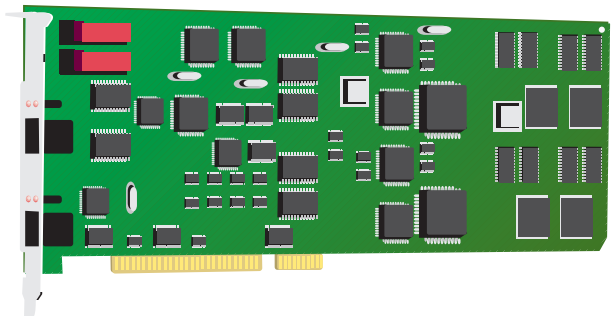
Intelligent Serial Interface



MultiModemISI Hybrid Series

Model ISIHP-2S/2U

Quick Start Guide

MultiTech® Systems

MultiModemISI Hybrid SeriesModel ISIHP-2S/2U

Quick Start Guide

82093800 Revision A

Record of Revisions

Revision	*Description*
A	Manual released. Preliminary (beta) release 2/19/99.

Patents

This product is covered by one or more of the following U.S. Patent Numbers: 5.301.274, 5.309.562, 5.355.365, 5.355.653, 5.452.289, 5.453.986. Other patents Pending.

Trademarks

The Multi-Tech logo is a registered trademark of Multi-Tech Systems, Inc.
NetWare is a registered trademark of Novell, Inc.
Pentium is a registered trademark of Intel Corporation.
SCO is a registered trademark of Santa Cruz Operation, Inc.
UNIX is a registered trademark of X/Open Company, Ltd.
Windows 95 and Windows NT are registered trademarks of Microsoft.

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, Minnesota 55112
(612) 785-3500 or (800) 328-9717
Fax (612) 785-9874
Fax Back (612) 717-5888
BBS (612) 785-3702 or (800) 382-2432
Tech Support (800) 972-2439
Internet Address: http://www.multitech.com

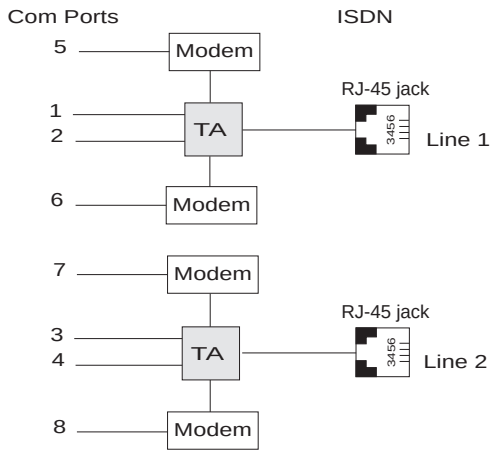
Contents

Introduction 4
Welcome and Product Description 4
Peripheral Component Interconnect (PCI) 5
Introduction 6
Computer Requirements 6
Shipping Contents 6
Safety Warnings 7
Hardware Installation Procedure 8
LED Indicators 10
Installing the ISIHP-2S/2U in Windows NT 3.51/4.0 12
Installing TAs and Modems to COM Ports in Windows NT 17
I/O Addresses and IRQ Codes 25
Removing ISIHP-2S/2U Card & Driver in Windows NT 3.51/4.0 26
Installing the ISIHP-2S/2U in Windows 95 and Windows 98 26
Windows 95 Installation 26
To Remove the ISIHP-2S/2U Card and Drivers in Windows 95 28
Windows 98 Installation 28
To Remove the ISIHP-2S/2U Card & Drivers in Windows 98 32
Removing the Driver 32
Installing TAs & Modems to COM Ports in Windows 95 /98 32
Removing the Driver (Windows 95 only) 41
Configuring the Terminal Adapter: Introduction 41
North American Users 41
International Users 42
Optional Settings 42
ISDN TA Configuration Utility 44
ConfigMenu Configuration Utility 50
AT Commands 51
NetWare Connect (Novell) Driver Installation 52
Configuring Ports for NetWare Connect 52
Removing the Driver (Novell) 52
SCO Open Server 5 Driver Installation 53
Activating Ports in SCO Open Server 5 56
Removing the Driver (SCO Open Server 5) 58
Linux Driver Installation 59
Service 61

Index 62

Welcome to Multi-Tech's new MultiModemISI Hybrid Series, model ISIHP-2S/2U, a multiport hybrid ISDN card that can be plugged into any PCI slot for Remote Access Server (RAS) applications. Included on the ISIHP-2S/2U are four V.90/K56flex central site modems for incoming analog modem and fax calls, as well as two terminal adapters. Each terminal adapter appears as two ports to the server PC using the ISIHP-2S/2U. The terminal adapters identify incoming analog calls and route them to the central site modems. The ISIHP-2S/2U also supports dial-out applications via the modems or terminal adapters.

The card features eight RAS ports using two Basic Rate Interface (BRI) ISDN lines. The eight ports allow a server to accept any combination of analog modem and digital ISDN calls, giving the user the flexibility to customize the settings of the terminal adapters and modems. Since the two BRI lines constitute only four Bearer channels, only four of the eight ports can be active at any one time. The two terminal adapters handle the four B-channels as four independent data connections (see diagram below).



From the perspective of the server PC, the ISIHP-2S/2U is an eight-port serial card with eight devices permanently attached to the serial ports. The first four ports are the two terminal adapters, each of which appear as two ports. The remaining four ports are the four central site modems. The following chart summarizes the correlation of ports and devices.

Port Number	Device	ISDN Line Number
1	TA	1
2	TA	1
3	TA	2
4	TA	2
5	Modem	1
6	Modem	1
7	Modem	2
8	Modem	2

This Quick Start Guide for the ISIHP-2S/2U contains installation instructions and technical support information to assist you in installing the ISIHP-2S/2U. This guide is written for audiences with basic PC skills; therefore, step-by-step instructions for basic operations such as logging in and file editing are not included.

Peripheral Component Interconnect (PCI)

First developed by companies such as Intel™, AT&T™ and Digital Equipment Corporation™, the Peripheral Component Interconnect (PCI) bus used by your ISIHP-2S/2U provides high performance and is easy to use. Because PCI devices contain registers with the device information required for configuration, full auto configuration of PCI Local Bus add-in boards and components is supported. Performance factors include a bus data path of 64 bits, clock speeds of 66 MHz, and bandwidth of 264 Mbs.

Introduction

This section describes how to install the ISIHP-2S/2U server card into the PCI bus on your personal computer, which involves

- Opening your PC
- Setting card configuration (determining I/O address DIP-switch setting and IRQ jumper setting)
- Installing the card into the PC

Computer Requirements

- Pentium-based PC or compatible with PCI bus architecture
- Microsoft Windows 95, Windows NT version 4.0, SCO Open Server version 5.0, Novell NetWare, or Linux
- At least one floppy drive
- 800 blocks of hard disk space for UNIX, 100K bytes for Windows NT, 34K bytes for Windows 95, 50K bytes for Novell

Shipping Contents

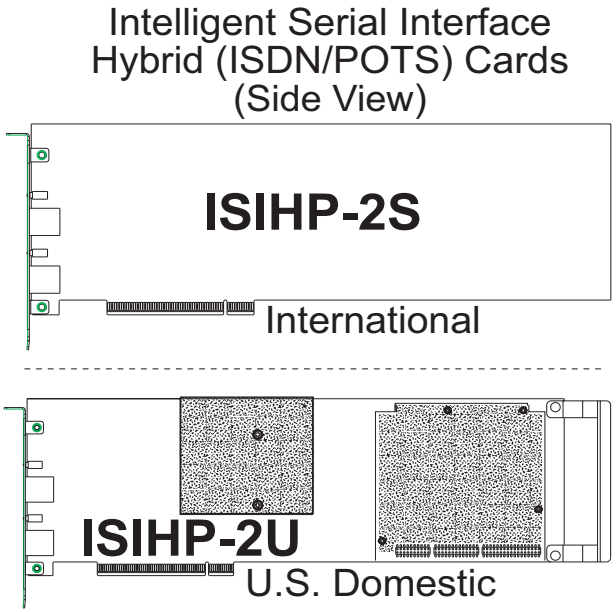
- ISIHP-2S/2U card
- RJ-45 ISDN cord (2)
- ISIHP Driver Disk set with ISDN TA Configuration Wizard
- Quick Start Guide

Safety Warnings

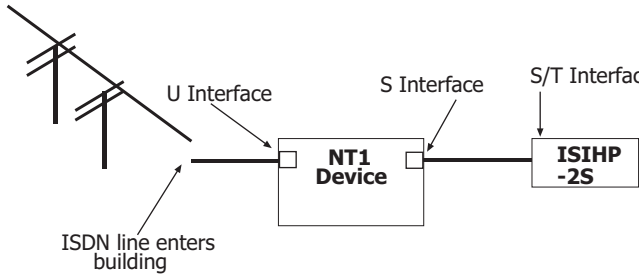
- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jacks are specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of that leak.
- Ports that are connected to other apparatus are defined as SELV. To ensure conformity to EN 41003, ensure that these ports are connected only to the same type on the other apparatus.

Hardware Installation Procedure

1. Before handling the ISIHP-2S/2U, discharge any static in your body by touching a piece of grounded metal such as the computer chassis.
2. Carefully remove the ISIHP-2S/2U 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 ISIHP-2S/2U. The 2U model is distinct from the 2S model in that it includes auxiliary modules, as shown below. If you have any concerns about the condition of your ISIHP-2S/2U unit, call Technical Support at (612) 717-5863.



4. To avoid damaging the ISIHP-2S/2U and your PC, make sure your computer and any peripheral equipment connected to it are turned off. The ISIHP-2S/2U can be installed in a 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 ISIHP-2S/2U card and remove the slot cover according to instructions in your computer's documentation.
7. Install the ISIHP-2S/2U card in the selected expansion slot in the same manner as any other add-on card according to your computer's documentation.
8. Fasten retaining bracket to the computer chassis and replace the cover.
9. Connect the ISIHP-2S/2U to your ISDN telephone wall jack with the provided modular telephone cable.



