Intelligent Serial *Interface*

ISI5634PCI/4/8
User Guide

MultiTech®
Systems

User Guide
Model ISI5634PCI/4/8
P/N S0000109, Revision D

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Record of Revisions

Revision	Description
A (2/12/99)	Manual released. All pages at Revision A.
B (4/9/99)	Novell Netware installation instructions added.
C (8/21/00)	Updated for universal ISI drivers
D (6/1/01)	Updated info on MTS patents, Windows 2000, Windows Me, and Novell Netware, and regulatory matters.

TRADEMARKS

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Contact Info	Patent Info
Multi-Tech Systems, Inc. 2205 Woodale Dr. Mounds View, Minnesota 55112, U.S.A. (763) 785-3500 (800) 328-9717 U.S. Fax: (763) 785-9874 Tech Support: (800) 972-2439 Internet: www.multitech.com	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; D394,250; 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; D374,222; 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; D361,764; D355,658; D355,653; D353,598; D353,144; 5,355,365; 5,309,562; 5,301,274. Other Patents Pending

Contents

Intelligent Serial Interface

Chapter 1—Introduction and Description

MultiTech Systems

Introduction

Welcome to the world of data communications. You have acquired one of the finest intelligent data and fax modems available today from one of America's oldest and most respected modem manufacturers—Multi-Tech Systems, Inc.

The new **Intelligent*Serial*Interface** card, model ISI5634PCI is a multiport serial port expansion card with four V.90/K56flex modems. The card's capability can be doubled by adding an auxiliary module, which also contains four modems. It is an excellent hardware solution for adding fast serial ports to communication servers and async hosts that have 32-bit PCI bus architecture.

Serial ports are essential to
- Communication servers that pool modems and other communication devices for users on a LAN
- Asynchronous hosts that provide user access through serial ports.

The ISI5634PCI ships with drivers for the following multiuser operating systems: Windows® 2000, Windows NT, versions 3.51 and 4.0; Windows 95 , Windows 98, and Windows Me; Novell Netware versions 3.x and 4.x.; SCO Open Server 5; and Linux.

The **Intelligent*Serial*Interface** card can be combined to support asynchronous serial devices (local or dial-up). The ports can be used to connect basic terminals with or without multiple pages of memory to multiplexer channels and asynchronous modems. Each ISI5634PCI port can support as many screens as there are physical pages of memory on the terminal. In Windows 95/98/Me, a built-in *autodetect* utility enables detection of Multi-Tech modems and sets the proper initialization strings.

ISI5634PCI Modems

The ISI5634PCI modems incorporate *V.90/K56flex*™technology, which enables Internet connections at data rates up to 53 Kbps over standard telephone lines. V.90/K56flex technology is able to send data downstream from the Internet to your computer at these speeds because data on the telephone network typically is converted from

digital to analog only once before it reaches your modem. Upstream transmissions and transmissions between client modems are limited to data rates of 33.6 Kbps, as are downstream transmissions that are converted more than once on the telephone network.

Note: Though these modems are capable of 56 Kbps download performance, line impairments, public telephone infrastructure, and other external technological factors currently prevent maximum 56 Kbps connections.

Modems on the ISI5634PCI card are Plug and Play capable with interactive automatic dialing and command mode 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. The modems pulse- or tone-dial and recognize dial tones and busy signals for reliable call-progress detection. The modems can detect AT&T calling card tones. They also have DTR dialing, Caller ID, remote configuration, callback security, two-wire leased-line, and 11-bit capabilities, and incorporate self-resetting lightning protection. Serial port speeds can be set to 230,400 bps. They are both FCC registered for connection without notification to the telephone company.

The ISI5634PCI card has full-duplex intelligent modems with V.42 error correction, V.42bis data compression, and V.17 (14,400 bps), Class 1 and 2, Group 3 fax capabilities. Voice functionality (+V commands) has also been added to the features of ISI5634PCI modems.

Intelligent*Serial*Interface

The ISI5634PCI is a multiport serial port expansion card that adds data buffering on each port for enhanced serial port performance. The ISI5634PCI features an on-board microprocessor to coordinate the communications activity of your local and remote terminals. Using the ISI5634PCI to provide additional serial connections enables your system's processor to perform more efficiently since the ISI5634PCI handles all byte-by-byte interrupts generated by asynchronous terminals and stores the data in buffers.

The processor, along with 256K bytes of RAM, works to allocate resources dynamically to the most active port. The ISI then generates one interrupt for an entire block of information and transfers the block to the system's microprocessor.

The ISI5634PCI has eight Mini RJ-11 jacks. It is a 3/4 size add-on card that supports a high-speed interface up to 230 Kbps.

How to Use This Manual

This manual contains hardware and operating system driver installation procedures, technical support and warranty information, and an appendix for additional information. Hardware configuration and installation procedures are described in Chapter 2. Installing the ISI5634PCI card also involves linking a driver to the operating system. This information is provided in Chapter 3.

It is assumed you have basic PC skills. Therefore, we have not included step-by-step instructions for basic operations such as logging in and file editing, etc.

Most of the steps listed in the driver installation section instruct you to press Enter. This is a reference to the key commonly known as the Enter, carriage-return, or Return key. Also, please note the difference between the letter O and the number 0. Both the letter and the number may be used in this manual.

ISI5634PCI Applications

The ISI5634PCI is an ideal solution for adding ports when a powerful microcomputer used as a server or host lacks enough connectivity to accommodate the desired number of users. The ISI5634PCI provides eight additional serial ports with every card installed, with a potential of four additional cards installed per system—for a total of thirty-two serial ports per system.

What Is in Your Modem Package?

Your modem package has several components. Make sure you have them all before trying to operate your modem. Your package should include:

- One ISI5634PCI/4 card
- One ISI5634PCI/EC auxiliary module (or "extender card"; part of the ISI5634PCI/8 model only)
- Four modular telephone cables (Eight with the ISI5634PCI/8 model)
- *Quick Start Guide* (printed manual)
- A full *User Guide* on CD-ROM
- An installation CD-ROM that includes drivers, auxiliary software, and documentation (readme files, this User Guide, etc.)

If any of these items are missing, contact Multi-Tech Systems or your dealer/distributor (see the Warranty, Service, and Tech Support section for information on contacting Multi-Tech via telephone and the Internet).

Related Manuals

The following related manuals are available on request:

82076200 *MT56XX Fax Class 1 Developer's Guide*

82006501 *TR29.2 (Proposed) Class 2 Fax Command Reference Manual*

88301900 *MT5634ZBA/ZBA-V User Guide (online manual)*

S0000099 *Voice +V Commands Developer's Guide*

Technical Specifications

Computer Requirements

- Pentium®- based PC or compatible with PCI Bus Architecture
- One of these operating systems: Microsoft Windows 2000, NT v. 3.51 or v. 4.0; Windows 95, Windows 98 and Windows Me; Novell Netware versions 3.x and 4.x., SCO Open Server 5; Linux.
- A CD-ROM drive.
- 100K bytes of hard disk space

Physical/Electrical/Environmental

- Dimensions: 6.875" x 4.2"
              17.46 cm x 10.67 cm
- Baud Rates: 300 bps to 230 Kbps per port
- Bus Type: PCI
- Connectors: Four (or eight) RJ-11 mini jacks
- Cables: Four (or eight) modulated telephone cables
- Temperature: 32° to 120°F (0° to 50°C)
- Power: 2.5 amp @ +5v DC (8 ports; ISI5634PCI/8)
          1.7 amp @ +5v DC (4 ports; ISI5634PCI/4)
- Base I/O Address: One 16-byte address space per card
- Interrupt Request (IRQ): One IRQ per card (can be shared)
- Warranty: Two years

Manufactured in Mounds View, MN, U.S.A.

Intelligent Serial Interface

Chapter 2—Hardware Installation

MultiTech Systems

Introduction

Included in this chapter are two sets of instructions for installing the
Multi-Tech ISI5634PCI card in your PCI bus personal computer. The
first set of instructions is for installing the ISI5634PCI card. The second
set contain instructions for installing the ISI5634PCI card and the
auxiliary module.

Safety Warnings Telecom

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jacks are
   specifically designed for wet locations.
3. This product is to be used with *UL* and *CUL* listed computers.
4. Never touch uninsulated telephone wires or terminals unless the
   telephone line has been disconnected at the network interface.
5. Use caution when installing or modifying telephone lines.
6. Avoid using a telephone (other than a cordless type) during an
   electrical storm. There may be a remote risk of electrical shock from
   lightning.
7. Do not use the telephone to report a gas leak in the vicinity of that
   leak.
8. To reduce the risk of fire, use only No. 26 AWG or larger
   Telecommunication line Cord.

Hardware Installation Procedures

Installing the ISI5634PCI card WITHOUT *the auxiliary module:*

1. Before handling the ISI5634PCI, discharge any static in your body
   by touching a piece of grounded metal such as the computer
   chassis.

2. Carefully remove the ISI5634PCI from its antistatic bag, handling it
   only by the mounting bracket and edges. Do not touch the gold-
   plated connectors along the bottom edge. (You may want to save
   packaging for possible future use.)

3. Visually inspect the ISI5634PCI card. If you have any concerns
   about its condition, call Technical Support at 800-972-2439.

4. To avoid damaging the ISI5634PCI card and your PC, make sure your computer and any peripheral equipment connected to it are turned off. The ISI5634PCI can be installed in any Pentium equivalent PCI bus computer.

5. Remove the cover of your computer as instructed in your computer's documentation.

6. Locate the unused PCI slot you will be using for your ISI5634PCI card and remove the slot cover according to instructions in your computer's documentation.

7. Install the ISI5634PCI card into the selected expansion slot in the same manner as any other add-on card, as instructed in your computer's documentation.

8. Fasten the retaining bracket to computer chassis and replace cover.

9. Plug one end of the phone cable into each modem's LINE jack and the other end into a phone line wall jack.

   There are 8 phone line receptacles on the ISI5634PCI-4, as well as 8 phone line receptacles on the ISI5634PCI-8. However, only four of these receptacles are functional on the ISI5634PCI-4 card. When connecting phone lines to the ISI5634PCI-4, be sure to use the first four receptacles on ISI5634PCI-4 card, *starting at the edge of the board with the screw-hole for attaching the card to the computer chassis.*

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

   Note: The Federal Communications Commission (FCC) and Industry Canada impose certain restrictions on equipment connected to public telephone systems. See Appendix A— Regulatory Information for more information.
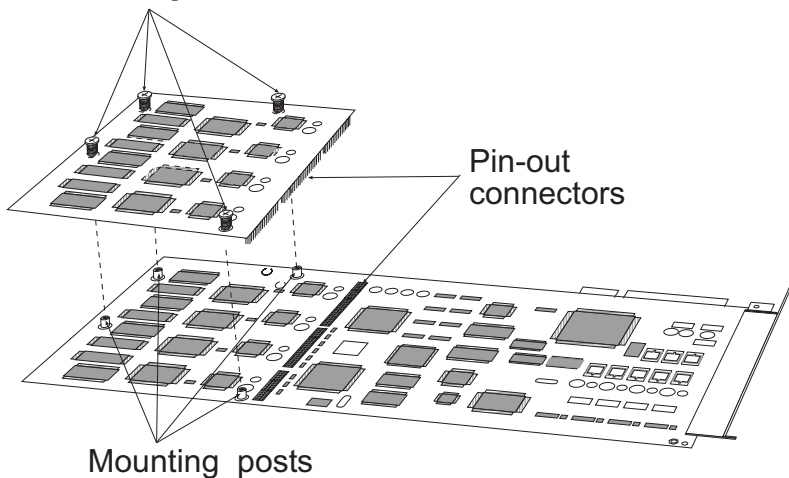
10. Turn on the power to the computer. You now are ready to install the software/drivers.

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Installing the ISI5634PCI card **WITH** *the auxiliary module:*

1. The auxiliary module attaches to the ISI5634PCI card. If you already have this card installed, you must remove it from the PC to install the auxiliary module.

2. Before handling the ISI5634PCI card or the auxiliary module, discharge any static in your body by touching a piece of grounded metal such as the computer chassis.

3. Carefully remove the ISI5634PCI card and module from the antistatic bag, handling only by the mounting bracket and edges. Do not touch the gold-plated connectors along the bottom edge. (You may want to save packaging for possible future use.)

4. Visually inspect the ISI5634PCI card and the auxiliary module. If you have any concerns about its condition, call Technical Support at (800) 972-2439.

5. To avoid damaging the card, module, or your PC, make sure your computer and any peripheral equipment connected to it are turned off. The ISI5634PCI and auxiliary module can be installed in any Pentium equivalent PCI bus computer.

6. Remove the cover of your computer as instructed in your computer's documentation.

7. Before installing the ISI5634PCI card, carefully line up the pin-out connectors of the ISI5634PCI card with the pin-out connectors of the auxiliary module. See figure below.

Mounting screws

Pin-out connectors

Mounting posts

8. Press gently but firmly to seat the module onto the card.

9. Fasten the mounting connections (four screws) of the auxiliary module to the ISI5634PCI card. See figure above.

10. Install the ISI5634PCI card into the selected expansion slot in the same manner as any other add-on card, as instructed in your computer's documentation.

11. Fasten the retaining bracket to computer chassis and replace cover.

12. Plug one end of the phone cable into each modem's LINE jack and the other end into a phone line wall jack.

13. Turn on the power to the computer. You now are ready to install the software/drivers.

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

Note: The Federal Communications Commission (FCC) and Industry Canada impose certain restrictions on equipment connected to public telephone systems. See Appendix A— Regulatory Information for more information.

Intelligent
Serial *Interface*

Chapter 3 — Software/Driver Installation

MultiTech®
Systems

Introduction

The ISI5634PCI card ships with drivers for each of the following operating systems: Windows® 2000, Windows NT, Windows 95, Windows 98, Windows Me, Novell Netware versions 3.x and 4.x, SCO Open Server 5, and Linux. This chapter describes the installation of these drivers.

In most cases, you will receive the ISI software drivers on a CD-ROM. In certain situations, however, software may be downloaded from the MultiTech web site, often onto diskette, and then installed. The instructions in this chapter generally presume that the driver files are being installed from CD-ROM and therefore show driver files being loaded from locations on the ISI CD-ROM. If installation is from diskette, you will be loading driver files from file path locations on that diskette. For example, a driver file found at `E:\servcard\drivers\win2000\` when installing from CD-ROM, might be located simply at `A:\` if installation is from diskette.

Installing a device driver modifies your system. For this reason, only the *super user* (system administrator) is allowed to perform the installation. If you cannot login as **administrator**, find the person in your organization with this authorization (i.e., password). To begin driver installation, login as **administrator**. Then proceed with the appropriate section: Windows 2000, Windows NT or Windows 95/98/Me. For Novell Netware, you need rights to read and write to the SYSTEM directory. The Unix-based OSs SCO and Linux similarly require such administrative rights.

Installing ISI5634PCI Software for Windows 2000

NOTE: A series of 'installation wizard' screens will appear repeatedly during this procedure (step 12). This is not an error. Do not discontinue the procedure when the 'installation wizard' screens repeatedly appear.

1. Shut down Windows 2000 and turn off the PC.

2. Install the ISI5634PCI card in an available PCI expansion slot in the computer. Follow the computer manufacturer's instructions concerning installation of expansion cards. Observe standard precautions regarding electro-static discharge (ESD) when

handling the ISI5634PCI board (the board should be kept in its shipping bag until used). During installation, handle the ISI5634PCI circuit card by its edges and keep one hand in contact with the PC chassis.

3. Turn on the PC and start Windows 2000.

4. Insert the ISI driver CD-ROM into the CD-ROM drive (if drivers have been downloaded from the MultiTech web site, they will typically be on diskette; in that case, insert diskette into floppy drive).

5. Windows 2000 will detect the ISI5634PCI card. The **Found New Hardware Wizard- Welcome** screen will appear.

Click **Next**.

