the Modem, and the other end to the phone wall jack.

 **Note:** If connecting the Modem in the United Kingdom, insert the telephone adapter included with the Modem package between the wall jack and phone cable.

4. Plug the cable connected to the telephone in the “Phone” port on the back of the Modem.
5. Plug the power adapter into an electrical wall outlet, and plug the power cable in the “Power” port on the back of the Modem.



The Modem is now connected. Next, install the driver software as explained in “Installing the Software.”

Power Switch

The Modem's Power Switch is located on the left side of the rear panel, and is a push-button type switch. Push the button to turn the Modem on, and push it again to turn it off.

Front Panel

The front panel of the Modem contains a series of indicator LEDs (light emitting diodes).

LEDs

PWR – When on, indicates the Modem is powered up.

RD – Receive Data; on when the Modem is receiving data.

TD – Transmit Data; on when the Modem is sending data.

OH – Off Hook; on when the Modem is off hook.

Installing the Software

3

After connecting the Modem to the computer and the phone line, the driver software must be loaded on the computer. Select the operating system used, and follow the instructions.

Windows 98 and 98 SE

1. Ensure the Modem is turned off, then power up the computer and, while it is booting, insert the Installation CD in the CD-ROM drive.
2. After the computer has booted, turn on the Modem.
3. The first “Add New Hardware Wizard” window appears. Click **Next**.



4. In the next window, select **Search for the best driver for your device (Recommended)**, then click **Next**.



5. When the next window appears, click **CD-ROM drive**, then click **Next**.



- In the next window that appears, Windows searches for and then finds the proper software on the Installation CD. Click **Next**.



- The software is loaded on the hard drive of the computer. When the window, below, appears, click **Finish**.



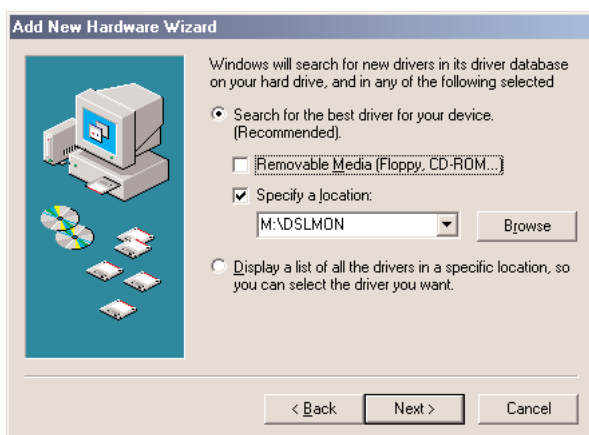
The Modem is now ready to use. To verify the driver software installation, see “Verifying Driver Software Installation (Windows 98 and Me)” on page 13.

Windows Me

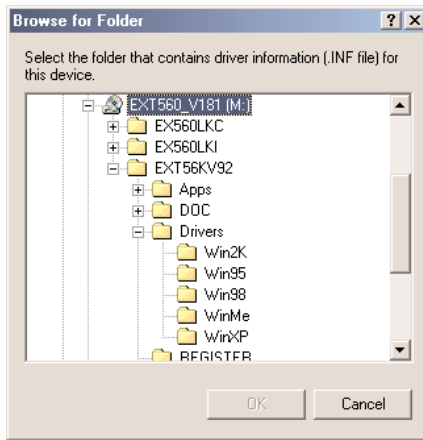
1. Ensure the Modem is turned off, then power up the computer and, while it is booting, insert the Installation CD in the CD-ROM drive.
2. After the computer has booted, turn on the Modem.
3. The first “Add New Hardware Wizard” window appears. Select the **Specify the location of the driver (Advanced)** option, then click **Next**.



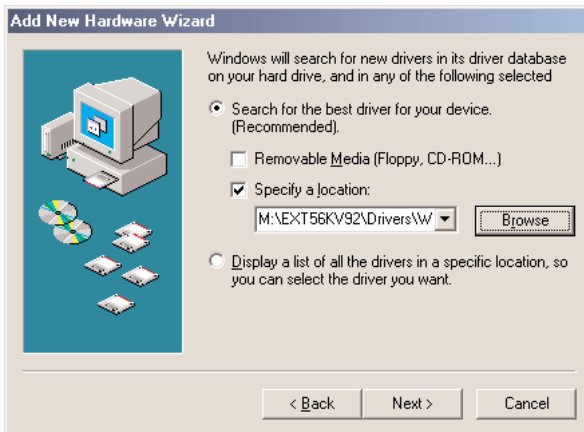
4. In the next “Add New Hardware Found” window, select **Search for the best driver for your device (Recommended)**. Then, select **Specify a location** and click **Browse**.



- The “Browse for Folder” window appears. Click on the + next to “EXT 560_V181 [X:]” CD-ROM icon (where X is the drive letter of the CD-ROM drive on the computer). Three folders appear underneath “EXT 560_V181 [X:]”. Click on the + next to the “EXT 56KV92” folder icon. More folders appear beneath “EXT 56KV92.” Click on the + next the “Drivers” folder. Select the “WinMe” folder icon from the folders that appear below “Drivers” then click **OK**.