***Note**: The ISIHP-2S/2U communicates over ISDN lines. If you don't have a standard modular jack near your computer, you should install one or have one installed by your telephone company. In the US, installation kits and adapters are available wherever telephones are sold.*

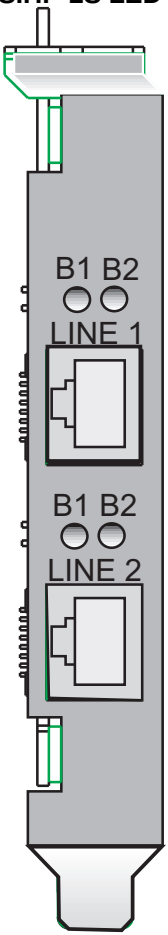
***Note:** The ISIHP-2S requires an S/T-interface. The ISDN phone cord must be connected between the ISDN network connection and the NT1 device.*

10. Turn on power to the computer. Now you are ready to install software.

LED Indicators

The mounting bracket for both the ISIHI-2S and the ISIHI-2U is similar, except the LEDs are labeled differently. Each mounting bracket has two sets of LED indicators that indicate status and line activity. Below, and on the next page, are graphics for each bracket along with descriptions of the LED indicators.

ISIHP-2S LED Indicators



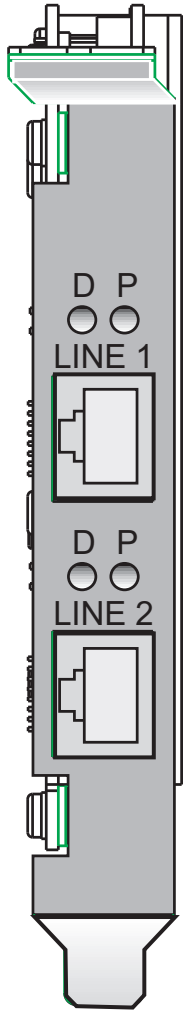
B1 LED Indicator

- When lit, indicates active or voice connection on B-channel 1.

B2 LED Indicator

- When lit, indicates active or voice connection on B-channel 2.

ISIHP-2U LED Indicators



P LED Indicator

- Indicates U interface status connection.
- Controlled by NT-1, which converts S/T interface (4-wire ISDN) to U interface (2-wire ISDN).
- When U interface and S/T interface are NOT active, LED remains off.
- Flashes 8 times/second (8 Hz)—U interface is attempting to activate.
- Flashes once/second (1 Hz)—U interface is active; S/T interface is not fully active.
- Lit, not flashing—Both U and S/T interfaces are active.

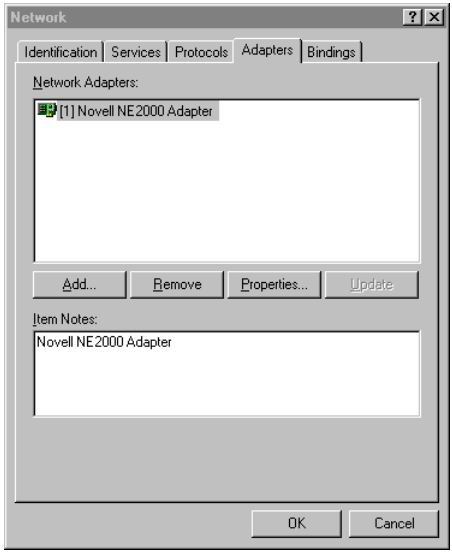
D LED Indicator

- Lights when the ISIHP-2S/2U is turned on.
- Flashes until SPIDs are verified with the central office switch; then remains lit without flashing.
- Indicates data link layer status.

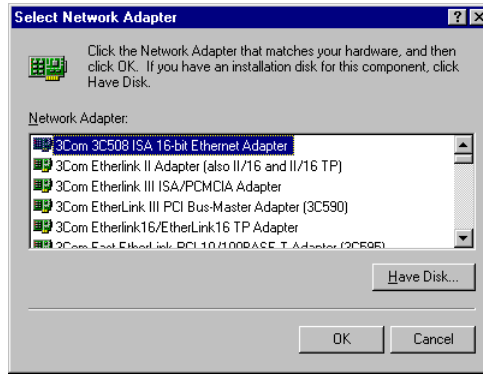
Installing the ISIHP-2S/2U in Windows NT 3.51/4.0

The following procedure describes how to install the ISIHP-2S/2U 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 refer to both 3.51 and 4.0.

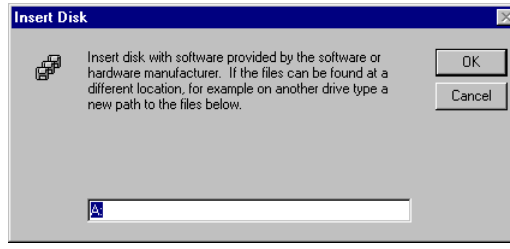
1. Install the ISIHP-2S/2U in an available PCI slot as described in the installation section of this manual.
2. Turn on the computer.
3. Click **Start**, **Settings**, **Control Panel**, and then double-click **Network**. In the **Network** dialog box, click the **Adapters** tab. Then click **Add**.



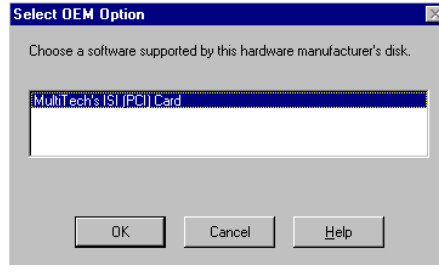
4. The **Select Network Adapter** dialog box appears. Click **Have Disk**.



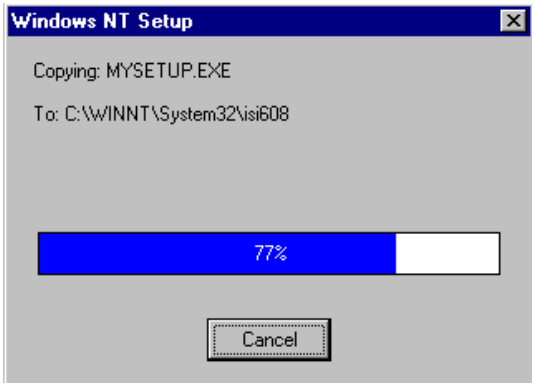
5. The **Insert Disk** dialog box appears. Insert the *MultiModem ISI Driver for Windows NT* diskette and click **OK**.



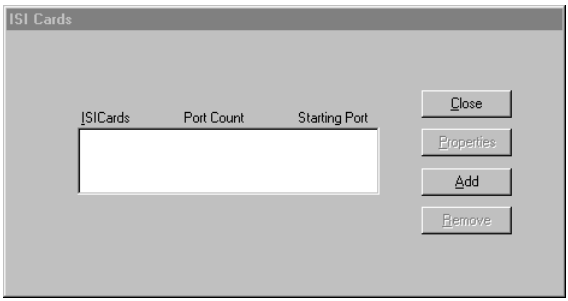
6. The **Select OEM Option** dialog box appears. Click **OK**.



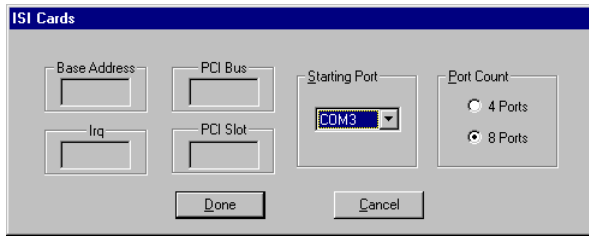
A transient dialog box will appear while the setup program is loaded from the diskette to the PC hard drive.



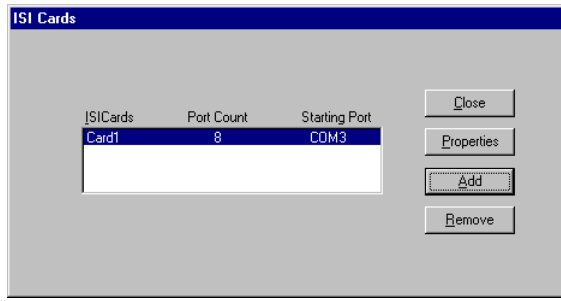
7. The **ISI Cards** dialog box appears. Click **Add**.



8. Then this **ISI Cards** dialog box appears. Select the starting port (usually port 3).

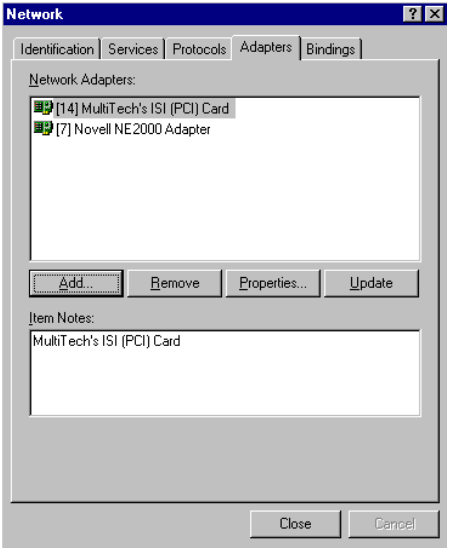


9. The **ISI Cards** dialog box appears again showing the port assignment. Click **Add** to add additional cards and repeat step 8.

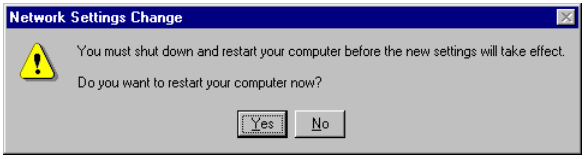


After the last ISIHP/2S/2U card has been added, click **Close**.

10. The file copies and **Multi-Tech ISIHP-2S/2U Adapter** appears in the **Network Adapters** box. Click **Close**.



11. When this dialog box appears, click **Yes** to reboot your system.

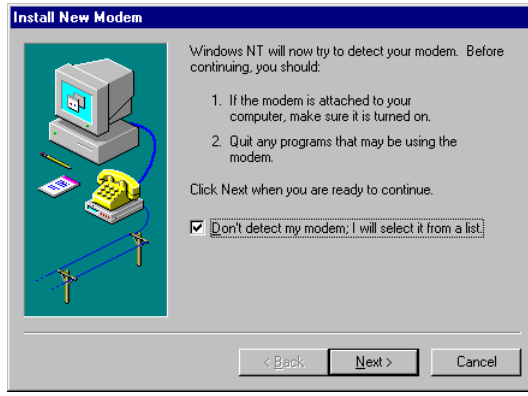


The ISIHP-2S/2U now is installed in Windows NT.