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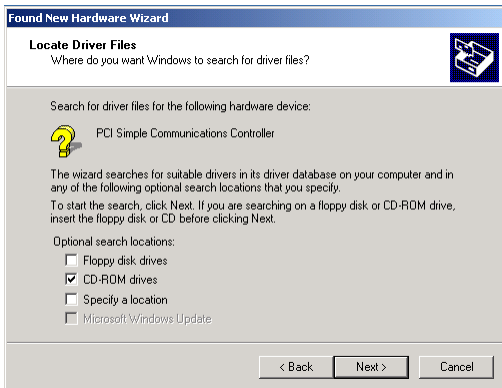
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6. The **Install Hardware Device Drivers** screen appears. Select "Search for a suitable driver ..." and click **Next**.

7. The **Locate Driver Files** screen appears (Windows 2000 is seeking the driver for the ISI5634PCI card). Select "CD-ROM drives" and click **Next**.

8. The **Driver File Search Results** screen appears.
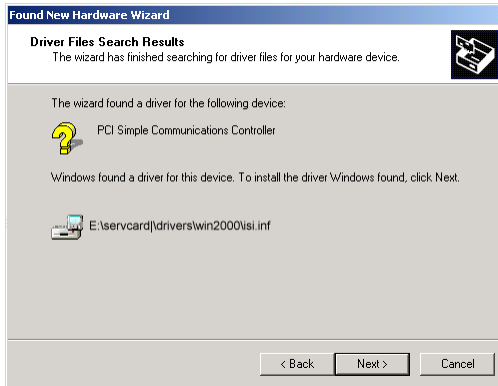
Click **Next**.

9. A progress screen will appear briefly while files are being copied.
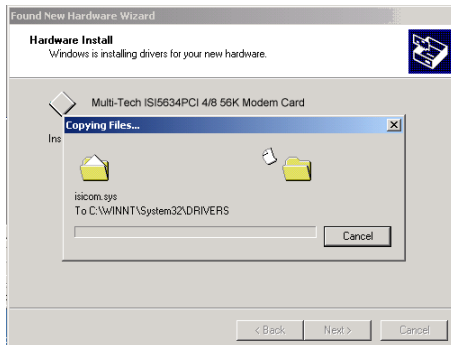
10. A completion screen will appear.
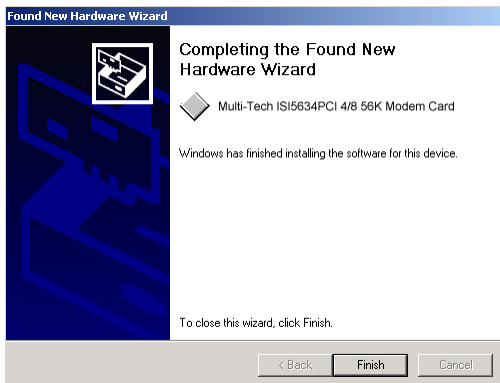
Click **Finish**.

11. Immediately after the ISI driver installation has been completed, another **Found New Hardware** screen will appear briefly indicating that the "MultiTech ISI Port" has been detected.
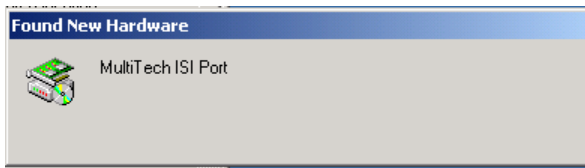
A second sequence of 'installation wizard' screens appears. This sequence of screens deals with the setting up of ISI ports. The first screen in this sequence is the **Found New Hardware Wizard -- Welcome** screen.

The **Found New Hardware -- MultiTech ISI Port** screen will appear once for each modem on the ISI5634PCI card:

• **8** times for the ISI5634PCI-**8**; or,

• **4** times for the ISI5634PCI-4.

12. The **Install Hardware Device Drivers** screen appears.



Select "Search for a suitable driver ... " and click **Next**.

13. The **Locate Driver Files** screen appears (Windows 2000 is seeking the ISI Port device driver). Select "CD-ROM drives" and click **Next**.
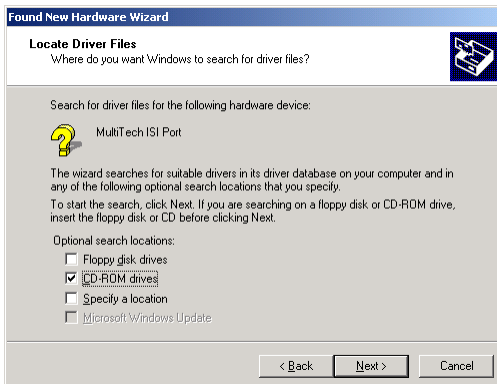
14. The **Driver Files Search Results** screen will indicate that the "isiport.inf" file has been found on the CD-ROM.
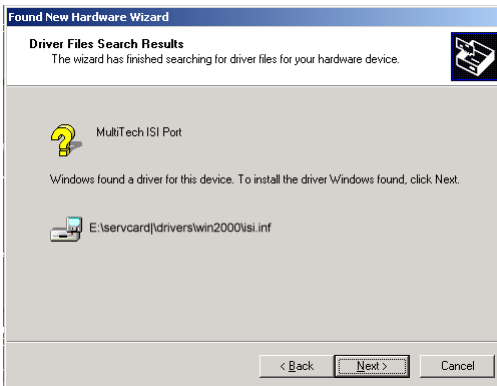
Click **Next**.

15. A completion screen will appear. It will indicate that the first "MultiTech ISI Port" has been set up successfully.

Click **Finish**.

Notice that the auto-detection facility of Windows 2000 will repeat the "ISI Port" installation sequence 3 more times for ISI5634PCI-4, or 7 more times for ISI5634PCI-8. That is, the **Found New Hardware -- MultiTech ISI Port** screen will appear many times after the ISI driver has been located. On this screen, the messages "Found New Hardware" and "Installing ..." will appear alternately.

Please understand that the repetition of these screen sequences is normal and is not an error. It does not indicate any problem with your PC, or with the MultiTech ISI card, or its driver software.

16. Driver installation for the ISI5634PCI card is complete.

ISI5634PCI for Windows 2000: Installing Modems to COM Ports

Pre-Requisite: Installation of Windows 2000 driver software must be completed before you can install the modems of the ISI5634PCI card.

1. Go to **Start | Settings | Control Panel | Phone and Modem Options**.

2. The **Location Information** screen appears.
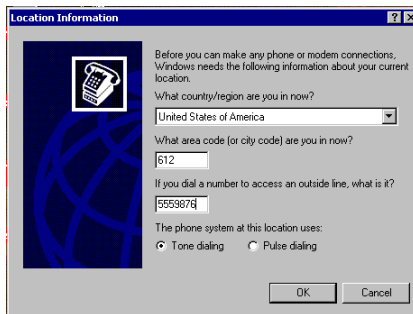
Enter the appropriate area code and access number. Click **OK**.

3.   At the **Phone and Modem Options** screen, click on the **Modems** tab and click **Add**.

4. At the **Install New Modem** screen, click on "Don't detect my modem ... " and click **Next**.
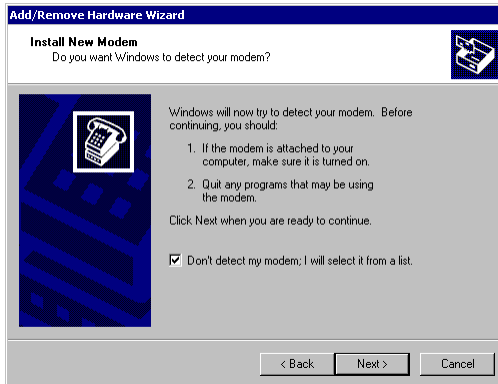
5. If the software driver CD-ROM (or other media, in cases of using drivers downloaded from the MultiTech web site) is not already in the appropriate disk drive in the PC, insert it now.

6. The **Add/Remove Hardware Wizard** screen will appear.
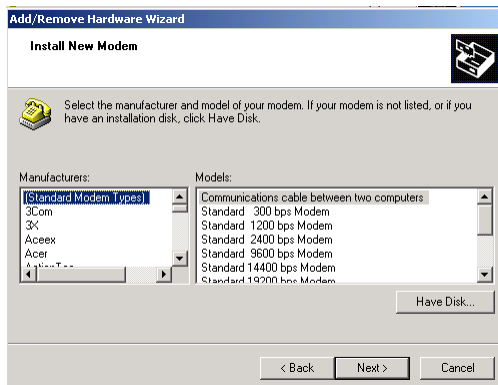
Click "Have Disk ... ."

7. The **Install from Disk** screen will appear.
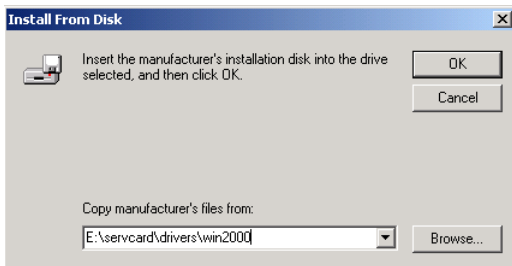
Type or browse for the file path of the modem software (for example, E:\servcard\drivers\win2000). Click **OK**.

8. The **Install New Modem** screen will appear.
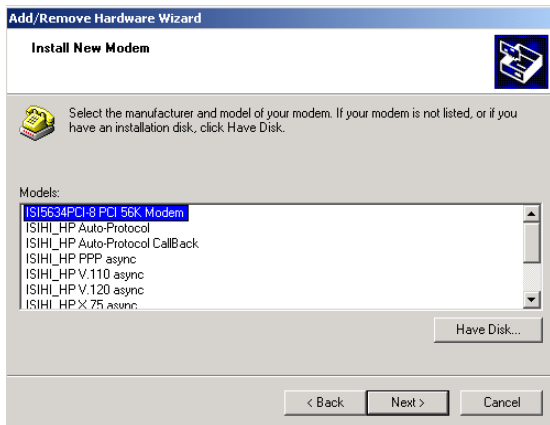
Highlight "ISI5634PCI -8 PCI 56K Modem." Click **Next**.

9. The **'Install New Modem** - *port list'* screen will appear.
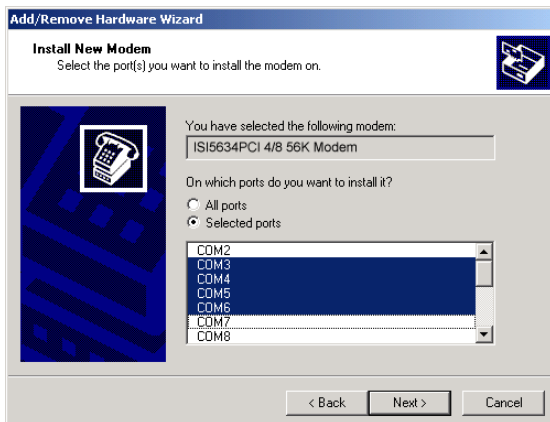
Highlight the COM ports on which you want modems to be installed. You must allocate 4 ports for the ISI5634PCI-4, or 8 ports for the ISI5634PCI-8.

Click **Next**.

10. A progress screen will appear as modem installation begins.

11. Screens denoting the installation of modems to specific COM ports will appear for each modem installed.
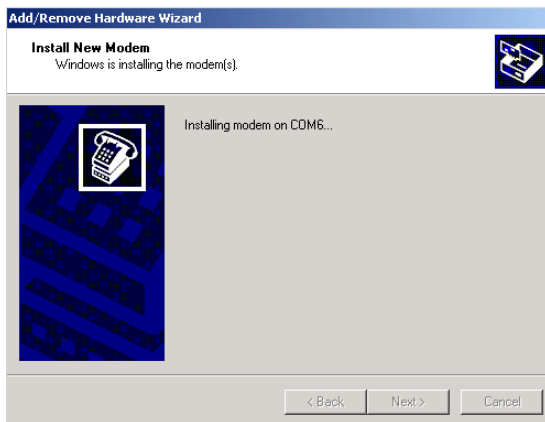
12. A completion screen will appear.
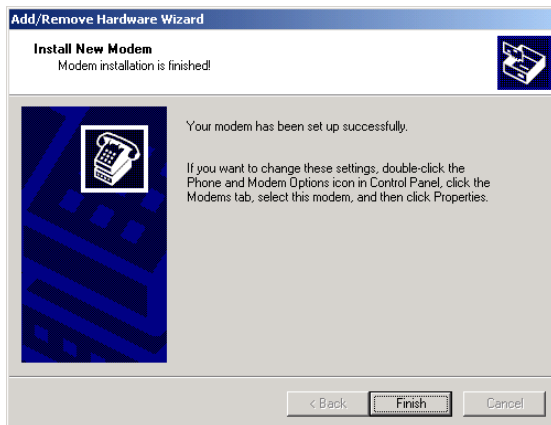
Click **Finish**.

13. The **Phone and Modems Options** screen (**Modems** tab) will re-appear and display the modems that have just been assigned to COM ports.
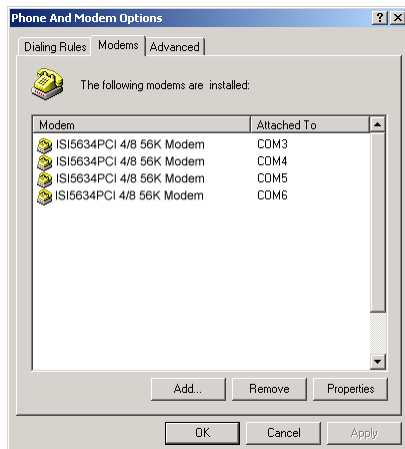
Installation of modems to COM ports in Windows 2000 is now complete.

Remove ISI5634PCI Driver (Windows 2000)

1. Go to **Start** | **Settings** | **Control Panel**.

2. Click on **Add/Remove Hardware**. Click **Next**.

3. Click on "Uninstall/Unplug a device" and click **Next**.

4. In the subsequent screen, click on "Uninstall a device" and click **Next**.

5. At the **Add/Remove Hardware Wizard** screen, highlight the ISI driver file for the specific server card that you intend to remove. Click **Next**.

6. When you are asked to confirm removal, click on the **Yes** radio button and click **Next**.

7. Click **Finish**. You can remove the driver for only one ISI5634PCI card at a time.

ISI5634PCI for Windows 2000: Installing ISI Management Software (server OSs only)

If you are using a Windows 2000 Server operating system ("Server" or "Advanced Server"), you must decide whether you want to use the MultiTech ISI Management Software in conjunction with your ISI5634PCI board. The ISI Management Software is shipped with the ISI card and, alternatively, can be downloaded from the MultiTech web site (www.multitech.com).

1. Turn on your computer and start Windows 2000.

2. Insert the CD-ROM or diskette containing the ISI Management Software into your CD-ROM or floppy drive.

3. Go to **Start | Run**. In the **Run** window, enter the file path at which the ISI Management Software setup program is located; for example `D:\MANAGEMENT\SETUP.EXE`.

   Click **OK**.

4. The **ISI Management** setup screen appears. At the **Welcome** screen, click **Next**.

5. A progress screen appears while files are copied. If the **Error Creating Virtual WWW Server** message appears, it may indicate that there was an attempt to install the ISI Management Software on a client version of Windows 2000. (The ISI Management Software can be installed only in the *Windows 2000 Server* and *Windows 2000 Advanced Server* operating systems.)

6. A completion screen appears. Select "Yes, I want to restart my computer now" and click **Finish**.

After the computer has restarted, the installation of the ISI Management Software will be complete.

Installing the ISI5634PCI Card in Windows NT 3.51/4.0

The following procedure describes how to install the ISI5634PCI in a system operating Microsoft Windows NT 3.51 or 4.0 for use with Remote Access Service (RAS) server and other communications/fax server type applications. These procedures apply to both 3.51 and 4.0.

1. Turn off the PC.

2. Install the ISI5634PCI card in an available PCI expansion slot in the computer. Follow the computer manufacturer's instructions concerning installation of expansion cards. Observe standard precautions regarding electro-static discharge (ESD) when handling the ISI5634PCI board (the board should be kept in its shipping bag until used). During installation, handle the ISI5634PCI circuit card by its edges and keep one hand in contact with the PC chassis.

