

**PCI Universal Differential Ultra SCSI Adapter
PCI Differential Ultra SCSI Adapter
Installation and Using Guide**

Note

Before using this information and the product it supports, be sure to read the general information under "Product Warranties and Notices" included with your system unit.

Fourth Edition (February 2000)

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Safety Information

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

Handling Static Sensitive Devices

Attention: Static electricity can damage this device and your system unit. To avoid damage, keep this device in its static protective bag until you are ready to install it. To reduce the possibility of electrostatic discharge, follow the precautions listed below:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it on its static-protective package. (If your device is an adapter, place it component-side up.) Do not place the device on your system unit cover or on a metal table.
- Take additional care when handling devices during cold weather, as heating reduces indoor humidity and increases static electricity.

About This Book

Use this book with your system unit documentation to install the PCI Universal Differential Ultra SCSI Adapter or the PCI Differential Ultra SCSI Adapter. Included are device driver installation and configuration instructions.

Terminology Note

Throughout this book, the PCI Universal Differential Ultra SCSI Adapter and PCI Differential Ultra SCSI Adapter is referred to as the *PCI Universal Adapter* and *PCI Differential Adapter*.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

The following publications contain related information:

- System unit and operating system documentation for information specific to your hardware and software configuration
- *PCI Adapter Placement Reference Guide* (for the latest version, you may need to contact your marketing representative)

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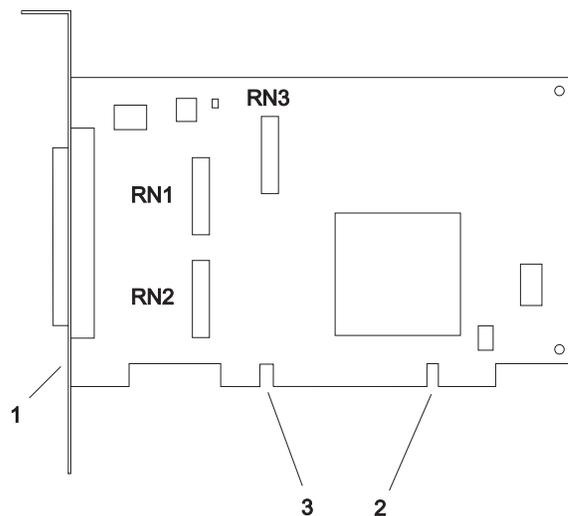
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Chapter 1. Overview

This guide describes how to install the PCI Universal Differential Ultra SCSI Adapter (hereafter called the *PCI Universal Adapter*) and the PCI Differential Ultra SCSI Adapter (hereafter called the *PCI Differential Adapter*) into a system unit with a PCI (peripheral compatible interface) bus. The PCI Universal Adapter and the PCI Differential Adapter enable you to use external SCSI (small computer system interface) differential devices and subsystems. The adapter conforms to the ANSI (American National Standards Institute) SCSI standard and to the PCI local specification, Revision 2.1.

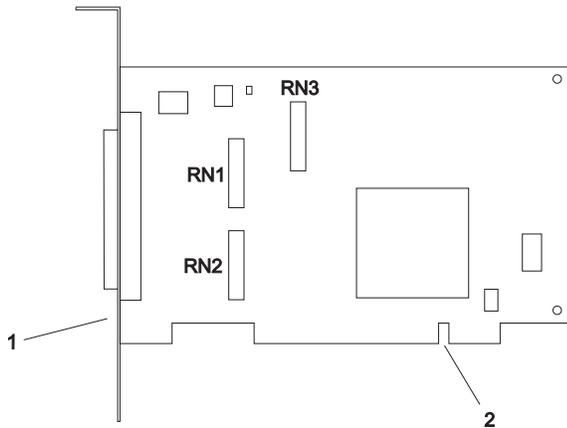
The PCI Universal Adapter and PCI Differential Adapter support ultra SCSI synchronous data rates up to 20 MHz. A 16-bit SCSI bus supports a maximum transfer rate of 40 megabytes (40,000,000 bytes) per second. An 8-bit SCSI bus supports a maximum transfer rate of 20 megabytes (20,000,000) per second.

The PCI Universal Adapter illustrated below and labeled 4-U has a second keying slot which allows it to plug into systems which support +3.3 volt or +5 volt adapters.



- 1 Label (4-U)
- 2 +5 Volt Keying Slot
- 3 +3.3 Volt Keying Slot

The PCI Differential Adapter illustrated below and labeled 4-L has one keying slot which allows it to plug into systems which support +5 volt adapters only.