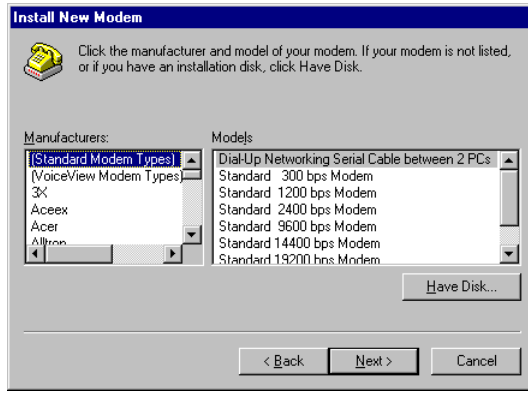
Installing TAs and Modems to COM Ports in Windows NT

To install terminal adapters:

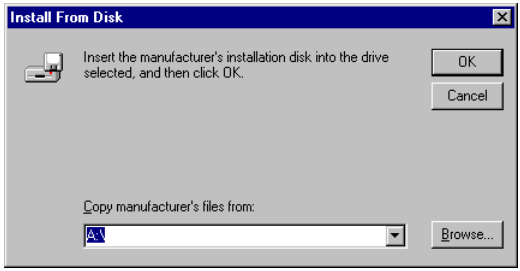
1. In the **Control Panel**, double-click the **Modems** icon.
2. The **Modem Properties** dialog box appears. Click **Add**.
3. The **Install New Modem** dialog box appears. Check the box marked **Don't detect my modem; I will select it from a list** and click **Next**.



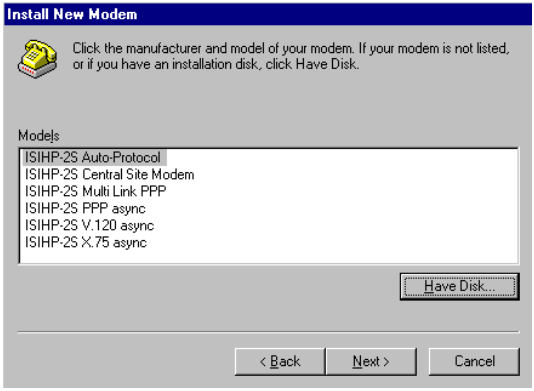
4. The **Install New Modem** dialog box appears. Click **Have Disk**.



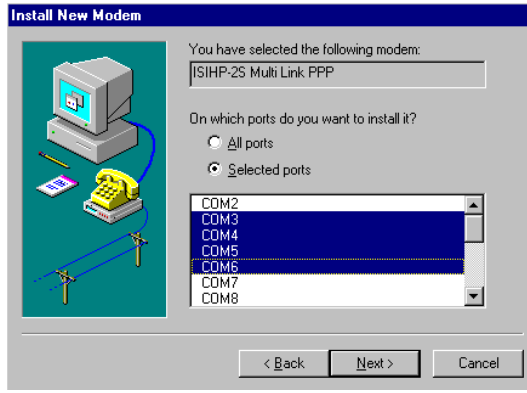
5. The **Install From Disk** dialog box appears. Click **OK** (diskette should still be in drive).



6. The **Install New Modem** dialog box appears. From the **Models** list, select an ISDN protocol (; Auto-Protocol, ML-PPP, PPP, V.120, or X.75, depending on your application). Then click **Next**.



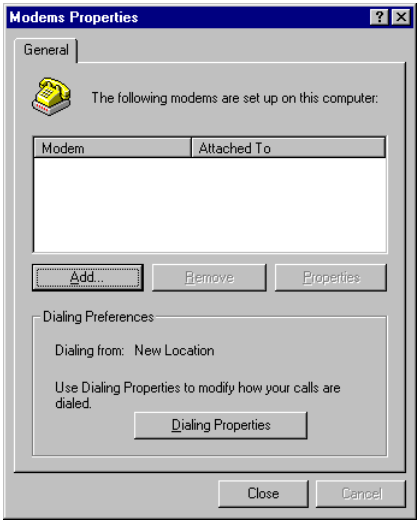
7. The **Install New Modem** dialog box appears. Select the ports that correspond to the first four ports of the ISIHP-2S/2U card. Any ports that existed prior to installing the ISIHP-2S/2U appear first in the list of available COM ports. Click **Next**. The terminal adapters (screen displays *modems*) install to the selected COM ports.



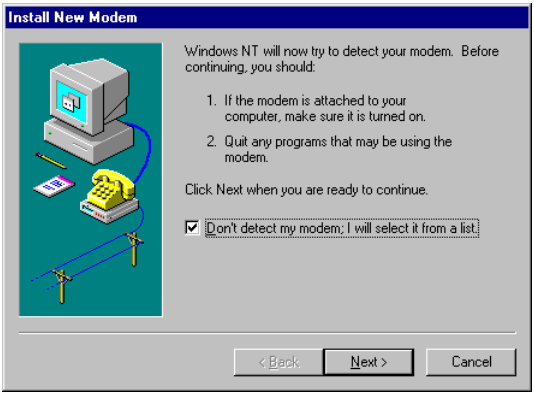
8. After the terminal adapters install, click **Finish** to return to the **General** tab to view COM port assignments (and make changes if necessary). Now you are ready to install the modems.

To install modems:

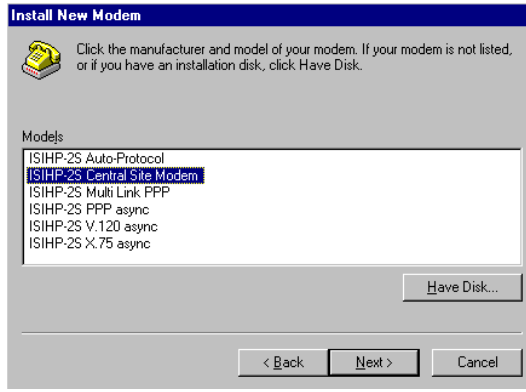
1. In the **General** tab, click **Add**.



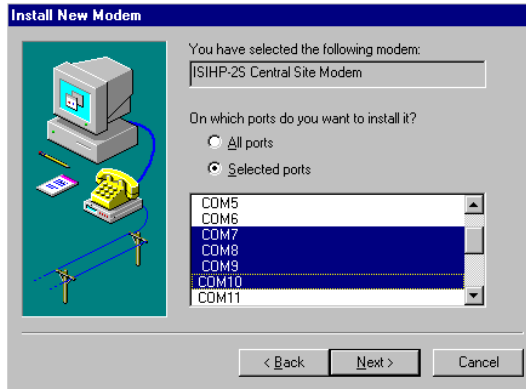
2. The **Install New Modem** dialog box appears. Check the box marked **Don't detect my modem; I will select it from a list.** Then click **Next**.



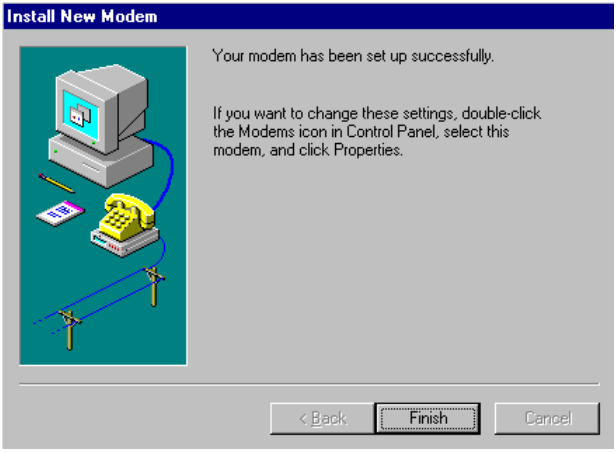
3. The **Install New Modem** dialog box appears. From the **Models** list, select **Central Site Modems** for the *modems*. Then click **Next**.



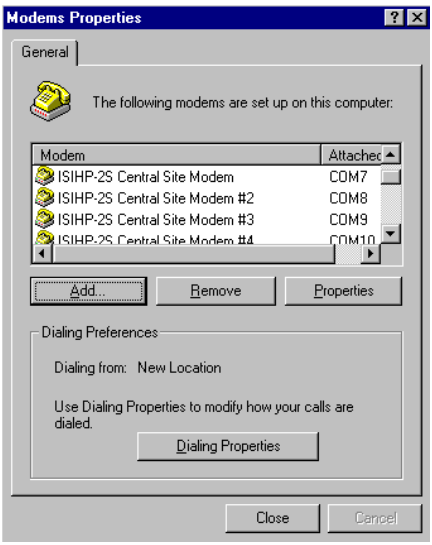
4. Select the ports that correspond to the last four ports of the ISIHP-2S/2U card. Click **Next**. The modems install to the selected COM ports.



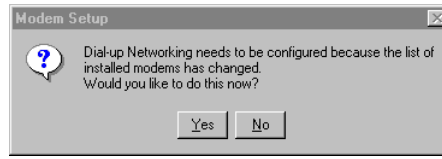
5. After the modems install to the ports, click **Finish** to return to the **General** tab.



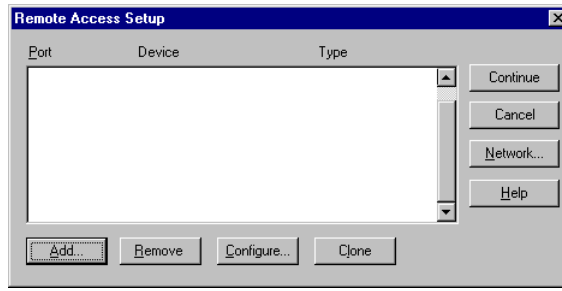
6. To view COM port assignments and make necessary changes, use the Modem Properties dialog box.



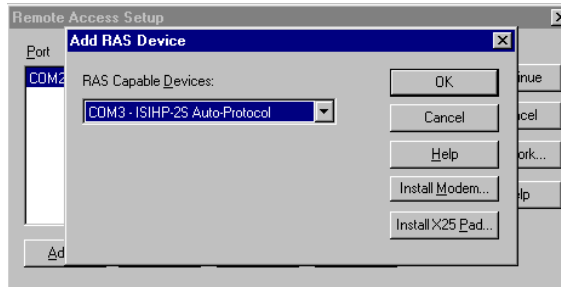
7. Close the **Modems Properties** dialog box. The message below appears asking if you want to configure dial-up networking. Click **Yes**.



