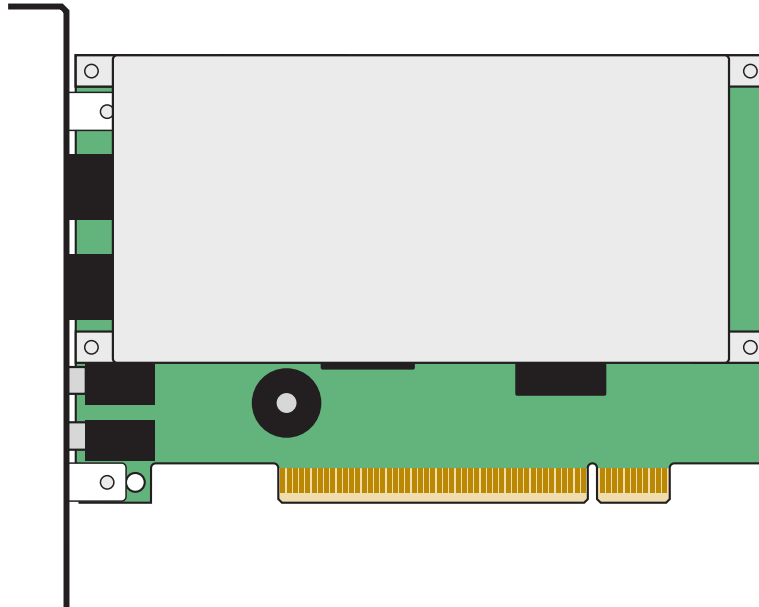# MultiModem® ZPX

MT5634ZPX-PCI-U/NV

MT5634ZPX-PCI-V92/NV

MT5634ZPX-PCI/NV

Internal Data / Super G3 Fax Modem

User Guide

MultiTech®
Systems

MultiModemZPX User Guide

MT5634ZPX-PCI-U, MT5634ZPX-PCI-U-NV, MT5634ZPX-PCI, 5634ZPX-PCI-NV, MT5634ZPX-PCI-V92, 5634ZPX-PCI-V92-NV

P/N MTS000197D Revision D

Record of Revisions

Revision	Date	Description
C	07/25/03	This manual replaces S000197B. It covers V.90, V.92, and Universal builds. It notes that the modem can be purchased with or without voice.
D	05/07/07	Updated the Technical Support contact list.
	05/15/09	Add link to the Multi-Tech Web site for warranty information.

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Warranty

For the Multi-Tech Warranty, see the Multi-Tech Web site at http://www.multitech.com

Patents

This device is covered by one or more of the following patents: 6,031,867; 6,012,113; 6,009,082; 5,905,794; 5,864,560; 5,815,567; 5,815,503; 5,812,534; 5,809,068; 5,790,532; 5,764,628; 5,764,627; 5,754,589; 5,724,356; 5,673,268; 5,673,257; 5,644,594; 5,628,030; 5,619,508; 5,617,423; 5,600,649; 5,592,586; 5,577,041; 5,574,725; 5,559,793; 5,546,448; 5,546,395; 5,535,204; 5,500,859; 5,471,470; 5,463,616; 5,453,986; 5,452,289; 5,450,425; 5,355,365; 5,309,562; 5,301,274. Other patents pending.

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112
Telephone (763) 785-3500 or (800) 328-9717
Fax (763) 785-9874

Technical Support

Country	By Email	By Phone
Europe, Middle East, Africa:	support@multitech.co.uk	+(44) 118 959 7774
U.S., Canada, all others:	support@multitech.com	(800) 972-2439 or (763) 717-5863

Internet Address: http://www.multitech.com

Contents

Chapter 1 - Introduction

Congratulations on your purchase of the MultiModemZPX. You have acquired one of the finest internal data/fax modems available today from one of the world's oldest modem manufacturers: Multi-Tech Systems, Inc. This User Guide will help you to install, configure, test, and use your modem.

This User Guide documents MT5634ZPX-PCI and MT5634ZPX-PCI-NV, which are V.90 protocol. The NV is for the No Voice option. The MT5634 ZPX-PCI-V.92 and MT5634-PCI-NV-V.92 are V.92 units. MT5634ZPX-PCI-U and MT5634ZPX-PCI-U-NV are univeral units that can be used in either 3.3 or 5 volt slots. The universal units are only V.92 protocol.

Product Description

One Modem, Worldwide Use. The MultiModemZPX is designed for global applications. This means one modem can ship around the world. The global modem is ideal for businesses with global operations that want to standardize on one modem and are looking to simplify the ordering process. Go to www.multitech.com/ to see a complete list of all the countries for which this modem has approvals.

V.90/V.92 Build: This modem was first designed using the V.90 protocol. Now, it is available as a V.92. The MultiModemZPX provides high-speed data transfer and fax capabilities for small businesses, telecommuters, and SOHO users. Its compatibility with the new ITU-T V.92 protocol provides quick connections, downstream transmissions at speeds up to 56K bps*, and upstream transmissions at speeds up to 48K bps when connected to V.92-compatible Internet service providers. Transmissions between the MultiModemZPX and other client modems are limited to 33.6K bps, as are upstream transmissions to non-V.92-compatible ISPs and downstream transmissions that are converted more than once on the telephone network.

Fax Communications: The MultiModemZPX also supports "Super G3" ITU-T V.34 fax communications at speeds up to 33.6K bps with Class 2.1 fax commands.

Features: Modem features include Plug and Play operation, callback security, and remote configuration. In standard mode, you can store up to four command lines or telephone numbers of up to 40 characters each in the modems' nonvolatile memory. In callback security mode, you can store up to 30 passwords and dialing strings. Other modem capabilities include voice operation using the included software, AT&T calling card tone detection, pulse and tone dialing, adaptive answer, DTR dialing, U.S. Caller ID reporting, two-wire leased-line operation, 11-bit operation, V.42 error correction, and V.42bis and V.44 data compression.
NOTE:

* Though this modem is capable of 56K bps download performance, line impairments, public tele-
   phone   infrastructure, and other external technological factors currently prevent maximum 56K
   bps connections.

Chapter 2 - Installation

What You Will Need

Before starting, please make sure you have everything you need:

We supply

- An MT5634ZPX-PCI data/fax modem

- An RJ-11 telephone cable

- A printed *Quick Start Guide*

- An MultiModemZPX system CD containing modem drivers, this User Guide, PhoneTools (a data communications software program), and Adobe Acrobat Reader

You supply

- A 100-MHz or faster Pentium personal computer with an unused PCI expansion slot. For video conferencing, we recommend a 166-MHz or faster computer.

- Windows 98, NT, 2000, ME, XP or Linux (2.2.x kernal) operating system installed

- A CD-ROM drive

- Tools to open your computer

- A nearby telephone line jack

- A 3.58mm (9/64-inch) plug male-to-male stereo patch cord (optional)

- An external speaker or headphone (optional)

- An external microphone (optional)

Safety Warnings

- Use this product only with UL- and CUL-listed computers (U.S.A.)

- To reduce the risk of fire, use only UL-listed 26 AWG (.41mm) or larger telephone wiring.

- Never install telephone wiring during a lightning storm.

- Never install a telephone jack in a wet location 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 during an electrical storm; there is a risk of electrical shock from lightning.

- Do not use a telephone in the vicinity of a gas leak.