- 1 Label (4-L)
- 2 +5 volt Keying Slot

The SCSI differential terminators are provided in sockets for easy removal in configurations that use the PCI Differential Adapter in multi-adapter configurations. The adapter has built-in SCSI differential terminators that are automatically enabled or disabled depending on the cables that are attached.

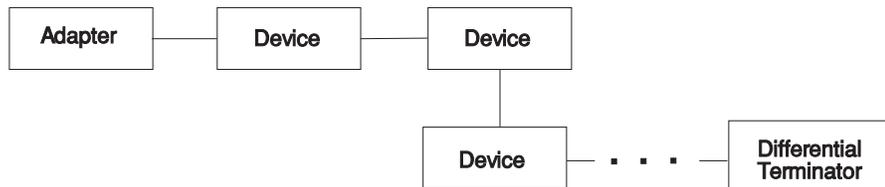
Software Requirements

The PCI Universal Adapter is supported on AIX Version 4.3.3 or later. The PCI Differential Adapter is supported on AIX Version 4.2.1 or later. If support is required on any other AIX release, ensure that this adapter is supported on that release of AIX prior to installation. Contact your support representative for assistance.

Chapter 2. Planning your SCSI Device Layout

SCSI devices are attached to a SCSI adapter in a chain. If you are connecting more than one SCSI device, it is important that you plan the layout of your SCSI chain. See Appendix A, “Multi-Adapter Configurations” on page 21 if you are connecting multiple adapters in different system units to the bus.

External Devices Only



Setting SCSI Addresses

Each SCSI device requires a unique SCSI address; a number from 0 to 7 for narrow devices or from 0 to 15 for wide devices. If two SCSI devices on the same bus have the same address, your system unit does not function properly. SCSI address 7 is reserved for the adapter, so additional SCSI devices may be set to address 6 through 0 and 15 through 8.

Determining Current SCSI Addresses

Manufacturers use many different methods to set SCSI addresses, including jumpers, dual inline package (DIP) switches, push buttons, or dials. If your SCSI device is new, check its documentation to see if it specifies a default SCSI address. If one is not specified, check how SCSI addresses are set, then check the device itself for the current SCSI address.

Planning SCSI Addresses

Make sure no two SCSI devices on the same bus have the same address, and that no device uses the SCSI address 7, which is reserved for the adapter.

Note: SCSI addresses are not in sequential order from highest to lowest priority. See Table 1 on page 4 for the priority associated with each SCSI address.

Table 1. Data Access Priorities for SCSI Adresses

Priority	SCSI ID	Actual SCSI Device Name
Highest	7	PCI Universal Differential or PCI Differential Ultra SCSI Adapter
	6	Second adapter*
	5	Third adapter*
	4	Fourth adapter*
	3	
	2	
	1	
	0	
	15	
	14	
	13	
	12	
	11	
	10	
V	9	
Lowest	8	

* Reserved for multi-adapter configurations.

Changing SCSI Addresses

If you need to change SCSI addresses, follow the instructions in the documentation supplied with each device.

Determining Cable Needs

External Cable Connectors: External SCSI devices are manufactured with a variety of connectors. Ensure you have cables with the appropriate connectors for each external 8 or 16-bit device in your planned SCSI chain.

For either external 8 or 16-bit device, the cable end that attaches to the adapter is a 68-pin connector. The device end varies with the type of device you are attaching.

External Cabling: Attach either an 8-bit or 16-bit SCSI device to the external 68-pin connector.

Review the following list of SCSI cable connections to correctly attach your device:

- An 8-bit device uses a cable with a 50-pin connector on the device end and a 69-pin connector on the adapter end.
- A 16-bit device uses a cable with a 68-pin connector on both ends.

SCSI specifications limit total cable length to 25 meters (approximately 80 feet). Total SCSI chain cable length includes internal and external cabling.

Terminating the SCSI Devices and Adapter

Some SCSI devices have built-in terminators controlled by a DIP switch, jumper, or push button. Other devices use terminators on the cable. Some devices require that a terminator be plugged into the device on a connector. After planning your installation, you must supply the correct terminator to the SCSI device at each end of the chain. Refer to the device instructions to determine how it is terminated. If necessary, purchase terminators when you buy devices and cables.

The basic rules of terminating SCSI buses are as follows:

- Terminate the ends of the chain.
- Do not terminate devices in the middle of the chain.
- Normally the adapter terminates one end of the cable.

Chapter 3. Preparing for Installation

This chapter helps you prepare to install the PCI Universal Adapter and the PCI Differential Adapter.

Note: If AIX is not installed on your system unit, install your adapter before you install the operating system (refer to Chapter 6, “Installing Hardware” on page 17). When you install AIX, your device driver software is automatically installed.

