IBM

PCI Dual Channel Ultra2 SCSI Adapter
Installation and User's 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.

First Edition (September 1999)

Contents

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 Dual Channel Ultra2 SCSI Adapter. Included are device driver install, configure, and verify instructions.

ISO 9000

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

Related Publications

This book refers to the documentation that came with your system unit.

PCI Adapter Placement Reference Guide, SA23-2504.

Trademarks

- AIX is a registered trademark of International Business Machines Corporation.

Chapter 1. Overview

This guide describes how to install the PCI Dual Channel Ultra2 SCSI Adapter in a system unit with a PCI (peripheral compatible interface) bus. The PCI Dual Channel Ultra2 SCSI Adapter enables you to use internal and external SCSI (small computer system interface) 8 or 16 bit devices. Each channel operates independently as an external LVD subsystem, an external single-ended or an internal singled-ended device. Any two of these configurations can not run simultaneously. For more information on connections, refer to Appendix A, "Connecting SCSI Devices to the Adapter" on page A-1. The adapter conforms to the ANSI (American National Standards Institute) SCSI standard and to the PCI local bus specification, Revision 2.1.

The PCI Dual Channel Ultra2 SCSI Adapter supports Ultra2 SCSI synchronous data rates up to 40 MHz in Low Voltage Differential (LVD) operation. A 16-bit Ultra2 SCSI device supports a maximum transfer rate of 80 megabytes (80,000,000 bytes) per second. In single-ended ultra operation, a 16-bit SCSI device supports a maximum transfer rate of 40 megabytes (40,000,000 bytes) per second. An 8-bit Fast SCSI device supports a maximum transfer rate of 10 megabytes (10,000,000 bytes) per second.

Attention: In single-ended operation, when the SCSI adapter detects any externally attached device, the SCSI bus negotiates for a maximum 10MHz Fast SCSI. In AIX, the automatic negotiation for 10MHz can be overridden using SMIT to reconfigure the adapter. Refer to "Configuring the Ultra SCSI Adapter" on page 5-5 for more information.

The use of internally and externally attached devices at the same time is not supported with this adapter.

SCSI Connectors

The adapter has four SCSI connectors:

- External connectors:
    - Channel A (J2), Channel B (J3) internal, 68-position, high-density plastic D-Shell VHDCI
- Internal Connectors:
    - Channel B (J4), Channel A (J6) internal, 68-position, high-density plastic D-Shell SCSI standard connector for 16-bit attachment

* Connectors J2 and J6 are connected together as Channel A. Connectors J3 and J4 are connected together as Channel B.
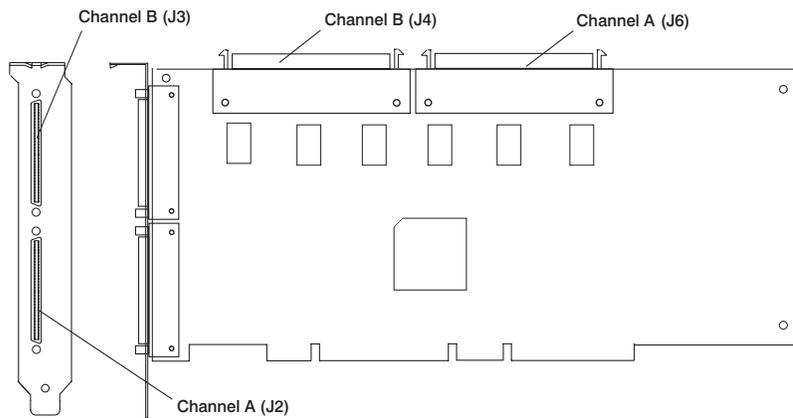
Figure 1-1. SCSI Connectors

The adapter has built-in SCSI terminators that are automatically enabled or disabled depending on the cables that are attached.

Software Requirements

The PCI Dual Channel Ultra2 SCSI Adapter is supported on AIX Version 4.2.1 and 4.3.3 or higher with updates.

Chapter 2. Preparing for Installation

This section outlines the installation process for the PCI Dual Channel Ultra2 SCSI Adapter.

The process includes:

- Taking an inventory of installation materials.
- Determining your cable needs.
- Installing your device driver software.
- Installing your adapter.

Note: If AIX is not installed on your system unit, install your adapter before you install the operating system (refer to Chapter 5, "Installing Hardware" on page 5-1). When you install AIX, your device driver software automatically installs.