Step 1: Install the MultiModemZPX in your Computer
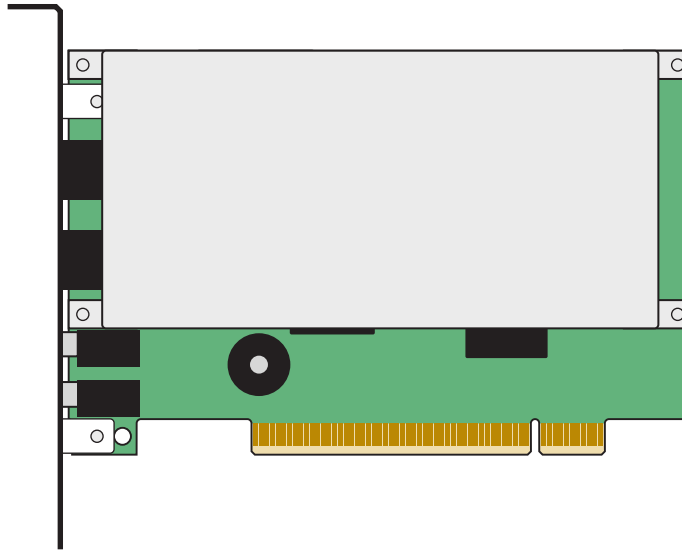
Figure 2-1. The MultiModemZPX.

Installing the MultiModemZPX requires you to open your computer. Please consult your computer manual in addition to the following instructions.

1. Turn off the computer and unplug it. Failure to do so may result in damage to both the MultiModemZPX and the computer. Do not turn on the computer until the instructions tell you to do so.

2. Remove the cover from the computer as instructed in the computer manual.

3. Select an empty PCI expansion slot. Remove the expansion slot cover and save the retaining screw.

4. Before handling the MultiModemZPX, discharge static in your body by touching a metal piece of the computer chassis. Carefully remove the MultiModemZPX from its antistatic bag, handling it only by the mounting bracket and edges. Do not touch the gold-plated connectors along the bottom edge.

5. Place the MultiModemZPX directly above the expansion slot and gently, but firmly, push it into the connector until the card's retaining bracket is flush against the computer chassis.

6. Fasten the retaining bracket to the computer chassis with the screw saved in step 3.

7. Replace the cover of the computer.

Step 2: Make the External Connections

Now connect the MultiModemZPX to the telephone line and, optionally, to your telephone. For voice mail or speakerphone use, you can also connect it to a microphone and an external speaker, headphone, or sound card. The microphone can be used for recording answering machine messages or for speakerphone use. The speaker or headphone can be used for playing back messages or as a speakerphone.
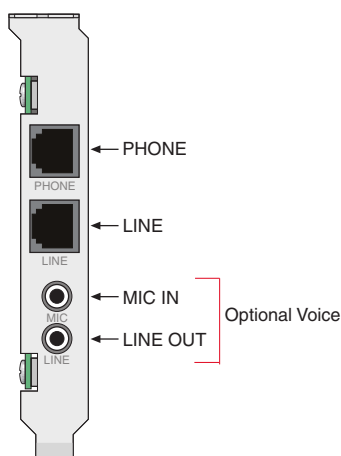
Figure 2-2. MT5634ZPX connectors.

Line Connection

Plug one end of the provided telephone cable into the modem's LINE jack, and the other end into a telephone wall jack. This is the only required connection.

> **Note:** The LINE jack is not interchangeable with the PHONE jack. Do not plug the phone into the LINE jack or the line cable into the PHONE jack.

> **Note:** The Federal Communications Commission (FCC) and Industry Canada impose certain restrictions on equipment connected to public telephone systems.

Phone Connection (Optional)

If you wish to connect a telephone to the same line as the modem, plug it into the modem's PHONE jack.

> **Note:** The PHONE jack is not interchangeable with the LINE jack. Do not plug the phone into the LINE jack or the line cable into the PHONE jack.

Microphone Connection (Optional)

For voice mail or speakerphone applications, plug an unamplified microphone into the MIC jack. The microphone should have a stereo 3.58mm (9/64-inch) mini plug. Do not use a monophonic microphone.

Sound Card and Speaker Connections (If you have the Voice Option)

For voice mail or speakerphone applications, use a 3.58mm (9/64-inch) plug male-to-male stereo patch cord to connect the LINE OUT jack on the modem to the LINE IN jack on your sound card. If your sound card does not have a LINE IN jack, use its MIC jack.

This will allow you to hear modem activity whether it is originating or answering a call, or playing a recorded message. If you do not have a sound card, you can plug an amplified speaker into the LINE OUT jack.

Step 3: Install the Modem Driver

If you use Windows 98 or newer, you must install the modem driver. The modem driver tells Windows how to control the modem. Separate procedures follow for the Windows operating systems. If you use a Linux operating system, please see Appendix E for installation instructions. If you use the SCO OpenServer operating system, please see Appendix G.

Installing the Modem Driver in Windows 98/Me/2000/XP

1. Make sure your modem is connected properly, and then turn on your computer. Windows should detect your new modem and open the **Install New Modem** wizard.
2. Insert the system CD into your CD-ROM drive, and then click **OK**.
3. Windows installs the modem driver.
4. Click **Finish** to exit.

Changing the Windows 98/Me COM Port Assignment

Unlike an external modem, the MultiModemZPX contains its own serial port. When Windows detects the MultiModemZPX, it assigns the next available COM port to it. Since COM1 through COM4 are standard serial ports in Windows computers, Windows typically assigns COM5 to the modem's serial port.

If Windows assigns the modem to a COM port higher than 4, then certain legacy software applications will not recognize the modem. To correct this situation, Multi-Tech Systems provides two additional driver files on the MultiModemZPX CD that may be used to reassign the modem to either COM3 or COM4. To reassign the COM port:

1. Insert the MultiModemZPX CD into your computer's CD-ROM drive.

2. Click **Start | Settings | Control Panel**. Double-click the **System** icon.

3. Select the **Device Manager** tab, and double-click the **Modem** icon.

4. Double-click **MT5634ZPX-PCI** to go to the **Properties** dialog box.

5. Select the **Driver** tab. Click the **Update Driver** button and follow the **Update Device Driver** wizard prompts. The wizard requests you to specify the path of the new driver. If you'd like to reassign your modem to COM3, type **D:\COM-3\pcicom3.inf**, where D: is the drive letter associated with your computer's CD-ROM drive. If you want to reassign your modem to COM4, type **D:\COM-4\pcicom4.inf** and continue with the wizard's instructions.

6. When the wizard completes its installation, your modem should be reassigned to the new COM port.

Verifying the Windows 98/Me Configuration

Windows assigns an interrupt request (IRQ) number for your modem. Because the number of IRQs is limited, a computer with several accessories may not have an available IRQ for your new modem. In that case, you may have to decide which of your other accessories you can modify or do without.

Be aware that resource settings should be changed only by users with expert knowledge of computer hardware and hardware configurations.

Note: Changing resource settings improperly can disable your hardware and can cause your computer to malfunction or be inoperable.