If AIX is operating on your system, install your device driver software before you install your adapter (refer to Chapter 4, “Installing Device Driver Software” on page 9).

Checking Prerequisites

To install the PCI Universal Adapter or the PCI Differential Adapter, make sure you have the following on hand:

- The adapter
- *PCI Adapter Placement Reference Guide*
- The system unit User's Guide
- A flat-blade screwdriver

To connect the SCSI devices to the adapter, you may also need:

- External cables
- A Differential SCSI terminator
- Media containing device driver software for the devices you are attaching

Chapter 4. Installing Device Driver Software

This chapter explains how to install device driver software.

If you are installing your PCI Universal Adapter labeled 4-U, the device driver software is installed with AIX Version 4.3.3. If you have additional devices attached to the adapter, you may want to install the device drivers prior to installing the adapter. Refer to the documentation that came with your devices and go to Chapter 6, "Installing Hardware" on page 17.

If you are installing your PCI Differential Adapter labeled 4-L, continue with Chapter 4, "Installing Device Driver Software."

To install device driver software, do the following:

1. Be sure you have read Chapter 3, "Preparing for Installation" on page 7 to determine:
 - if you should install your device driver software first, go to step 2 and continue with this section.
 - if you should install your adapter hardware first, go to Chapter 6, "Installing Hardware" on page 17. When you install AIX, your adapter device driver automatically installs.
2. Turn on the system unit power.
3. Log in as **root** user.
4. Insert the media containing the device driver software (for example; CD-ROM) into the appropriate media device.
5. Type the following System Management Interface Tool (SMIT) fast path:
smitty devinst
6. Press Enter. The Install Additional Device Software screen highlights the **"INPUT device/directory for software"** option.
7. Select or type *your input device*:
 - Press **F4** to display the input device list. Select the *name of the device* (for example; CD-ROM) that you are using and press Enter.
OR
 - In the entry field, type the *name of the input device* you are using and press Enter.

The Install Additional Device Software window highlights the **SOFTWARE to install** option.

Chapter 5. Installing the Device Driver on the RS/6000 SP System

In an SP, you need to do on each node what you normally do on a standalone system. You must make the installation files available and then install them on all the relevant nodes.

Perform the following tasks on the Control Workstation. You should not need to **telnet** or **rlogin** to the individual SP nodes. You need to be familiar with the **dsh** command. If not, refer to the *Parallel System Support Program for AIX: Administration Guide* or *Parallel System Support Program for AIX: Command and Technical Reference*.

If you are unable to utilize the "dsh" command because of the setup at your site, then you will have to telnet to each node and perform the steps below, omitting the "dsh" prefix.

Check System Prerequisites

___ 1. Log into the Control Workstation as a **root**.

___ 2. Go to a temporary directory by typing:

```
cd /tmp
```

at the system prompt, then press Enter.

___ 3. Make a "working collective" file containing a list of the relevant nodes on which you want to perform the update in preparation for the dsh command. Type the following, press Enter after each line:

```
cat > group1
nodename1
nodename2
nodename3.....
CTRL-D
export WCOLL=/tmp/group1
```

___ 4. Test the working collective by typing:

```
dsh date
```

then press Enter. The results should look similar to:

```
nodename1:  Wed Apr 10 10:37:46 EDT 1996
nodename2:  Wed Apr 10 10:37:46 EDT 1996
nodename3:  Wed Apr 10 10:37:47 EDT 1996
nodename4:  Wed Apr 10 10:37:48 EDT 1996
```

If not, examine your nodelist file `./group1` and also ensure that the Kerberos ticket is current to permit "rsh" to be performed. If not, you may need to refresh it. The System Administrator should also be able to help you with Kerberos initialization. If not, consult your support center.

If you only need to do a few nodes, use the `dsh -w host1,host2,host3...` command format to explicitly exercise groups of nodes rather than using the working collective.

- ___ 5. Determine if the AIX operating system on each relevant node is at the required level by typing:

```
dsh oslevel
```

-OR -

```
dsh -w <host1,host2> oslevel
```

at the prompt, then press Enter. `<host1,host2>` is a list of the hostnames for the nodes which the adapter will be installed on.

- ___ 6. The required AIX Level is: 4.2.1, 4.3.3 and higher.

If the nodes are NOT at a supported AIX level, upgrade the AIX level on the nodes. Contact the System Administrator for assistance.