If AIX is operating on your system, install your device driver software prior to installing your adapter (refer to Chapter 3, "Installing Device Driver Software" on page 3-1).

Additional device drivers may be required for the SCSI devices attached to your adapter. Refer to the documentation that came with your devices for installation instructions.

Inventory

To install the PCI Dual Channel Ultra2 SCSI Adapter, you need:

- The adapter.
- This document, *PCI Dual Channel Ultra2 SCSI Adapter Installation and User's Guide*.
- The system unit User's Guide.
- The *PCI Adapter Placement Reference* guide.
- Media containing device driver software.
- A flat-blade screwdriver.

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

- The documentation that came with your SCSI devices.
- External cables.
- Internal cables.
- A Single-Ended SCSI terminator.
- 68 position high-density plastic D Shell VHDCI to 68 position high-density plastic D Shell SCSI standard 16 bit interposer cable.
- 68 position to 50 position interposer connector.

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 an internal, 68-position, high-density plastic D-Shell connector. The device end varies with the type of device you are attaching.

- LVD subsystems come with a cable having a VHDCI connector to attach to the adapter.

- Attach a VHDCI to P Shell convertor cable to the adapter to allow single-ended 8 or 16 devices to be attached with their cables.

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

- An LVD subsystem uses a cable with a 68 pin VHDCI connector on both ends.

- An 8-bit device can be attached using a 50-pin to 68-pin interposer, an 8-bit or a 16-bit SCSI cable, attached to a VHDCI to a P-Shell converter cable.

- A 16-bit single-ended device uses a cable with an internal, 68-position, high-density plastic D-Shell connector on both ends. The 68 pin connector attaches to the converter cable which plugs into the adapter.

SCSI specifications limit the total cable length attached as a function of SCSI bus speed as follows:

- To attach an LVD subsystem running at Ultra2 speed (80 MBPS), the maximum cable length is 12m.

- To attach an Ultra, 20MHz, synchronous device such as a 16-bit SCSI disk drive that can transfer up to 40 megabytes per second of data, the maximum cable length is limited to 3 meters (approximately 10 feet). Up to two devices can be attached.

- To attach a fast, 10MHz, synchronous device (such as a 8-bit SCSI disk that can transfer up to 10 megabytes per second of data or a 16-bit SCSI disk that can transfer up to 20 megabytes per second of data) the maximum cable length is limited to 3 meters (approximately 10 feet). Up to two devices can be attached.

For information about connecting SCSI devices to your adapter, see Appendix A, "Connecting SCSI Devices to the Adapter" on page A-1.

Internal Cable Connections: Depending on your machine type, up to six (6) SCSI devices can be plugged into a backplane. A 16-bit cable attaches the adapter's internal connector Channel B (J4) or Channel A (J6) to the backplane. See Figure 1-1 on page 1-2 for an illustration of the SCSI connectors.

To use internal SCSI devices in your system, obtain the necessary cables for your system unit. Install the cables using information found in your system unit User's Guide. Terminators are already built onto the backplane within your system unit.

Chapter 3. Installing Device Driver Software

This section explains how to install device driver software.

Note: Additional device drivers may also be required for the SCSI devices attached to the adapter. Refer to the documentation that came with your devices for installation instructions.

AIX Device Driver Software Installation

1. Be sure you have read Chapter 2, "Preparing for Installation" on page 2-1.

   - Determine if you should install your device driver software first.

   - Determine if you should install your adapter hardware first.

   - If you should install your device driver software first, go to step 2 and continue with this section.

   - If you should install your hardware first, go to Chapter 5, "Installing Hardware" on page 5-1. When you install AIX, your adapter device driver automatically installs.

2. Turn the system unit power on.

3. Log in as **root**.

4. Insert the media containing the device driver software (example: CD-ROM) into the appropriate media device.

5. Type the following

   ```
   smitty install_all
   ```

   and press Enter.

6. The Install and Update From All Available 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* (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.

8. The Install and Update From All Available screen highlights the **SOFTWARE to install** option.

9. Press **F4** to display the SOFTWARE to install screen.

10. Type the following to display the Find screen:

    /

11. Type the following

    `devices.pci.00100b00`

    and press Enter. (The system finds and highlights this device driver software.)