Use the following procedure to check the assignments Windows has made for your modem:

1. Click **Start | Settings** | **Control Panel**. Double-click the **System** icon.

2. When the **System Properties** dialog box appears, click the **Device Manager** tab. A list of device types appears.

3. Double-click **Modem** to display a list of modems installed in your computer.

4. Double-click **Multi-Tech Systems MT5634ZPX-PCI**. The **Modem Properties** dialog box appears.

5. Click the **Resources** tab and note the **Conflicting Device** list. If there is a conflict between your modem and another device in your computer, the information appears here. For help in resolving a conflict, click **Start** | **Help**, and then search the Help index for the Hardware Conflict Troubleshooter. When finished, click **OK** to exit the **System Properties** dialog box.

6. In **Control Panel**, double-click the **Modems** icon.

7. When the **Modems Properties** dialog box appears, click the **Diagnostics** tab. A list of ports and devices appears.

8. Highlight the COM port associated with the MT5634ZPX-PCI. Click **More Info**. Clicking **More Info** causes Windows to send commands to and receive responses from the modem. The system also displays information about the modem's COM port.

9. Write down the modem's port, interrupt, address, and highest speed. You will need this information to configure any *legacy* (nonWindows) communications software you install.

    Port: COM _____   Interrupt: _____   Address: _____   Speed: _____

10. Click the **General** tab. Select **Multi-Tech Systems MT5634ZPX-PCI**, and click **Properties** to review the modem's default communications settings. Do not change any settings unless you have special requirements.

11. Click **Dialing Properties** and review your dialing settings. If you are required to dial **9** to get an outside line, type **9** in the local and long distance boxes. If you have Call Waiting service, disable Call Waiting to prevent it from interrupting a data or fax transmission. When you are finished, click **OK** to exit the dialog box.

Installing the Modem Driver in Windows NT 4.0

Before you begin a Windows NT installation, make sure Windows NT Service Pack 3 or newer is installed on the computer. Also, to add and remove devices you must be logged on with Administrator privileges.

1. After installing the MultiModemZPX modem into your computer, turn the computer on and allow Windows NT to start.
2. Insert the MultiModemZPX system CD into your computer's CD-ROM drive.
3. When the **MT5634ZPX-PCI Autorun** menu appears, choose **Windows NT Setup**.
4. The **Multi-Tech Systems NT4 PCI Modem Setup** dialog box
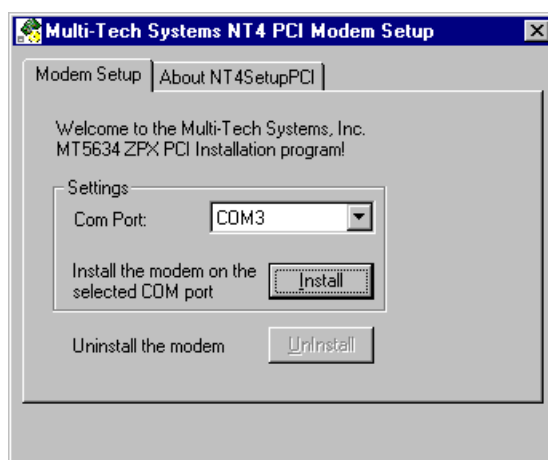
5. Now click **Install**. The MT5634ZPX-PCI-V92 driver is installed on the selected COM port.
6. When a message asking you to restart the computer appears, remove the CD from the CD-ROM drive, and then click **OK** to restart the computer.

Remote Access Setup

Before you can use your modem, Dial-Up Networking must be installed, and the new modem must be selected as the Remote Access Service device.

Verifying the Windows NT Configuration

To verify your modem configuration in Windows NT:

1. Click **Start** | **Settings** | **Control Panel**. Double-click **Modems**.
2. The **Modem Properties** dialog box appears, showing the COM port associated with the modem.
3. Click **Properties**. View the **General** tab to display information about modem speed. Click the **Connection** tab to see information about connection and call preferences.

You can also view configuration information under NT's Remote Access Services, by clicking **Start** | **Settings** | **Control Panel**. Double-click the **Network** tab. Click the **Services** tab, Highlight **Remote Access Services** and then click **Properties**. The list of modems and associated COM ports appears.

Verifying the Windows 2000 Configuration

To verify your modem adapter configuration in Windows 2000:

1.   Click **Start | Settings | Control Panel**. Double-click **Phone and Modem Properties**.

2.   In the **Phone and Modem Properties** dialog box, click the **Modems** tab.

3.   In the **Modem** tab, select **Multi-Tech Systems MT5634ZPX-PCI,** and then click the **Diagnostics tab** and then click the **Query Modem** button to display information about your modem settings.

     Windows 2000 automatically configures Plug and Play devices such as the MultiModemZPX to work properly with other devices installed in your computer.

Viewing System Resources

1.   Click **Start | Settings | Control Panel**.

2.   Double-click **System**, and then click the **Hardware** tab.

3.   Click **Device Manager**.

4.   Click the **Action** tab to display information about Device Manager options.

Removing Previous Modems from Windows 2000

1.   To remove a modem adapter from Windows 2000, click **Start | Settings | Control Panel**. Double-click **Add/Remove Hardware**.

2.   The **Add/Remove Hardware Wizard** displays. Click **Next**.

3.   When the **Choose Hardware Task** dialog box displays, select **Uninstall/Unplug a device**.

4.   In the **Choose a Removal Task** dialog box, select **Uninstall a device**, and then click **Next**.

5.   The **Installed devices on your computer** dialog box provides a list of devices installed on your computer. Select the device you want to uninstall from the list. Click **Next**.

6.   In the **Uninstall a Device** dialog box, verify that the correct device is highlighted, and then select **Yes**. Click **Next** to continue.

7.   When the **Completing the Add/Remove Hardware** dialog box indicates Windows has successfully uninstalled the device, click **Finish**.

     Note: If you are removing a Plug and Play device from Windows 2000, you must physically remove the device from the computer or Windows 2000 will request driver installation each time the system starts.

Step 4: Configure the Modem for Your Country

Before you use your modem, you must configure it for the country in which it will be used. You must also do this if you move the modem to another country after it has been configured for the first country. You can use one of two configuration methods: the Global Wizard utility or AT commands.

The Global Wizard Utility

The Global Wizard configuration utility is recommended for computers running Windows 98 or newer.

1. Insert the MultiModemZPX CD into the CD-ROM drive. The **Autorun** menu should appear.

2. Click **Initial Setup and Country Selection**.

3. In the **Global Wizard** dialog box, select either **Run from CD** or **Install on your PC**. Choose the former to configure your modem without installing the Global Wizard on your computer. Choose the latter to install the Global Wizard on you computer and Start menu.

4. Click **Next**. The Global Wizard searches for your modem and identifies it.

5. Click **Next**.

6. Select the country in which the modem will be used, and then click **Next**.

7. Review your choice of country. If it is correct, click **Next** to configure the modem.

8. When Global Wizard announces that the parameters have been set, click **Finish** to exit.

AT Commands

Non-Windows users can configure the modem using AT commands. You must enter these commands in your communication program's terminal window.

There is a separate document of AT Commands provided for reference on the MultiModem system CD.

1. Run your favorite communication program, and open the program's terminal window.

2. To configure the modem for a specific country, type **AT%T19,0,***nn*, where *nn* is the country code in hexadecimal notation, and then press Enter.

3. To verify the change, type **ATI9**, and then press Enter. The country code is displayed in decimal format.

Example of country, command and result codes

Country	AT command (hexadecimal)	Country Code (decimal)
Euro/NAM	AT%T19,0,34 (default)	52
Japan	AT%T19,0,10	16

A complete list of country codes can be found on the Multi-Tech Web site at
http://www.multitech.com/GlobalModem/config.