- ___ 7. Determine if the PSSP level on each node is at the required level by typing:

```
/usr/lpp/ssp/bin/splstdata -G -b
```

then press Enter. The results are in a form similar to the following:

```
node#      hostname  hdw_enet_addr  svr      response  install_disk
last_install_image  last_install_time  next_install_image  lppsource_name
                                           pssp_ver
-----
1 eion01.ppd.pok.i  08005A75A6D4    0        disk      hdisk0
      default Thu_Dec__4_09:07:23      default <lppsource>
                                           <pssp level>
```

`<lppsource>` is the lppsource name for the node. `<pssp level>` is the pssp level installed on the node.

- ___ 8. The required PSSP level is: 2.4 and higher.

If the nodes are NOT at a supported PSSP level, upgrade the PSSP level on the nodes. Contact the System Administrator for help.

- ___ 9. Record the name that appears below `lppsource_name` for each node on which the adapters are being installed; you use this later.
- ___ 10. Check if the device driver is installed in the `lppsource` directory by typing:


```
cd /spdata/sys1/install/<lppsource_name>/lppsource
```

 at the system prompt. `<lppsource_name>` was recorded in the previous step. Once in this directory, type:


```
ls devices.pci.00100f00*
```

 at the system prompt to see if the fileset is in `lppsource` directory.
- ___ 11. If the device driver is not in the `lppsource` directory, proceed to section “Install Software on the Control Workstation” on page 14 to install the software.
- ___ 12. Update the SPOT (Shared Product Object Tree) by:
 - ___ a. Type


```
smitty nim_res_op
```

 at the system prompt. The **Resource Name** panel displays with


```
boot          resources  boot
```

 highlighted.
 - ___ b. Move the cursor down until the *SPOT resource* is highlighted. The *SPOT resource* should look like:


```
spot_AIX421  resources  spot
```

 The format of the spot name is: `spot_<lppsource_name>`.
`<lppsource_name>` was recorded in a previous step.
 - ___ c. When the *SPOT resource* is highlighted, press Enter to select this option. The **Network Install Operation to Perform** panel displays with the **reset** option highlighted for selection.
 - ___ d. Move the cursor until the **cust** option is highlighted and press Enter to select this option. The **Customize a SPOT panel** displays with the **Source of Install Images** highlighted for selection.
 - ___ e. Press F4 to display the list of Install Images and select the appropriate `lppsource`.
 - ___ f. Move the cursor until the appropriate `lppsource` is displayed. For example:


```
lppsource_AIX421  resources  lpp_source
```

- ___ g. Move the cursor until the **fileset names** and type:
 `devices.pci.00100f00`
- ___ h. Press Enter to start the SPOT update. This operation can take up to 15 minutes.
- ___ 13. Check if the software is already installed by typing:
 `dsh "lslpp -l devices.pci.00100f00* 2>&1" |more`
 at the system prompt.
- ___ 14. If the device driver is already installed on the Node, contact your service provider to have the adapter installed.
- ___ 15. If the device driver is not installed on the Node, proceed to section "Install Device Drivers on the SP Nodes" on page 16.

Install Software on the Control Workstation

Note: If your system is "partitioned" i.e. there are more than one operating system among the nodes, you may **only** install this adapter in nodes that have **4.2.1, 4.3.3 and higher**.

- ___ 1. If you are not logged into the Control Workstation as a root user, log in now. You may also need to export the working collective. Refer to section "Check System Prerequisites" on page 11.
- ___ 2. Select the appropriate operating system media.

<i>Table 2. Device Driver Sources</i>	
AIX 4.3.3	Additional Device Software
AIX 4.2.1	Additional Device Software

- ___ 3. Insert the installation media into the Control Workstation's drive.
- ___ 4. Transfer the files to the Control Workstation's lppsource, as follows:
 - ___ a. Type
 `smitty bffcreate`
 then press Enter.
 - ___ b. Select the input device/directory. Press F4 then move the cursor to the appropriate input device and press Enter.

- ___ c. Move the cursor to the "SOFTWARE package to copy" option and press F4 to select the software to be installed. Use the F7 key to select the following device driver(s):
 - No Prerequisite Driver
 - devices.pci.00100f00
 at the system prompt, then press Enter.
- ___ d. Move the cursor down to "DIRECTORY for storing software package" and enter the appropriate lppsource destination directory:
 - /spdata/sys1/install/<lppsource_name>/lppsource
 using the <lppsource_name> you recorded earlier.
- ___ e. Press Enter to begin copying the files.
 - Note:** This step may take several minutes as the directory table of contents is updated.
- ___ 5. Update the SPOT (Shared Product Object Tree) by:
 - ___ a. Type
 - smitty nim_res_op
 at the system prompt. The **Resource Name** panel displays with
 - boot resources boot
 highlighted.
 - ___ b. Move the cursor down until the *SPOT resource* is highlighted. The *SPOT resource* should look like:
 - spot_AIX421 resources spot
 The format of the spot name is: spot_<lppsource_name>. <lppsource_name> was recorded in a previous step.
 - ___ c. When the *SPOT resource* is highlighted, press Enter to select this option. The **Network Install Operation to Perform** panel displays with the **reset** option highlighted for selection.
 - ___ d. Move the cursor until the **cust** option is highlighted and press Enter to select this option. The **Customize a SPOT panel** displays with the **Source of Install Images** highlighted for selection.
 - ___ e. Press F4 to display the list of Install Images and select the appropriate lppsource.
 - ___ f. Move the cursor until the appropriate **lppsource** is displayed. For example:
 - lppsource_AIX421 resources lpp_source