3. Turn on the PC and start Windows NT.

4. Insert the ISI driver CD-ROM into the CD-ROM drive (if drivers have been downloaded from the MultiTech web site, they will typically be on diskette; in that case, insert diskette into floppy drive).

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5. Click **Start**, **Settings**, **Control Panel**, and then double-click **Network**. In the **Network** dialog box, click the **Adapters** tab.
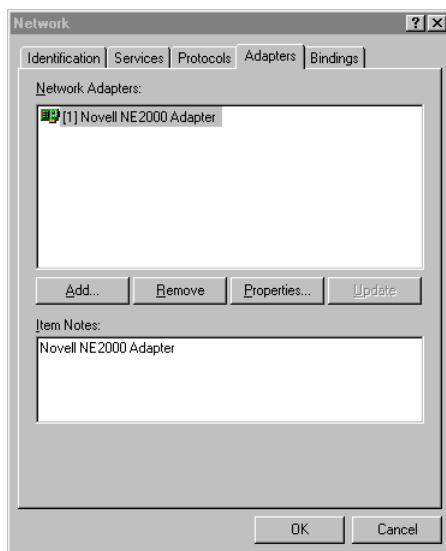
Click **Add**.

6. The **Select Network Adapter** dialog box appears. Click **Have Disk**.
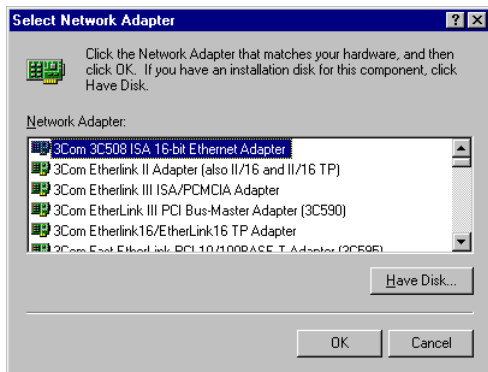
7. The **Insert Disk** dialog box appears. Type in or browse for the path (file directory location) of the Windows NT driver (for example, E:\servcard\drivers\winnt\setup.exe). Click **OK**.

8. The **Select OEM Option** dialog box appears. Click **OK**. The driver files will be copied from the installation CD-ROM.
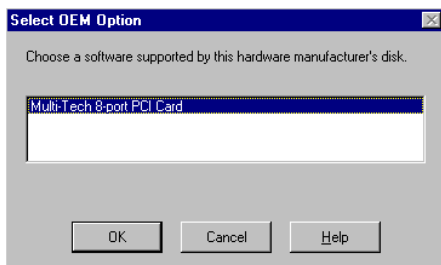
A transient dialog box will appear indicating the progress of the setup program.

9. The **ISI Cards** dialog box appears. Click **Add**.

10. Then the **ISI Card Settings** dialog box appears. In the **Port Count** field, enter the correct port count, as follows:

   • allocate 4 ports for the ISI5634PCI-4

   • allocate 8 ports for the ISI5634PCI-8

Select the first port number (**Starting Port** field) for ISI5634PCI modems. Typically, in a newly outfitted server, this will be COM3.

In the **Bus Type** field, select "PCI."

When the correct settings have been made, click **Done**.

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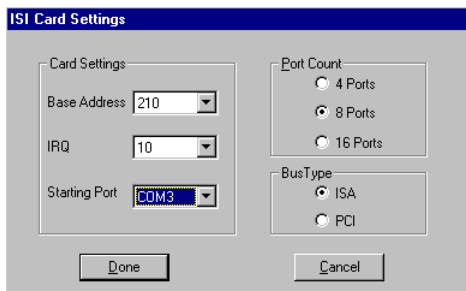
11. The **ISI Cards** dialog box appears again showing the port resource allocation that has just been made.
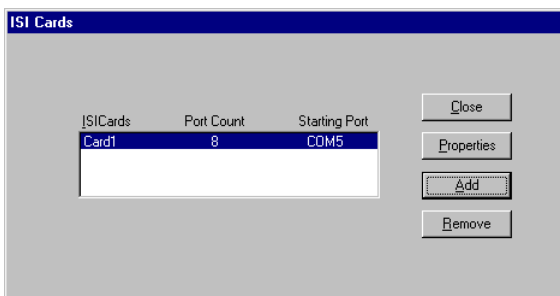
To add additional ISI5634PCI cards, click **Add** and repeat step 10. After the last ISI card has been added, click **Close** in the **ISI Cards** dialog box.

12. The **Multi-Tech 8-port PCI Card** appears in the **Network Adapters** dialog box. Click **Close**.
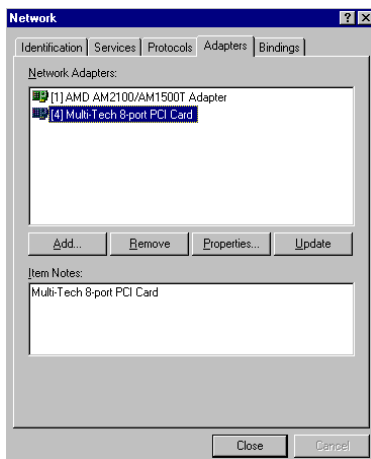
13. After bindings are reviewed and stored, the **Network Settings Change** dialog box appears. Click **Yes** to reboot your system.
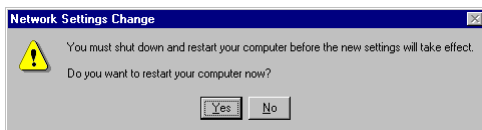
The ISI5634PCI now is installed in Windows NT and you are ready to install modems.

Installing Modems to COM Ports in Windows NT

1. Click **Start|Settings|Control Panel**, and double-click the **Modems** icon.

2. The **Modem Properties** dialog box appears. Click **Add**.

3. The **Install New Modem** dialog box appears. Check the box marked **Don't detect my modem; I will select it from a list** and click **Next**.
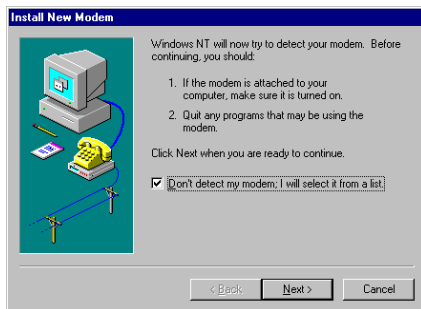
4. The **Install New Modem - Models** dialog box appears.
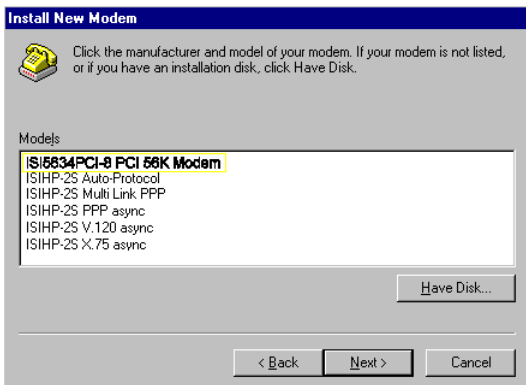
Highlight "ISI5634PCI-8 PCI 56K Modem" and click **Next**.

5. Select ports for modem use.

• For the ISI5634PCI-4, you should have reserved four ports during driver installation. Highlight four ports in the list.

• For the ISI5634PCI-8, you should have reserved 8 ports during driver installation. Highlight eight ports in the list.

Click **Next**. The modems will be installed to the selected COM ports.
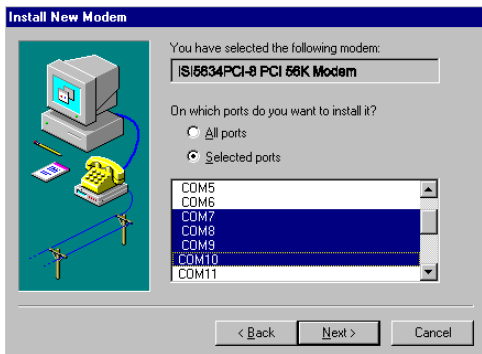
6. After the modems install to the ports, click **Finish** to return to the **General** tab.
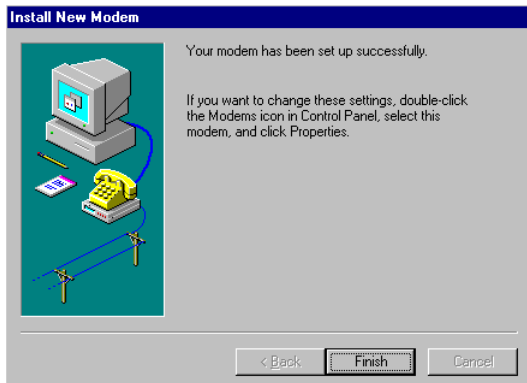
7. To view COM port assignments (and make changes if necessary), use the **Modem Properties** dialog box.
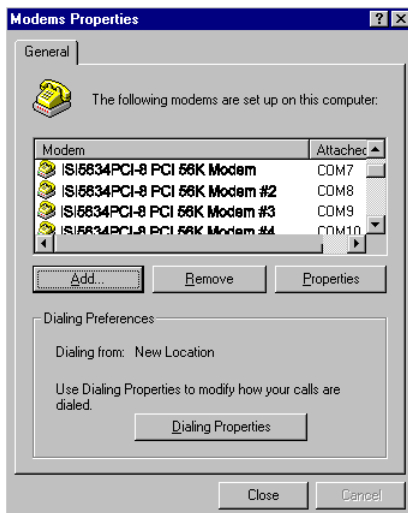
8. When finished, close the **Modem Properties** dialog box. The message below appears asking if you want to configure Dial-Up Networking. Click **Yes**.
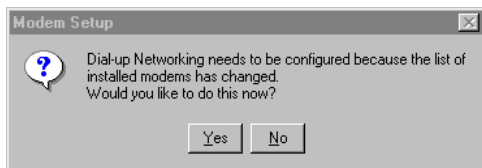
9. The **Remote Access Setup** dialog box appears. Click **Add**.
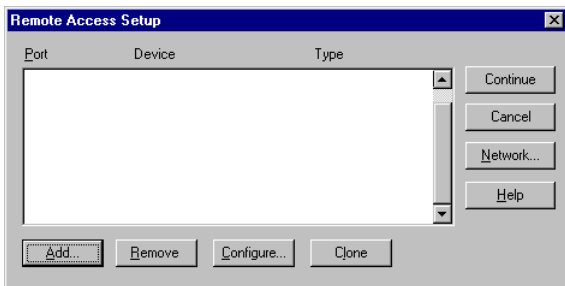
10. Each COM port appears in a separate **Add RAS Device** dialog box. To add the highlighted device, click **OK**.
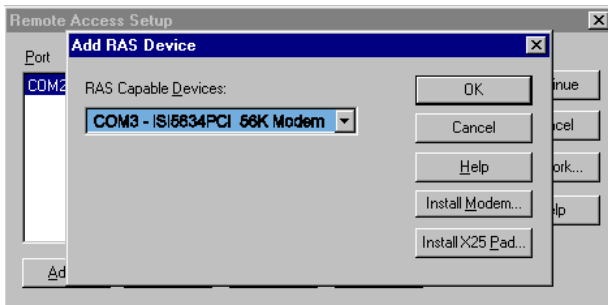
11. The **Remote Access Setup** dialog box displays again. Repeat steps 9 and 10 until all modems are added.

12. When all modems have been added, click **Continue**.

Remote Access Setup			
Port	Device	Type	Continue
COM3	ISI5634PCI-8 PCI 56K Modem	Modem (unimodem)	Cancel
COM4	ISI5634PCI-8 PCI 56K Modem #2	Modem (unimodem)	Network...
COM5	ISI5634PCI-8 PCI 56K Modem #3	Modem (unimodem)	Help
COM6	ISI5634PCI-8 PCI 56K Modem #4	Modem (unimodem)	
COM7	ISI5634PCI-8 PCI 56K Modem #5	Modem (unimodem)	
COM8	ISI5634PCI-8 PCI 56K Modem #6	Modem (unimodem)	
COM9	ISI5634PCI-8 PCI 56K Modem #7	Modem (unimodem)	
COM10	ISI5634PCI-8 PCI 56K Modem #8	Modem (unimodem)	

[Add...] [Remove] [Configure...] [Clone]

13. After bindings have been reviewed and stored, you will be prompted to re-start your computer. Click **Yes**.

Network Settings Change	
⚠	You must shut down and restart your computer before the new settings will take effect.
	Do you want to restart your computer now?
	[Yes] [No]
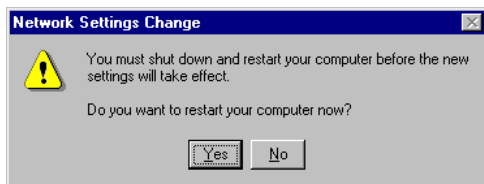
You have completed installation of modems to COM ports and configuration of RAS in Windows NT.

Note: By default, Microsoft sets the serial baud rate at 57,600 bps. For improved performance, you can raise the serial baud rate. To do so, go to **Start | Settings | Control Panel**. *Click on the* **Modems** *icon. Then click on the* **Properties** *button of the* **Modems Properties** *dialog box. Reset the "Maximum Speed" as needed. A speed of 320,400 bps improves performance significantly without complications in most cases.*

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Removing ISI5634PCI Driver in Windows NT 3.51/4.0

1. Click **Start**, **Settings**, **Control Panel**, and then double-click **Network**.

2. The **Network** dialog box appears. Click the **Adapters** tab.

3. Select **Multi-Tech 4, 8, 16-port ISI Card,** and then click **Remove**.

4. To complete an uninstall, reboot your computer.

ISI5634PCI Software Installation Procedure for Windows 95/98/Me

1. Turn off the PC.

2. The ISI5634PCI card must be installed in an expansion slot in the computer. If not, follow the computer manufacturer's instructions concerning installation of expansion cards. Install the ISI5634PCI card in an available PCI expansion slot. Observe standard precautions regarding electro-static discharge (ESD) when handling the ISI board (the board should be kept in its shipping bag until used). During installation, handle the ISI circuit card by its edges and keep one hand in contact with the PC chassis.

3. Turn on the PC and start Windows 95/98/Me.

4. Windows will autodetect the ISI5634PCI card. When the **Add New Hardware Wizard** screen appears, click **Cancel**.

5. Insert the MultiTech ISI driver CD-ROM into the CD-ROM drive. (If driver was downloaded from MultiTech web site and placed on a diskette, insert diskette into floppy drive now.)

6. (Follow either 6A or 6B, but not both.)

A. From Windows Explorer, open the **95-98-Me** directory on the CD-ROM (for example, E:\SERVCARD\DRIVERS\95-98-ME\SETUP.EXE) or floppy drive that contains the ISI driver file. Highlight the file **setup.exe**.
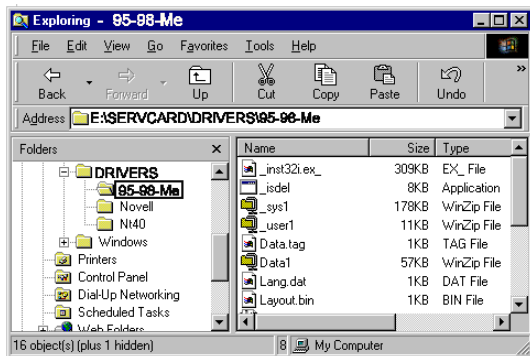
B. From the **Start** menu, go to **Run**. Browse to the path of the **95-98-ME** directory (for example, E:\SERVCARD\DRIVERS\95-98-ME\).

7. Launch the setup program. (From Windows Explorer, double-click on **setup.exe**; from the **Run** menu, click **OK**.)