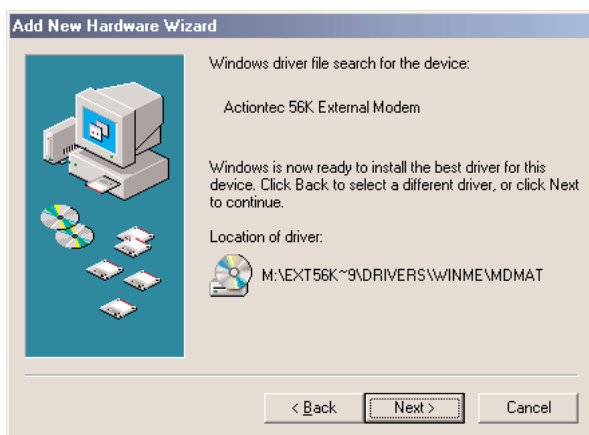
- The “Add New Hardware Wizard” window reappears, with the proper path to the driver software appearing in the text box next to the “Browse” button. Click **Next**.



7. In the next “Add New Hardware Wizard” window, click **Next**.



8. In the next window, Windows searches for and then finds the proper software on the Installation CD. Click **Next**.



9. The final “Add New Hardware Wizard” window appears. Click **Finish** to complete the download.

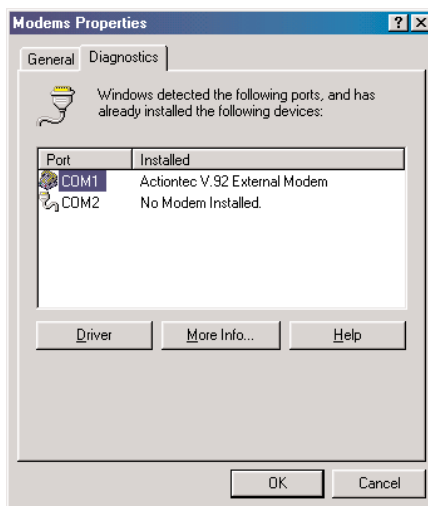


The Modem is now ready to use.

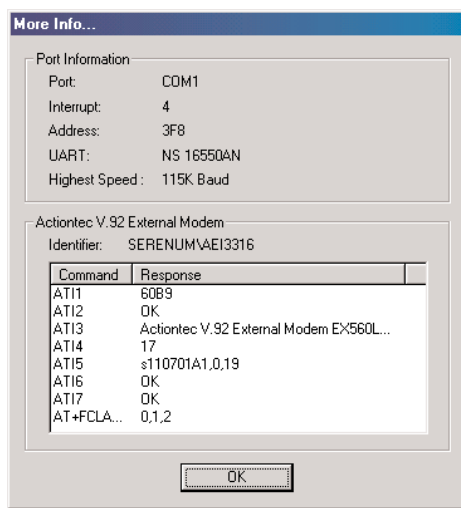
Verifying Driver Software Installation (Windows 98 and Me)


To verify the Modem and its driver software are configured properly:

1. Select **Start, Settings, then Control Panel**.
2. In the “Control Panel” window, select **Properties**, then **Diagnostics**.



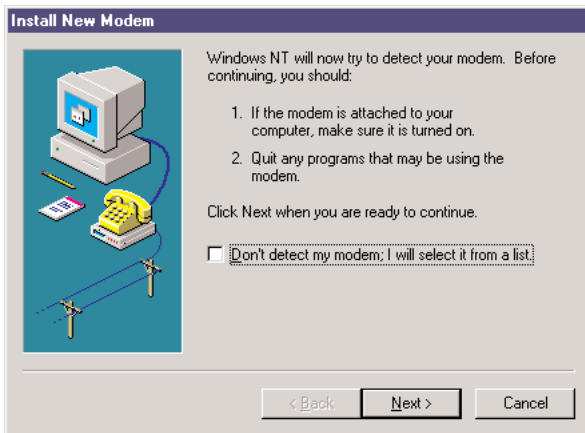
3. In the “Diagnostics” tab of the “Modem Properties” window, select the COM port used by the Modem, then click **More Info...**
4. The “More Info” window appears, displaying the settings used by the Modem. Click **OK** when finished.



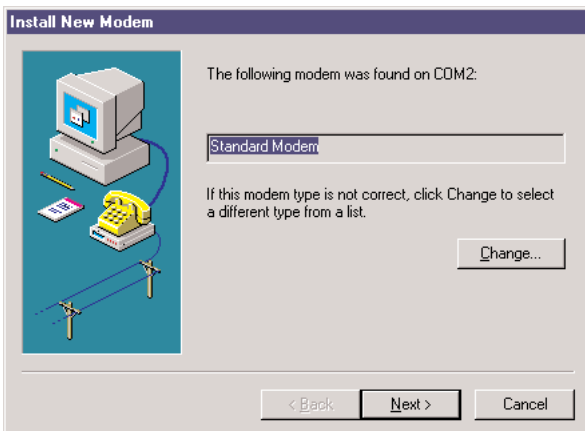
 **Note:** The settings displayed in the “More Info” window shown above may be different from the user’s settings.