- ___ g. Move the cursor until the **fileset names** and type:
 `devices.pci.00100f00`
- ___ h. Press Enter to start the SPOT update. This operation can take up to 15 minutes.
- ___ 6. Proceed to section "Install Device Drivers on the SP Nodes"

Install Device Drivers on the SP Nodes

- ___ 1. Make sure that the lppsource directory is exported to the Nodes by typing:
 `showmount -e`
at the system prompt. The result should be something of the form:
 `/spdata/sys1/install/AIX421/lppsource (everyone)`
- ___ 2. If the directory is not exported, you may temporarily export the directory by typing:
 `exportfs -i /spdata/sys1/install/<lppsource_name>/lppsource`
- ___ 3. NFS Mount the lppsource directory by typing:
 `dsh mount <controlwks>:`

 `/spdata/sys1/install/<lppsource_name>/lppsource /mnt`
at the system prompt. `<controlwks>` is the name of the Control Workstation known for the Nodes. `<lppsource_name>` is the name you recorded earlier in section "Check System Prerequisites" on page 11.
- ___ 4. Perform a preview of the files to be installed on the nodes by typing:
 `dsh "installp -p -acqXd /mnt device driver 2>&1" | more`
at the system prompt. *device driver* is the filesets that must be installed for the adapter. The list includes:
 - No Prerequisite Driver
 - `devices.pci.00100f00`
- ___ 5. Then perform the device driver installation by typing:
 `dsh "installp -acqXd /mnt device driver 2>&1" | more`
at the system prompt. *device driver* is defined in the previous step.
- ___ 6. If the device driver is already installed on the node, contact your service provider to have the adapter installed.

Chapter 6. Installing Hardware

This chapter explains how to install a PCI adapter. Before you begin, be sure you have read “Handling Static Sensitive Devices” on page vii.

Attention: Do not remove the PCI Universal Adapter or the PCI Differential Adapter from its anti-static package at this time.

Installing the Adapter

To install the adapter, do the following:

1. Be sure you have read Chapter 2, “Planning your SCSI Device Layout” on page 3 and Chapter 3, “Preparing for Installation” on page 7 to determine:
 - If you require multiple adapters on the same SCSI bus. Refer to Appendix A, “Multi-Adapter Configurations” on page 21.
 - If you should install your adapter hardware first, go to step 2 and continue with this section.
 - If you should install your device driver software first, go back to Chapter 4, “Installing Device Driver Software” on page 9. Return here to install your hardware.
2. Refer to the User's Guide that shipped with your system unit to shut down your system unit.
3. Go to your system unit User's guide for PCI adapter installation instructions and return here to connect your external devices.

Connecting External Devices

To connect external devices, do the following:

1. Connect the 68-pin connector to the external port (J2) on the adapter. Use the fastening screws on the cable connector to securely attach the connector to the adapter.
2. Connect the other end of the cable to your SCSI device.
3. If necessary, connect additional cables to additional SCSI devices.
4. When all devices are connected, ensure that a SCSI terminator is attached to the last device.
5. Turn on your system unit, your display, and your attached devices. Follow any instructions on the screen.

Verifying the Installation

Use the following procedures to verify the initial installations:

- Verify Adapter Hardware Installation (lsdev)
- Verify AIX Software Installation (lspp)

Verifying Adapter Hardware Installation

To verify that your system unit recognizes the PCI adapter, do the following:

1. If necessary, log in as **root** user.
2. At the command line, type:

```
lsdev -Cs pci | grep scsi
```
3. Press Enter.

Possible results are as follows::

- If the PCI Universal Adapter or PCI Differential Adapter did install correctly and is AVAILABLE, the following is an example of the data that displays on your screen:

```
scsi0 Available 01-03 Wide/Ultra-2 SCSI I/O Controller  
scsi1 Available 01-03 Wide/Fast-20 I/O Controller
```

If a similar message displays and the Wide/Fast-20 I/O Controller displays as AVAILABLE in the slot you installed your adapter, you are finished installing your adapter.