8. The installation wizard will begin running. At the **Welcome** screen, click **Next**.

9. Under **Select Type of Card**, do not check the **Install ISA Card** box.
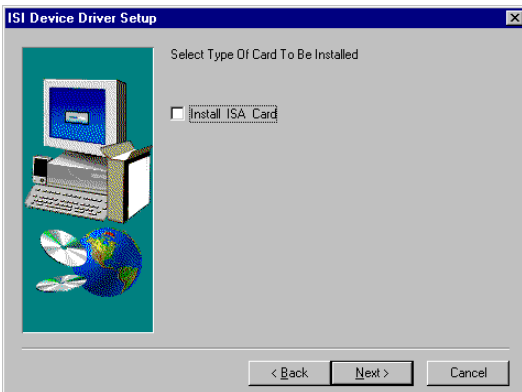
   Click **Next**.

10. A completion screen appears.

11. When prompted to restart your computer, click **Yes** and click **OK**.
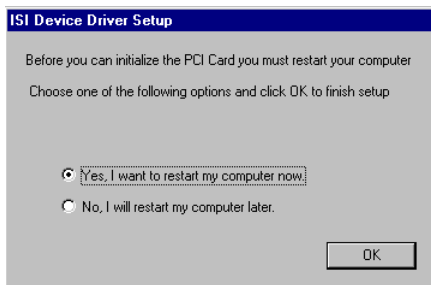
12. During the re-start process, Windows 95/98/Me will detect the ISI5634PCI card. The **Add New Hardware Wizard** screen will appear. Click **Next**.

13. The next screen asks, **What do you want Windows to do?** Click on **Search for the best driver for your device.** Click **Next**.

14. When asked for the location at which Windows 95/98/Me should search for the new driver, check **Specify a Location** and enter the path (file directory location) of the driver.

15. Windows will indicate that the .INF file for the ISIHP card has been found. Click **Finish** to complete device driver installation.
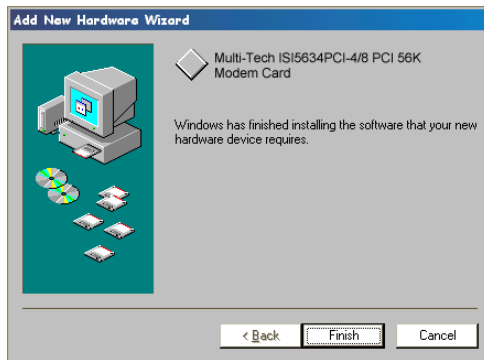
16. Windows will now detect and create COM ports (for ISI5634PCI-4, 4 ports are made; for ISI5634PCI-8, 8 ports are made).

17. After the COM parts have been created, you must re-boot your PC (remove the diskette from the floppy drive before re-booting).

18. To view the COM ports, click **Control Panel** and double-click **System**. The **System Properties** dialog box appears.
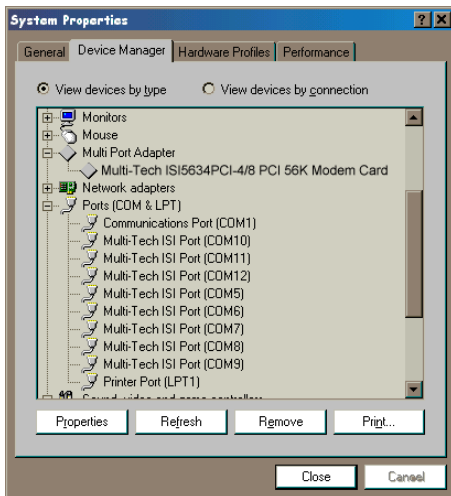
The **MultiTech PCI ISI Card** is located under **Multi Port Adapter**. Click **Ports (COM & LPT)** to view the ports. Click **OK** to close.

Installing Modems to COM Ports in Win 95 /98/Me

1. Click **Start**, **Settings**, **Control Panel**, and then double-click the **Modems** icon. In the **General** tab, click **Add**.
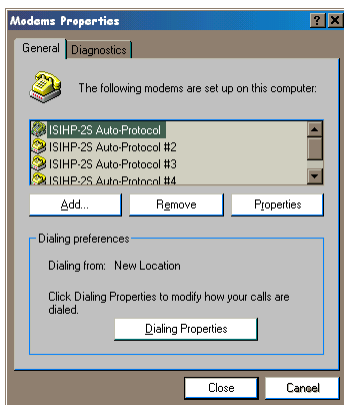
2. The **Install New Modem** dialog box will appear. Check the box marked "Don't detect my modem; I will select it from a list**."** Then click **Next**.

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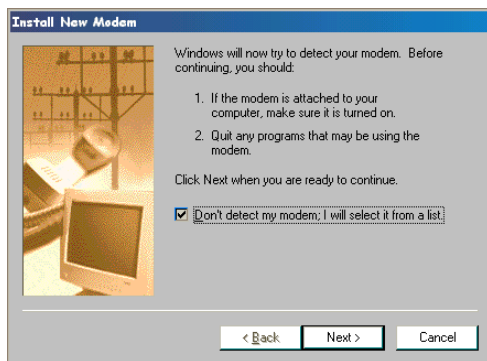
3. The **Install New Modem - Manufacturers** dialog box appears. In the **Manufacturers** list, scroll down and highlight "MultiTech Systems." In the **Models** list, highlight the modem type used on the ISI board. Highlight "ISI5634PCI-8 PCI 56K Modem" and click **Next**.
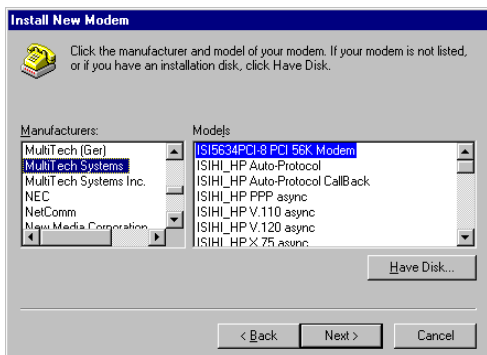
4. The **Install New Modem** dialog box appears. Select the numbered COM ports onto which you want to install the modems. For the ISI5634PCI-4, select four COM ports (COM6 through COM9 are shown in this example). For the ISI5634PCI-8, select eight COM ports.
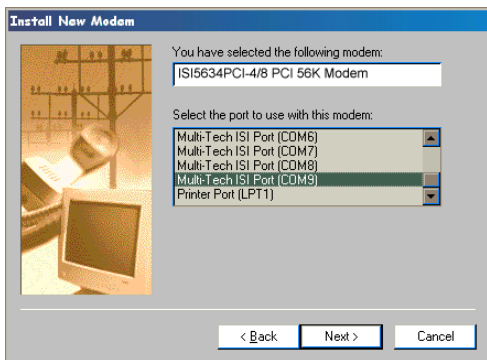
Click **Next**. The modems will be installed to the designated COM ports.

5. When installing the first ISI modem, the **Location Information** screen will appear (it does not appear when additional modems or terminal adapters are installed). Fill in the appropriate area code and phone number information.

6. After the modem installs to the port, click **Finish.**
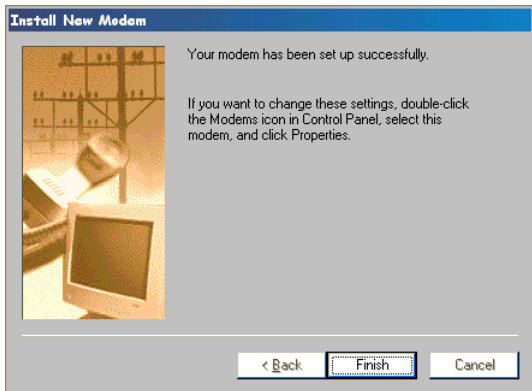
7. Return to the **General** tab to view COM port assignments (and make changes if necessary).
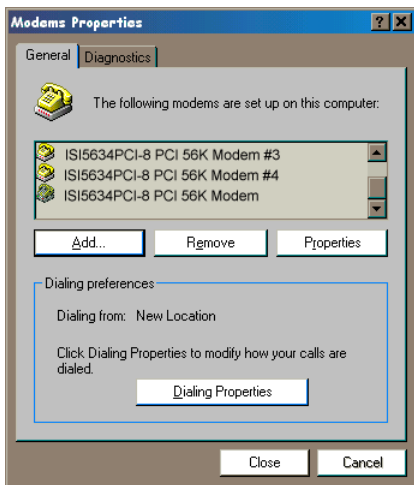
8. Click **Add** and repeat installation steps 2–7 to install modems (one at a time)
   - to the last three modem ports of the ISI5634PCI-4, OR
   - to the last seven modem ports of the ISI5634PCI-**8**.
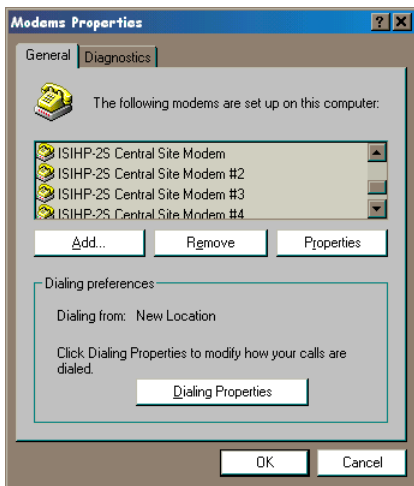
Removing the ISI5634PCI Driver (Windows 95/98/Me)

1. Click **Settings**, **Control Panel**, and then double-click **Add/Remove Programs**.

2. From the list box, select **MultiTech ISI Driver Device**.

3. Click **Add/Remove** and follow screen instructions.

NetWare Driver Installation

Multi-Tech Systems provides AIO drivers for the ISI5634PCI cards, so they can function with Novell compatible asynchronous applications (e.g., NetWare Connect). The AIO driver is simply an NLM (NetWare Loadable Module) that runs on the file server. Drivers must be loaded on the file server where the board is installed. Drivers can be loaded from the file server's console prompt or incorporated for autoloading in the AUTOEXEC.NCF file.

The file AIOMTS.MDC contains Novell (version 3.12 and higher) initialization strings for ISI products not previously listed for use with BorderManager and Netware Connect. The file AIOMTS.MDC is included on the ISI Product Family CD. To benefit from the AIOMTS.MDC file, you must copy it from the CD to the appropriate directory on your computer.

To use AIOMTS.MDC under Border Manager, RAS, NIAS in 4.2 or 5.x:

Copy AIOMTS.MDC to your System directory.

To use AIOMTS.MDC under Novell NetWare 3.x, 4.1, 4.11 with NetWare Connect 2.0.28 or higher:

Copy AIOMTS.MDC to your System and System/AIO directory.

To install the Multi-Tech AIO driver, copy the file *AIOISIX.NLM* to the system directory of the file server from a workstation on the network. To copy, you can use the following command:

```
COPY E:\SERVCARD\DRIVERS\NOVELL\AIOSIX.NLM
F:\SYSTEM
```

If you have downloaded the ISI driver from the MultiTech web site onto a diskette, use this command:

```
COPY A:\NOVELL\AIOISIX.NLM  F:\SYSTEM
```

To load the driver, go to the system or PC console (where the ISI card is installed) and enter the following at the prompt:

```
LOAD AIOISIX [port=W] [interrupt=X] [name=Y] [note=Z]
```

Because the ISI5634PCI models are PCI-bus cards, Netware will set up the interrupt (IRQ) and I/O address automatically.

To install the ISI card scripts, copy **aiomdms.mdc** to **f:\system\aio\directory**. Click **Yes** to overwrite the existing aiomdms.mdc file.

Configuring Ports for NetWare Connect

When the driver is installed, it will allocate consecutive ports for the ISI card as follows:

• 8 consecutive ports for the ISI5634PCI-8

• 4 consecutive ports for the ISI5634PCI-4

To set up NetWare Connect ports, enter **LOAD NWCCON** at the NetWare console prompt. LOAD NWCCON opens the NetWare Connect Configuration Utility. Select the appropriate menu options (modem type, speed, flow control, etc.).

Removing the Driver (Novell)

In Novell, remove file AIOISIX.NLM from the system directory and make the appropriate changes to the *Autoexec.ncf* file.

SCO Open Server 5 Driver Installation

The ISI driver for SCO Open Server 5 is shipped on CD-ROM (FAT file system) and can also be downloaded from the Multi-Tech web site. In both cases, the driver files are compressed ("tarred"). Users installing from the CD-ROM should begin at "To install from CD-ROM" directly below. Users installing from a floppy disk should skip down to "To install driver from floppy disk" later in this section. The filename of the SCO5 driver in its tarred form is **sco50x.tar**.

This present installation section is task-oriented with minimal explanation of procedural steps. The section *Multi-Tech Installation Script,* which immediately follows this section, presents additional details to aid in installation.

To install from CD-ROM:

```
# mount -r /dev/cd0 /mnt
# cd /mnt
# cd servcard/drivers/sco50x
#cp sco50x.tar /
# cd<ENTER>
```

To format a floppy disk for SCO5:

1. At the Unix prompt, run the **scosh** program.

2. Select **Manager**.

3. Select **Archive**.

4. Select **Format**.

5. Make sure that Device is pointed to the floppy drive.

6. Select **Continue**.

To untar the driver file and copy files onto floppy disk:

1. Make a temporary directory for the ISI driver files..

```
# mkdir /isi
```

2. Copy the tarred isi driver file into the temporary directory.

```
# cp sco50x.tar /isi
```

3. Untar this file and put its contents into the temporary directory.

```
# cd /isi
# tar xvf sco50x.tar
```

4. Copy the untarred (inflated or non-compressed) files to a floppy disk

```
# cd /isi/unifiedinstimg301
#scosh
```

- Select **Manager**.

- Select **Archive**.

- Select **Create**.

- Press space bar to highlight tmp/ and usr/ directories.

- Press <ENTER> to copy.

- Make sure Device is pointed to the floppy disk.

- Make sure that the "Type" is cpio.

- Select **Continue**.

5. To verify that the files have been copied onto the floppy disk, use these commands:

```
# scosh
```

- Select **Manager**.

- Select **Archive**.

- Select **List**.

- Make sure Device is pointed to the floppy disk.

- Select **Continue**.

To install driver from floppy disk

(Users starting with the untarred SCO5 driver on a floppy disk can begin the installation here).

1. Run the **custom** utility.

2. Select **Software**.

3. Select **Install New**.

4. Highlight driver file from local host and select **Continue**.

5. Select as the Media Device "Floppy Disk Drive."

6. Select **Continue**.

7. Highlight "Multi-Tech ISA/PCI ..." and select **Install**.

8. Enter **Y** (yes) to continue installing the ISI driver.

9. As many as four ISI cards can be installed in the server. Regardless of how many cards you will install in your server, type **0**. (Because the ISI5634PCI cards are PCI-equipped, SCO can detect the cards and will set up I/O addresses and IRQ values as needed.

For further details see *MultiTech Installation Script* step 1.

10. Type the number of pseudo-devices to be created.
For the ISI5634PCI-4, type **4**.
For the ISI5634PCI-8, type **8**.

For further details see *MultiTech Installation Script* step 2.

11. Type **Y** (yes) to accept the prefix for tty ports. For further details see *MultiTech Installation Script* step 3.

12. Type **Y** (yes) to confirm the selection. For further details see *MultiTech Installation Script* step 4.

13. After the driver is installed, press <ENTER> to continue. For further details see *MultiTech Installation Script* step 4(last paragraph) and step 5.

14. Exit the **custom** utility. For further details see *MultiTech Installation Script* step 6.

15. Remove the floppy disk and reboot your computer. For further details see *MultiTech Installation Script* step 7.

MultiTech Installation Script

The Multi-Tech Installation Script for SCO Open Server 5 systems requests information about how many boards you want to install, designations for communication ports and printer ports, and how many pseudo devices you want to create for Multi_View utility. Based on this information, the appropriate driver files will be installed and linked with your system's kernel.

1. This text appears on the screen:

```
You can install up to 4 ISA/PCI cards in a
system. The PCI cards will be autodetected
on bootup [ISI5634PCI is a PCI card, i.e.,
it has a PCI bus]. Enter the number of ISA
cards you want to install and configure on
your system (0-4):
```

Select **0** if your computer has a PCI bus. This tells the SCO operating system to autodetect the ISI cards.