8. The **Remote Access Setup** dialog box appears. Click **Add**.

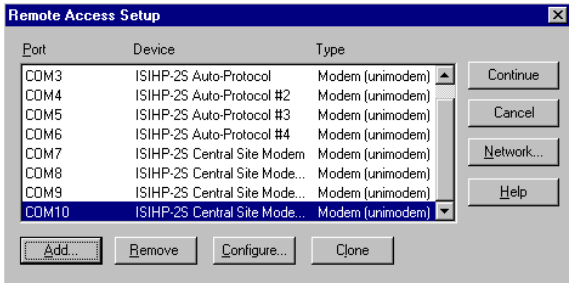


9. Each COM port appears in a separate **Add RAS Device** dialog box. To add the highlighted device, click **OK**.

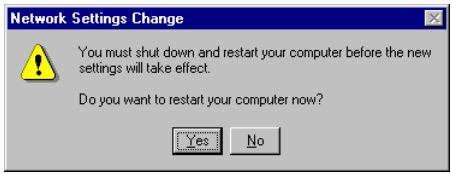


10. The **Remote Access Setup** dialog box displays again. Repeat steps 7 and 8 until all devices are added.

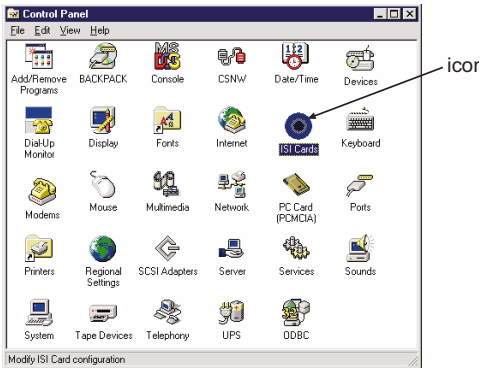
11. When all devices have been added, click **Continue**.



12. After the bindings have been reviewed and stored, the message below appears, click **Yes**.



After re-booting, the **ISI Cards** icon appears in the **Control Panel.**

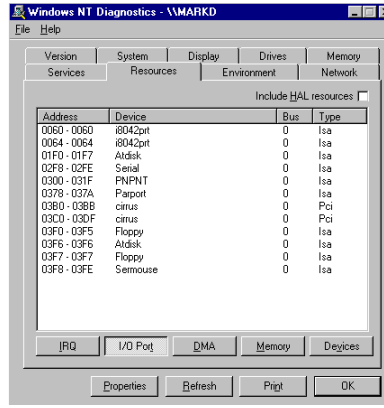


You are now ready to configure the terminal adapter. See the section,“Configuring the Terminal Adapter,” on page 45.

I/O Addresses and IRQ Codes

Unlike many modem products, the ISIHP-2S/2U has no DIP switch for I/O addresses and no jumper to determine the IRQ code. The input/ output address and the interrupt request code (IRQ) for the ISIHP-2S/ 2U are assigned automatically during driver installation. During any subsequent re-cofiguring of your PC, you may need to know the assigned I/O address andIRQ code. To determine the I/O address and IRQ assigned to the ISIHP-2S/2U:

(*for Windows NT*) click on **Start**, **Settings**, **Control Panel** and select the **ISI Cards** icon; *or* click on **Start**, **Programs**, **Administrative Tools (Common)**, **Windows NT Diagnostics**, **Resources**;



(*for Windows 95*) click on **Start**, **Settings**, and **Control Panel**. From the Control Panel, click on **System** icon and then the **Device Manager** tab. From there, click on the **Computer** icon at the top of the **Device Manager** window. The **Computer Properties** dialog box will appear. In the **View Resources** tab, click on either the **Interrupt Request** (IRQ) or **Input/Output** (I/O) radio buttons to view lists of both the IRQs and I/O memory addresses in use in the computer and what devices are currently using these resources.

Removing ISIHP-2S/2U Card and 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 PCI ISI Card,** and then click **Remove**.

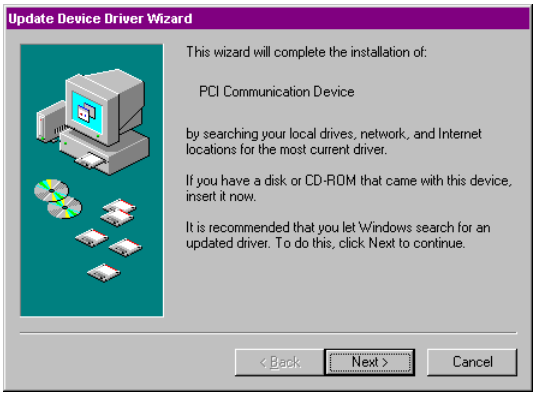
Note: *To complete an uninstall, reboot your system.*

Installing the ISIHP-2S/2U in Windows 95 and Windows 98

This section describes how to install the ISIHP-2S/2U in systems operating Microsoft Windows 95 or Windows 98 to use with a Remote Access Service (RAS) server and other communications/fax server type applications.

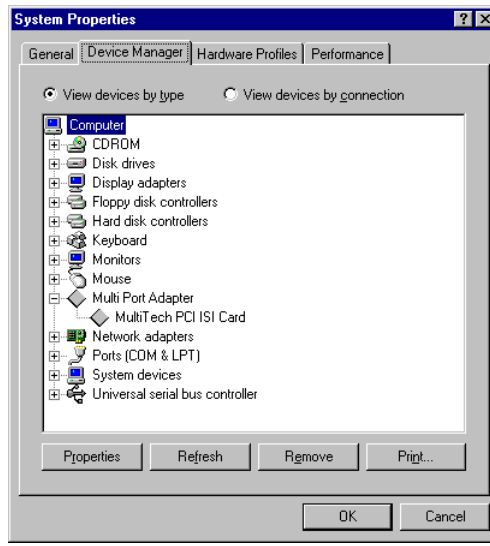
Windows 95 Installation

1. After installing the ISIHP-2S/2U in an available PCI slot, turn on the computer.
2. Windows 95 automatically detects the ISIHP-2S/2U card. A dialog box appears with a message stating that Windows has found the new hardware and is locating the software for it.
3. The **Update Device Driver** dialog box appears. Insert the ISIHP-2S/2U Windows 95 driver diskette and click **Next**.



4. Windows 95 automatically searches for the unknown device and locates the MultiTech ISI Port. After the operating system goes through this process for every port added, click **Finish**.

5. To view the COM ports, click **Control Panel** and double-click **System**. In the **System Properties** dialog box in **Device Manager**, the **MultiTech PC ISI Card** appears under **Multi Port**. To view ports, click **Ports (COM & LPT)**. Click **OK** to close.



To Remove the ISIHP-2S/2U Card and Drivers in Windows 95

To remove the ISIHP-2S/2U:

1. Click **Start**, **Settings**, **Control Panel**, and then **System**.
2. The **System Properties** dialog box appears. Click the **Device Manager** tab.
3. Click **Multi Port Adapter** and select **MultiTech PCI ISI Card**, and then click **Remove**.

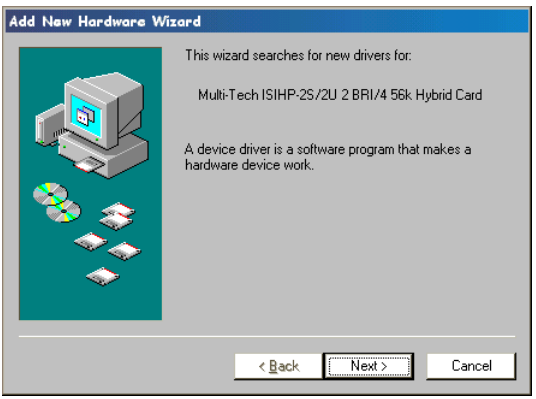
To remove the drivers:

1. Click **Start**, **Settings**, **Control Panel**, and then double-click **Add/ Remove Programs**.
2. Select **MultiTech ISI Card** and then click **Add/Remove**.

Note: *To complete an uninstall, reboot your system.*

Windows 98 Installation

1. After installing the ISIHP-2S/2U in an available PCI slot, turn on the computer.
2. Windows 98 automatically detects the ISIHP-2S/2U card. A dialog box appears with a message stating that Windows has found the new hardware and is locating the software for it.
3. The **Add New Hardware Wizard** dialog box appears. Click **Next**.

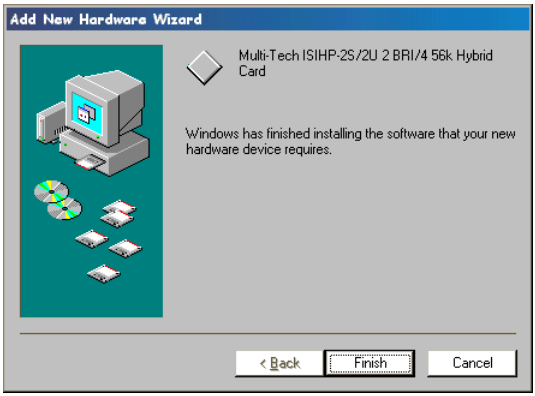


4. In the next Wizard dialog box, select **Search for the best driver for your device. (Recommended).** Then click **Next**.

5. In the next Wizard dialog box, make sure **Floppy disk drives** is checked. Insert the *MultiModem ISI Driver for Windows 95/98* diskette. Then click **Next** and the system locates the file.

6. When this Wizard dialog box appears, click **Next**.

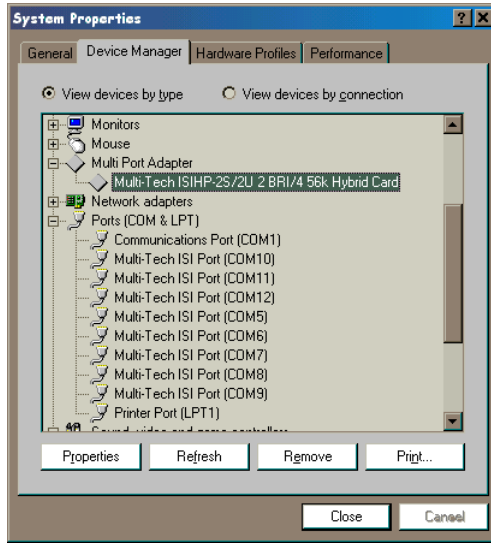
7. Windows then installs the device driver for the ISIHP-2S/2U card. When this dialog box appears, click **Finish**.