Windows NT 4.0

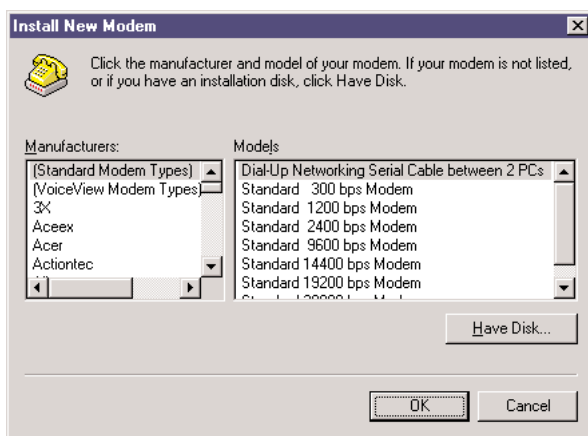
1. Ensure the Modem is turned off, then power up the computer and, while it is booting, insert the Installation CD in the CD-ROM drive.
2. After the computer has booted, turn on the Modem.
3. From the desktop, select **Start, Settings, then Control Panel**.
4. In the “Control Panel” window, double-click **Modems**. The first “Install New Modem” window appears. Ensure the check box is not checked, then click **Next**.



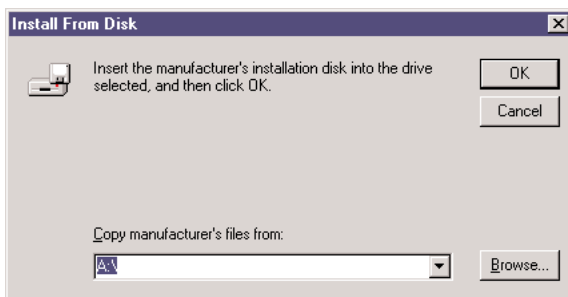
5. In the next “Install New Modem” window, Windows detects the Modem. When “Standard Modem” appears in the text box, click **Change....**



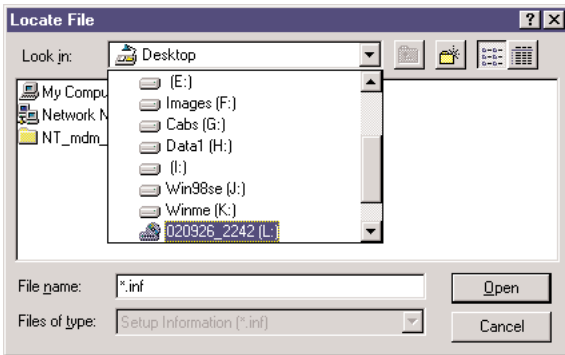
6. In the next window, click **Have Disk...**



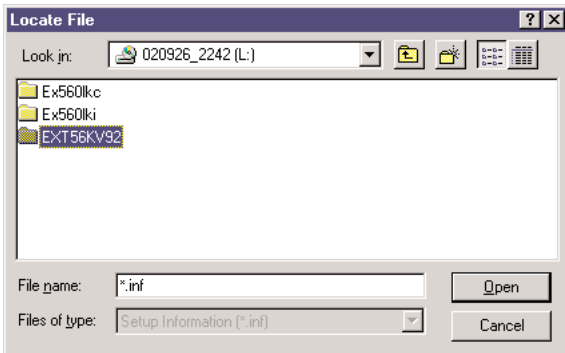
7. In the "Install From Disk" window, navigate to the CD-ROM drive (either by browsing using the **Browse...** button, or entering the drive letter of the CD-ROM drive in the "Copy manufacturer's files from" text box), then click **OK**.



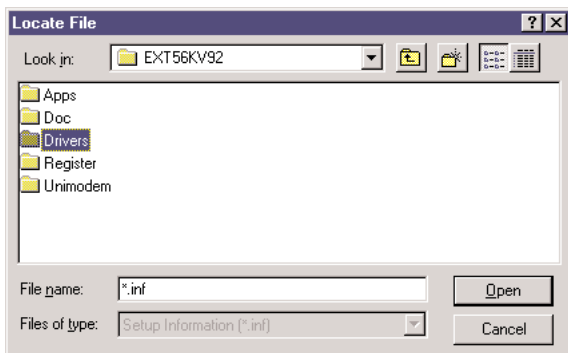
8. The “Locate File” window appears. Select the CD-ROM drive icon from the “Look in” drop down list.



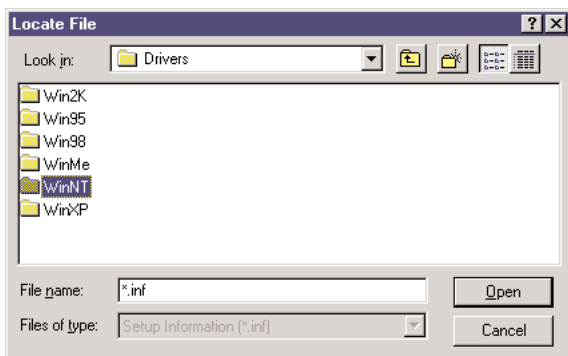
9. The contents of the CD appear in the “Locate File” window. Select **EXT 56KV92**, then click **Open**.



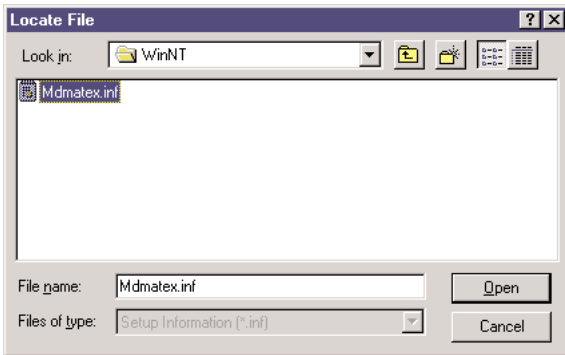
10. The contents of the folder appear in the “Locate File” window. Select **Drivers**, then click **Open**.