- If the message on your screen indicates your adapter is DEFINED instead of AVAILABLE, shut down your machine. Verify that the PCI Universal Adapter or PCI Differential Adapter installed correctly. Go to “Installing the Adapter” on page 17, and return to this section and repeat the verification steps.

Note: If the message on your screen indicates your adapter is DEFINED a second time, it may be necessary to contact your service representative.

- If the adapter installed does not appear, continue with “Verifying AIX Software Installation” on page 19.

Verifying AIX Software Installation

To verify that the device driver for the PCI Universal Adapter or the PCI Differential Adapter device driver is installed, do the following:

1. If necessary, log in as **root** user.
2. At the command line, type:

```
lslpp -l devices.pci.00100*
```
3. Press Enter.

Possible results are as follows:

- If the PCI Universal Adapter or PCI Differential Adapter device driver is installed, the following is an example of the data that displays:

Fileset	Level	Action	Status	Date	Time

Path: /usr/lib/objrepos					
devices.pci.00100100.rte					
	4.1.5.0	COMMIT	COMPLETE	02/03/97	09:42:
	4.1.5.2	COMMIT	COMPLETE	02/03/97	09:42:
devices.pci.00100f00.rte					
	4.1.5.0	COMMIT	COMPLETE	02/03/97	09:40:
	4.1.5.2	COMMIT	COMPLETE	02/03/97	09:42:

You should verify that the filesets 'devices.pci.00100100.rte' or 'devices.pci.00100100.com' and 'devices.pci.00100f00.rte' or 'devices.pci.00100f00.com' are installed at the 4.1.5.2 level or higher.

If this information displays but you continue to have problems, go to “Installing the Adapter” on page 17.

- If no data displays on your screen, the PCI Universal Adapter or PCI Differential Adapter device driver did not install correctly. Return to Chapter 4, “Installing Device Driver Software” on page 9. After you complete the steps, return to “Verifying Adapter Hardware Installation” on page 18 and continue with step 1 again.

If you continue to experience problems, it may be necessary to call your system support organization. Refer to your operating system documentation for instructions.

Appendix A. Multi-Adapter Configurations

Multi-adapter configurations with each adapter located in a different system unit use more than one SCSI adapter on any single SCSI bus. In some of these cases, you may need to physically remove the SCSI differential terminators from their sockets. Refer to the illustrations in Chapter 1, “Overview” on page 1.

These configurations also require that you change the default SCSI ID of additional adapters to something other than 7. All devices and adapters that share a SCSI bus must have a unique SCSI ID. The default SCSI ID setting on the adapter is modified by software. Refer to Chapter 3, “Preparing for Installation” on page 7 and the software documentation for the operating system and device driver you are using to determine how to do this. Typically, addresses 4-6 are used by multiple adapters connected to the bus.

Typical Multi-Adapter Configurations

Because the adapter only supports external devices, the typical multi-adapter configuration consists of two or more computer systems sharing the same external devices. There may be as many as four adapters on the same SCSI bus.

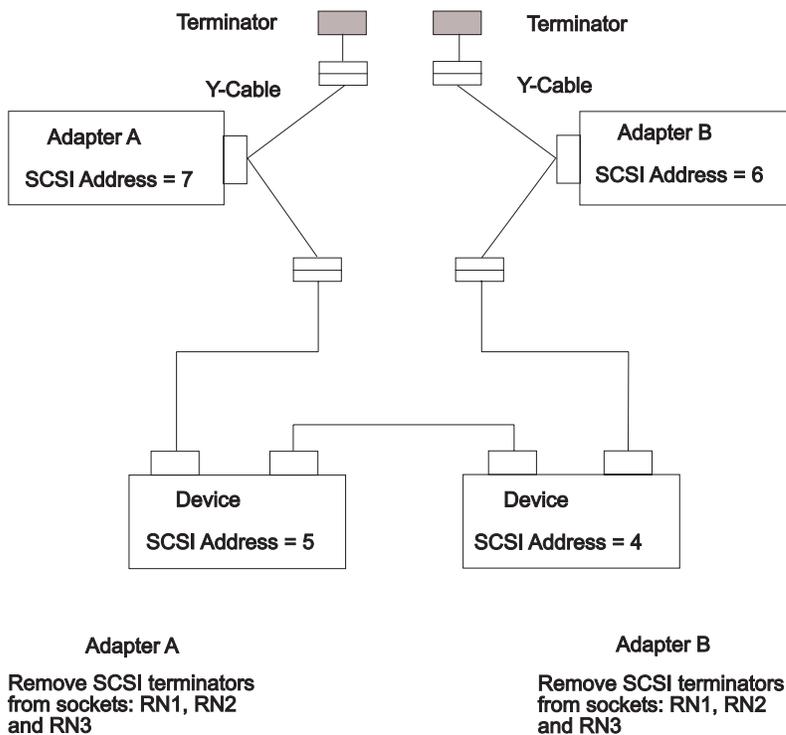
Important: Before you set the SCSI addresses, you must first determine which addresses are available; that is, not already in use by other SCSI devices and adapters already attached to your multi-adapter SCSI bus. Each SCSI device or adapter must have a unique address. To determine the SCSI addresses of the devices/adapters already attached, enter the following command:

```
lsdev -Cs scsi
```