Step 5: Install PhoneTools

You can use PhoneTools to setup the operation of your modem. Multi-Tech includes this data communications software program on the product CD shipped with your modem. In general, the modem will work with most data communications software programs. Data communications software gives you access to commands that govern how the modem operates; that is, how the modem handles incoming and outgoing data streams, etc.

1. Insert the MultiModemZPX system CDinto your CD-ROM drive. Allow Autorun to bring up the introductory screen.

2. Click on the PhoneTools icon and choose the appropriate country/language.

3. Follow the PhoneTools installation wizard. No input is needed. You may choose to view the "Readme" file and whether or not to run PhoneTools immediately.

   Windows NT/2000/XP Note: During installation, an advisory screen may appear saying "FAX capture driver installation" - this may cause a delay in the installation. This is normal. The installation process has not failed or stalled. Simply wait a few moments until this screen disappears.

4. After installation, you can launch PhoneTools either from a desktop icon or from the **Start | Programs** menu. Typically, it's not necessary to reboot before using PhoneTools.

Chapter 3 - Remote Configuration

Remote configuration is a network management tool that allows you to configure the MT5634ZPX modem anywhere in your network from one location. With password-protected remote configuration, you can issue **AT** commands to a remote modem for maintenance or troubleshooting as if you were on site.

Basic Procedure

The following steps are valid regardless of whether the connection is established by the local or the remote Multi-Tech modem.

> **Note:** For this procedure, the remote computer must be running, and a communication program must be ready for a data connection, which will be indicated by a lighted **TR** indicator on the front of the modem.

1. Establish a data connection with a remote MT5634ZPX.

2. Send three remote configuration escape characters followed by **AT** and the setup password, and press ENTER. Example: **%%%ATMTSMODEM**. You have four tries to enter the correct password before being disconnected. If the password is correct, the remote modem responds with **OK.**

3. Type **AT** commands to configure the remote modem.

4. When you have finished configuring the remote modem, save the new configuration by typing **AT&W0** and pressing ENTER.

5. Type **ATO** and press ENTER to exit remote configuration. You can now break the connection in the normal way.

Setup

Multi-Tech modems are shipped with a default setup password (MTSMODEM). Because anyone who has the *User Guide* knows the default setup password, you should change the password and possibly also the remote configuration escape character.

To Change the Setup Password

1. Open a data communications program such as HyperTerminal or PhoneTools.

2. In the terminal window, type **AT#SMTSMODEM** (or **AT#S*xxxxxxxx*** if you have replaced the MTSMODEM password with *xxxxxxxx*) and press ENTER. The modem responds with *OK* if the setup password is correct, and *ERROR* if it is wrong.

3. To change the password, type **AT#S=*xxxxxxxx***, where *xxxxxxxx* stands for the password, and then press ENTER. The password can include any keyboard character, and can be up to eight characters long. The modem responds with *OK*.

> **CAUTION:** Passwords are case-sensitive. The next time you enter the password, it must be in the same case as you set it up.

4. The new password is saved automatically. You can now either enter more AT commands or exit the data communications program. The next time you wish to set up the modem, you must use the new password.

To Change the Remote Escape Character

To further improve security, you can change a remote modem's remote configuration escape character either locally or remotely. The remote configuration escape character is stored in register *S9*. The factory default is 37, which is the ASCII code for the percent character (%). Setting *S9* to 0 (zero) disables remote configuration entirely.

CAUTION: If you do this remotely, you won't be able to change it back remotely.

1.   Establish a remote configuration link with the remote modem as described in "Basic Procedure."

2.   Type **ATS9=*n***, where *n* is the ASCII code for the new remote configuration escape character, and then press ENTER.

3.   Save the new value by typing **AT&W** and pressing ENTER.

4.   Type **ATO** and press ENTER to exit remote configuration.

Chapter 4 - Troubleshooting

Your modem was thoroughly tested at the factory before it was shipped. If you are unable to make a successful connection, or if you experience data loss or garbled characters during your connection, it is possible that the modem is defective. However, it is more likely that the source of your problem lies elsewhere. The following symptoms are typical of problems you might encounter:

- The modem does not respond to commands.
- The modem cannot connect when dialing.
- The modem disconnects while online.
- The modem cannot connect when answering.
- File transfer is slower than it should be.
- Data is being lost.
- There are garbage characters on the monitor.
- The modem doesn't work with Caller ID.
- Fax and data software can't run at the same time.
- The voice functions don't work.

If you experience problems, please check the following possibilities before calling Technical Support (see Appendix D).

The Modem Does Not Respond to Commands

- Make sure you are issuing the modem commands from data communications software, either manually in terminal mode or automatically by configuring the software. (You cannot send commands to the modem from the DOS prompt.)

- Make sure you are in terminal mode in your data communications program, then type **AT** and press ENTER. If you get an *OK* response from your modem, your connections are good and the problem likely is in the connection setup in your communications software.

- If you don't get an *OK*, make sure you have properly configured the port in your com munications program. Most legacy (prior to Windows 95) communications programs connect to the COM port when the software loads and remain connected until the program terminates. Some programs can disconnect without exiting the program. If this is the case, try issuing the software's connection command. If more than one communications program is open, they may conflict with each other. Make sure all other communications programs are closed, and then try to make the connection again.

- Your communication software settings might not match the port the modem is connected to. Make sure the COM port you chose during setup matches the COM port set in your communications software. See Chapter 2 for more information.

- Another expansion card, such as a sound or game card, might be using the same COM p ort, memory address, or interrupt request (IRQ) as your modem. See Chapter 2 for infor mation on verifying the configuration for your operating system. Look for conflicts with

other devices installed on your computer. Resources are assigned at power-up by the computer's BIOS. If the resources assigned to the MultiModemZPX-PCI conflict with the resources of another device, the resources of the second device have to be changed. Select the port the conflicting device is on and change it to resolve the conflict. If you need to change switches or jumpers on the conflicting device, refer to the device's documentation.

• If you have another MultiModemZPX-PCI, install it and try to make a connection.

• The modem might have a problem beyond the scope of this user guide. If you have an other Multi-Tech modem, try swapping modems. If the problem goes away, call Techni cal Support for assistance.

The Modem Cannot Connect When Dialing

Reasons why the MultiModemZPX-PCI may fail to connect include:

• lack of a physical connection to the telephone line.

• a wrong dial tone.

• a busy signal.

• a wrong number.

• no modem at the other end.

• a faulty modem, computer, or software at the other end.

• incompatibility between modems

• poor line conditions.

You can narrow the list of possibilities by using extended result codes. Extended result codes are enabled by default. If they have been disabled, include **V1X4** in the modem's initialization string, or in terminal mode enter **ATV1X4** and press ENTER. When you dial again, the modem reports the call's progress.

• If the modem reports *NO DIALTONE*, check that the modem's telephone line cable is connected to both the modem's LINE jack (not the PHONE jack) and the telephone wall jack. If the cable looks secure, try replacing it.