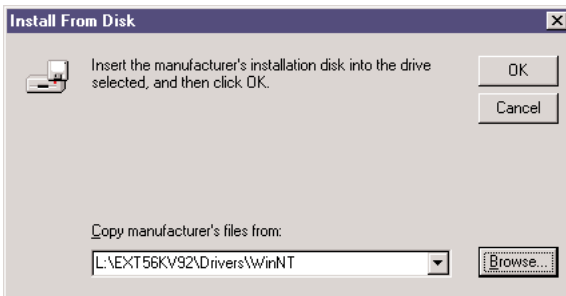
11. The contents of the “Drivers” folder appear in the “Locate File” window. Select **WinNT**, then click **Open**.



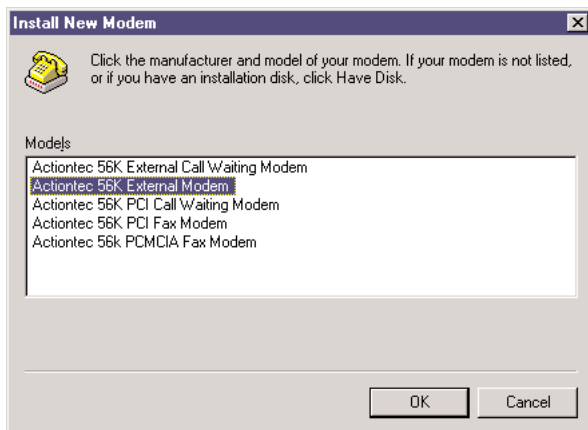
- The contents of the “WinNT” folder appear in the “Locate File” window. Select **Mdmatex.inf**, then click **Open**.



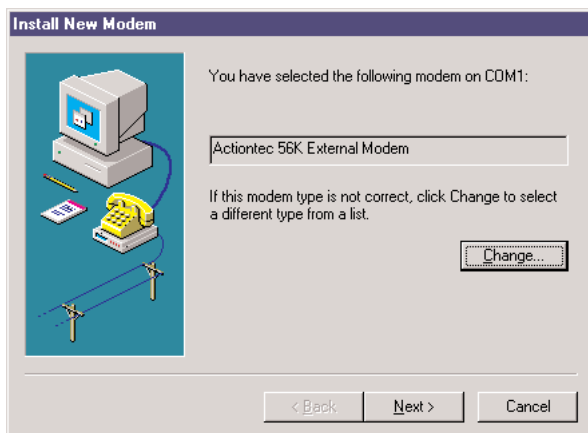
- An “Install From Disk” window appears. Click **OK**.



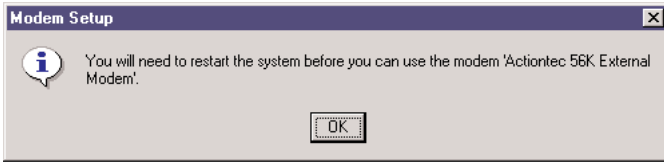
14. In the next window, ensure **Actiontec 56K External Modem** is listed in the “Models” list box, then click **OK**



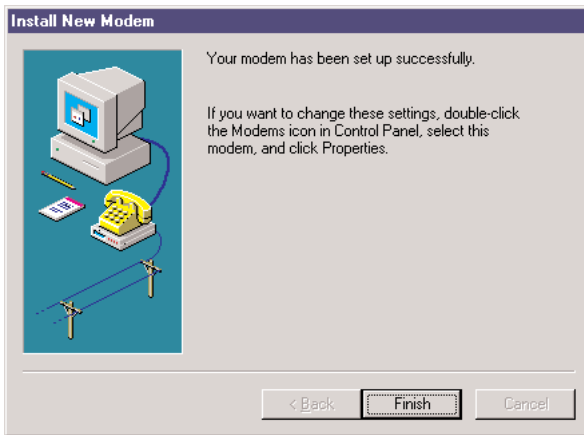
15. Another window appears. Ensure **Actiontec 56K External Modem** is listed in the text box, then click **Next**.



16. A “Modem Setup” window appears, stating that the computer needs to be restarted before the Modem can be used. Click **OK**.



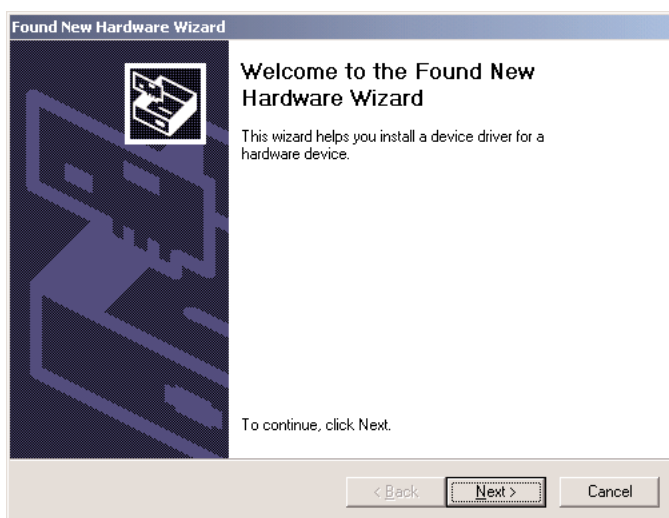
17. After the computer has restarted, an “Install New Modem” window appears, stating that the Modem has been set up successfully. Click **Finish**.