    A screen similar to the following displays:

    `devices.pci.00100b00                    ALL`

12. Press **PF7** to select the highlighted device driver software.

    Note: If you are running AIX 4.2.1, the following commands need to be performed before continuing:

    - Type the following to display the Find screen:

      /

    - Type the following

      `bos.rte.devices_msg`

      and press Enter. (The system finds and highlights this device driver software.)

      A screen similar to the following displays:

      `4.2.1.4 Device Driver Messages`

    - Press **PF7** to select the highlighted device driver software.

13. Press Enter.

14. The Install and Update from All Available Software screen displays. Entry data fields are automatically updated. Press Enter to accept the data.

15. The **ARE YOU SURE** screen displays. Press Enter to accept the data.

16. The **COMMAND STATUS** screen appears.

    - The term `RUNNING` is highlighted to indicate that the install and configure command is in progress.

    - When `RUNNING` changes to `OK`, scroll down to the bottom of the page and locate the Installation Summary.

    - After a successful installation, `SUCCESS` appears in the Result column of the summary at the bottom of the page.

17. Remove the installation media from the drive.

18. Press **F10** to exit SMIT.

19. Go to adapter install procedure, Chapter 5, "Installing Hardware" on page 5-1.

Chapter 4. Installing the Device Driver on the RS/6000 SP System

In an SP System, 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 System 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 have to telnet to each node and perform the steps below, omitting the "dsh" prefix.

Check System Pre-Requisites

__ 1. Log into the Control Workstation as **root**.

__ 2. Go to a temporary directory by typing:

```
cd /tmp
```

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 and 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 "dsh" to be performed. If not, you may need to refresh it. The System Administrator should also be able to assist 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 is installed on.

__ 6. The required AIX Level is 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 srvr       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 assistance.

__ 9. Record the name that appears below

```
lppsource_name
```

for each node on which the adapters are being installed; you need this later.

___ 10. Check if the device driver is installed in the lppsource directory by typing:

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

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

```
ls devices.pci.00100b00.rte
ls devices.pci.00100100.com
ls devices.pci.00100f00.rte
ls devices.common.IBM.scsi.rte
```

to see if the fileset is in the lppsource directory.

___ 11. If the device driver is not in the lppsource directory, proceed to section "Installing Software on the Control Workstation" on page 4-4 to install the software.

___ 12. Update the SPOT (Shared Product Object Tree) by doing the following:

    ___ a. Type

```
smitty nim_res_op
```

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_AIX433     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_AIX433     resources        lpp_source
```

___   g. Move the cursor to **fileset names** and type:

```
devices.pci.00100b00
```

___   h. Press Enter to start the SPOT update. This operation can take up to 15 minutes.

___   i. Repeat steps "g" and "h" for all devices you want to install.

```
devices.pci.00100100
devices.pci.00100f00
devices.common.IBM.scsi
```

___ 13. Check if the software is already installed on the node(s) by typing at the system prompt

```
dsh "lslpp -l devices.pci.00100b00* 2>&1" |more
dsh "lslpp -l devices.pci.00100100* 2>&1" |more
dsh "lslpp -l devices.pci.00100f00* 2>&1" |more
dsh "lslpp -l devices.common.IBM.scsi* 2>&1" |more
```

___ 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 System Nodes" on page 4-6.

Installing 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 **4.3.3 and higher**.

___ 1. If you are not logged into the Control Workstation as **root**, log in now. You may also need to export the working collective. Refer to section "Check System Pre-Requisites" on page 4-1.

___ 2. Insert the installation media into the Control Workstation's drive.

___ 3. 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):

```
devices.pci.00100100
devices.pci.00100f00
devices.common.IBM.scsi
```

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.

__ 4. Update the SPOT (Shared Product Object Tree) by:

__ a. Type

`smitty nim_res_op`

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_AIX433    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_AIX433     resources        lpp_source
```

___ g. Move the cursor until the **fileset names** and type:

```
devices.pci.00100b00
```

___ h. Press Enter to start the SPOT update. This operation can take up to 15 minutes.

___ i. Repeat steps "g" and "h" for all device drivers you have selected.

```
devices.pci.00100100
devices.pci.00100f00
devices.common.IBM.scsi
```

Proceed to section "Install Device Drivers on the SP System Nodes."