Record the names and SCSI addresses of your installed SCSI devices in Table 1 on page 4. This helps you select nonconflicting addresses for any new devices you add.

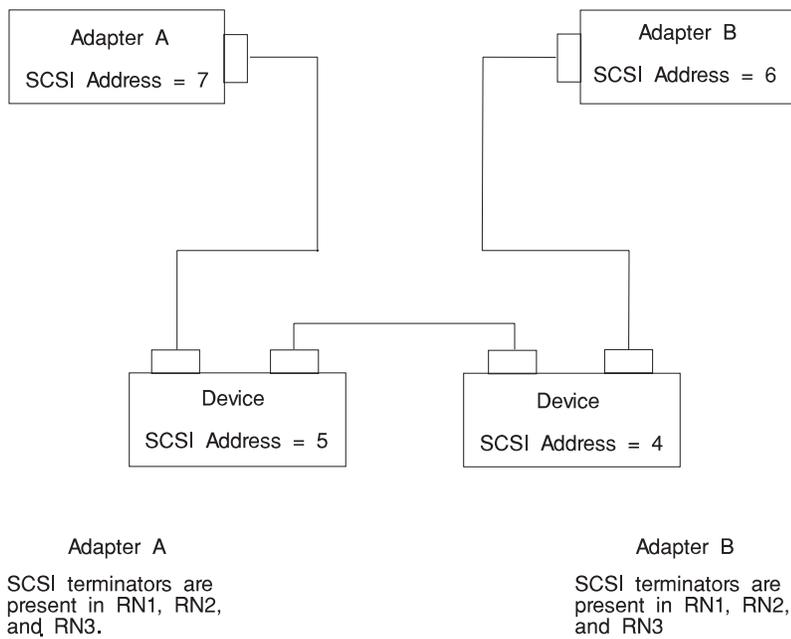
Terminating this adapter may require manual intervention in multi-adapter configurations. The user must either leave in or remove terminators from sockets RN1, RN2, or RN3. Refer to the illustration on Chapter 1, “Overview” on page 1.

Two adapters sharing the same external devices: In this example, you must remove the differential SCSI terminators from sockets RN1, RN2 and RN3 on both adapters. Refer to the illustration in Chapter 1, "Overview" on page 1.



If a Y-cable is removed from adapter A, adapter B can still use the SCSI bus because the Y-cable is still attached to adapter B and has a terminator attached. Adapter A which had the Y-cable removed is no longer terminated and may fail diagnostics. In order to run diagnostics, either replace the terminators in RN1, RN2 and RN3 or simply attach a wide differential SCSI terminator to adapter A's external connector from which the Y-cable was removed. Refer to the illustrations in Chapter 1, "Overview" on page 1 for locations.