Windows 98 will now detect and create 8 COM ports.

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

9. 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.

To Remove the ISIHP-2S/2U Card and Drivers in Windows 98

To remove the ISIHP-2S/2U card:

1. Re-boot your computer.
2. Click **Start**, **Settings**, **Control Panel**, and then **System**.
3. The **System Properties** dialog box appears . Click the **Device Manager** tab.
4. Click **Multi Port Adapter** and select **MultiTech ISIHP-2S/2U 2BRI/4 56K Hybrid Card.** Then click **Remove**.

To remove the drivers:

1. Click **Start**, **Settings**, **Control Panel**, and then double-click **Add/ Remove Programs**.
2. Select **MultiTech ISI Card** and then click **Add/Remove**.

Removing the Driver

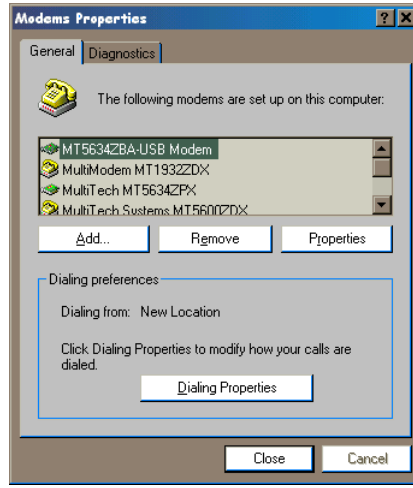
1. Click **Settings**, **Control Panel**; then double-click **Add/Remove Programs**.
2. From the list box, select **ISICOM Driver**.
3. Click **Add/Remove** and follow dialog box instructions.

Installing TAs & Modems to COM Ports in Windows 95 /98

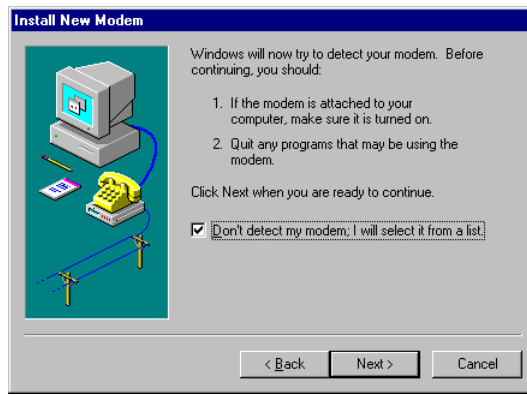
To install terminal adapters:

1. Click **Start**, **Settings**, **Control Panel**, and then double-click the **Modems** icon.
2. If no modems are currently installed, the **Install New Modem** dialog box appears. Check the box marked **Don't detect my modem; I will select it from a list.** Then click **Next**.

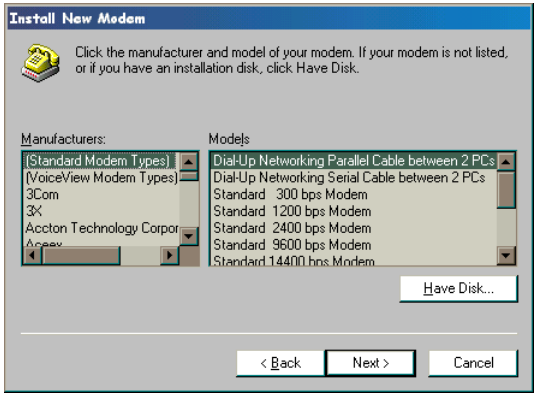
   If other modemshave been installed, the **Modems Properties** dialog box will appear.



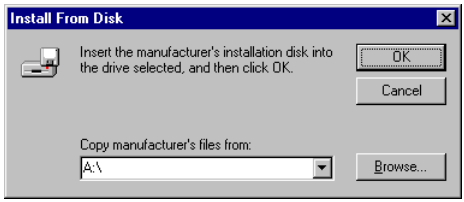
Click **Add** and the **Install New Modem** dialog box will appear. Check the box marked **Don't detect my modem; I will select it from a list.** Then click **Next**.



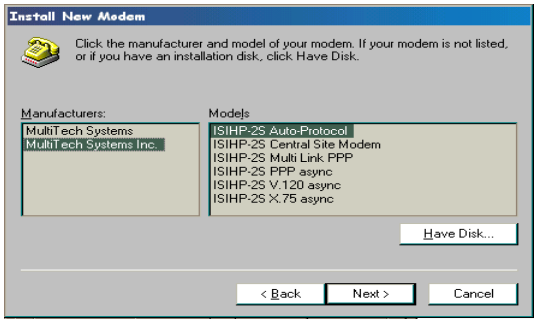
3. The **Install New Modem** dialog box appears. Insert diskette labeled *MultiModem ISI Driver for Windows 95 & Netware AIO* and click **Have Disk**.



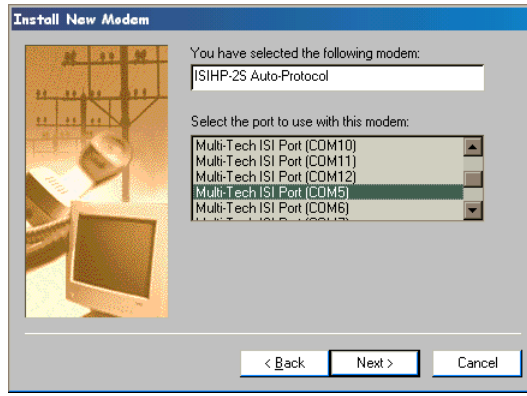
4. The **Install From Disk** dialog box appears. Click **OK**.



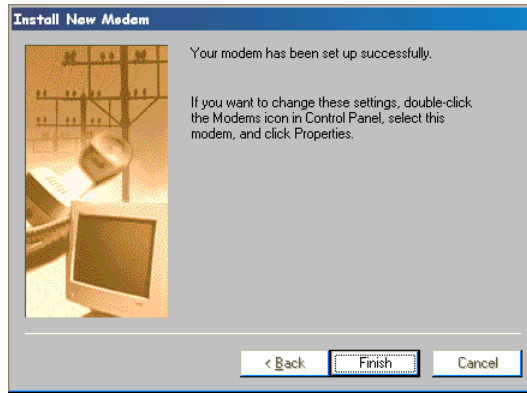
5. The **Install New Modem** dialog box appears. Select a protocol (depending on your application) from the **Models** list; then click **Next**.



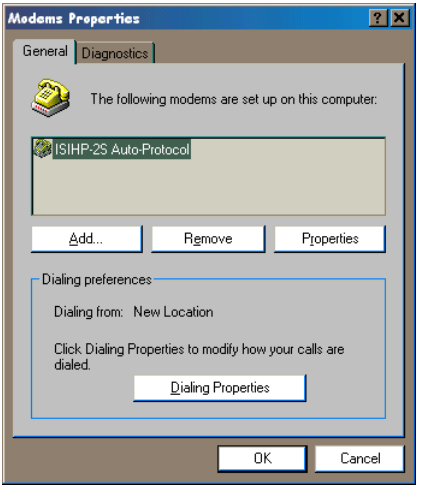
6. The **Install New Modem** dialog box appears. Select the port that corresponds to the lowest numbered port of the ISIHP-2S/2U card. Any ports that had been installed before installing the ISIHP-2S/2U card are numbered lower than the ports of the ISIHP-2S/2U card. Click **Next**.



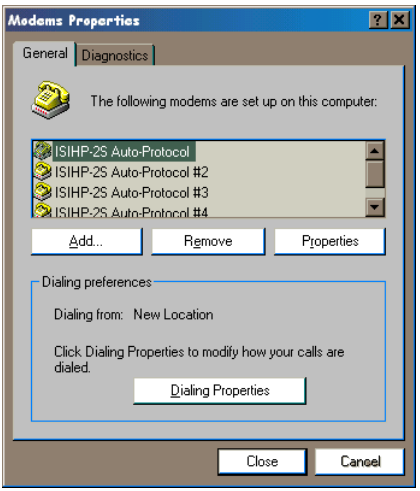
7. Windows will install the first terminal adapter. Click **Next**.



8. After the terminal adapter installs, click **Finish** to return to the **General** tab to view COM port assignments (and make changes if necessary).

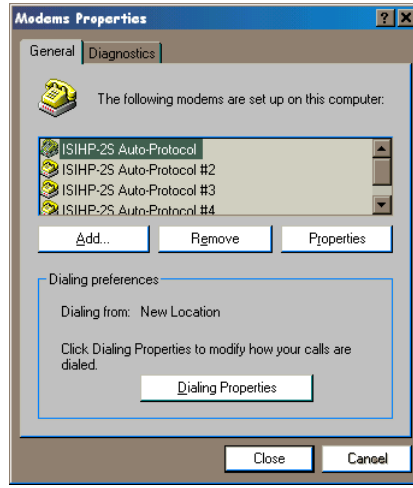


9. Click **Add** and repeat installation steps 2–8 to install terminal adapters to the first four ports of the ISIHP-2S/2U. After the terminal adaptershave been installed, you are ready to install the modems.

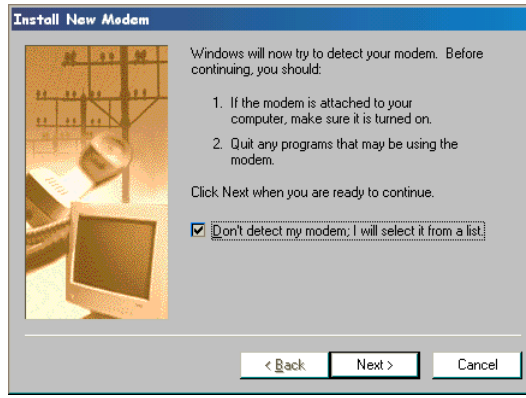


To install modems (Windows 95/98):

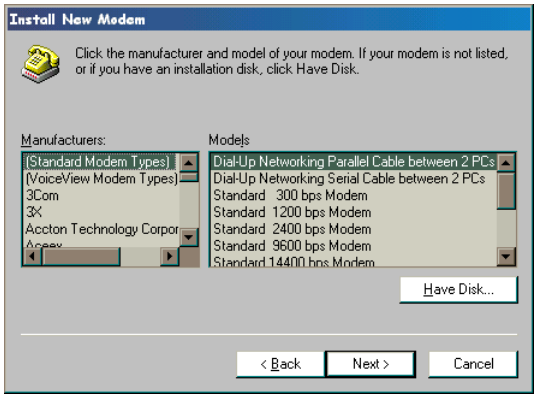
1. In the **General** tab, click **Add**.