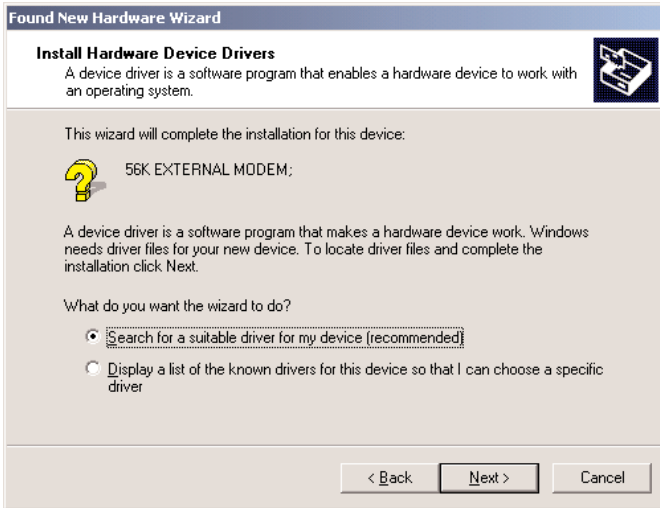
The Modem is now ready to use. To use the Modem to dial into a Windows NT Remote Access server or connect to the Internet, configure “Dial Up Networking.” For more details, see the Windows NT documentation.

Windows 2000

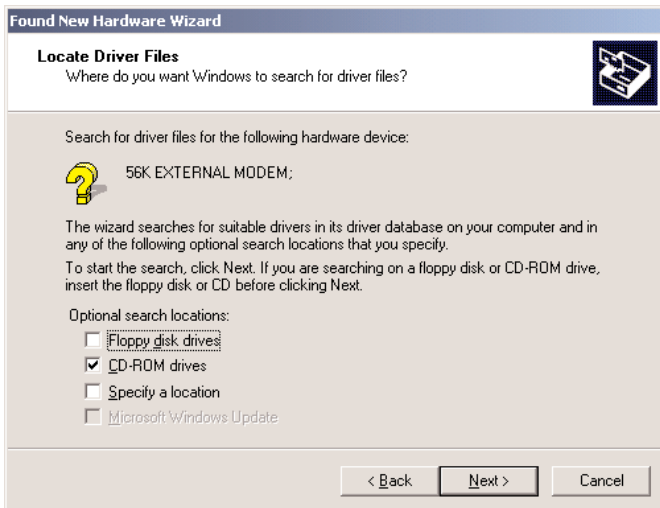
1. Ensure the Modem is turned off, then power up the computer and, while it is booting, insert the Installation CD in the CD-ROM drive.
2. After the computer has booted, turn on the Modem.
3. The first “Found New Hardware Wizard” window appears. Click **Next**.



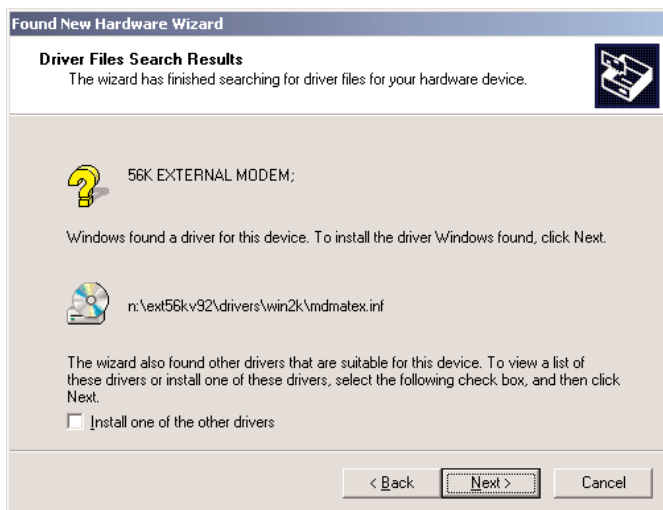
- In the next window, select **Search for a suitable driver for my device (recommended)**, then click **Next**.



- Another "Found New Hardware Wizard" window appears. Select **CD-ROM drives** from the "Optional search locations" list, then click **Next**.



6. In the next window, Windows states it has found the driver. Click **Next**.



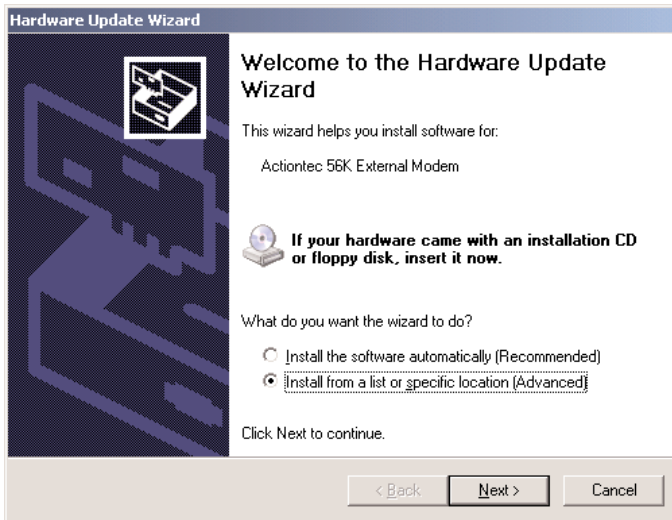
7. The final “Found New Hardware Wizard” window appears. Click **Finish**. The driver software is now installed.