2. The following text appears on the screen:

```
Multi_View is a utility which will allow you
to have multiple sessions on terminals that
have multiple pages of physical memory.  In
order for this utility to work with
MultiTech's serial cards, pseudo devices
have to be created in your /dev directory.
These devices are system-wide resources.
```

```
Enter the number of pseudo-devices to be
created for the use of Multi_View utility
(1 - 256).
```

The Multi_View utility initializes the multiple-page capability of terminals with multiple pages of memory. The number specified here is the total number of devices (between 1 and 256) available to all Multi-Tech terminals and it's the number of pseudo devices available to the Multi_View utility.

Specify **8** pseudo devices for each ISI5634PCI-8 card installed; specify **4** devices for each ISI5634PCI-4 card installed. For example, if the computer contains three ISI5634PCI-8 cards, you would enter **24**.

3. This text appears on the screen and relates to the "/dev" directory.

```
This script also creates the devices in your
system to communicate with the ports of
```

```
ISICOM.  The default prefix for the tty
ports is ttyl.  The default prefix for the
printer is prnl.  Is this acceptable? (y/n/
q).
```

For most users, it's best to select **y**, which entails accepting the default values. Then proceed to step 4.

Details for use of non-default port/printer values. The /dev directory holds device-information files used by the kernel to access the hardware. When you add an ISI card, you must give the ISI ports unique names so they do not conflict with existing ports or with other devices known to your system. If a device name has already been assigned to an existing device and the operator assigns that name to a new device, then the existing device will be *deleted* when the ISI port using its name is created.

a. To use a non-default base name, type **N** and then enter a basename having less than five characters. The base name you select will be used for all ports on each card you install. ISI port designations will have this form:
[*basename prefix*][*board number*][*port letter*].

basename:	Length is one to four characters.
board number:	Values will be 1, 2, 3, or 4, depending on how many ISI cards are installed in your computer.
port letter:	For ISI5634PCI-4, use letters A through D for modems. For ISI5634PCI-8, use letters A through H for modems. (For terminal control devices, use lower-case letters as port identifiers.)

Device basename selected: _____

b. After you select a device basename, you are prompted for a printer base name. This prefix identifies each port that supports a terminal with a printer attached to its auxiliary port (for transparent

---

printing). Specify a unique printer base name (printer parameters are outlined in the Multi_Setup Utility section in this manual).

Printer base name selected: _____

When you have specified the device base name and the printer base name, press ENTER to continue.

4. The confirmation screen lists the values you have selected. The following text appears on the screen (default values are shown):

```
You have chosen the following setup
The tty prefix is ttyl.
The printer prefix is prnl.
Number of Multi_View pseudo devices
[user-specified number].
```

If these values are correct, type **Y** and the installation process will continue. If there is an error in any of the values displayed, type **N** and the first screen displays. Then re-enter the information for each card.

When you accept the confirmation list (by typing **Y**), a series of messages displays while the driver is being installed and the kernel rebuilt. After the terminals have been added to the Terminal Control database, and when the display says "**Press <Enter> to continue**:", then press ENTER. When **Installation complete** displays, press ENTER again.

5. Select **Host** and press ENTER . Remove diskette from the drive.

6. Select **Exit** and press ENTER .

7. To reboot the system (required), enter the following commands:

Type **shutdown -g0-y** and press ENTER

OR

Type **init 6** and press ENTER .

Driver installation for the ISI5634PCI card now is complete.

Activating Ports in SCO Open Server 5

SCO Open Server 5 provides a device database that monitors the activity of serial ports through which users can log onto the host. If your ISI ports are used by terminals (e.g., to allow users to log onto your host), you must create an entry in the system's device database that furnishes specific information for the terminals that will be used on each ISI port. The database is referenced each time a user attempts to log in. If there is no database entry for a particular terminal, access to the host is denied.

1. Turn on your system and verify that the firmware for each ISI5634PCI card loads successfully. If the firmware for a given ISI5634PCI card does not load, none of its ports will be accessible. (If this happens, see *Multi-Tech's Administrative Utility* section in this manual.)

2. Type the complete name of the first device you want to create in **usr/lib/uucp/Devices**. Substitute the specific base name, board number, and port letter for the generic parameters in the expression **ttylbx**. Use a lower-case **x** value for local DTE (terminal) support and an upper case **X** value for modem control for each port you want to enable. Example: **ttyl2A** denotes the second ISI card (2) and the first port on that card (A). The port status can be altered later, but one setting must be selected at this time. The ACU line would read as follows: **ACU ttylbX - 9600 *dialer name*.** Replace **b, X** and **dialer-name** with appropriate values.

3. Repeat this process for each port on each board you have installed. **Record the setting you select for each port.**

4. Using device names created in the previous section, type the following command for each port you want to activate: **enable ttylbx**

5. Repeat this command for each port you want to activate, using the lower case letter for local terminal use or upper case for modem control.

Note: Only one of the options (e.g., modem control or local terminal access) should be enabled for any port at one time. For example, you cannot enable `tty11a` and then enable `tty11A`. To change the status of a port, disable the current status (`disable tty11a`) and then enable it for the desired status (`enable tty11A`).

Removing the Driver (SCO Open Server 5)

To remove the Multi-Tech Serial Card Driver, enter the configuration utility (e.g., custom for SCO Open Server 5) and follow instructions to remove the entire driver and rebuild the kernel without the ISI driver. If it is necessary to reinstall the driver due to I/O address or IRQ overlap, remove the driver first.

Note: Remove the driver before permanently removing the ISI card from the computer.

Linux Driver for ISI5634PCI-4/8

This is the standard installation procedure for Linux and is applicable to all Linux operating systems of the correct kernel level (2.0, 2.2, or 2.4). The next major section of this manual, *RedHat Linux 6.2/7.0 RPM Drivers for ISI Server Cards (PCI bus only)*, is an alternative installation procedure applicable only to RedHat Linux 6.2 and 7.0 using the RedHat Package Management System (RPM). Note that RedHat Linux versions 6.2 and 7.0 both use the Linux 2.2 kernel and the applicable driver can be installed using this standard installation procedure, as well.

LINUX: Pre-Installation Issues

When unpacking the Linux driver, there are two choices, one driver for the 2.0.x kernel (at this writing, it is filename L300_20X.TAR), and one driver that works for both the 2.2.x kernel and the 2.4.x kernel (at this writing, it is filename L305_22X_24X.TAR). Be absolutely positive about which kernel you have! Note that updated driver files may be

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issued from time to time.

The 'make' utility, GNU C compiler, and the kernel sources need to be installed on your system. If any of these are missing, the compilation will fail. Most later Linux OSs install these elements automatically .

LINUX: Copying the driver from the media

The Linux drivers (2.0 and 2.2/2.4 kernels) are shipped in compressed ('tarred') form on a CD-ROM formatted with the FAT file system. In some cases, users may download Linux ISI drivers from the MultiTech web site onto diskette (in ext2 format). We present instructions for both situations below.

LINUX: Copying and untarring the driver from CD-ROM

1. Mount the CD-ROM using this command:

```
mount -r /dev/cdrom /mnt/cdrom
```

2. Change directory

```
cd /mnt/cdrom
```

3. List the files on the CD-ROM and locate the directory for the kernel in use (2.0 or 2.2/2.4), using this command

```
ls
```

4. Untar the appropriate Linux driver using this command:

> `tar vxf` *{filename}*`/tmp`

At this writing, the filename will be either L300_20X.TAR or L305_22X_24X.TAR.

LINUX: Copying and untarring the driver from a floppy

The ISI driver *.tar* file can be copied from a DOS formatted floppy using the 'mcopy' command if the 'mtools' have been installed. Issue 'mcopy a:isilinux.tar <destination folder>' to copy the isilinux.tar (or current driver name) file to the destination folder. As an alternative, the floppy can be manually mounted and the file copied to the required destination folder.

NOTE: To read from a DOS formatted floppy, a kernel with support for the FAT file system (either statically linked in the kernel or as modules) is required.

Steps for copying the driver from a floppy:

1. Linux floppy disks are in ext2 format.

2. Insert Linux driver in drive A: and mount floppy drive.

   ```
   > mount -t ext2 /dev/fd0 /mnt/floppy
   ```

3. Copy files from floppy to a temporary directory on hard drive.

   ```
   > mkdir /isi
   > cd /isi
   > cp /mnt/floppy/kernel_2.2.x/*  /isi
   ```

   After you have copied the installation tar file to a folder, use the command 'tar xvf isilinux.tar' to untar (unzip or de-compress) the installation files in that folder.

LINUX: Driver installation and loading

Execute the 'Install' script to build the driver and to copy the driver and firmware files to the required folder.

```
> cd /isi
>./Install
```

For ISI cards with the ISA bus, the installation script requires the user to type in the I/O address and the IRQ to be used. However, for ISI cards with the PCI bus (ISI5634PCI cards have the PCI bus), simply press ENTER when asked for addresses and IRQs. The installation creates the script file 'ISICOMStart' in the destination folder. 'ISICOMStart' automates the loading process for the driver and firmware.

To view busy I/O address space on your system, enter
```
cat/proc/ioports
```

To view busy IRQs, enter:
```
cat /proc/interrupts
```

You must load the driver before you can load the firmware. You can load the driver manually using the 'insmod' utility. For ISI cards with the ISA bus, the I/O base address and the IRQ required by the card also need to be passed as parameters to insmod (this does not apply to ISI5634PCI cards because they are equipped with the PCI bus).

```
   insmod isicom io=card1, ... card4 irq=card1,
... card4
```

The PCI cards and their configurations will be auto-detected by the driver.

You can manually load the firmware into all of the installed ISI cards simultaneously by executing the 'frmld' utility in the installation folder. The firmware to all the installed cards can be manually loaded by executing the 'firmld' utility in the installation folder. This utility requires the firmware files (.bin) to be located in the /usr/local/ISICOM/ folder.

LINUX: Setting the baud rate

The 'stty' utility can be used to set the baud rate of a particular port. For example, to set the baud rate of the first port on the first card (ttyM1a) to 38400 bps, execute 'stty 38400 < /dev/ttyM1a'.

The current baud rate can be viewed by executing 'stty < /dev/ttyM1a'.

LINUX: Verifying the ports

Terminal utilities like 'minicom' can be used to verify the ports, 'talk' to the modem, and dial out.

To configure 'minicom' for a particular port, run it with the '-s' option. In the 'serial port setup' menu option, set the serial device to the required ISI port device (for example, '/dev/ttyM1a' for the

first port on the first card). Save the configuration for a particular port using the 'save setup as' menu option as, for example, '1a' for the port /dev/ttyM1a. To connect to the port /dev/ttyM1a using minicom the next time, '`minicom 1a`' needs to be executed.

LINUX: TTY Devices Created by the Drivers:

Device files corresponding to ports on the ISI card are created in the **/dev** folder. Use `ttyMxy` for normal ports and `cumxy` for corresponding callout ports. Normal ports (`ttyM`) are configured for dial-in connections. Callout ports (`cum`) are used for dial-out connections.

In these expressions (`ttyMxy` and `cumxy`), the letter `x` is the card number (1-4), and `y` is the port designator (a, b, c, ...).

The ISI Linux driver creates the following TTY devices in /dev directory:

- /dev/ttyM1a TO /dev/ttyM1p for the first ISI card

- /dev/ttyM2a TO /dev/ttyM2p for the second ISI card

- /dev/ttyM3a TO /dev/ttyM3p for the third ISI card

- /dev/ttyM4a TO /dev/ttyM4p for the fourth ISI card

For the ISI5634PCI-4, it uses the following:

- /dev/ttyM1a TO /dev/ttyM1d for the first card

- /dev/ttyM2a TO /dev/ttyM2d for the second card

- /dev/ttyM3a TO /dev/ttyM3d for the third card

- /dev/ttyM4a TO /dev/ttyM4d for the fourth card

For the ISI5634PCI-8, it uses the following:

- /dev/ttyM1a TO /dev/ttyM1h for the first card

- /dev/ttyM2a TO /dev/ttyM2h for the second card

- /dev/ttyM3a TO /dev/ttyM3h for the third card

- `/dev/ttyM4a TO /dev/ttyM4h` for the fourth card

Devices mapped for modem cards (ISI5634PCI-4 and ISI5634PCI-8 cards):

For ISI5634PCI-4 cards (4 ports):

- `/dev/ttyM1a` to `/dev/ttyM1d` *for modem ports.*

For ISI5634PCI-8 cards (8 ports):

- `/dev/ttyM1a` to `/dev/ttyM1h` *for modem ports.*

LINUX -- Dial-in configuration:

To configure a particular port for dial-in, utilities like 'mgetty' need to be installed on the system. If, for example, the port /dev/ttyM2c needs to be configured for a remote-access dial-in connection, an entry of the form 'M2c:12345:respawn:/sbin/mgetty ttyM2c' needs to be added in the /etc/inittab file. After you have made the change, execute 'init q' so that the 'init' process re-reads the inittab file and spawns the mgetty process to wait for an incoming connection. Users can then dial in, use their user names and passwords to log in, and access their accounts on the machine.

To disable dial-in access on a particular port, change the entry in the /etc/inittab file to 'M2c:12345:off:/sbin/mgetty ttyM2c'or just comment-out that entry by prefixing a '#' to the entry on the line.

LINUX -- PPP setup:

The 'PPP-HOWTO' (a document that is available as a part of the 'HOWTO' documentation on most of the distributions under /usr/doc/HOWTO) explains in detail the procedure for configuring a Linux machine as a PPP server. This information is also available at

http://www.interweft.com.au/other/ppp-howto/ppp-howto.html.

The documentation in the PPP-HOWTO is directly applicable to ISI ports.

> **Note:** A base I/O address of 0, e.g., ISIBaseX=oxo, or omission of these parameters for any card X, disables that particular card.

Miscellaneous:

Device files corresponding to ports on the ISI5634PCI cards are created in the **/dev** folder. Use **ttyMxy** for normal ports and **cumxy** for corresponding callout ports. The letter **x** is the card number (1–4), and **y** is the port number, (a–d) for 4-port cards or (a-h) for 8-port cards.

Normal ports (**ttyM**) are configured for dial-in connections. Callout ports (**cum**) are used for dial-out connections.

To view busy I/O address space on your system, enter:
```
cat /proc/ioports
```

To view busy IRQs, enter:
```
cat /proc/interrupts
```

To load the driver manually, use insmod.

Example: To load two ISI cards configured with base I/O addresses 0x210 and 0x200 and IRQs 5 and 10, enter the following in the destination folder:
```
insmod isicom
ISIBase1=0x210
Irq1=5
ISIBase2=0x200
Irq2=10
```

To remove the driver manually, enter **rmmod isicom**. This removes the driver only if no ISI ports are in use.

Removing the ISI Driver (Linux)

1. Type cd /usr/local. Press ENTER.

2. Type rm -r ISICOM. Press ENTER.

3. This will remove driver for all ISI5634PCI cards in that Linux server.

4. Remove the isictl file by typing "rm isictl" in the /dev directory.

5. Remove all devices that start with ttyM1x, ttyM2x, ttyM3x and ttyM4x in the /dev directory.

"rm ttyM1*"

"rm ttyM2*"

"rm ttyM3*"

"rm ttyM4*"

RedHat Linux 6.2/7.0 RPM Drivers for ISI5634PCI-4/8 Server Cards

This installation procedure applies only to RedHat Linux versions 6.2 and 7.0. The standard ISI5634PCI Linux installation procedure ("Linux Driver for Multi-Tech ISI Server Cards (for PCI and ISA busses)") can still be used for any Linux operating system of the correct kernel level (including RedHat Linux versions 6.2 and 7.0, if so desired). Note that RedHat Linux versions 6.2 and 7.0 both use the Linux 2.2 level kernel.

LINUX-RPM: Pre-Installation Issues

The 'make' utility, GNU C compiler, and the kernel sources need to be installed on your system. If any of these are missing, the compilation will fail. Most later Linux OSs install these elements automatically .

LINUX-RPM: Copying the driver from the media

The RedHat Linux RPM drivers are on the ISI-Family Installation CD-ROM in separate directories, ServCard/Drivers/Linux/RPMS/70RPM for version 7.0 and ServCard/Drivers/Linux/RPMS/62RPM for version 6.2. In some cases, users may download RPM drivers from the MultiTech web site onto diskette (in ext2 format). We present instructions for both situations below.