Install Device Drivers on the SP System Nodes

___ 1. Make sure that the lppsource directory is exported to the Nodes by typing:

```
showmount -e
```

The result should be something of the form:

```
/spdata/sys1/install/AIX433/lppsource (everyone)
```

___ 2. If the directory is not exported, you may temporarily export the directory by typing:

```
exportfs -i /spdata/sys1/install/<lppsoruce_name>/lppsource
```

___ 3. NFS Mount the lppsource directory by typing:

```
dsh mount <controlwks>:/spdata/sys1/install/<lppsource_name>/lppsource /mnt
```

`<controlwks>` is the name of the Control Workstation known for the Nodes. `<lppsource_name>` is the name you recorded earlier in section "Check System Pre-Requisites" on page 4-1.

___ 4. Perform a preview of the files to be installed on the nodes by typing:

```
dsh "installp -p -acgqXd /mnt device driver 2>| more
```

`device driver` is the filesets that must be installed for the adapter. The list includes:

```
devices.pci.00100b00
devices.pci.00100100
devices.pci.00100f00
devices.common.IBM.scsi
```

___ 5. Then perform the device driver installation by typing:

`dsh "installp -acgqXd /mnt device driver 2>&1" | more`

`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 5. Installing Hardware

This section provides the guidance necessary to install a PCI adapter. Before you begin, be sure you have read "Handling Static Sensitive Devices" on page vii. Also refer to the *PCI Adapter Placement Reference* guide.

Attention: Do not remove the PCI Dual Channel Ultra2 SCSI Adapter from its anti-static package at this time.

Installing the Adapter

 1. Be sure you have read Chapter 2, "Preparing for Installation" on page 2-1.

    - Determine if you should install your adapter hardware first.

    - Determine if you should install your device driver software first.

    - 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 3, "Installing Device Driver Software" on page 3-1. Return here to install your hardware.

 2. Determine if you are installing your adapter for internal or external connection:

    - For external connections, refer to your system unit User's guide for PCI adapter installation instructions. Reinstall the covers once the installation is complete. Return here and go to "Connecting Internal or External Devices" on page 5-2.

    - For internal connections, refer to your system unit User's guide for PCI adapter installation instructions. Do not reinstall the covers once the installation is complete. Return here and go to "Connecting Internal or External Devices" on page 5-2.

Connecting Internal or External Devices

While your system is shut down, perform the following:

To connect external devices:

- Connect the internal, 68-position, high-density plastic D-Shell VHDCI to P shell converter cable or the host to device cable with VHDCI connectors on both ends to an external port Channel A (J2) or Channel B (J3). Use the fastening screws on the cable connector to securely attach the connector to the adapter.

- Connect the other end of the converter cable to the cable attached to a single-ended SCSI device or subsystem.

- Connect the other end of the VHDCI to VHDCI cable to the LVD SCSI subsystem.

- If necessary, connect additional cables to additional SCSI devices.

- When all devices are connected, ensure that a SCSI terminator is attached to the last device.

- Turn on both your system unit and your display and any external devices. Follow any instructions on the screen.

To connect internal devices:

- Attach 16-bit cable to the adapter and the 6 position backplane.

- Connect the adapter end of the internal cable to the correct internal connector on the PCI Dual Channel Ultra2 SCSI Adapter. Use either connector Channel B (J4) or Channel A (J6).

- When completed, refer to your system unit User's guide to put covers on and power on the system unit and all other attached devices.

   Note: All the connectors are built so they can only be plugged in one way.

Verifying the Installation

Initial installation is verified using the following procedures:

- Verify AIX Hardware Installation (lsdev)
- Verify AIX Software Installation (lslpp)

Verify AIX Hardware Installation

1. To verify that your system unit recognizes the PCI Dual Channel Ultra2 SCSI Adapter:

   - If necessary, login as **root**.

   - Type:

     ```
     lsdev -Cs pci | grep scsi
     ```

     and press Enter.

2. Possible Results:

   - If the PCI Dual Channel Ultra2 SCSI Adapter did install correctly, the following is an example of the data that appears on your screen:

     ```
     scsi1 Available 04-03 Wide/Ultra-2 SCSI I/O Controller
     scsi2 Available 04-03 Wide/Ultra-2 SCSI I/O Controller
     ```

     If this message displays, you have finished installing the adapter.

   - If the message on your screen indicates your adapter is DEFINED instead of AVAILABLE, shut down your machine. Check the PCI Dual Channel Ultra2 SCSI Adapter to ensure it is installed correctly. Go to "Installing the Adapter" on page 5-1, and return to this section and repeat step 1.