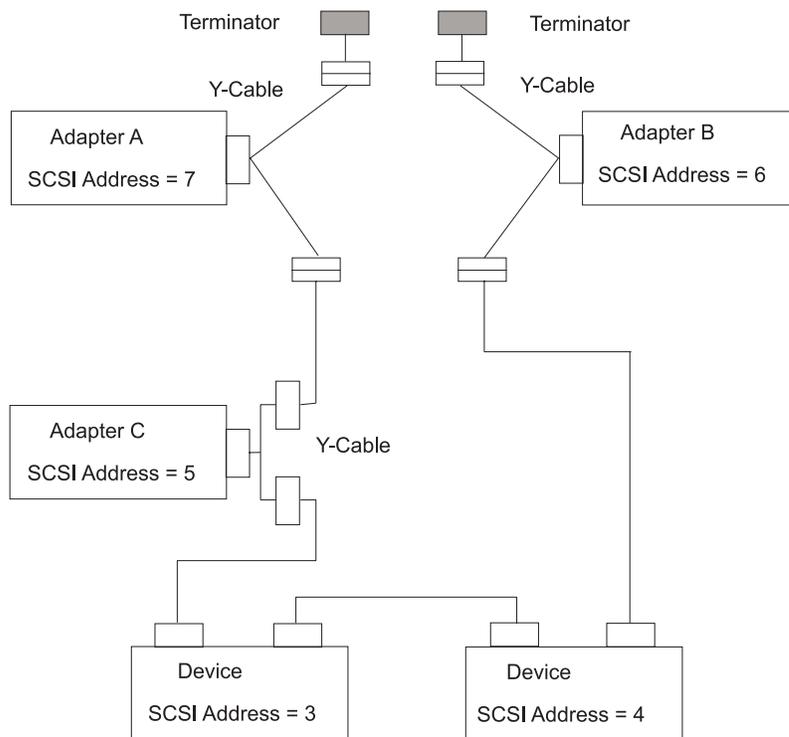
Two adapters sharing the same external devices, simplified: In this example, you must leave the differential SCSI terminators in their sockets on both adapters.



In the above example, if any adapter-to-device cable is removed from an adapter, the SCSI bus does not function properly unless it is re-terminated. Do not attempt to operate or run diagnostics on the SCSI bus with any dangling or unconnected cables in the chain.

However, diagnostics may be run on any adapter which has its cable disconnected from its external connector without the need to place a terminator on the adapter's external port.

Three adapters sharing the same external devices: In this example, you must remove the differential SCSI terminators from sockets RN1, RN2 and RN3 for the three adapters. Refer to the illustration in Chapter 1, “Overview” on page 1.

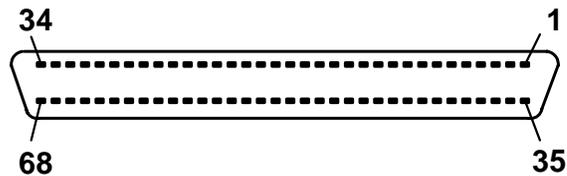


Adapter A	Adapter B	Adapter C
Remove SCSI terminators from sockets: RN1, RN2 and RN3	Remove SCSI terminators from sockets: RN1, RN2 and RN3	Remove SCSI terminators from sockets: RN1, RN2 and RN3

In this example, any Y-cable may be removed from any adapter and the SCSI bus remains properly terminated and functional for the remaining adapters. Because all terminators have been removed from their sockets, the adapter removed from the SCSI bus must have the terminators replaced or a terminator placed on its external connector before running diagnostics.

Appendix B. Bus Connectors for the PCI Universal Adapter and PCI Differential Adapter

The following table shows the pinout for the external 68-pin SCSI connectors.



Signal Name	Pin	Pin	Signal Name
DB(12)	1	35	-DB(12)
DB(13)	2	36	-DB(13)
DB(14)	3	37	-DB(14)
DB(15)	4	38	-DB(15)
DB(P1)	5	39	-DB(P1)
DB(0)	6	40	-DB(0)
DB(1)	7	41	-DB(1)
DB(2)	8	42	-DB(2)
DB(3)	9	43	-DB(3)
DB(4)	10	44	-DB(4)
DB(5)	11	45	-DB(5)
DB(6)	12	46	-DB(6)
DB(7)	13	47	-DB(7)
DB(P)	14	48	-DB(P)
Ground	15	49	Ground
CPRNST	16	50	CPRNST
TERMPWR	17	51	TERMPWR
TERMPWR	18	52	TERMPWR
Reserved	19	53	Reserved
Ground	20	54	Ground
ATN	21	55	-ATN
Ground	22	56	Ground
BSY	23	57	-BSY
ACK	24	58	-ACK
RST	25	59	-RST
MSG	26	60	-MSG
SEL	27	61	-SEL
C/D	28	62	-C/D

Signal Name	Pin	Pin	Signal Name
REQ	29	63	-REQ
I/O	30	64	-I/O
DB(8)	31	65	-DB(8)
DB(0)	32	66	-DB(0)
DB(10)	33	67	-DB(10)
DB(11)	34	68	-DB(11)

Appendix C. Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, New York 10504
Telephone: (919) 543-2193



Tested to Comply
With FCC Standards

FOR HOME OR OFFICE USE

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to

maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe B est conform à la norme NMB-003 du Canada.

Canadian Department of Communications Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づきクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

Reader's Comments — We'd Like to Hear From You

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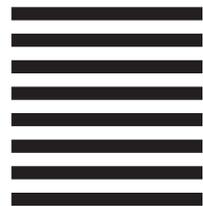
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