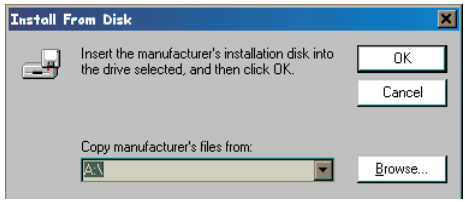
2. The **Install New Modem** dialog box appears. Check the box marked **Don't detect my modem; I will select it from a list.** Then click **Next**.



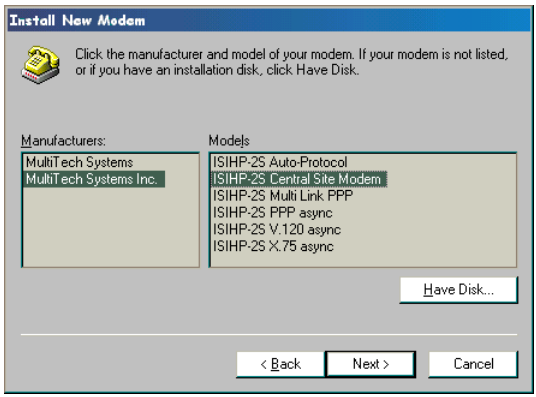
3. The **Install New Modem** dialog box appears. Insert the driver diskette labeled *MultiModem ISI Driver for Windows NT*. Then click **Have Disk**.



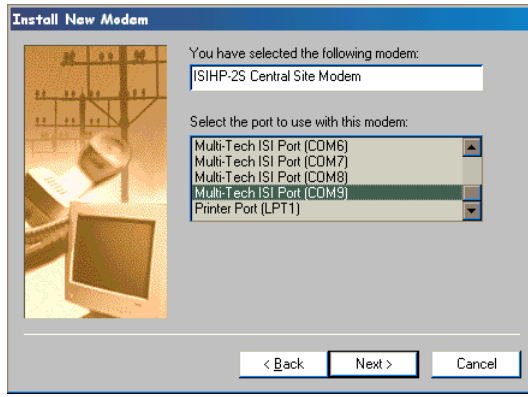
4. The **Install from Disk** dialog box appears. Click **OK**.



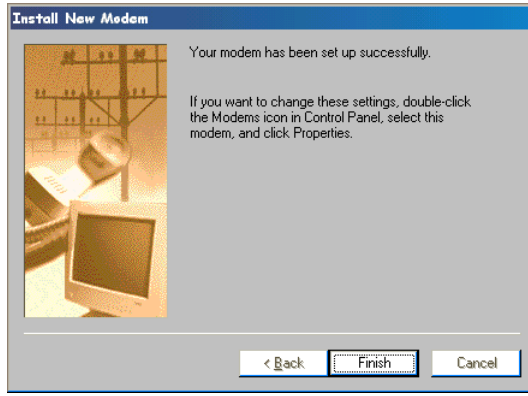
5. The **Install New Modem** dialog box appears. From the **Models** list, select **Central Site Modems** for the *modems*. Then click **Next**.



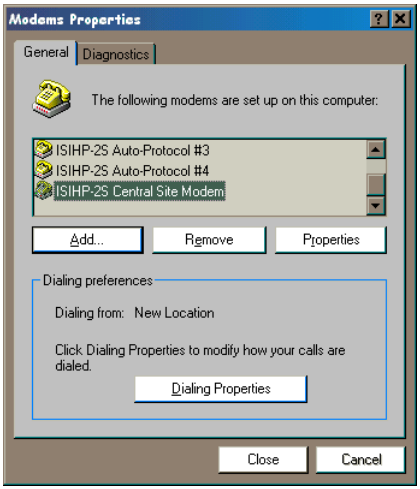
6. The **Install New Modem** dialog box appears. Select the numbered port (the fourth highest number) of the ISIHP-2S/2U card. Click **Next**. The modem installs to the COM port.



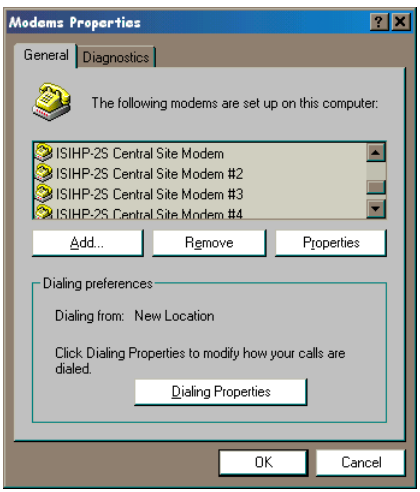
7. After the modem installs to the port, click **Finish.**



8. Return to the **General** tab to view COM port assignments (and make changes if necessary).



9. Click **Add** and repeat installation steps 2–8 to install modems to the last three ports of the ISIHP-2S/2U.



Now you are ready to configure the terminal adapters.

Removing the Driver (Windows 95 only)

1. Click **Settings**, **Control Panel**, and then double-click **Add/ Remove Programs**.
2. From the list box, select **ISICOM Driver**.
3. Click **Add/Remove** and follow screen instructions.

Configuring the Terminal Adapter

Introduction

North American users must configure the terminal adapter to match network switch type, the service profile identifier (SPID), and the directory number (DN). For international users, the terminal adapter ships already configured for NET3, which should work on most phone lines in Europe. However, you may want to customize settings, regardless of your location. (See "Optional Settings" on the following page.)

You can configure the terminal adapters with the ISDN TA Configuration utility, ConfigMenu, or with AT commands. Instructions for all three are provided in this section.

- ***ISDN TA Configuration Utility***—recommended for computers with Windows 95/98 and Windows NT.
- ***ConfigMenu***—recommended for computers with DOS or Windows 3.x and a VT100/ANSI compatible terminal or data communication program that includes VT100/ANSI terminal emulation.
- ***AT Commands***—allow you to fine tune TA operation with AT commands and S-registers. Enter these commands in your data communication program's terminal mode. AT commands are described in detail in the online manual.

North American Users

Before you connect the ISIHP-2S/2U to your network terminator, you must configure it to match the following:

- *Network Switch Type*_____
  Select the network switch type your ISDN service uses at its local central office. You can set the TA to NET3, AT&T 5ESS, NT DMS-

100, or US National ISDN-1. If you don't know the switch type, get the information from the local phone company. *AT command:* ***!CO=***

- *SPIDs and DNs*
  The TA must be configured with the Service Profile Identifier (SPID). The SPID, assigned by the local phone company, is for the specific BRI line where TA is attached. The SPID field is empty prior to configuration. *AT command:* ***AT!C6=*** *and* ***AT*!C6***

  The Directory Number (DN) is the phone number another user would call to contact this TA once it is attached to the ISDN. *AT commands:* ***AT!N1=*** *and* ***AT*!N1=***

> ***Note:*** *SPIDs only apply for North American switch types.*

International Users

The terminal adapters ship already configured for NET3, which should work for most telephone lines in Europe. If you want to customize settings, refer to the "Optional Settings" below.

Optional Settings

- *Data TEI*
  The Data TEI is the TEI (terminal endpoint identifier) assigned to the data channel. You can select *Auto TE*I, a fixed TEI, or *Disable*. A TEI is a number used by the central office switch to uniquely identify each device that is connected to the network. When it uses dynamic TEI assignments (Auto TEI), the central office switch assigns a TEI each time the TA connects to the network. However, the ISDN service provider may assign a fixed TEI at subscription time, in which case you must configure the TA with the fixed TEI number. You also can disable the channel, which may be useful when multiple TAs are attached to a network terminator bus. *AT command:* ***!D3=***

- *Voice TEI*
  The Voice TEI is the TEI assigned to the voice channel. You have the same choices as for Data TEI: *Auto TEI*, fixed TEI number, or *Disable*.
  AT command: ****!D3=***

- *Persistent DTR Dialing*

A high DTR (Data Terminal Ready) signal on the serial port indicates that your computer or terminal is ready to communicate with your TA. DTR normally goes high when a communication program starts or is ready to dial. Persistent DTR dialing enables the TA to automatically redial the number stored in memory location 0 whenever DTR is high, and the serial port does not have an active call. You can enable or disable this feature. *AT command:* ***$D***

- *Auto Answer Data Calls* _____ *Rings to Answer* _____
  Select Auto Answer if you want the TA to automatically answer all incoming data calls (option does not affect analog port). The Rings to Answer number (range: 1—255) selects number of rings the TA waits before answering an incoming call. Default: 1 ring. *AT command:* ***S0=***

- *Dialing Method* _____
  Select either the *Enbloc* or the *Overlap* dialing method for use when establishing a data call. Your ISDN provider determines the dialing method. The enbloc method is used for most ISDN dialing; however, you can select the overlap method if you are working with a private network. *AT command:* ***%A97=***

- *Data Protocol* _____
  The data protocol, also known as the B-channel protocol and the rate adaption protocol, is the *language* spoken over each 64 Kbps channel between two ISDN devices. The devices on both ends of the ISDN link must use identical protocols. *AT command:* ***!Z***

  V.120 Protocol—provides rates up to 64000 bps on each B channel.

  PPP Protocol—provides rates up to 64 Kbps per channel.