     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 no data appears, continue with "Verify AIX Software Installation" on page 5-4.

Verify AIX Software Installation

1. To verify that the device driver for the PCI Dual Channel Ultra2 SCSI Adapter device driver is installed:

    - If necessary, login as **root**.

    - Type:

      ```
      lslpp -l all | grep 00100b00
      ```

      and press Enter.

2. Possible Results:

    - If the PCI Dual Channel Ultra2 SCSI Adapter device driver is installed, the following is an example of the data that appears:

      ```
      devices.pci.14102e00.diag 4.2.1.0 COMMITTED SYM53C896 DUAL CHANNEL PCI
      devices.pci.14102e00.rte  4.2.1.0 COMMITTED SYM53C896 DUAL CHANNEL PCI
      ```

      If this appears but you continue to have problems, go to "Installing the Adapter" on page 5-1.

    - If no data appears on your screen, the PCI Dual Channel Ultra2 SCSI Adapter device driver did not install. Return to Chapter 3, "Installing Device Driver Software" on page 3-1. Return to "Verify AIX Hardware Installation" on page 5-3 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 directions.

Configuring the Ultra SCSI Adapter

This adapter prevents use of Ultra speeds by an external device. Ultra speeds for
external devices may be enabled through the SCSI SMIT panel (below).

Enable Ultra Speed (on external devices) during single-ended operation

1. At the command prompt, type:

   smit scsia

   and press Enter.

2. Select **Change / Show Characteristics of a SCSI Adapter**.

3. Select *your Ultra2 SCSI adapter* from the list and press Enter.

   Example: (This screen varies based on the adapter you select.)

```
                    Change / Show Characteristics of a SCSI Adapter

   Type or select values in entry fields.
        Enter AFTER making all desired changes.
                                            |Entry Fields|
   SCSI Adapter                             scsi2
   Description                              Wide/Ultra-2 SCSI I/O >
   Status                                   Available
   Location                                 04-04
   PCI-SCSI I/O Processor type              53C896
   Adapter card SCSI ID                     |7|
   BATTERY backed adapter                   no
   Negotiate after SCSI check condition     yes
   Maximum synchronous data transfer rate (mHz)   40
   Wide bus enabled                         yes
   SCSI bus transceiver alternative         LVD/SE
   Number of DMA bursts per PCI bus ownership   32
   DMA bus memory LENGTH                     (0x200000)
   Target mode bus memory length             (0x40000)
   Ultra speed on SE bus w/external cable    disable
   Bus mode limiting wide transfer with 2 cables  SE
   Apply change to DATABASE only             no
```

4. Select **Ultra speed on SE bus with external cable**.

5. Press **F4**.

6. Select **enable**, and press Enter.

7. Press Enter.

8. If the change was successful, press **F10** to exit SMIT.

If you were not successful using "Enable Ultra Speed (on external devices) during single-ended operation" on page 5-5, try the following:

1. Select **Apply change to DATABASE only**.

2. Press **F4** and select **yes**.

3. Press Enter.

4. Press **F10** to exit SMIT.

5. At this point, adapter and child devices must be reconfigured. At the command prompt, type

   ```
   shutdown -Fr
   ```

   to reboot your system.

Speeds for SCSI devices can be controlled via the SMIT panel. External single-ended devices default to a speed of 10M data cycles per second. Speeds of 5M, 10M, or 20M data cycles per second may be selected.

In LVD mode, the maximum speed is automatically set to 40 data cycles per second.

Limit Adapter Speed

1. At the command prompt, type:

   ```
   smit scsia
   ```

   and press Enter.

2. Select **Change / Show Characteristics of a SCSI Adapter**.

3. Select *your Wide Ultra2 SCSI adapter* from the list.

   Note: For example, see step 2 on page 5-5.

4. Select **Maximum synchronous data transfer rate (MHz)**.

5. Press **F4**.

6. Select the desired speed: **5, 10,** or **20** million data cycles per second and press Enter.

7. Press Enter.

8. If the change was successful, press **F10** to exit SMIT.

If you were not successful using "Limit Adapter Speed," try the following:

1. Select **Apply change to DATABASE only**.

2. Press **F4** and select **yes**.

3. Press Enter.

4. Press **F10** to exit SMIT.

5. At this point, adapter and child devices must be reconfigured. At the command prompt, type

   ```
   shutdown -Fr
   ```

   to reboot your system.