LINUX-RPM: Copying the driver from CD-ROM

1. Mount the CD-ROM using this command:

   mount -r /dev/cdrom /mnt/cdrom

2. Change directory

   cd /mnt/cdrom

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3. List the RPM files on the CD-ROM using this command:

```
ls
```

LINUX-RPM: Copying the driver from a floppy

The ISI driver *.rpm* file can be copied from a DOS formatted floppy using the 'mcopy' command if the 'mtools' have been installed.

For RPM version 6.2, issue the command
`'mcopy a:isicom-1.1-3.src.rpm <destination folder>'` to copy the isicom-1.1-3.src.rpm (or current driver name) file to the destination folder.

For RPM version 7.0, issue the command
`'mcopy a:isicom-1.2-3.src.rpm <destination folder>'` to copy the isicom-1.2-3.src.rpm (or current driver name) file to the destination folder.

 As an alternative, the floppy can be manually mounted and the file copied to the required destination folder.

NOTE: To read from a DOS formatted floppy, a kernel with support for the FAT file system (either statically linked in the kernel or as modules) is required.

Steps for copying the driver from a floppy:

1. Linux floppy disks are in ext2 format.

2. Insert Linux driver in drive A: and mount floppy drive.

```
> mount -t ext2 /dev/fd0 /mnt/floppy
```

3. Copy files from floppy to a temporary directory on hard drive.

```
> mkdir /isi
> cd /isi
```

4. The current isicom.o file should be backed up before installing the RPM. The easiest way is simply to rename it or copy it into another file. For example, "`cp` (or `mv`) `isicom.o isicom.original`". It is usually located in the /usr/local/ISICOM directory. For the version 7

RPM, you will need to use the '--force' option in the RPM command as in step 5b below.

5a. For RPM version 6.2:

Copy the RPM to a temporary folder. In this example, we'll use /isi. Installation is in three parts, building the 'isicom-smp.spec' file from the source file, then building the actual RPM from that "spec" file, and finally, installing the RPM. Do not type the quotation marks shown in the commands below.

- Run "`rpm -i /isi/isicom-1.1-3.src.rpm`".

- Run "`rpm -ba /usr/src/redhat/SPECS/isicom-smp.spec`".

- Run "`rpm -ihv /usr/src/redhat/RPMS/i386/isicom-1.1-3.i386.rpm`"

- Reboot the system, either using the command "`init 6 <ENTER>`" or your favorite method.

5b. For RPM version 7.0:

Copy the RPM to a temporary folder. In this example, we'll use /isi. Installation is in three parts, building the 'isicom-smp.spec' file from the source file, then building the actual RPM from that "spec" file, and finally, installing the RPM. Do not type the quotation marks shown in the commands below. Replace the x below with the actual version numbers being used.

- Run "`rpm -i /isi/isicom-1.2-3.src.rpm`".

- Run "`rpm -ba /usr/src/redhat/SPECS/isicom-rh7.spec`".

- Run "`rpm -ihv --force /usr/src/redhat/RPMS/i386/isicom-1.2-3.i386.rpm`".

- Reboot the system, using either the command "`init 6 <ENTER>`" or your favorite method.

LINUX-RPM: Verifying the ports

To test the installation, you can use the terminal program 'minicom'. Use the command "`minicom -s`" to set up the tty port that you will use to communicate.

1. In the **Configuration** window, select "Serial Port Setup."

2. Select **A** to set the Serial Device (for example, /dev/ttyM1a).

3. Select **E** to set the baud rate.

4. Press Escape (**Esc**) to exit.

5. Select **Exit** to communicate with the port.

6. Issue AT commands and make sure it returns "OK".

LINUX-RPM: TTY Devices Created by the Drivers

Device files corresponding to ports on the ISI card are created in the **/dev** folder. Use **ttyMxy** for normal ports. Normal ports (**ttyM**) are configured for dial-in connections.

In these expressions (**ttyMxy**), the letter **x** is the card number (1-4), and **y** is the port designator (a, b, c, ...).

The ISI Linux driver creates the following TTY devices in /dev directory:

- /dev/ttyM1a TO /dev/ttyM1p for the first ISI card

- /dev/ttyM2a TO /dev/ttyM2p for the second ISI card

- /dev/ttyM3a TO /dev/ttyM3p for the third ISI card

- /dev/ttyM4a TO /dev/ttyM4p for the fourth ISI card

For the ISI5634PCI-4, it uses the following:

- /dev/ttyM1a TO /dev/ttyM1d for the first card

- /dev/ttyM2a TO /dev/ttyM2d for the second card

- /dev/ttyM3a TO /dev/ttyM3d for the third card

- /dev/ttyM4a TO /dev/ttyM4d for the fourth card

For the ISI5634PCI-8, it uses the following:

- `/dev/ttyM1a` TO `/dev/ttyM1h` for the first card

- `/dev/ttyM2a` TO `/dev/ttyM2h` for the second card

- `/dev/ttyM3a` TO `/dev/ttyM3h` for the third card

- `/dev/ttyM4a` TO `/dev/ttyM4h` for the fourth card

Devices mapped for modem cards (ISI5634PCI-4 and ISI5634PCI-8 cards):

For ISI5634PCI-4 cards (4 ports):

- `/dev/ttyM1a` to `/dev/ttyM1d` *for modem ports.*

For ISI5634PCI-8 cards (8 ports):

- `/dev/ttyM1a` to `/dev/ttyM1h` *for modem ports.*

LINUX-RPM -- Dial-in configuration:

To configure a particular port for dial-in, utilities like 'mgetty' need to be installed on the system. If, for example, the port /dev/ttyM2c needs to be configured for a remote-access dial-in connection, an entry of the form 'M2c:12345:respawn:/sbin/mgetty ttyM2c /dev/ttyM2c' needs to be added in the /etc/inittab file. After you have made the change, execute 'init q' so that the 'init' process re-reads the inittab file and spawns the mgetty process to wait for an incoming connection. Users can then dial in, use their user names and passwords to log in, and access their accounts on the machine.

To disable dial-in access on a particular port, change the entry in the /etc/inittab file to 'M2c:12345:off:/sbin/mgetty ttyM2c'or just comment-out that entry by prefixing a '#' to the entry on the line.

LINUX-RPM -- PPP setup:

The 'PPP-HOWTO' (a document that is available as a part of the 'HOWTO' documentation on most of the distributions under /usr/doc/

HOWTO) explains in detail the procedure for configuring a Linux machine as a PPP server. This information is also available at

> http://www.interweft.com.au/other/ppp-howto/ppp-howto.html.

The documentation in the PPP-HOWTO is directly applicable to ISI ports.

Removing the ISI Driver (Linux-RPM)

1. To remove the ISI driver, type `rpm -e isicom`

If more than one instance of the isicom file exists in the system, an error message will be returned. To resolve this, type rpm -q isicom. Press ENTER. All isicom RPM modules will be listed. Decide which of these files you want to delete. Then type `rpm -e filename` to delete those files.

Installing and Configuring Your Software

You must have communications software installed in your computer to use the Multi-Tech modems on the ISI5634PCI card. If you want to use communications software that is already installed, you should reconfigure it for your new modem. Otherwise, install the data and fax communications software provided the ISI5634PCI.

1. Turn on your computer and run your communications software.

2. Find the dialog box or menu that allows you to specify your modem. See different data communications examples below:
   • In Windows Terminal, select **Settings** and then **Modem Commands**
   • In HyperTerminal, select **File**, **Properties**, and then **Phone Number**

3. Select your modem from the software's modem list. If not listed, choose a generic modem and modify the settings as necessary.

4. Change the modem initialization string, if necessary. The factory default configuration works well for most purposes.

   • To load the factory default configuration, use **AT&F**.

- To load a custom configuration that was saved using the **&W** command, use **ATZ**. Note that the **Z** command must be in a command string by itself.

- For a Macintosh, the initialization should include the **&D0** command.

- If you don't want the modem to always answer the phone, add **S0=0** to the string.

- To use Caller ID with the modem, add S0=2 to the string (Caller ID information is sent between the first and second rings, so the phone must ring at least twice before the modem picks up the line.) Depending on the software, you may have to end the string with a carriage return character (**^M**).

---

*Note: To change the modem's default configuration, type new commands in the software's terminal window, adding the **&W** command to store them in the modem's nonvolatile memory. For instance, to create a default configuration for a Macintosh computer that turns off autoanswer, type **AT&F&D0S0=0&W**. The new configuration loads automatically whenever the modem is turned on or receives the **ATZ** command.*

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5. Select the port where the modem is connected (normally starts at COM5).

6. Select your serial port speed and label it *maximum speed*, *DTE bps*, or *baud rate*.

   - If you use data compression, set your serial port baud rate to four times the modem's maximum transmission speed or faster. However, few files can be compressed enough to require speeds that high, and not all serial ports can handle speeds that high.

   - Set the serial port baud rate to 320,400 bps.

7. If the software has an autobaud selection make sure it is disabled. Autobaud applies only to older modems and can cause problems if enabled.

8. If the software allows you to edit the no connect messages (NO CARRIER, BUSY, NO ANSWER, NO DIALTONE), make sure there is space between DIAL and TONE in NO DIALTONE.

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References

ISI5634PCI User Guide

The ISI5634PCI Quick Start Guide is a condensed version of this *User Guide* in printed form. It is especially intended for use during installation. The Quick Start Guide is also on the ISI CD-ROM.

If you have any problems getting your modem to work, please consult this *User Guide* before calling Technical Support (800-972-2439).

The World Wide Web

The World Wide Web is an excellent source of information about modems in general and modem installation, configuration, and troubleshooting in particular. The following Web sites are good places to start:

- Costmo's Other Resources Page:
  http://modems.rosenet.net/or/
- Curt's High Speed Modem Page:
  http://elaine.teleport.com/~curt/modems.html
- Data Communications FAQ:
  http://www.best.com/~malch/comfaq.html
- Multi-Tech Systems, Inc.:
  http://www.multitech.com/

Intelligent
Serial *Interface*

Chapter 4—

AT Commands, S-Registers, & Result Codes

MultiTech
Systems

AT Commands

AT commands are used to control the operation of your modem. They are so called because each command must be preceded by the characters *AT* to get the *AT*tention of the modem.

AT commands can be issued only when the modem is in command mode or online command mode. The modem is in *command mode* whenever it is not connected to another modem. The modem is in *data mode* whenever it is connected to another modem and ready to exchange data. *Online command mode* is a temporary state where you can issue commands to the modem while connected to another modem. To put the modem into online command mode from data mode, you must issue an *escape sequence* (+++) followed immediately by the *AT* characters and the command, e.g., +++**ATH** to hang up the modem. To return to data mode from online command mode, you must issue the command **ATO**.

To send AT commands to the modem, you must use a communications program such as the HyperTerminal applet in Windows 95 and NT 4.0 or the communications program included with your modem. You can issue commands to the modem either directly—typing them in the terminal window of the communications program or indirectly— configuring the operating system or communications program to send the commands automatically. Fortunately, communications programs make daily operation of modems effortless by hiding the commands from the user. Most users, therefore, need to use AT commands only when reconfiguring the modem, e.g., to turn autoanswer on or off.

The format for entering an AT command is **AT*Xn***, where *X* is the command and *n* is the specific value for the command, sometimes called the command *parameter*. The value is always a number. If the value is zero, you can omit it from the command; thus, **AT&W** is equivalent to **AT&W0**. Most commands have a *default* value, which is the value that is set at the factory. The default values are shown in the *AT Command Summary*, which begins on the next page.

You must press ENTER to send the command to the modem. Any time the modem receives a command, it sends a response known as a *result code*. The most common result codes are *OK*, *ERROR*, and the *CONNECT* messages that the modem sends to the computer when it is

connecting to another modem. For a table of valid result codes, see *Result Codes* at the end of this chapter.

You can issue several commands in one line, in what is called a command *string*. The command string begins with **AT** and ends when you press ENTER. Spaces to separate the commands are optional; they are ignored by the command interpreter. The most familiar command string is the *initialization string*, which is used to configure the modem when it is turned on or reset or when your communications software calls another modem.

AT Command Summary

Command:	**AT**	**Attention Code**
Values:		n/a
Description:		The attention code precedes all command lines except **A/**, **A:**, and escape sequences.

Command:	**ENTER key**	
Values:		n/a
Description:		Press ENTER (RETURN) to execute most commands.

Command:	**A**	**Answer**
Values:		n/a
Description:		Answer call before final ring.

Command:	**A/**	**Repeat Last Command**
Values:		n/a
Description:		Repeat the last command string. Do not precede this command with **AT**. Do not press ENTER to execute.

Command:	**B***n*	**Communication Standard Setting**
Values:		*n* = 0–3, 15, 16
Default:		1 and 16
Description:	B0	Select ITU-T V.22 mode when modem is at 1200 bps.
	B1	Select Bell 212A when modem is at 1200 bps.
	B2	Deselect V.23 reverse channel (same as ***B3***).
	B3	Deselect V.23 reverse channel (same as ***B2***).
	B15	Select V.21 when the modem is at 300 bps.
	B16	Select Bell 103J when the modem is at 300 bps.

Command:	**C***n*	**Carrier Control**
Values:		*n* = 1
Default:		1
Description:	C0	Transmit carrier always off. (Not supported.)
	C1	Normal transmit carrier switching (included for backward compatibility with some software).

Command:	**D***s*	**Dial**
Values:		*s* = dial string (phone number and dial modifiers)
Default:		none
Description:		Dial telephone number *s*, where *s* may up to 40 characters long and include the 0–9, *, #, A, B, C, and D characters, and the **L**, **P**, **T**, **V**, **W**, **S**, comma (**,**), semicolon (**;**), **!**, **@**, **^** and **$** dial string modifiers.

Dial string modifiers:

L   Redial last number. (Must be placed immediately after **ATD**.)

P   Pulse-dial following numbers in command.

T   Tone-dial following numbers in command (default).

W   Wait for a new dial tone before continuing to dial. (**X2**, **X4**, **X5**, **X6**, or **X7** must be selected.)

,   Pause during dialing for time set in register S8.

;   Return to command mode after dialing. (Place at end of dial string.)

!   Hook flash. Causes the modem to go on-hook for one-half second, then off-hook again.

@   Wait for quiet answer. Causes modem to wait for a ringback, then 5 seconds of silence, before processing next part of command. If silence is not detected, the modem returns a NO ANSWER code.

^   Disable data calling tone transmission.

$ Detect AT&T call card "bong" tone. The character should follow the phone number and precede the user's call card number:
ATDT1028806127853500$123456789

Command: **DS=*y* Dial Stored Telephone Number**
Values: *n* = 0–3
Default: none
Description: Dial a number previously stored in directory number *y*
             by the ***&Zy=x*** command.
             Example: **ATDS=3**

Command: **E*n*   Echo Command Mode Characters**
Values: *n* = 0 or 1
Default: 1
Description: E0   Do not echo keyboard input to the terminal.
             E1   Do echo keyboard input to the terminal.

Command: **F*n*   Echo Online Data Characters**
Values: *n* = 1
Default: 1
Description: F0   Enable online data character echo. (Not supported.)
             F1   Disable online data character echo (included for back-
                   ward compatibility with some software).

Command: **H*n*   Hook Control**
Values: *n* = 0 or 1
Default: 0
Description: H0   Go on-hook (hang up).
             H1   Go off-hook (make the phone line busy).

Command: **I*n*   Information Request**
Values: *n* = 0–5, 9, 11
Default: None
Description: I0   Display default speed and controller firmware version.
             I1   Calculate and display ROM checksum (e.g., *12AB*).
             I2   Check ROM and verify the checksum, displaying *OK* or
                   ERROR.
             I3   Display default speed and controller firmware version.
             I4   Display firmware version for data pump (e.g., *94*).
             I5   Display the board ID: software version, hardware ver-
                   sion, and country ID
             I9   Display the country code (e.g., *NA Ver. 1*).