If that doesn't work, the problem might be in your building's telephone installation. To test the building installation, plug a telephone into your modem's telephone wall jack and listen for a dial tone. If you hear a dial tone, your modem might be installed behind a corporate phone system (PBX) with an internal dial tone that sounds different from the normal dial tone. In that case, the modem might not recognize the dial tone and might treat it as an error. Check with your PBX personnel or the PBX system manual to see if you can change the internal dial tone. If you can't, change your modem's initialization string to replace **X4** with **X3**, which will cause the modem to ignore dial tones (note, however, that **X3** is not allowed in some countries, such as France and Spain).

• If the modem reports BUSY, the other number might be busy. Try again later. BUSY can also indicate that you failed to add a **9,** prefix to the phone number if you must dial *9* for an outside line.

If you must dial *9* to get an outside line, the easiest way to dial it automatically using legacy software is to include it in the modem's dial prefix, e.g., **ATDT9,**. Note the comma, which inserts a pause before the number is dialed. By inserting **9,** into the dial prefix, you do not have to include it in each directory entry.

To change the dial prefix in Windows HyperTerminal, select **Connect** from the **Call** menu, click **Dialing Properties**, and type **9** in the local and long distance boxes.

- If the modem reports *NO ANSWER*, the other system has failed to go off-hook, or you might have dialed a wrong number. Check the number.

- If the modem reports *NO CARRIER*, the phone was answered at the other end, but no connection was made. You might have dialed a wrong number, and a person answered instead of a computer, or you might have dialed the correct number but the other computer or software was turned off or faulty. Check the number and try again, or try calling another system to make sure your modem is working. Also, try calling the number on your telephone. If you hear harsh sounds, then there is a modem at the other end. In that case, the modems might be having problems negotiating because of incompatibilities or line noise. Try the call again, connecting at a lower speed by setting register S37 to a lower rate (for example, by typing **ATS37=11** in the terminal window and pressing ENTER).

- Poor line conditions can also affect the connection. When using V.34 or V.32 client-to-client connections in poor conditions, setting **S38=0** may result in better performance.

The Modem Disconnects While Online

- If you have Call Waiting on the same phone line as your modem, it can interrupt your connection when someone tries to call you. If you have Call Waiting, disable it before each call. In most telephone areas in North America, you can disable Call Waiting by preceding the telephone number with ***70** (but first check with your local telephone company).

  You can automatically disable Call Waiting by including the disabling code in the modem's dial prefix (e.g., **ATDT*70,**—note the comma, which inserts a pause before the number is dialed). For example, in Windows select **Start | Settings | Control Panel**, and then **Modems**. In the **Modems Properties** dialog box, select **Multi-Tech MT5634ZPX-PCI**, and then click **Dialing Properties**. Check **This location has call waiting**, and then select the correct code for your phone service.

- If you have extension phones on the same line as your modem, you or someone else can interrupt the connection by picking up another phone. If this is a frequent problem, disconnect the extension phones before using the modem, or install another phone line especially for the modem.

- Check that the phone cord between the modem's LINE jack and the wall jack is undamaged and firmly connected to both.

- You might have had a poor connection because of line conditions or the problem might have originated on the other end of the line. Try again.

- Your ISP might have hung up on you because of lack of activity on your part or because you exceeded your time limit for the day. Try again.

The Modem Cannot Connect When Answering

- Autoanswer might be disabled. Turn on autoanswer in your communications program or send the command **ATS0=1** (**ATS0=2** if you have Caller ID service) to your modem in terminal mode.

- The application should supply DTR. The default DTR Control command (**&D2**) inhibits autoanswer. To enable autoanswer, change DTR Control to **&D0**, and make sure **&Q0**, **&Q5**, or **&Q6** is also set. For more information, see the **&D** command in the AT Commands Reference Guide.

File Transfer Is Slower Than It Should Be

- If you are using a slow transfer protocol, such as Xmodem, try Zmodem or Ymodem/G instead.

- Is your line noisy? If there is static on your line, the modem has to resend many blocks of data to insure accuracy. You must have a clean line for maximum speed.

- If you are downloading a compressed file with MNP 5 hardware compression enabled, try disabling data compression. The transfer may be marginally slower with data compression enabled, because hardware data compression cannot compress a file already compressed by an archiving program.

- Does your Internet service provider (ISP) use the same 56K protocol as your modem? The default setting of your modem is to connect using either the V.92 or the V.90 protocol, depending on which one the ISP's modem is using. If your ISP uses the V.90 protocol, the maximum speed you will be able to upload at is 33,600 bps. Check with your ISP to see which protocols it supports.

- Are you trying to send a file to another client modem? If so, then your maximum possible connect speed is 33,600 bps. You can upload at speeds greater than 33,600 bps only when connected to an ISP that supports the V.92 protocol.

- Try entering the **I11** command in online mode or the **&V** command in command mode to display information about the last connection, making a screen print of the connection statistics, and checking for parameters that might be unacceptable.

Data Is Being Lost

- If you are using data compression, set the serial port baud rate to two to six times the data rate.

- Make sure the flow control method you selected in your software matches the method selected in the modem (see AT commands **&K** and **Q**.)

- Enter the **I11** command in online mode to display information about the last connection. Then make a screen print of the connection statistics, and look for unacceptable parameters.

There Are Garbage Characters on the Monitor

- Your computer and the remote computer might be set to different word lengths, stop bits, or parities. If you have connected at 8-N-1, try changing to 7-E-1, or vice-versa, using your communication software.

- You might be experiencing line noise. Enable error correction, if it is disabled, or hang up and call again; you might get a better connection the second time.

- At speeds above 2400 bps, the remote modem might not use the same transmission or error correction standards as your modem. Try connecting at a slower speed or disabling error correction. (With no error correction, however, line noise can cause garbage characters.)

- Enter the **I11** command in online mode or the **&V** command in command mode to display information about the last connection. Then make a screen print of the connection statistics, and look for unacceptable parameters.

The Modem Doesn't Work with Caller ID

- Caller ID information is transmitted between the first and second rings, so if autoanswer is turned off (**S0=0**) or if the modem is set to answer after only one ring (**S0=1**), the modem will not receive Caller ID information. Check your initialization string, and if necessary change it to set the modem to answer after the second ring (**S0=2**).

- Make sure that you have Caller ID service from your telephone company.

Fax and Data Software Can't Run at the Same Time

- Communication devices can be accessed by only one application at a time. In Windows 98 and higher, you can have data and fax communication applications open at the same time, but they cannot use the same modem at the same time.

The Voice Functions Don't Work

There are several tests that you can perform to verify the voice circuits of the MultiModemZPX. First, make sure all connecting cables—telephone, microphone, and speaker—are undamaged and firmly connected to the correct jacks. Then retry whatever action was not working. If the problem persists, try the voice mail test; if that doesn't work, and if you have a microphone and speaker connected to the MultiModemZPX, try the loopback and speakerphone tests, which do not require special software.

Voice Mail Test

Test the MultiModemZPX's voice function by using the included software to set up the MultiModemZPX for voice mail. Have an acquaintance call and leave a message, and then play it back.

If your modem does not play sound files in voice mode, go to Windows Control Panel and double-click the Multimedia icon. Under the **Audio** tab, select **Modem Wave Driver** as your preferred device for both playback and recording, then try again.

Loopback Test

1. Connect a microphone and speaker to the MultiModemZPX. To avoid feedback, make sure the microphone and speaker are well separated; better yet, use a headphone instead of a speaker.