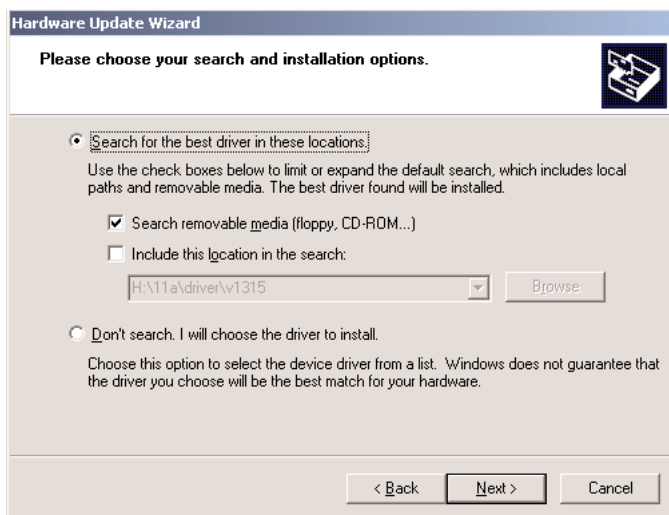
The Modem is now ready to use. To verify the driver software installation, see “Verifying Driver Software Installation (Windows 2000 and XP)” on page 27.

Windows XP

1. Ensure the Modem is turned off, then power up the computer and, while it is booting, insert the Installation CD in the CD-ROM drive.
2. After the computer boots up, turn on the Modem.
3. The first “Hardware Update Wizard” window appears. Select **Install from a list, or specific location (Advanced)**, then click **Next**.



- Another “Hardware Update Wizard” window appears. Select **Search removable media (floppy, CD-ROM...)**, then click **Next**.



- When the “Found New Hardware Wizard” window appears, click **Finish**. The driver software is now installed.

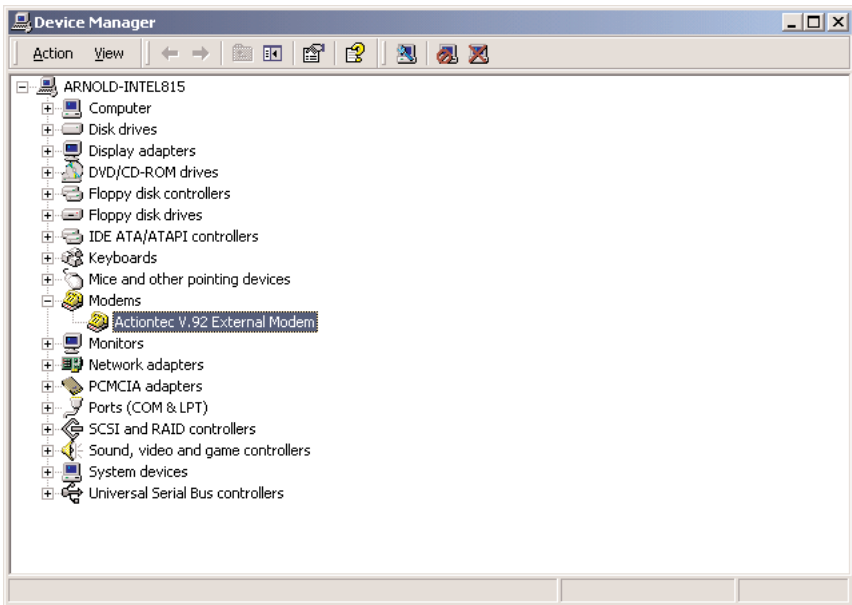


The Modem is now ready to use.

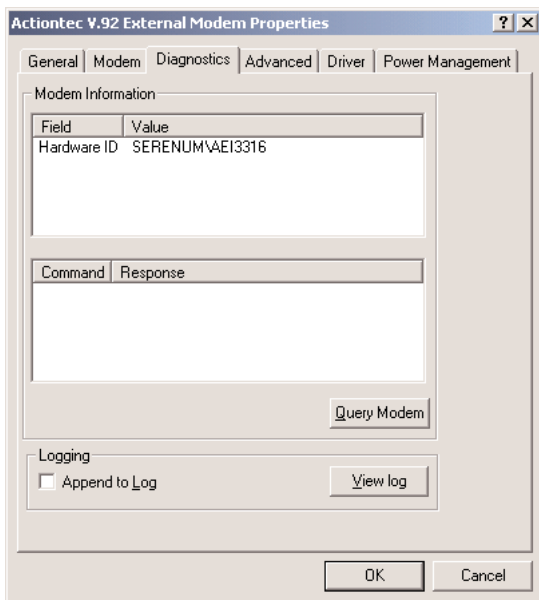
Verifying Driver Software Installation (Windows 2000 and XP)

To verify the Modem and its driver software are configured properly:

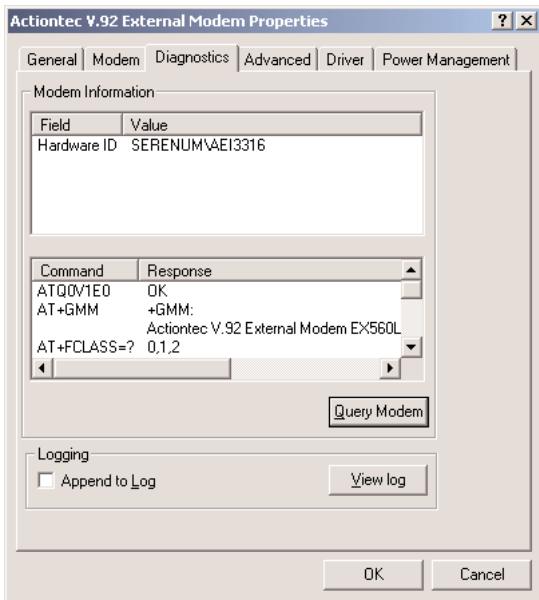
1. Right-click **My Computer**, then select **Properties**.
2. In the “System Properties” window, select **Hardware**, then click **Device Manager**....
3. In the “Device Manager” window, click the “+” next to “Modems,” then double-click **Actiontec V.92 External Modem**.



- When the “Actiontec V.92 External Modem Properties” window appears, select **Diagnostics**, then click **Query Modem**.



- The modem's configuration information is displayed.



Troubleshooting

4

This section describes a few problems that may be encountered when using the Modem, and solutions to overcome them.

When I restart my computer, the Modem is not detected.


Ensure the Modem is turned on, and the serial cable is connected properly to a COM port on the computer, then restart the computer.

The Modem doesn't dial.

Ensure the Modem is turned on and connected to a working phone line. To ensure the phone line is functioning properly, plug a telephone into the phone wall jack and listen for a dial tone.

The Modem dials but doesn't connect.

First, verify the communications software is configured to the correct COM port and IRQ setting. Second, ensure the phone line is working properly (plug a telephone into the phone wall jack and listen for a dial tone).

 **Note:** To determine the COM port and IRQ setting used by the Modem, select **Start, Settings, Control Panel**, then double-click **Modems**. Select **Diagnostics**, then **More Info**.

The Modem reports a busy signal.

First, verify the Modem is connected directly to a wall phone jack. If the Modem is connected to a phone via a splitter, it will not function properly. Second, ensure the numerical prefix ***70** is not included before the access number provided by the Internet Service Provider (ISP). The ***70** prefix disables call waiting, sending out a busy signal instead.

AT Commands

A

To access the Modem manually, use AT commands. AT commands can be sent to the Modem from a computer running a communications program.

Command Format

All commands must begin with the AT prefix, followed by the parameter, and ending by pressing the **Enter** key on the keyboard. All commands can be entered in either all upper- or all lower-case, but not upper- and lower-case mixed together. A command entered without any parameters automatically specifies the same command with a parameter of "0." The maximum length of a command is eight (8) characters. The Modem does not count the AT prefix, carriage returns, or spaces.

For example, entering the command

ATH

causes the modem to hang up.

Basic AT Commands

In the following lists, the commands are in bold text, followed by a short functional description. Default settings are noted with an asterisk (*).

- A/** Repeat last command (do not precede this command with AT or follow by pressing the Enter key)
- A** Answer
- D_** Dial command
- P** Select pulse dialing (affects current and subsequent dialing)
- T** Select tone dialing (affects current and subsequent dialing)
- En** Command echo
- E0** Disables echo
- E1** Enables echo*
- Hn** Switch hook control

- H0** Hangs up the telephone line*
- H1** Picks up the telephone line
- Ln** Speaker volume
- L0** Off or low speaker volume
- L1** Low volume
- L2** Medium volume*
- L3** High volume

ITU-T V.90 Operation Commands

Three S-registers support K56flex, V.90, and V.34 connections. The S37 register is used to control the upstream V.34 rate. The S38 register is used to control the maximum downstream speed at which the Modem attempts to connect. To disable V.90, set S38 to **0**. The S109 register is used to select between K56flex and V.90 protocols.

Dial Line Rate (S37)

- S37 = 0** maximum modem speed*
- S37 = 1** reserved
- S37 = 2** 1200 bits/s and 75 bits/s
- S37 = 3** 300 bits/s
- S37 = 4** reserved
- S37 = 5** 1200 bits/s
- S37 = 6** 2400 bits/s
- S37 = 7** 4800 bits/s
- S37 = 8** 7200 bits/s
- S37 = 9** 9600 bits/s
- S37 = 10** 12000 bits/s
- S37 = 11** 14400 bits/s

| | |
|-----------------|--------------|
| S37 = 12 | 16800 bits/s |
| S37 = 13 | 19200 bits/s |
| S37 = 14 | 21600 bits/s |
| S37 = 15 | 24000 bits/s |
| S37 = 16 | 26400 bits/s |
| S37 = 17 | 28800 bits/s |
| S37 = 18 | 31200 bits/s |
| S37 = 19 | 33600 bits/s |

56K Dial Line Rate (S38)

| | |
|-----------------|---|
| S38 = 0 | Disable all 56K connections |
| S38 = 1 | autorate (maximum achievable connection)* |
| S38 = 2 | 29333 bits/s |
| S38 = 3 | 30666 bits/s |
| S38 = 4 | 32000 bits/s |
| S38 = 5 | 33333 bits/s |
| S38 = 6 | 34666 bits/s |
| S38 = 7 | 36000 bits/s |
| S38 = 8 | 37333 bits/s |
| S38 = 9 | 38666 bits/s |
| S38 = 10 | 40000 bits/s |
| S38 = 12 | 42666 bits/s |
| S38 = 13 | 44000 bits/s |
| S38 = 14 | 45333 bits/s |
| S38 = 15 | 46666 bits/s |

| | |
|-----------------|--------------|
| S38 = 16 | 48000 bits/s |
| S38 = 17 | 49333 bits/s |
| S38 = 18 | 50666 bits/s |
| S38 = 19 | 52000 bits/s |
| S38 = 20 | 53333 bits/s |