I11	Display diagnostic information for the last modem connection, such as DSP and firmware version, link type, line speed, serial speed, type of error correction/data compression, number of past retrains, etc.

Command:	**N***n*	**Modulation Handshake**
Values:		*n* = 0 or 1
Default:		1
Description:	N0	Modem performs handshake only at communication standard specified by *S37* and the *B* command.
	N1	Modem begins handshake at communication standard specified by *S37* and the *B* command. During handshake, fallback to a lower speed can occur.

Command:	**O***n*	**Return Online to Data Mode**
Values:		0, 1, 3
Default:		None
Description:	O0	Exit online command mode and return to data mode (see *+++AT<cr>* escape sequence).
	O1	Issue a retrain and return to online data mode.
	O3	Issue a rate renegotiation and return to data mode.

Command:	**P**	**Pulse Dialing**
Values:		P, T
Default:		T
Description:		Configures the modem for pulse (non-touch-tone) dialing. Dialed digits are pulsed until a *T* command or dial modifier is received.

Command:	**Q***n*	**Result Codes Enable/Disable**
Values:		*n* = 0 or 1
Default:		0
Description:	Q0	Enable result codes.
	Q1	Disable result codes.
	Q2	Returns an *OK* for backward compatibility with some software.

Command:	**S*r*=*n***	**Set Register Value**
Values:		*r* = S-register number; *n* varies
Default:		None
Description:		Set value of register S*r* to value of *n*, where *n* is entered in decimal format. E.g., **S0=1**.

Command:	**S*r*?**	**Read Register Value**
Values:		*r* = S-register number
Default:		None
Description:		Read value of register S*r* and display it in 3-digit decimal form. E.g., **S2?** gives the response *043*.

Command:	**T**	**Tone Dialing**
Values:		P, T
Default:		T
Description:		Configures the modem for DTMF (touch-tone) dialing. Dialed digits are tone dialed until a *P* command or dial modifier is received.

Command:	**V*n***	**Result Code Format**
Values:		*n* = 0 or 1
Default:		1
Description:	V0	Displays result codes as digits (terse response).
	Vl	Displays result codes as words (verbose response).

Command:	**W*n***	**Result Code Options**
Values:		*n* = 0, 1, or 2
Default:		2
Description:	W0	CONNECT result code reports serial port speed, disables protocol result codes.
	W1	CONNECT result code reports serial port speed, enables protocol result codes.
	W2	CONNECT result code reports line speed, enables protocol result codes.

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Command: **X***n*	**Result Code Selection**
Values:	*n* = 0–7
Default:	4

Description:	X0	Basic result codes (*e.g., CONNECT*); does not look for dial tone or busy signal.
	X1	Extended result codes (*e.g., CONNECT 46000 V42bis*); does not look for dial tone or busy signal.
	X2	Extended result codes with *NO DIALTONE*; does not look for busy signal.
	X3	Extended result codes with *BUSY*; does not look for dial tone.
	X4	Extended result codes with *NO DIALTONE* and *BUSY*.
	X5	Extended result codes with *NO DIALTONE* and *BUSY*.
	X6	Extended result codes with *NO DIALTONE* and *BUSY*.
	X7	Basic result codes with *NO DIALTONE* and *BUSY*.

Command: **Y***n*	**Long Space Disconnect**
Values:	*n* = 0
Default:	0

Description:	Y0	Disable sending or responding to long space break signal on disconnect.
	Y1	Enable sending or responding to long space break signal on disconnect. (Not supported.)

Command: **Z***n*	**Modem Reset**
Values:	*n* = 0 or 1
Default:	None

Description:	Z0	Resets modem to profile saved by last **&W** command.
	Z1	Same as **Z0**.

Command: **&B***n*	**V.32 Auto Retrain**
Values:	*n* = 1
Default:	1

Description:	&B0	Disable V.32 auto retrain. (Not supported.)
	&B1	Enable V.32 auto retrain.

Command: **&C*n*** **Data Carrier Detect (DCD) Control**
Values: *n* = 0 or 1
Default: 1
Description: &C0 Forces the DCD circuit to be always high.
&C1 DCD goes high when the remote modem's carrier signal is detected, and goes low when the carrier signal is not detected.

Command: **&D*n*** **Data Terminal Ready (DTR) Control**
Values: *n* = 0, 1, 2, or 3
Default: 2
Description: &D0 Modem ignores the true status of the DTR signal and responds as if it is always on.
&D1 If DTR drops while in online data mode, the modem enters command mode, issues an *OK*, and remains connected.
&D2 If DTR drops while in online data mode, the modem hangs up. If the signal is not present, the modem will not answer or dial.
&D3 If DTR drops, the modem hangs up and resets as if an **ATZ** command were issued.

Command: **&F*n*** **Load Factory Settings**
Values: *n* = 0
Default: None
Description: &F0 Load factory settings as active configuration.
*Note: See also the **Z** command.*

Command: **&G*n*** **V.22bis Guard Tone Control**
Values: *n* = 0, 1, or 2
Default: 0
Description: &G0 Disable guard tone.
&G1 Set guard tone to 550 Hz.
&G2 Set guard tone to 1800 Hz.
*Note: The **&G** command is not used in North America.*

Command:	**&J*n***	**Auxiliary Relay Control**
Values:		*n* = 0
Default:		0
Description:	&J0	The auxiliary relay is never closed.
	&J1	Not supported—responds *ERROR*.

Command:	**&K*n***	**Flow Control Selection**
Values:		*n* = 0, 3, or 4
Defaults:		3
Description:	&K0	Disable flow control.
	&K3	Enable CTS/RTS hardware flow control.
	&K4	Enable XON/XOFF software flow control.

Command:	**&M*n***	**Communications Mode**
Values:		*n* = 0
Defaults:		0
Description:	&M0	Asynchronous mode.
	&M1	Not supported—responds *ERROR*.

Command:	**&Q*n***	**Asynchronous Communications Mode**
Values:		*n* = 0, 5, 6, 8, or 9
Default:		5
Description:	&Q0	Asynchronous with data buffering. Same as *\N0*.
	&Q5	Error control with data buffering. Same as *\N3*.
	&Q6	Asynchronous with data buffering. Same as *\N0*.
	&Q8	MNP error control mode. If MNP error control is not established, the modem falls back according to the setting in *S36*.
	&Q9	V.42 or MNP error control mode. If neither error control is established, the modem falls back according to the setting in *S36*.

Command:	**&S*n***	**Data Set Ready (DSR) Control**
Values:		*n* = 0 or 1
Default:		0
Description:	&S0	Forces DSR always high (on).
	&S1	Lets DSR go high only during a connection.

Command: **&T*n*** **V.54 Test Commands**
Values: *n* = 0, 1, 3 or 6
Default: None
Description: &T0 Abort. Stop any test in progress.
&T1 Local analog loopback test.
&T3 Local digital loopback test.
&T6 Remote digital loopback test.
Note: To stop a test, you must use the escape sequence (+++AT) before typing AT&T0.

Command: **&V** **Display Current Settings**
Values: n/a
Description: Displays the active modem settings, including the callback security settings if callback security is enabled. If the setup password has been entered, it also displays the callback security passwords.

Command: **&W*n*** **Store Current Configuration**
Values: *n* = 0
Default: None
Description: &W0 Stores current modem settings in nonvolatile memory and causes them to be loaded at power-on or following the **ATZ** command instead of the factory defaults. See also the ***&F*** command.
&W1 Clears user default settings from nonvolatile memory and causes the factory defaults to be loaded at power-on or following the **ATZ** command.

Command: **&Y*n*** **Select Stored Configuration for Hard Reset**
Values: *n* = 0
Default: 0
Description: &Y0 Select stored configuration 0 on power-up. (For backward compatibility with some software.)
&Y1 Not supported—responds *ERROR*.

Command: **&Zy=*x* Store Dialing Command**
Values: y = 0–3 (callback security disabled) or 0–29 (callback security enabled)
           x = Dialing command
Default: None
Description: Stores dialing command *x* in memory location *y*. Dial the stored number using the command **ATDS=y**. See also the *#CBSn* command. For callback security options, see Chapter 6.

Command: **\A*n* Select Maximum MNP Block Size**
Values: *n* = 0, 1, 2, or 3
Default: 3
Description: \A0   64-character maximum.
         \A1   128-character maximum.
         \A2   192-character maximum.
         \A3   256-character maximum.

Command: **\B*n* Transmit Break**
Values: *n* = 0–9 in 100 ms units
Default: 3
Description: In non-error-correction mode only, sends a break signal of the specified length to a remote modem. Works in conjunction with the *\K* command.

Command: **\G*n* Modem Port Flow Control**
Values: *n* = 0
Default: 0
Description: \G0   Returns an *OK* for backward compatibility with some software.
         \G1   Not supported—responds *ERROR*.

Command: **\J*n* Data Buffer Control**
Values: *n* = 0
Default: 0
Description: \J0   Enable data buffer—serial port speed is independent of connect speed.
         \J1   Disable data buffer—serial port speed is forced to the line speed.

Command:	**\K***n*	**Break Control**
Values:		*n* = 0–5
Default:		5
Description:		Controls the response of the modem to a break received from the computer, the remote modem, or *B* command. Response is different for each of three different states.

Data mode. The modem receives the break from the computer:

\K0   Enter online command mode, no break sent to the remote modem.

\K1   Clear data buffers and send break to the remote modem.

\K2   Same as *K0*.

\K3   Send break immediately to the remote modem .

\K4   Same as *K0*.

\K5   Send break to the remote modem in sequence with the transmitted data.

Data mode. The modem receives the break from the remote modem:

\K0   Clear data buffers and send break to the computer.

\K1   Same as *K0*.

\K2   Send break immediately to the computer.

\K3   Same as *K2*.

\K4   Send break to the computer in sequence with the received data.

\K5   Same as *K4*.

Online command mode. The modem receives a *Bn* command from the computer:

\K0   Clear data buffers and send break to the remote modem.

\K1   Same as *K0*.

\K2   Send break immediately to the remote modem.

\K3   Same as *K2*.

\K4   Send break to the remote modem in sequence with the transmitted data.

\K5   Same as *K4*.

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Command:	\N*n*	**Error Correction Mode Selection**
Values:		*n* = 0–5, or 7
Default:		3
Description:	\N0	Non-error correction mode with data buffering (buffer mode; same as *&Q6*).
	\N1	Direct mode.
	\N2	MNP reliable mode. If the modem cannot make an MNP connection, it disconnects.
	\N3	V.42/MNP auto-reliable mode. The modem attempts first to connect in V.42 error correction mode, then in MNP mode, and finally in non-error-correction (buffer) mode with continued operation.
	\N4	V.42 reliable mode. If the modem cannot make a V.42 connection, it disconnects.
	\N5	V.42, MNP, or non-error correction (same as *N3*).
	\N7	V.42, MNP, or non-error correction (same as *N3*).

Command:	\Q*n*	**Flow Control Selection**
Values:		*n* = 0, 1, or 3
Default:		3
Description:	\Q0	Disable flow control (same as *&K0*).
	\Q1	XON/XOFF software flow control (same as *&K4*).
	\Q2	CTS-only flow control. Not supported.
	\Q3	RTS/CTS hardware flow control (same as *&K3*).

Command:	\T*n*	**Inactivity Timer**
Values:		*n* = 0, 1–255
Default:		0
Description:	\Tn	Sets the time (in minutes) after the last character is sent or received that the modem waits before disconnecting. A value of zero disables the timer. Applies only in buffer mode.
		*Note: You can also set the inactivity timer by changing the value of **S30**.*

Command:	\V*n*	**Protocol Result Code**
Values:		*n* = 0, 1, or 2
Default:		1

Description:	\V0	Disable the appending of the protocol result code to the DCE speed.
	\V1	Enable the appending of the protocol result code to the DCE speed.
	\V2	Same as *\V1*.

Command:	**\X*n***	**XON/XOFF Pass-Through**
Values:		*n* = 0 or 1
Defaults:		0
Description:	\X0	Modem responds to and discards XON/XOFF characters.
	\X1	Modem responds to and passes XON/XOFF characters.

Command:	**-C*n***	**Data Calling Tone**
Values:		*n* = 0 or 1
Defaults:		0
Description:	-C0	Disables V.25 data calling tone to deny remote data/fax/voice discrimination.
	-C1	Enables V.25 data calling tone to allow remote data/fax/voice discrimination.

Command:	**% B** **View Numbers in Blacklist**
Values:	n/a
Description:	If blacklisting is in effect, **AT%B** displays the numbers of the last failed call attempt in the previous two hours. In countries that do not require blacklisting, the *ERROR* result code appears.

Command:	**%C*n***	**Data Compression Control**
Values:		*n* = 0 or 1
Default:		1
Description:	%C0	Disables V.42bis/MNP 5 data compression.
	%C1	Enables V.42bis/MNP 5 data compression.

Command:	**%DC*n***	**AT Command Control**
Values:		*n* = 0 or 1
Default:		0
Description:	%DC0	The modem responds to AT commands.

%DC1 The modem ignores AT commands.

          Note: *The modem responds to **AT%DC** for 10 seconds after power-up.*

Command:	**%E***n*	**Fallback and Fall Forward Control**
Values:		*n* = 0, 1, or 2
Default:		2
Description:	%E0	Disable fallback and fall forward.
	%E1	Enable fallback, disable fall forward.
	%E2	Enable fallback and fall forward.

Command:	**$D***n*	**DTR Dialing**
Values:		*n* = 0 or 1
Default:		0
Description:	$D0	Disables DTR dialing.
	$D1	Dials number in memory location 0 when DTR goes high.

Command:	**$EB***n*	**Asynchronous Word Length**
Values:		*n* = 0 or 1
Default:		0
Description:	$EB0	Enables 10-bit mode.
	$EB1	Enables 11-bit mode.

Command:	**+ES=***n* **Enable Synchronous Buffered Mode**
Values:	*n* = 6
Default:	None
Description:	Allows an H.324 video application direct access to the synchronous data channel. On underflow, the modem sends HDLC flag idle (0x7E) to the remote modem. This special error control mode is overridden by any of the following commands: *&F*, *&M*, *&Q*, or *\N*.

                  AT+ES=? shows the only allowed value.
                  AT+ES? shows the current value.

Command:	**#CBA***n* **Callback Attempts**
Values:	*n* = 1–255
Default:	4
Description:	Sets the number of callback attempts allowed after passwords have been exchanged between modems.·

Command: **#CBD*n* Callback Delay**
    Values: *n*=0–255
    Default: 15
Description: Sets the length of time (in seconds) that the modem
                  waits before calling back the remote modem.

Command: **#CBF? Callback Failed Attempts Display**
    Values: n/a
Description: Requests the number of failed callback passwords since
                  reset or power-up. Use the *&W* command to store this
                  number to nonvolatile memory.

Command: **#CBFR Callback Failed Attempts Reset**
    Values: n/a
    Default: n/a
Description: Resets the number of failed callback passwords to 0.
                  This does not reset the number stored in nonvolatile
                  memory.

Command: **#CBI*n* Callback Inactivity Timer**
    Values: *n*=1–255
    Default: 20
Description: Sets time (in minutes) that the modem waits for a
                  command before forcing the user to enter the setup
                  password again.

Command: **#CBN*y*=*x* Store Callback Password**
    Values: *y*=0–29
                  x = password
    Defaults: None
Description: Sets the callback security password for the *y* memory
                  location. The password must have 6 to 10 characters,
                  and cannot include the + or - characters.

Command: **#CBP*n* Callback Parity**
    Values: *n* = 0, 1, or 2
    Default: 0
Description: Sets parity for the callback security messages.

#CBP0 No parity.
#CBP1 Odd parity.
#CBP2 Even parity.

Command: **#CBRy**

Callback Security Reset

Values: $y = 0$–29

Default: None

Description: Clears password & phone number in y memory location.

Command: **#CBSn Callback Enable/Disable**

Values: $n = 0, 1, 2,$ or 3

Default: 0

Description: #CBS0   Disable callback security.