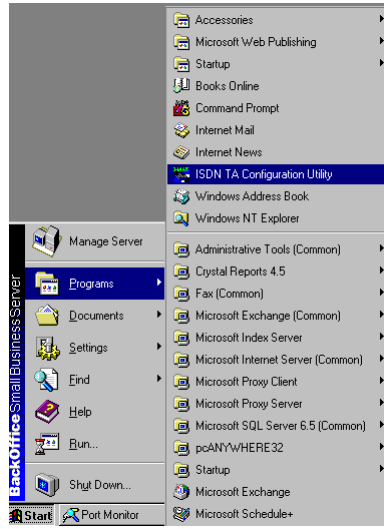
- *Stored Numbers* _____
  The TA can optionally store as many as 10 phone numbers, up to 20 characters each. *AT command:* ***&Z=***

- *Dialing Stored Numbers* _____
  The TA can dial a number previously stored in directory number *n* using the ***&Zn=x*** command. *AT command: e.g.,* ***DS3***

ISDN TA Configuration Utility

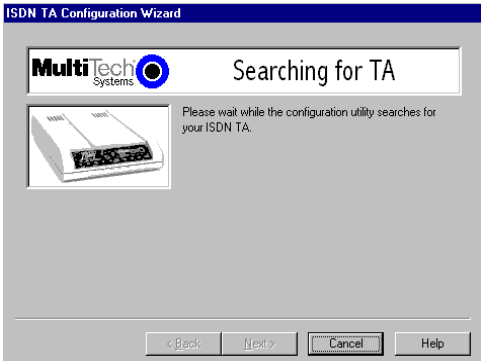
1. Before you start the ISDN TA Configuration utility, disconnect the ISIHP-2S/2U by removing the RJ-45 cable from the ISDN jack.
2. Make sure Windows NT Remote Access Service (RAS), or any other application that is using the modem, is shut down. To shut down RAS, click **Start**, **Programs**, and then **Administrative Tools (Common)**. Then click **Remote Access Admin** and click **Server**, which will indicate whether or not RAS is running. If it is running, click **Stop Remote Access Service**.
3. Insert the Config Utility diskette into the floppy drive.
4. From the main desktop of your PC, select **Start**, **Settings**, **Control Panel**. Click on the **Add/Remove Programs** icon. Click **Install**.
5. The dialog box **Install Program** from Floppy Disk or CD-ROM appears. Click **Next**. The **Run Installation Program** dialog box appears. Click **Finish**.
6. The Welcome dialog box for the ISDN TA Configuration Utility Setup program appears. Click **Next**.
7. The **Choose Destination Location** dialog box appears.
8. The **Setup** dialog box appears.
9. The **Information** dialog box appears. Click OK.

10. Click **Start**, **Programs**, and then the **ISDN TA Configuration Utility** icon.

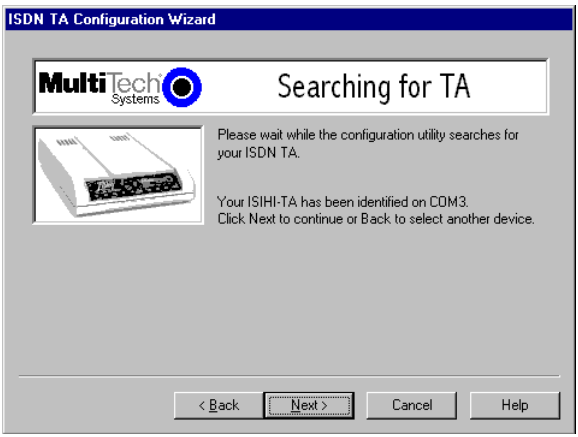


11. The **Welcome** dialog box appears. Click **Next.**

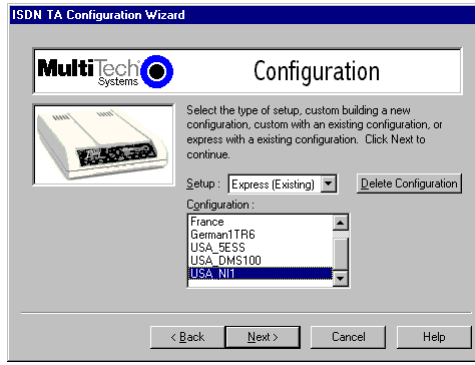
12. The **Searching for TA** dialog box appears. Click **Next**.



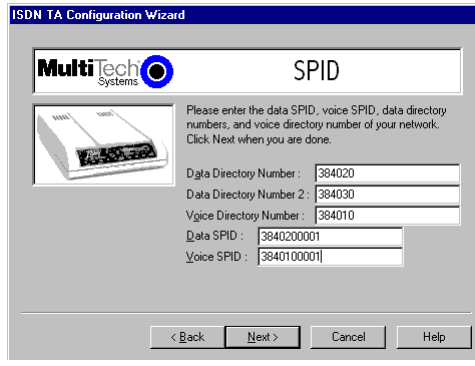
The next dialog box specifies the TA that has been identified.



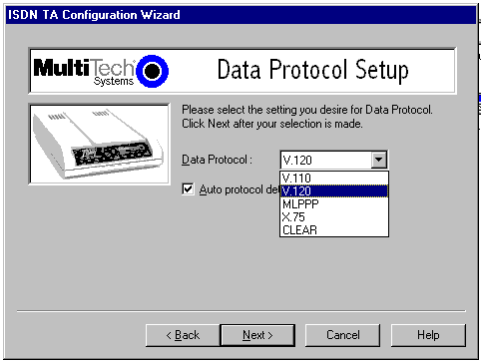
13. The **Configuration** dialog box appears. If you have questions about choices, click **Help**. After entering information in each dialog box, click **Next**.



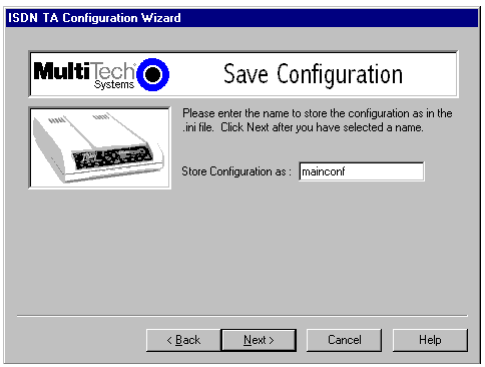
14. The **SPID** dialog box appears (North America only). Referring to your network configuration notes, enter the appropriate information; then click **Next**.



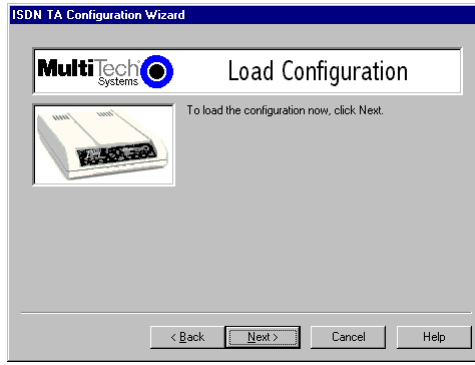
15. The **Data Protocol Setup** dialog box appears. Referring to your network configuration notes, enter the appropriate information; then click **Next**.



16. In the **Save Configuration** dialog box, enter a name to store the configuration. Then click **Next**.



17. To load the configuration, click **Next** in the **Load Configuration** dialog box.



18. Then click **Finish** in the **Configured** dialog box.

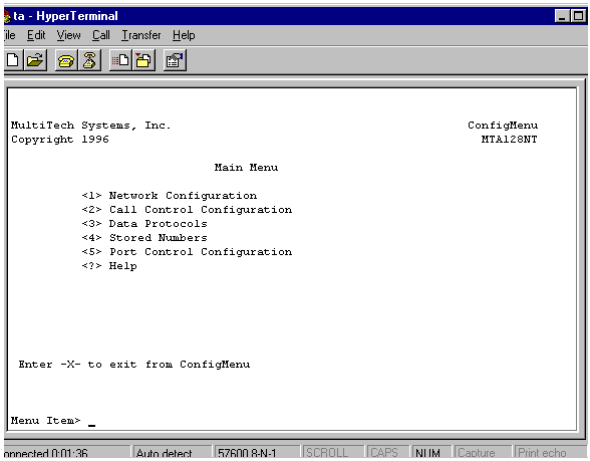
19. The first TA now is configured. Click **Back** to return to the **Configuration** dialog box and repeat steps 5 through 10 to configure the remaining TA(s). If you install multiple ISIHP-2S/2U in the same PC, you must configure two TAs per card installed. For example, if you install four ISIHP-2S/2U cards in one PC, you have to configure eight TAs (two per card).
20. After both TAs are configured, close the ISDN TA Configuration utility and connect the to the network again.

ConfigMenu Configuration Utility

Use the ConfigMenu configuration utility with computers using DOS or Windows 3.x operating systems. ConfigMenu is installed in the TAs as part of the firmware.

To use ConfigMenu:

1. Start a data communication program and select the COM port where the TA is connected.
2. In the communication program dialog box, type **AT@CONFIG** and press ENTER. ConfigMenu's **Main Menu** appears (see screen below).



3. To select menu item, type its number and press ENTER. A submenu then appears where you can make selections. At the lowest level, you can change a configuration option by selecting a number or typing a value and pressing ENTER.
4. When you finish, close ConfigMenu.
5. Use the **&W** command to save your new configuration and to load it automatically when the TA is turned on.

ConfigMenu Menus

Network Configuration Menu—configures network parameters such as switch type, data and voice TEIs, and data and voice MSNs. When you finish, select *Save Network Configuration* to save your work.

Call Control Configuration Menu—changes how the TA originates and answers calls. Options include Auto Answer, Rings to Answer, Dialing Method, and Persistent DTR Dialing.

Data Protocol Menu—changes rate adaption protocol used by the TA.

Stored Numbers Menu—stores up to ten phone numbers (maximum of 20 characters each). Stored number 0 is the phone number that will be dialed if persistent DTR dialing is enabled.

Port Control Configuration Menu—configures TA's serial port, including how TA responds to control signals on the serial interface.

Help Menu—provides assistance in navigating through the TA menu system or viewing the ISIHP-2S/2U's firmware version numbers.

AT Commands

You can configure the terminal adapters using AT commands, just as you would configure an analog modem. Use this method if you prefer to work with AT commands or if you have a special requirement not addressed by either of the configuration utilities.

To configure the TAs with AT commands:

1. Disconnect the ISIHP-2S/2U from the network (remove RJ-45 cables from ISDN jacks).
2. Start a data communication program and select the first and third COM ports to be configured.
3. Referring to records made for your system, enter AT commands in the terminal window of the data communications program.
4. When you finish, use the ***&W*** command to save your new configuration and to select it to load automatically when the ISIHP-2S/2U is turned on.
5. Close the data communications program and reconnect the TA to the network terminator.