Appendix A. Connecting SCSI Devices to the Adapter

Planning Your SCSI Device Layout

SCSI devices are attached to a SCSI adapter in a chain. Devices in the chain can be internal (inside your system unit) or external (connected outside your system unit).
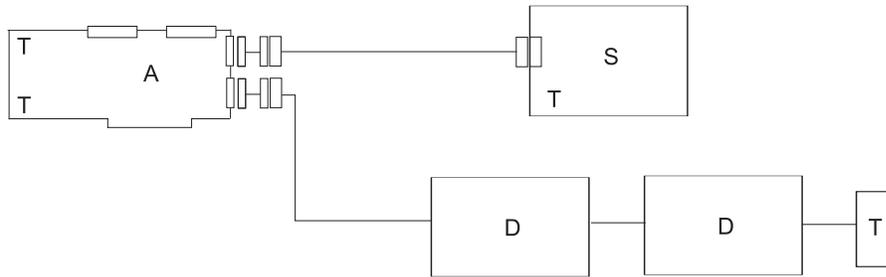
If you are connecting more than one SCSI device, it is important that you plan the layout of your SCSI chain.

Note: At each end of the SCSI chain, a terminator is required.
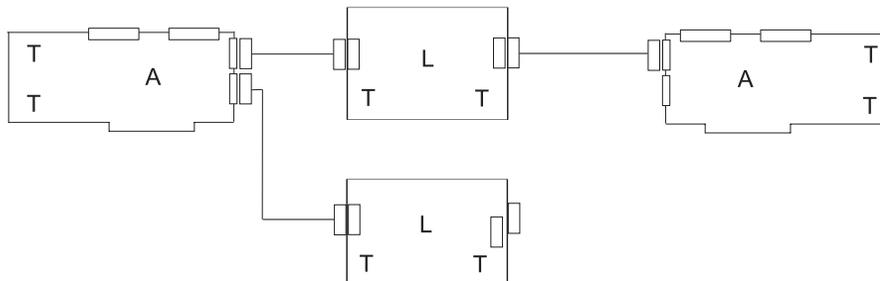
A Adapter
L Low Voltage Differential
T Terminator

Figure   A-1. External: Low Voltage Differential:.   The interconnection cable is provided with the external subsystem. It has VHDCI connectors.

A Adapter
D Device
S Subsystem
T Terminator

Figure   A-2. External Single-Ended:.   A convertor cable may be used to attach VHDCI connectors on the adapter and P Shell connector on external cables.
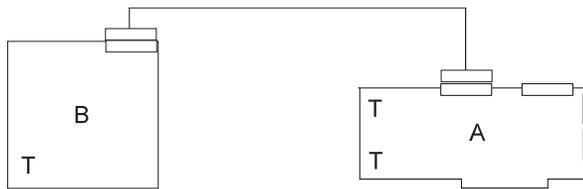
A Adapter
B Backplane
T Terminator

Figure   A-3. Internal Single-Ended:.   Terminators are built into the adapter and backplane.

Term is the SCSI terminator on the last device or the end of the cable. The adapter terminates the other end of the cable.

Setting SCSI Addresses

Each SCSI device requires a unique SCSI address. The address is a number from 6 through 0 for 8-bit devices or from 6 through 0 and 15 through 8 for 16-bit devices. If two SCSI devices have the same address, your system unit does not function properly. SCSI address 7 is reserved for the adapter, so additional SCSI devices can be set to addresses 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 the manual that shipped with the device 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. Be sure to maintain a list of all your SCSI addresses for future reference (your system unit documentation may provide a table where you can record them).

Planning SCSI Addresses

No two SCSI devices should have the same address, and no device should use the SCSI address 7. Address 7 is reserved for the adapter.

Note: SCSI addresses are not in sequential order from highest to lowest priority. Refer to Table A-1 for the priority associated with each SCSI address.

Table A-1. Data Access Priorities for SCSI Addresses

Priority	SCSI ID	Actual SCSI Device Name
Highest	7	PCI Dual Channel Ultra2 SCSI Adapter
|	6	
|	5	
|	4	
|	3	
|	2	
|	1	
|	0	
|	15	
|	14	
|	13	
|	12	
|	11	
|	10	
V	9	
Lowest	8	

Changing SCSI Addresses

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

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 a terminator be plugged into the device on a connector. After planning your installation, you need to supply the correct terminator to the SCSI device at each end of the chain. Refer to the device instructions to find out how it is terminated. If necessary, you should purchase terminators when you buy devices and cables.