2. Select **Start**, point to **Programs**, point to **Accessories**, and click **HyperTerminal**.

3. Click **Cancel** in the **Connection Description** dialog box.

4. In the HyperTerminal terminal window, type **AT&&S** and press ENTER. This command causes input from the microphone to be looped back to the speaker.

5. Speak into the microphone; you should hear your voice on the speaker or headphone.

6. Type **ATZ** and press ENTER to reset the modem.

Speakerphone Test (with voice option)

1. Connect a microphone and speaker to the MultiModemZPX.

2. Select **Start**, point to **Programs**, point to **Accessories**, and click **HyperTerminal**.

3. Click **Cancel** in the **Connection Description** dialog box.

4. In the HyperTerminal terminal window, type

   AT+FCLASS=8
   AT+VLS=7
   ATDT*xxxxxxx* (for *xxxxxxx* substitute a telephone number)

5. Speak into the microphone to talk to the person on the other end of the line, and listen over the speaker.

6. Type **+++ATH** and press ENTER to hang up.

7. Type **ATZ** and press ENTER to reset the modem.

Appendix A - Regulatory Compliance

FCC Part 68 Telecom

1. This equipment complies with part 68 of the Federal Communications Commission Rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration number. This information must be provided to the telephone company.

2. The suitable USOC jack (Universal Service Order Code connecting arrangement) for this equipment is shown below. If applicable, the facility interface codes (FIC) and service order codes (SOC) are shown.

3. An FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant. See installation instructions for details.

4. The ringer equivalence number (REN) is used to determine the number of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the device not ringing in response to an incoming call. In most, but not all, areas the sum of the RENs should not exceed 5.0. To be certain of the nuber of devices that may be connected to the line, as determined by the total RENs, contact the local telephone company.

5. If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify you as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

6. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.

7. If trouble is experienced with this equipment (the model of which is indicated below) please contact Multi-Tech Systems, Inc. at the address shown below for details of how to have repairs made. If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.

8. No repairs are to be made by you. Repairs are to be made only by Multi-Tech Systems or its licensees. Unauthorized repairs void registration and warranty.

9. This equipment should not be used on party lines or coin lines.

10. If so required, this equipment is hearing-aid compatible.

11. Manufacturing information:

Manufacturer:	Multi-Tech Systems, Inc.
Trade Name	MultiModemZPX
Model Number:	MT5634ZPX-PCI
FCC Registration No:	AU7USA-27014-M5-E
Ringer Equivalence No:	0.4A
Modular Jack (USOC):	RJ11C
Service Center in USA:	Multi-Tech Systems, Inc.
	2205 Woodale Drive
	Mounds View, MN 55112
	U.S.A.
	(763) 785-3500
	(763) 785-9874 Fax

FCC Part 15

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 one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Plug the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules. Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Fax Branding Statement

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including fax machines, to send any message unless such message clearly contains the following information:

- Date and time the message is sent
- Identification of the business or other entity, or other individual sending the message
- Telephone number of the sending machine or such business, other entity, or individual

This information is to appear in a margin at the top or bottom of each transmitted page or on the first page of the transmission. (Adding this information in the margin is referred to as *fax branding*.)

Since any number of fax software packages can be used with this product, the user must refer to the fax software manual for setup details. Typically the fax branding information must be entered via the configuration menu of the software.

Canadian Limitations Notice

Notice: The ringer equivalence number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the ringer equivalence numbers of all the devices does not exceed 5.

Notice: The Industry Canada label identifies certificated equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Industry Canada label does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment or equipment malfunctions may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Industry Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Reglement Canadien sur le matériel brouilleur.

Protection Against Contact with TNV Circuit

The protective cover is fastened to the modem card by means that will only allow a tool to remove the cover.

Warning: Removal of the protective cover will affect product safety and user safety requirements.

EMC, Safety, and R&TTE Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

• Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;

and

• Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

and

• Council Directive 1999/5/EC of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

New Zealand Telecom Warning Notice

1. The grant of a Telepermit for any item of terminal equipment indicates only that Telecom has accepted that the item complies with minimum conditions for connection to its network. It indicates no endorsement of the product by Telecom, nor does it provide any sort of warranty. Above all, it provides no assurance that any item will work correctly in all respects with another item of Telepermitted equipment of a different make or model, nor does it imply that any product is compatible with all of Telecom's network services.

   This equipment is not capable under all operating conditions of correct operation at the higher speed which it is designated. 33.6 kbps and 56 kbps connections are likely to be restricted to lower bit rates when connected to some PSTN implementations. Telecom will accept no responsibility should difficulties arise in such circumstances.

2. Immediately disconnect this equipment should it become physically damaged, and arrange for its disposal or repair.

3. This modem shall not be used in any manner which could constitute a nuisance to other Telecom customers.

4. This device is equipped with pulse dialing, while the Telecom standard is DTMF tone dialing. There is no guarantee that Telecom lines will always continue to support pulse dialing.

   Use of pulse dialing, when this equipment is connected to the same line as other equipment, may give rise to 'bell tinkle' or noise and may also cause a false answer condition. Should such problems occur, the user should not contact the Telecom Faults Service.

   The preferred method of dialing is to use DTMF tones, as this is faster than pulse (decadic) dialing and is readily available on almost all New Zealand telephone exchanges.

5. Warning Notice: No '111' or other calls can be made from this device during a mains power failure.

6. This equipment may not provide for the effective hand-over of a call to another device connected to the same line.

7. Some parameters required for compliance with Telecom's Telepermit requirements are dependent on the equipment (PC) associated with this device. The associated equipment shall be set to operate within the following limits for compliance with Telecom's Specifications:

For repeat calls to the same number:

   • There shall be no more than 10 call attempts to the same number within any 30-minute period for any single manual call initiation, and

   • The equipment shall go on-hook for a period of not less than 30 seconds between the end of one attempt and the beginning of the next attempt.

      For automatic calls to different numbers:

   • The equipment shall be set to ensure that automatic calls to different numbers are spaced such that there is no less than 5 seconds between the end of one call attempt and the beginning of another.

      For automatically answered incoming calls:

   • The equipment shall be set to ensure that calls are answered between 3 and 30 seconds of receipt of ringing.

8. For correct operation, total of the RNs of all devices connected to a single line at any time should not exceed 5.

South African Notice

This modem must be used in conjunction with an approved surge protection device.

International Modem Restrictions

Some dialing and answering defaults and restrictions may vary for international modems. Changing settings may cause a modem to become non-compliant with national telecom requirements in specific countries. Also note that some software packages may have features or lack restrictions that may cause the modem to become non-compliant.