For more information, see the online Owner's Manual.

NetWare Connect (Novell) Driver Installation

Multi-Tech Systems provides AIO drivers for the ISIHP-2S/2U, so it 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.

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

To load the driver, go to the system or PC console (where the ISIHP-2S/2U is installed) and enter the following at the prompt:

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

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

Configuring Ports for NetWare Connect

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 installation utility provided by SCO is called *custom*. This section provides a brief guide for opening the utility and installing the driver. The instructions below should be used only on SCO Open Server 5 systems. When you have completed the steps below, go to *Multi-Tech Installation Script,* which immediately follows this section.

1. If installing the driver from your default floppy drive, type **custom** and press ENTER to open the custom utility. If using a nondefault drive, you must inform your system of the disk drive from where you are doing the installation and the size and capacity of the diskette(s).
2. Select **Software** and press ENTER.
3. The main menu displays a list of options. Press ENTER to select the highlighted item (default): **Install**.
4. Select **From comsco** and press ENTER.
5. Make sure the driver diskette is in the floppy diskette drive and then press ENTER to select the highlighted item (default): **Floppy Disk Drive 0**. The following message appears:
   Examining media. Please wait …
6. The system recognizes you are installing the Multi-Tech Serial Card Driver and prompts you to select the type of installation.
7. Select **Full Installation** and press ENTER to continue. The following messages appear:
   Extracting Files...
   Executing Multi-Tech Serial Card Driver Init Script...
8. When installation finishes, this prompt appears:
   Do you wish to continue (y / n / q):?

   Type **Y** and press ENTER. Proceed with the next section, *Multi-Tech Installation Script*.

This section guides you through the Multi-Tech Installation Script for SCO and UNIXWare systems. The script requests information such as how many boards you want to install, what I/O address and IRQ values (interrupt requests) you have selected, and how many pseudo devices you want to create for Multi_View utility. This information extracts the necessary drivers, which will be linked with your system's kernel.

1. The first screen requests the number of ISIHP-2S/2U cards you are installing. If installing more than one ISIHP-2S/2U, use the chart on page 7 of this guide—**Recommended Base I/O Address and IRQ Values**—to enter the appropriate values for each card. Enter the number of cards and press ENTER.
2. The second screen requests the number of ports. Enter 8 and press ENTER.
3. The third screen requests the base I/O address you selected for the first card you are installing. It is important to verify that the address you select for each ISI does not overlap with existing devices or with another ISI. **The ISI card uses the base I/O address and the next fifteen addresses.**

   Note: *If the I/O address you select conflicts with an existing device in your system, you must remove the ISI driver and reinstall it.*

   Enter the base I/O address and press ENTER. For additional information, refer to the online manual.
4. The fourth screen requests the IRQ value for this card. Verify that the IRQ you select for each ISI does not overlap with existing devices or with another ISI. Type the desired IRQ value and press ENTER.

   Note: *If you entered a number greater than 1 at the first screen, the previous three screens reappear in sequence for each card you install. After you enter the necessary information, installation continues.*

   ---

5. The fifth screen requests you to enter the number of pseudo devices to create for Multi_View Utility. Enter the value and press ENTER.

   Note: *You must enter a minimum of 8 for each board installed.*

6. 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 other devices known to your system. If you use an existing device name to identify your new ISI ports, the existing device is *deleted* when the ISI port using its name is created.

   The default base name for ISIHP-2S/2U ports is **ttyl.** The default base name for printer ports is **prnl**. If this is acceptable, type **Y** and press ENTER.

   To change the base name, type **N** and provide a prefix of less than five characters. The base name you select will be used for all ports on each card you install.

   The following describes the format used in naming ISI ports:

   Default device name and format: **ttyl**

   ttyl BASENAME

   This prefix is applied to all ISI ports on all boards. Base names contain 1–4 characters.

   b BOARD NUMBER

   Values of 1 through 4, depending on the number of cards installed.

   x PORT LETTER

   Values of A–H for ISI ports. (SCO UNIX values A–H indicate modem ports.)

   Device base name selected: _____

7. After you select a device base name, 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). Select a unique base name or accept the default of **prnl** (printer parameters are outlined in the Multi_Setup Utility section in this guide).

   Printer base name selected: _____

8. The Multi_View utility initializes the multiple-page capability of terminals with multiple pages of memory. You are asked how many pseudo devices (the total number of pseudo devices you want to make available to the Multi_View utility) to create. This is the total number of devices available to all Multi-Tech's terminals. You can have a maximum of 256 pseudo devices in your system.
9. The confirmation screen lists the values you selected. If these values are correct, type **Y** and the installation process continues.

   If there is an error in any of the values displayed, type **N** and the first screen displays. Then reenter 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. When the display finishes, press ENTER to continue. When ***Installation complete*** displays, press ENTER .
10. Select **Host** and press ENTER. Remove the diskette from the drive.
11. Select **Exit** and press ENTER.
12. To reboot the system, enter the following commands:

    Type **sync** and press ENTER.

    Type **sync** again and press ENTER.

    Type **haltsys** and press ENTER.

Driver installation for the ISIHP-2S/2U 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, noting that the firmware for each ISIHP-2S/2U loads successfully. If the firmware for a given ISIHP card does not load, none of its ports will be accessible. (If this happens, see

Multi-Tech's Administrative Utility section in the online manual.)

2. The device database can be modified in two ways:
   - To create terminal accounts with default settings, type **/tcb/bin/ttys_update**.
   - To customize terminal entries, you must create them individually by entering the system administrator's shell (you must be logged in as the root user). To enter the administrator's shell, type **sysadmsh** and press ENTER.
3. Create device entries for each port of the ISI card by selecting the following from the database menu: **Accounts, Terminal, Create**.
4. Type the complete name of the first device you want to create, substituting the base name, board number, and port letter for the parameters: **ttylb**. 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. The port status can be altered later, but one setting must be selected at this time.
5. Repeat this process for each port on each board you have installed. **Record the setting you select for each port.**
6. Using device names created in the previous section, type the following command for each port you want to activate: **enable ttylbx**
7. 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 ttyl1a and then enable ttyl1A. To change the status of a port, disable the current status (disable ttyl1a) and then enable it for the desired status (enable ttyl1A).*

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.

Linux Driver Installation

To install the Linux driver:

1. Insert the driver installation diskette.
2. Prepare a temporary installation directory: **mkdir isicom**
3. Change your current directory to the temporary installation directory: **cd \isicom**
4. Place the file **isicom.tar** into the isicom directory.
5. Then extract the file using the *tar* utility: **tar xvf /isicom/isicom.tar**
6. Make sure the following are installed on your system: the *make* utility, the GNU C compiler (gcc), and kernel sources.
7. Run the **bash Install** script to compile the driver as a loadable module and to compile the user space firmware loader.
8. The files are copied to the destination folder. If you don't specify the folder, the destination folder default is **/usr/local/ISICOM** (case sensitive). This also creates device files for the ISI cards, normal and callout ports, in the **/dev** folder.
9. To load the driver manually, use the ISIHP-2S/2U installation configuration stored in the *ISICOMStart* file in the destination folder.

   Or, you can include the configuration in the appropriate start-up script stored in the **/etc/rc.d/** folder, so it loads when you start the computer.
10. If you make any changes to this configuration, edit the first line of the ISICOMSTART file. The correct syntax for this line is as follows:

    insmod <destination folder>isicom.o
    ISIBase1=0xXXXX
    Irq1=XX
    ISIBase2=0xXXXX
    Irq2=XX

    ISIBasex and Irqx represent the base I/O address and IRQ that are passed to the driver at module loading time. Refer to the **insmod** manual page for more details on parameter passing.

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 ISIHP-2S 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–p) for 16-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.

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.

Service

Multi-Tech has an excellent technical support staff available to help you get the most out of your Multi-Tech product. If you have any questions about the operation of this product, call Technical Support at (800) 972-2439. Model and serial numbers are located on the Multi-Tech label on the component side of the ISIHP-2S/2U. To display the firmware version, type ATI1 in terminal mode. Software versions are printed on the diskette labels. Before calling Technical Support, note the status of your equipment, including screen messages, diagnostic test results, problems with a specific application, etc.

Index

A

AT commands 41

B

Basic Rate Interface (BRI) 4

C

ConfigMenu 41
  Call Control Configuration Menu 51
  Data Protocol Menu 51
  Help Menu 51
  menus 51
  Network Configuration Menu 51
  Port Control Configuration Menu 51
  Stored Numbers Menu 51
configuration
  AT commands 41, 51
  ConfigMenu 41, 50
  ISDN Configuraiton Utility 44
  ISDN Configuration Utility 41
  ports
    in Netware Connect 52
connecting
  to ISDN wall jack 8
Contents, package 5

H

hardware
  computer requirements 6
  installation 7
hardware installation
  introduction 6

I

installation
  activating ports
    in SCO Open Server 5 56
  hardware 7
  modems to COM ports
    in Windows 95 37
    in Windows NT 20
  software/drivers
    in SCO Open Server 5 53
    Linux 59
    NetWare Connect 52
  terminal adapters to COM ports
    in Windows 95 32
    in Windows NT 17
  to COM ports
    in Windows NT 17
installing
  software/driver
    in Windows 95 26
    in Windows 98 28
    in Windows NT 12
ISDN Configuration Utility 41
ISDN line 5

L

LED indicators 10

M

mounting bracket 10
MultiModemISI Hybrid Series
  introduction 4

N

naming ports 55
Netware Connect (Novell) 52

P

package contents 5

R

Remote Access Server (RAS) 4
removing
  software/driver
    NetWare Connect (Novell) 52
  software/drivers

in SCO Open Server 5 58
removing driver
in Windows NT 32
removing software/driver
in Windows 95 28
in Windows 98 32
in Windows NT 26

S

S/T interface 11
safety warnings 7
SCO Open Server 5 53
service 61
shipping contents 6
software/driver installation
in Windows 95 26
in Windows 98 28
in Windows NT 12

T

terminal adapter
configuring 41

U

U interface 11

W

warranty 61