Active terminators are required for all installations for reliable SCSI operation.

The basic rules of terminating SCSI buses are:

- Terminate the ends of the chain.
- Do not terminate devices in the middle of the chain.

Attaching a Toroid Assembly

On systems that are specified to be FCC Class B compliant, attach a toroid assembly, if provided, around each cable plugging into the external connector(s) of the adapter. Place the toroid assembly as close to the connector(s) as possible. The toroid assembly will clamp around the cable and the two halves will snap together to secure it.
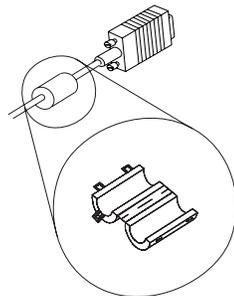

Figure   A-4. Toroid Assembly

Appendix B. Internal, External 68-Position, 16-Bit Single-Ended High-Density VSCSI or VHDCI Bus Connector

The following table shows the pinout for the internal and external 68-position, high-density plastic D-Shell SCSI connectors.
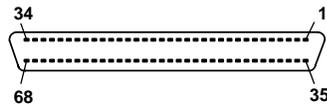

Figure B-1. Internal, External 68-Pin Connector

Signal Name		Connector		Signal Name
SE	**LVD**	**Pin**	**Pin**	**SE and LVD**
Ground	+DB(12)	1	35	-DB(12)
Ground	+DB(13)	2	36	-DB(13)
Ground	+DB(14)	3	37	-DB(14)
Ground	+DB(15)	4	38	-DB(15)
Ground	+DB(P1)	5	39	-DB(P1)
Ground	+DB(0)	6	40	-DB(0)
Ground	+DB(1)	7	41	-DB(1)
Ground	+DB(2)	8	42	-DB(2)
Ground	+DB(3)	9	43	-DB(3)
Ground	+DB(4)	10	44	-DB(4)
Ground	+DB(5)	11	4	-DB(5)
Reserved	+DB(6)	12	46	-DB(6)
Ground	-DB(7)	13	47	-DB(7)
Ground	+DB(P)	14	48	-DB(P)
Ground	Ground	15	49	Ground
Ground	DIFFSENS_	16	50	CPRNST
TERMPWR	TERMPWR	17	51	TERMPWR
TERMPWR	TERMPWR	18	52	TERMPWR
Reserved	Reserved	19	53	Reserved
Ground	Ground	20	54	Ground
Ground	+ATN	21	55	-ATN
Ground	Ground	22	56	Ground
Ground	+BSY	23	57	-BSY

Signal Name		Connector		Signal Name
SE	LVD	Pin	Pin	SE and LVD
Ground	+ACK	24	58	-ACK
Ground	+RST	25	59	-RST
Ground	+MSG	26	60	-MSG
Ground	+SEL	27	61	-SEL
Ground	+C/D	28	62	-C/D
Ground	+REQ	29	63	-REQ
Ground	+I/O	30	64	-I/O
Ground	+DB(8)	31	65	-DB(8)
Ground	+DB(9)	32	66	-DB(9)
Ground	+DB(10)	33	67	-DB(10)
Ground	+DB(11)	34	68	-DB(11)

Note:

- 8-bit SE devices which connect to the P-cable should tie the following signals inactive high: -DB(8), -DB(9), -DB(10), -DB(11), -DB(12), -DB(13), -DB(14), -DB(15), -DB(P1), or select "Disable Wide Negotions" on the front Option Jumper Block and float the same signal lines.

- For 8-bit LVD devices or SE mode the following signals must be tied inactive (+ = inactive low, - = inactive high). +/-DB(8), +/-DB(9), +/-DB(10), +/-DB(11), +/-DB(12), +/-DB(13), +/-DB(14),+/-DB(15), +/-DB(P1). Floating these signals is not sufficient.

- All other signals shall be connected as defined.

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 Dual Channel Ultra2 SCSI Adapter 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

FCC 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
> 基づくクラス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

PCI Dual Channel Ultra2 SCSI Adapter Installation and User's Guide

Part Number: 03N3705

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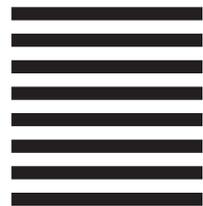
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