Appendix B - Technical Specifications

The MultiModemZPX modem meets the following specifications:

Trade Name	MultiModemZPX™
Model Number	MT5634ZPX-PCI
Build Number	MT5634ZPX-PCI-U, MT5634ZPX-PCI-U-NV, MT5634ZPX-PCI, 5634ZPX-PCI-NV, MT5634ZPX-PCI-V92, 5634ZPX-PCI-V92-NV
Server-to-Client Data Rates	56K speeds when accessing a V.90 or V.92 server (actual speed depends on server capabilities and line conditions)*
Client-to-Server Data Rates	Up to 48Kbps when accessing a V.92 server (actual speed depends on server capabilities and line conditions); otherwise the same as client-to-client data rates.
Client-to-Client Data Rates	33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400, 1200, 0-300 bps
Fax Data Rates	33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400, 300 bps
Data Format	Serial, binary, asynchronous
Modem Compatibility	ITU-T V.92, V.90, V.34 enhanced, V.34, V.32bis, V.32, V.22bis, V.22; Bell 212A and 103/113; ITU-T V.21 & V.23; V.42, V.42bis, V.44
Fax Compatibility	ITU-T "Super" Group 3, Class 1.0, 2.0, 2.1, T.4, T.30, V.21, V.27ter, V.29, V.34, V.17; TIA/EIA 578 Class 1, 2; TR29.2
Voice Compatibility	AT+V/TAM command set
Error Correction	ITU-T V.42 (LAP-M or MNP 4)
Data Compression	ITU-T V.44 (6:1 throughput), V.42bis (4:1 throughput), MNP 5 (2:1 throughput)
Speed Detection	Automatic speed detection and switching between available speeds
Speed Conversion	Serial port data rates adjustable to 300, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, and 115,200 bps
Modes of Operation	Fax online modes; full duplex data over dial-up lines; voice
Flow Control	XON/XOFF (software), RTS/CTS (hardware)
Intelligent Features	Plug and play; fully AT command compatible; autodial, redial, repeat dial; pulse or tone dial; dial pauses; auto answer; adaptive answer; EIA extended automode; adaptive line probing; automatic symbol and carrier frequency during start-up, retrain, and rate renegotiation; DTMF detection; call status display, auto-parity and data rate selections; keyboard-controlled modem options; non-volatile memory; remote configuration; DTR dialing; callback security; A-law support in 56K modes; 11-bit support; real-time fax compression conversion; U.S. Caller ID reporting; quick-connect startup.
Command Buffer	40 characters
Transmit Level	-11 dBm (North America and Pan Euro)—varies by country setting

Frequency Stability	±0.01%
Receiver Sensitivity	-43 dBm under worst-case conditions
AGC Dynamic Range	43 dB
Bus Type	PCI 2.1
Connectors	Two RJ-11 phone jacks, one microphone jack, and one speaker jack
Cables	One RJ-11 phone cable
	Note: Any cables connected to the computer should be shielded to reduce interference.
Diagnostics	Power-on self-test (POST) and local analog loop
Environmental	Temperature range 0°–50°C (32°–120°F); humidity range 20–90% (non-condensing)
Storage Temperature	-10° to +85°C (14°–185°F)
Power Requirements	3.3 or 5 volt slot
Dimensions	1.8 cm wide × 14.7 cm long × 12.2 cm high (0.7″ × 5.8″ × 4.8″)
Operating Systems	Tested for use with Windows 98, NT, and 2000, and Linux (2.2.x kernal).
Limited Warranty	2 years

Appendix C - Upgrading the Modem

Introduction

Your modem is controlled by semi-permanent software, called *firmware*, which is stored in flash memory. Firmware is nonvolatile; that is, it remains stored in memory when the modem is turned off. However, it can be changed by either the manufacturer or the user as bugs are fixed or new features are added.

Since the firmware in your modem is stored in flash memory, you can upgrade it yourself in a few minutes by using the following procedures.

Upgrade Overview

The upgrade procedure consists of the following steps, which are described in greater detail in the following sections.

1. Identify the model number and firmware version of your modem.

2. Identify the current version of the firmware at the Multi-Tech Web site. If your modem already has the current firmware, there is no need to update it.

3. Download the upgrade file and the appropriate Flash Wizard for your modem.

4. Install the Flash Wizard and extract the firmware .HEX file from the file you downloaded.

5. Document and clear your stored parameters.

6. Upgrade the modem's firmware using the .HEX file and the Flash Wizard.

7. Restore your parameters.

Step 1: Identify the Modem Firmware

You must know the model number and firmware version of your Multi-Tech modem to know whether or not you should update it.

1. Run your favorite terminal program. If you are using Windows 95 or above, you can use HyperTerminal.

2. In the program's terminal window, type **AT&F**. Even if you cannot see the **AT&F** command on your screen, be sure to type it completely, and then press ENTER. If the modem does not respond with *OK*, repeat the **AT&F** command.

3. Now type **ATI**, press ENTER, and record your results. The model number and firmware version should appear similar to that shown below.

   LT V.92 1.0 MT5634ZPX-PCI-V92 Serial Data/Fax Modem Version 1.25a

Step 2: Identify the Current Firmware Version

Identify the current version of your modem's firmware at the Multi-Tech Web site. If your modem already has the current firmware, there is no need to update it.

1. Using your favorite Web browser, go to http://www.multitech.com/SUPPORT/ MultiModemZPX/firmware.asp.

2. Scroll down to your modem model number.

3. Look at the firmware version number for your modem.

4. If the firmware version number matches the firmware version number found in "Step 1: Identify the Modem Firmware," your modem has the current firmware version, and does not need to be updated.

5. If the firmware version number is greater than the firmware version number found in "Step 1: Identify the Modem Firmware," your modem has an older firmware version. Continue with "Step 3: Download the Upgrade File."

> **Warning:** The first digit of the new firmware must match the first digit of the old firmware, or the modem may not work properly. E.g., if your current firmware version is 4.16, replace it only with 4.xx firmware, not 6.xx firmware.

Step 3: Download the Upgrade File

1. If you are not already at the MultiModemZPX Firmware page of the Multi-Tech Web site, follow the procedure in "Step 2: Identify the Current Firmware."

2. Download the upgrade file for your modem by clicking its name, and save the file in a temporary folder on your hard disk.

3. In the same section of the Web page, download the Flash Wizard utility by clicking it, and save it in the same folder. Alternately, install the Flash wizard from the MultiModemZPX compact disc.

Step 4: Extract the Upgrade Files

1. Install the Flash Wizard utility by double-clicking the Flash Wizard file name in Windows Explorer.

2. Extract the upgrade files by double-clicking the file name. The extracted files include a .HEX file, which contains the upgrade data, and a Readme file.

3. Copy the upgrade .HEX file into the Flash Wizard folder, which, in a default installation, is at C:\Program Files\MultiTech Systems\Flash Wizard\.

Step 5: Document and Clear Your Stored Parameters

Before you flash your modem, you should record the parameters that are currently stored in it so you can reprogram it after flashing. After you have recorded them, send the **AT&W1Z** command to the the modem to clear the stored parameters.

1. Run your favorite terminal program.

2. In the program's terminal window, type **AT&V** and press ENTER to list your modem's current parameters.

3. Record your parameters by saving the screens and sending them to your printer.

4. Type **AT&W1Z** and press ENTER to clear your stored parameters and reset your modem to factory default.

5. Close the terminal program.

Step 6: Upgrade the Modem's Firmware

Before you begin the following procedure, read the README.TXT file extracted from the upgrade archive file. Note the file name for the new firmware (example: ARQG125A.HEX). Also, if you are using Windows NT, you must disable Windows RAS and Microsoft Fax Service before upgrading the modem's firmware. To disable RAS and your Fax service, Click **Start** | **Settings** | **Control Panel**, and then double-click **Services**. Select **Remote Access Server** , and then click the **Startup** button. Select **Manual** as the startup type, and then click **OK**. Do the same for any fax service.

WARNING: Never install an older version of firmware over a newer version. Doing this WILL DESTROY THE FLASH PROM! If the flash PROM is destroyed, the modem must be sent in for repair.