K56flex and V.90 Selection (S109)

Use this register to disable 56K connections, or to select between K56flex and V.90 protocols. The default setting (S109=1) will attempt K56flex, and then V.34, depending upon the central site modem being called and the condition of the phone line.

| | |
|-----------------|-------------------------------|
| S109 = 0 | Disable all 56K connections |
| S109 = 1 | K56flex only (V.90 disabled)* |
| S109 = 2 | V.90 only (K56flex disabled) |

Command Examples

The following list contains a few AT Command examples.

at&fs38=0s109=0 – disables ALL 56K connections.

at&fs38=1s109=1s37=14 – disables V.90 connections. The Modem attempts to connect at K56flex rates, with the V.34 upstream rate limited to 21.6K bps.

at&fs38=1s109=2 – causes the Modem to attempt a V.90 connection only. If V.90 is not achieved, it will fall back to V.34 rates.

at&fs38=10s109=2 – causes the Modem to attempt a V.90 connection at 40K bps. It will fall back to slower speeds if it cannot achieve or maintain this rate.

As a suggested “init string” in the communications program, use:

at&fw2s109=2s38=1s37=14

Notices

Regulatory Compliance Notices

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by implementing one or more of the following measures:

- Reorient or relocate the receiving antenna;
- Increase the separation between the equipment and receiver;
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected;
- Consult the dealer or an experienced radio or television technician for help.


Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by *Actiontec Electronics, Inc.*, may void the user's authority to operate the equipment.

Declaration of conformity for products marked with the FCC logo – United States only.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference;
2. This device must accept any interference received, including interference that may cause undesired operation.

 **Note:** To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

For questions regarding your product or the FCC declaration, contact:

Actiontec Electronics, Inc.
760 N. Mary Ave.
Sunnyvale, CA 94086
United States
Tel: 408.752.7700
Fax: 408.541.9005

Limited Warranty

Hardware: *Actiontec* Electronics, Inc., warrants to the end user (“Customer”) that this hardware product will be free from defects in workmanship and materials, under normal use and service, for twelve (12) months from the date of purchase from *Actiontec* Electronics or its authorized reseller.

Actiontec Electronics’ sole obligation under this express warranty shall be, at *Actiontec*’s option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, *Actiontec* Electronics may, in its sole discretion, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of *Actiontec* Electronics, Inc. Replacement products may be new or reconditioned. *Actiontec* Electronics warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.

Software: *Actiontec* Electronics warrants to Customer that each software program licensed from it will perform in substantial conformance to its program specifications, for a period of ninety (90) days from the date of purchase from *Actiontec* Electronics or its authorized reseller. *Actiontec* Electronics warrants the media containing software against failure during the warranty period. The only updates that will be provided are at the sole discretion of *Actiontec* Electronics and will only be available for download at the *Actiontec* Web site, www.actiontec.com. *Actiontec* Electronics’ sole obligation under this express warranty shall be, at *Actiontec* Electronics’ option and expense, to refund the purchase price paid by Customer for any defective software product, or to replace any defective media with software which substantially conforms to applicable *Actiontec* Electronics published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. *Actiontec* Electronics makes no warranty or representation that its software products will meet Customer’s requirements or work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third-party products listed in the *Actiontec* Electronics software product documentation or specifications as being compatible, *Actiontec* Electronics will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a “bug” or defect in the third party’s product or from use of the software product not in accordance with *Actiontec* Electronics published specifications or user guide.

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Obtaining Warranty Service: Customer may contact *Actiontec Electronics* Technical Support Center within the applicable warranty period to obtain warranty service authorization. Dated proof of purchase from *Actiontec Electronics* or its authorized reseller may be required. Products returned to *Actiontec Electronics* must be pre-authorized by *Actiontec Electronics* with a Return Merchandise Authorization (RMA) number marked on the outside of the package, and sent prepaid and packaged appropriately for safe shipment, and it is recommended that they be insured or sent by a method that provides for tracking of the package. The repaired or replaced item will be shipped to Customer, at *Actiontec Electronics*' expense, not later than thirty (30) days after *Actiontec Electronics* receives the defective product.

Return the product to:
(In the United States)
Actiontec Electronics, Inc.
760 North Mary Avenue
Sunnyvale, CA 94085

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Dispute Resolution: The customer may contact the Director of Technical Support in the event the Customer is not satisfied with *Actiontec* Electronics' response to the complaint. In the event that the Customer is still not satisfied with the response of the Director of Technical Support, the Customer is instructed to contact the Director of Marketing. In the event that the Customer is still not satisfied with the response of the Director of Marketing, the Customer is instructed to contact the Chief Financial Officer and/or President.

Governing Law: This Limited Warranty shall be governed by the laws of the State of California, U.S.A., excluding its conflicts of laws and principles, and excluding the United Nations Convention on Contracts for the International Sale of Goods.

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