#CBS1 Enable local and remote callback security.

#CBS2 Enable remote callback security only.

#CBS3 Disable callback security until local hangup or reset.

Command: **#Pn   Set 11-bit Parity**

Values: $n = 0$ or 1

Default: 2

Description: #P0   No parity.

#P1   Odd parity.

#P2   Even parity.

Command: **#Sx   Enter Setup Password**

Values: $x =$ password (1–8 characters, case sensitive)

Default: MTSMODEM

Description: Enters the remote configuration setup password.

Command: **#S=x Store Setup Password**

Values: $x =$ password (1–8 characters, case sensitive)

Default: MTSMODEM

Description: Stores a new remote configuration setup password.

Command: **+++AT<cr> Escape Sequence**

Values: n/a

Description: Puts modem in command mode (and optionally issues a
                command) while remaining online. Type **+++AT** and up

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to ten command character. Then press ENTER. Used mostly to issue hangup command: **+++ATH<cr>**.

Command:	**%%%AT<cr>Remote Configuration Escape Sequence**
Values:	n/a
Description:	Initiates remote configuration mode while online with remote modem. The remote configuration escape character (%) is defined in register **S13**.

Controlling DTMF Functionality with the command +FCLASS=

The *+FCLASS=* command controls DTMF functionality and is used as follows.

1. Enter the command *AT+FCLASS=8 <cr>* to the modem.

2. Call into modem with phone. A *>r* ("arrow r"), incoming ring indication) is displayed, followed by *OK* . The modem is now in Online Voice Command mode, allowing DTMF characters to be passed through from the remote phone. The characters is displayed as shown below:

```
AT+FCLASS=8
OK
➤ R is Ring
➤ / ➤ I ➤ ~
```

The Data link escape character (>), and the 'start of DTMF tone shielding' character (/) are both output once a button is pressed. The DTMF digit will continue to be output along with a > until the button is released, then another > is output along with a 'DTMF transitions to off' (~) character. Silence on the line is indicated with a (>s) displayed.

About DTMF

DTMF (dual tone multi frequency) is the signal to the phone company that you generate when you press an ordinary telephone's touch keys. In the United States and perhaps elsewhere, it's known as "Touchtone" phone (formerly a registered trademark of AT&T). DTMF has generally replaced loop disconnect ("pulse" or "rotary") dialing. With DTMF, each key you press on your phone generates two tones of specific frequencies. So that a voice can't imitate the tones, one tone is generated from a high-frequency group of tones and the other from a low frequency group. Here are the signals you send when you press your touchtone phone keys:

Digit	Low Freq	High Freq
1	697 Hz	1209 Hz
2	697 Hz	1336 Hz
3	697 Hz	1477 Hz
4	770 Hz	1209 Hz
5	770 Hz	1336 Hz
6	770 Hz	1477 Hz
7	852 Hz	1209 Hz
8	852 Hz	1336 Hz
9	852 Hz	1477 Hz
0	941 Hz	1336 Hz
*	941 Hz	1209 Hz
#	941 Hz	1477 Hz

When any key is pressed, both the high and low tones of of the row are generated, hence the name "dual tone". For example, pressing the '5' button generates the tones 770Hz and 1336Hz. The frequencies were chosen to avoid harmonics (no frequency is a multiple of another, the difference between any two frequencies does not equal any of the frequencies, and the sum of any two frequencies does not equal any of the frequencies).

Dual Tone Multi-frequency (DTMF) was a technique proposed by the phone company to replace "pulse dialing" to make dialing faster and more reliable. In anticipation to adding other "customer services", 6 additional digits were included, totaling 16 digits. Most commercial phones only include 12 digits. Many specialized phones and telephone equipment (such as ADSI phones, PBXes, etc.) utilize all 16 digits. DTMF was first introduced in the 1960s to the general public as "touch tone" dialing. The conversion from "pulse dialing" to "touch tone" dialing took over 20 years in the US. To this date (and in the foreseeable future) all phone companies support pulse dialing, and most phones you buy still allow you to switch to pulse. In the 80s, DTMF found a complete new use as a "key pad" for voice mail and interactive voice response systems. Since these systems have become a way of life now, DTMF has become the most common "man machine" interface.

S-Registers

Certain modem values, or parameters, are stored in memory locations called S-registers. Use the **S** command to read or to alter the contents of S-registers (see previous section).

REGISTER	UNIT	RANGE	DEFAULT	DESCRIPTION
S0	1 ring	0, 1–255	1	Sets number of rings until the modem answers. **ATS0=0** disables autoanswer completely.
S1	1 ring	0–255	0	Counts the rings that have occurred.
S2	decimal	0–127 128–255	43(+)	Sets ASCII code for the escape sequence character. Values greater than 127 disable escape.
S3	decimal	0–127	13(^M)	Sets ASCII code for the carriage return character.
S4	decimal	0–127	10(^J)	Sets ASCII code for the line feed character.

S5	decimal	0–32 33–127	8(^H)	Sets ASCII code for the backspace character. Values greater than 32 disable backspace.
S6	seconds	2–65*	2*	Sets time the modem waits after it goes off-hook before it begins to dial the telephone number.
S7	seconds	1–255*	50*	Sets time the modem waits for a carrier signal before aborting a call. Also sets wait for silence time for the @ dial modifier.
S8	seconds	0–65	2	Sets length of a pause caused by a comma character in a dialing command.
S9	decimal	0, 1–127	37(%)	Sets ASCII code for remote configuration escape character. **S9=0** disables remote configuration.
S10	100 ms	1–254	20	Sets how long a carrier signal must be lost before the modem disconnects.
S11	1 ms	50–150*	95*	Sets spacing and duration of dialing tones.
S28	decimal	0, 1–255	1	0 disables, 1–255 enables V.34 modulation.
S30	1 minute	0, 1–255	0	Sets length of time the modem waits before disconnecting when no data is sent or received. Value of zero disables the timer. See also the *T* command
S35	decimal	0–1	0	0 disables, 1 enables the V.25 data calling tone, which allows remote data/fax/voice discrimination.
S36	decimal	0–7	7	Specifies the action to take in the event of a negotiation failure when error control is selected. (See *S48*.)
S37	decimal	0–19	0	Sets maximum V.34 *upstream* speed at

which the modem attempts to connect.

0 = maximum modem speed
1 = reserved
2 = 1200/75 bps
3 = 300 bps
4 = reserved
5 = 1200 bps
6 = 2400 bps
7 = 4800 bps
8 = 7200 bps
9 = 9600 bps
10 = 12000 bps
11 = 14400 bps
12 = 16800 bps
13 = 19200 bps
14 = 21600 bps
15 = 24000 bps
16 = 26400 bps
17 = 28800 bps
18 = 31200 bps
19 = 33600 bps

S38 decimal 0–14 1 Sets maximum 56K *downstream* speed at which modem attempts to connect. Default maximum speed is 56 Kbps.

0 = 56K disabled
1 = 56K enabled w/automatic speed selection at maximum modem speed
2 = 32000 bps
3 = 34000 bps
4 = 36000 bps
5 = 38000 bps
6 = 40000 bps
7 = 42000 bps
8 = 44000 bps
9 = 46000 bps
10 = 48000 bps
11 = 50000 bps

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				12 = 52000 bps 13 = 54000 bps 14 = 56000 bps
S42	decimal	0–1	1	Enables/disables the 56K auto rate. When 56K auto is disabled, fallback to V.34 is also disabled. 0 = disable; 1 = enable.
S43	decimal	0–1	1	*For testing and debugging only.* Enables/disables V.32bis start-up auto mode operation. 0 = disable; 1 = enable.
S48	decimal	7 or 128	7	Enables (7) or disables (128) LAPM negotiation. The following table lists the *S36* and *S48* configuration settings for certain types of connections.

	S48=7	S48=128
S36=0, 2	LAPM or hangup	Do not use
S36=1, 3	LAPM or async	Async
S36=4, 6	LAPM, MNP, or hangup	MNP or hangup
S36=5, 7	LAPM, MNP, or aysnc	MNP or async

S89	seconds	0, 5–255	10	Sets the length of time in the off-line command mode before the modem goes into standby mode. A value of zero prevents standby mode; a value of 1–4 sets the value to 5.
S108	decimal	0–3, 6, 7	6	Selects 56K digital loss if using the modem thru a PBX line. Default value is -6 dB loss, the value used when calling from a typical POTS line long distance.

0 = -0 dB digital loss, no robbed-bit signaling
1 = -3 dB PBX digital loss
2 = -2 dB digital loss
3 = -3 dB digital loss
6 = -6 dB digital loss
7 = -0 dB digital loss with robbed-bit signaling

Result Codes

In command mode, ISI5634PCI modems can send responses called *result codes* to your computer. Result codes are used by communications programs and can also appear on your monitor.

Terse		Verbose	Description
0		OK	Command executed
1		CONNECT	Modem connected to line
2		RING	Ring signal detected
3		NO CARRIER	Carrier signal lost or not detected
4		ERROR	Invalid command
5	*	CONNECT 1200	Connected at 1200 bps
6		NO DIALTONE	No dial tone detected
7		BUSY	Busy signal detected
8		NO ANSWER	No answer at remote end
10	*	CONNECT 2400	Connected at 2400 bps
11	*	CONNECT 4800	Connected at 4800 bps
12	*	CONNECT 9600	Connected at 9600 bps
13	*	CONNECT 14400	Connected at 14400 bps
14	*	CONNECT 19200	Connected at 19200 bps
24	*	CONNECT 7200	Connected at 7200 bps
25	*	CONNECT 12000	Connected at 12000 bps
26	*	CONNECT 16800	Connected at 16800 bps
40	*	CONNECT 300	Connected at 300 bps
55	*	CONNECT 21600	Connected at 21600 bps
56	*	CONNECT 24000	Connected at 24000 bps
57	*	CONNECT 26400	Connected at 26400 bps
58	*	CONNECT 28800	Connected at 28800 bps
59	*	CONNECT 31200	Connected at 31200 bps
60	*	CONNECT 33600	Connected at 33600 bps
70	*	CONNECT 32000	Connected at 32000 bps, 56K rate
71	*	CONNECT 34000	Connected at 34000 bps, 56K rate
72	*	CONNECT 36000	Connected at 36000 bps, 56K rate
73	*	CONNECT 38000	Connected at 38000 bps, 56K rate
74	*	CONNECT 40000	Connected at 40000 bps, 56K rate
75	*	CONNECT 42000	Connected at 42000 bps, 56K rate
76	*	CONNECT 44000	Connected at 44000 bps, 56K rate
77	*	CONNECT 46000	Connected at 46000 bps, 56K rate

78	*	*CONNECT 48000*	Connected at 48000 bps, 56K rate
79	*	*CONNECT 50000*	Connected at 50000 bps, 56K rate
80	*	*CONNECT 52000*	Connected at 52000 bps, 56K rate
81	*	*CONNECT 54000*	Connected at 54000 bps, 56K rate
82	*	*CONNECT 56000*	Connected at 56000 bps, 56K rate
88		*DELAYED*	Delay is in effect for the dialed number
89		*BLACKLISTED*	Dialed number is blacklisted
90		*BLACKLIST FULL*	Blacklist is full

* *EC* is added to these result codes when the extended result codes configuration option is enabled. *EC* is replaced by one of the following codes, depending on the type of error control connection:

V42bis —V.42 error control (LAP-M) and V.42bis data compression

V42 —V.42 error control (LAP-M) only

MNP5 —MNP 4 error control and MNP 5 data compression

MNP4 —MNP 4 error control only

NoEC —No error control protocol).

Intelligent
Serial *Interface*

Chapter 5—

Warranty, Service, and Tech Support

MultiTech
Systems

Software User License Agreement

The ISI drivers and firmware are licensed by Multi-Tech Systems, Inc. to the original end-user purchaser of the product, hereafter referred to as *Licensee*. The License includes the distribution diskette, other accompanying programs, and the documentation.

The ISI drivers and firmware, hereafter referred to as *Software, consists* of the computer program files included on the original distribution diskette.

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If this package contains both 3.5" and 5.25" disks, they are provided only to facilitate use on a single computer. Neither this Software nor the accompanying documentation may be modified or translated without the written permission of Multi-Tech Systems, Inc.

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Limited Warranty

Multi-Tech Systems, Inc. (*MTS*) warrants that its products will be free from defects in material or workmanship for a period of two years from the date of purchase, or if proof of purchase is not provided, two years from date of shipment. MTS MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by the customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period, or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PURCHASE PRICE FOR DEFECTIVE PRODUCTS.

On-Line Warranty Registration

If you want to register your modem on-line, you can do so at the following address:

http://www.multitech.com/register

Tech Support

Multi-Tech has an excellent staff of technical support personnel available to help you get the most out of your Multi-Tech product. If you have any questions about the operation of this unit, call 1-800-972-2439. Please fill out the information below and have it available when you call. If you require service, the tech support specialist will advise you in Multi-Tech's service procedure (see Service section in this chapter).

Recording ISI5634PCI Information

Please fill in the following information on your Multi-Tech product. This will help tech support in answering your questions.

Serial No.: _____

Firmware Version: _____

Driver Version: _____

Operating System: _____

COM Port #: _____

Please note the status of your ISI5634PCI card before calling tech support (e.g., screen messages, diagnostic test results, problems with a specific application, etc.). Use the space below to note status:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Service

If your tech support specialist decides that service is required, your unit may be sent (freight prepaid) to our factory. Return shipping charges will be paid by Multi-Tech Systems.

Include the following with this product:

- A description of the problem.
- Return billing and return shipping addresses.
- Contact name and phone number.
- Check or purchase order number for payment if the ISI5634PCI/4/8 is out of warranty. (The standard repair charge is $95. This price is valid at the time of this publication but could change in the future. Check with your technical support specialist.)
- If possible, note the name of the technical support specialist with whom you spoke and the tracker number assigned to your case.

Record the serial number and the tracker number for future reference. If you need to inquire about the status of the returned product, you will be asked to provide the **serial number** of the product sent. Providing the tracker number when you inquire also helps to readily identify your service request.

Send the ISI5634PCI card to this address:

MULTI-TECH SYSTEMS, INC.
2205 WOODALE DRIVE
MOUNDS VIEW, MINNESOTA 55112
ATTN: SERVICE OR REPAIRS

About the Internet

Multi-Tech is a commercial provider on the Internet, and we retrieve e-mail messages from our customers on a periodic basis. If you prefer to receive service via the Internet, you can contact Tech Support at:

http://www.multitech.com/_forms/email_tech_support.htm

Multi-Tech's presence includes a Web site at:

http://www.multitech.com

Intelligent Serial Interface

Appendices

MultiTech Systems

Appendix A—Regulatory Information

FCC Regulations for Telephone Line Interconnection

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

3. A 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 which is Part 68 compliant. See installation instructions for details.

4. The ringer equivalence number (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive REN's 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 REN's should not exceed (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total REN's, 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 the customer 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 MultiTech Systems, Inc. at the address shown below for details of how to have repairs made. If the equipment is causing harm to the network, the telephone company may request you to 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 MultiTech Systems or its licensees. Unauthorized repairs void registration and warranty.

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

Manufacturer:	MultiTech Systems, Inc.
Trade Name:	MultiModemISI
Model Numbers:	ISI5634PCI/4
	ISI5634PCI/8
FCC Registration Number:	AU7USA-33395-M5-E
Ren:	0.1A
Modular Jack (USOC):	RJ-11C or RJ11W
Service Center in USA:	MultiTech Systems, Inc.
	2205 Woodale Drive
	Mounds View, MN 55112
	(800) 328-9717
	(612) 785-3500
	Fax (612) 785-9874

Class A Statement

FCC Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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 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.

Industry Canada

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

Cet appareil numerique de la classe A respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

Canadian Limitations Notice: Ringer Equivalence Number

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 certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department 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.

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, users must refer to the their fax software manual for setup details. Typically, the fax branding information must be entered via the configuration menu of the software.

$$C\,\epsilon$$

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

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.

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

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.

Intelligent Serial Interface

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MultiTech® Systems

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Symbols

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