1. Run Flash Wizard by double-clicking its icon or file name, or by selecting it from the Start menu. The program begins by identifying devices attached to your computer.

2. Select the modem to be upgraded, and then click **Next** to proceed.

3. Select the port to be upgraded from the **Port** list, select the appropriate .HEX file from the **Hex File** list, and then click **Next** to continue.

> *Note: Do not use FLASHLDR.HEX. This file is used internally by Flash Wizard.*

4. The **Progress** dialog box now displays the progress of the upgrade.

> *Caution: Any disruption of the program during this stage of the upgrade can cause your modem to become inoperable. Wait for the **Next** button to become active before proceeding.*

5. When the flash upgrade is complete, the message *Programming Complete* appears. Click **Next** to continue.

6. The **Results** dialog box appears next. Click **Finish** to exit Flash Wizard.

> *Note: If you are using Windows NT, be certain to enable RAS and your fax service when the operating system restarts.*

Step 7: Restore Your Parameters

Your modem has been updated. You can now open your terminal program to reprogram your modem parameters or to confirm the update by typing **ATI** in the terminal window and pressing ENTER.

Appendix D - Installing Under Linux

Introduction

This appendix explains how to install a modem on a computer operating under the Red Hat Linux 6.2 operating system. Other versions of Red Hat and other Linux operating systems should be similar. Briefly, in Linux, you do not need drivers for most modems. Programs in Linux commonly call upon the port, rather than the modem.

Standard Linux Serial Port Definitions

PC port Linux port

Com1   ttyS0

Com2   ttyS1

Com3   ttyS2

Com4   ttyS3

Installation

Install the MultiModemZPX in the computer as described in Chapter 2.

Setup

1. Turn on the computer and allow the computer to boot to the command prompt.

2. Log on as **root**.

3. Determine the resources the modem is using by typing the command **cat /proc/pci** or the command **less /proc/pci**. Look for the entry listing **vendor id=11c1** and **device id=480**. Note the IRQ the device uses as well as the first I/O address listed.

     Output example:
   Non-prefetchable 32 bit memory at 0x00000000
   Bus 0, device 17, function 0:
   Communication controller:Unknown vendor Unknown device (rev 0)
   Vendor id=11c1   Device id=480
   Medium devsel. Fast back-to-back capable.   **IRQ 11**. Master Capable. No bursts.
   Min GNT=252. Max lat=14
   Non-prefetchable 32 bit memory at 0xe4000000
   I/O at 0x6400
   I/O at 0x6800
   I/O at 0x6c00

4. Using the IRQ and first I/O address from the output obtained in step 3, type the command **setserial /dev/ttyS***x* **uart 16550A port** *y* **irq** *z,* where *x* is the serial device you want to use, *y* is the I/O address, and *z* is the IRQ. Example: **setserial /dev/ttyS2 uart 16550A port 0x6400 irq 11**.

> *Note:* The preceding example places the modem on COM3. Your IRQ and port
> may vary. Substitute the IRQ and port values in the example with the values for
> your computer as listed in the results of the command issued in step 3. To set
> Linux to configure the modem at boot-up, use an editor such as "jed" and add the
> **setserial** command to the end of the rc.local file.

5. Once you've completed your installation, you must configure your modem for country-specific operation. See Chapter 2 for information on using AT commands to configure your modem for use in your country.

Using the Terminal Program Minicom to Verify Operation

This section describes how to make sure Linux can talk to the modem and be able to dial up to the Internet. Linux can use different programs and desktops depending on who made the Linux operating system and what version it is. The following procedures use the most commonly installed components of Red Hat 6.2. More information can be found in your Linux OS owner's manual.

1. At the command prompt, type **minicom –s** and press ENTER.

2. Select **Serial port setup** and press ENTER.

3. From **Serial port setup**, use the A key to access **Serial Device**, and then press ENTER.

4. Press ESC.

5. You are now in the Minicom terminal. Type **AT** and press ENTER. The screen should display *OK* to verify the operation. Alternately, dial a phone number to verify line operation

6. To leave Minicom, press CTRL + A, and then press Z.

7. On the help menu, press X to exit.

Using the Modem to Call the Internet

Linux allows different graphic user interfaces (GUI). In the following steps, we'll use the Gnome Desktop GUI and assume that the Internet Service Provider (ISP) you are calling assigns you the Domain Name Service (DNS) and Internet Protocol (IP) addresses. For more information on DNS or IP, see the Linux OS owner's manual or contact your ISP.

1. On the Task Bar at the bottom of the screen, select the Gnome Footprint.

2. Select **Internet** from the menu.

3. Select **Dialup Configuration Tool**.

4. Select **Add**, and then click **Next**.

5. Enter the connection name and phone number, and then click **Next**.

6. Enter your user name and password, and then click **Next**.

7. Select **Normal ISP** if your ISP is not listed, and then click **Next**.

8. Click **Finish**.

Calling the ISP

1. On the Task Bar at the bottom of the screen, select the Gnome Footprint.

2. Select **Internet** from the menu.

3. Select **RH PPP Dialer**.

4. Select the connection name you entered in step 5 of the previous section.

5. Click **OK**.

Answering Calls

To use the system for answering calls, Linux requires other programs to be installed, such as Mgetty, Mgetty+Sendfax, and others, depending on your requirements. Each vendor of Linux has more than adequate information on installing these programs.

Appendix E - Installing Under SCO OpenServer

Introduction

This appendix explains how to install a modem on a computer operating under the SCO OpenServer 5.0.x operating system. Briefly, in SCO OpenServer , you do not need drivers for most modems. Programs in SCO OpenServer commonly call upon the port, rather than the modem.

Installation

Install the MultiModemZPX in the computer as described in Chapter 2.

Setup

1. Turn on the computer and allow the computer to boot to the command prompt.

2. Log in as **root**.

3. Determine the port address and IRQ for the modem by typing: **hw -r pci**
   To output the port address and IRQ information to a file, type: **hw -r pci>pci.txt**

   Caution: If you choose to output the information to a file, make sure the output file name includes the .txt extension. While logged on as "root", the possibility exists that the system file "pci" will be overwritten. By default, UNIX does not ask if you want to overwrite a file.

4. Look at the **ClassCode: 0x078000** (other communications device) section of the output. The MultiModemZPX is identified as **SubSystemID: 0x0480**.

5. Use the first I/O address listed as the port address. In the output, look for:
   BaseAddr [x]: I/O *NxNNNN*
   where x is the first I/O base address (not memory) and *NxNNN* is the I/O address.

6. Use Serial Manager (or **mkdev serial**) to add a serial port. Choose **IBM Com** *X* for the new port, where *X* is the number of the new port. Use the first I/O address listed in the output file created in step 3 (**BaseAddr [x]:**) as the port address.

7. Use the IRQ listed in the **InterruptLine** of the output file created in step 3.

8. Once the serial port has been added, the system will require the kernal to be relinked. After the relinking is complete, restart the system to activate the changes.

9. Log back on as **root**.

10. At this point, you may configure the modem as needed on the new port and add required entries to Devices.

11. Once you've completed your hardware installation and system setup, you must configure your modem for country-specific operation. Refer to Chapter 2 for information on using AT commands to configure the modem for use in your country.

Note: If you are using the modem to dial out, a dialer may be needed.