PCI Dual Channel Ultra3 SCSI Adapter

Installation and Using Guide

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 communications lines.
D05

Handling Static-Sensitive Devices

Attention: Static electricity can damage this device and your system unit. To avoid damage, keep this device in its antistatic 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 other printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its antistatic 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 documentation to install the PCI Dual Channel Ultra3 SCSI Adapter.

ISO 9000

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

References to AIX Operating System

This document may contain references to the AIX operating system. If you are using another operating system, consult the appropriate documentation for that operating system.

This document may describe hardware features and functions. While the hardware supports them, the realization of these features and functions depends upon support from the operating system. AIX provides this support. If you are using another operating system, consult the appropriate documentation for that operating system regarding support for those features and functions.

Related Publications

The following publications contain related information:
* System unit documentation specific to your hardware configuration
* *PCI Adapter Placement Reference* (for the latest version, you may need to contact your marketing representative)

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* RS/6000
* SP

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Chapter 1. Overview

Note: This document may contain references to the AIX operating system. If you are using another operating system, consult the appropriate documentation for that operating system.

This document may describe hardware features and functions. While the hardware supports them, the realization of these features and functions depends upon support from the operating system. AIX provides this support. If you are using another operating system, consult the appropriate documentation for that operating system regarding support for those features and functions.

This guide describes how to install the PCI Dual Channel Ultra3 SCSI Adapter in a system unit with a PCI (peripheral component interconnect) bus. The PCI Dual Channel Ultra3 SCSI Adapter enables you to use internal and external SCSI (small computer system interface) 8- or 16-bit devices. Each channel operates independently with external LVD (low voltage differential) subsystems, internal LVD devices, or external single-ended devices (see Appendix C, "Connecting SCSI Devices to the Adapter" on page 25). None of these configurations can be connected simultaneously on a channel (see "SCSI Connectors" on page 2).

The adapter conforms to the ANSI (American National Standards Institute) SCSI Standard X3T10/1365D and to the PCI local bus specification, revision 2.2.

The PCI Dual Channel Ultra3 SCSI Adapter runs on the following:
- Either 3V or 5V slots
- Either 32-bit or 64-bit slots

The PCI Dual Channel Ultra3 SCSI Adapter supports Ultra3 SCSI synchronous data rates up to 80 MHz in LVD operation. Maximum transfer rates are as follows:
- 16-bit Ultra3 SCSI device: 160 MB/s
- 16-bit Ultra2 SCSI device: 80 MB/s
- 16-bit Ultra SCSI device in single-ended Ultra operation: 40 MB/s
- 8-bit Fast SCSI device: 10 MB/s

SCSI Connectors

The adapter has the following external and internal connectors:

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

Connectors J2 and J6 are connected as Channel A. Connectors J3 and J4 are connected as Channel B.

Attention: Simultaneous use of internally and externally attached devices on the same channel is not supported with this adapter. The following figure shows the external and internal channels.

PCI Dual Channel Ultra3 SCSI Adapter
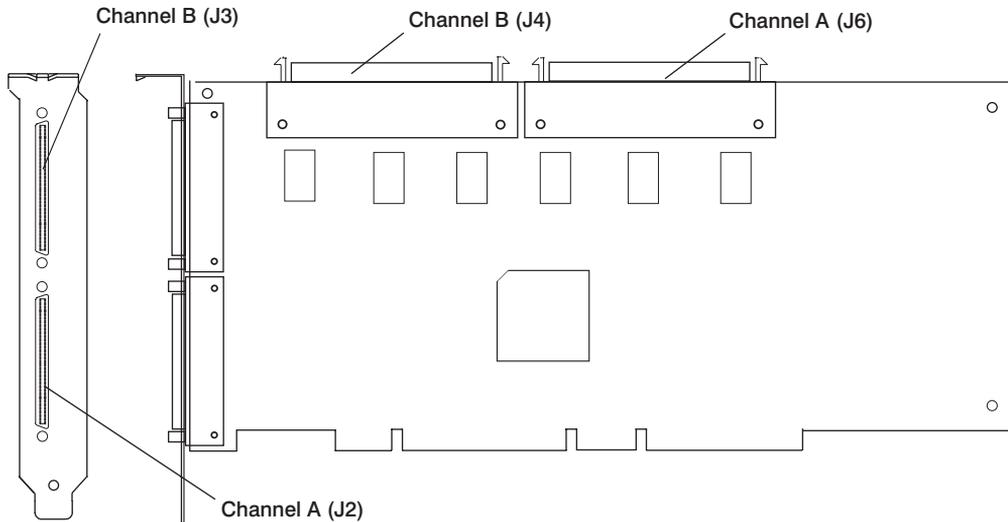
Note: The adapter has built-in SCSI terminators on each channel that are automatically enabled when a cable is attached to either the external or internal connector.

Software Requirements

The PCI Dual Channel Ultra3 SCSI Adapter is supported on AIX Version 4.3.3.x and 5.1.x or higher with updates.

Chapter 2. Preparing for Installation

This chapter outlines how to prepare to install the PCI Dual Channel Ultra3 SCSI Adapter.

The installation preparation includes:

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

Note: This adapter is supported on multiple systems and may require a system firmware update. Contact your service representative for further details.

Note: If AIX is not installed on your system unit, install your adapter before you install the operating system. (See Chapter 5, "Installing Adapter Hardware" on page 13.) When you install AIX, your device driver software automatically installs.

If AIX is operating on your system, install your device driver software before you install your adapter. (See Chapter 3, "Installing Device Driver Software" on page 5.)

Note: Additional device drivers may also be required for the SCSI devices attached to the adapter. For installation instructions, refer to the documentation provided with your devices.

Inventory

To install the PCI Dual Channel Ultra3 SCSI Adapter, you need the following:
- The adapter
- This publication, *PCI Dual Channel Ultra3 SCSI Adapter Installation and Using Guide*
- The system unit installation guide
- *PCI Adapter Placement Reference*, order number SA38-0538
- Media containing device driver software
- A flat-blade screwdriver

To connect the SCSI devices to the adapter, you may also need the following:
- The documentation provided with your SCSI devices
- External cables
- Internal cables
- A single-ended SCSI terminator
- A 68-position high-density plastic D-shell VHDCI to 68-position high-density plastic D-shell SCSI standard 16-bit interposer cable
- A 68-position to 50-position interposer connector

Determining Cable Needs

Use this section to determine your cable needs.

External Cable Connectors

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

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

For either external 8- or 16-bit single-ended devices, the cable end going to the adapter is a 68-position high-density plastic D-shell connector. This connector joins to a VHDCI to P-shell converter cable, which plugs into the adapter.

External Cable Lengths

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 (80 MB/s) or Ultra3 speed (160 MB/s), the maximum cable length is 25 meters (approximately 80 feet).
- To attach an Ultra, 20 MHz synchronous device (such as a 16-bit SCSI disk drive that can transfer up to 40 MB/s of data), the maximum cable length is 3 meters (approximately 10 feet). Up to two devices can be attached.
- To attach a fast, 10 MHz synchronous device (such as an 8-bit SCSI disk that can transfer up to 10 MB/s of data or a 16-bit SCSI disk that can transfer up to 20 MB/s of data), the maximum cable length is 3 meters (approximately 10 feet). Up to four devices can be attached.

For information about connecting SCSI devices to your adapter, see Appendix C, "Connecting SCSI Devices to the Adapter" on page 25.

Internal Cable Connectors

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. For an illustration of the SCSI connectors, see the PCI Dual Channel Ultra3 SCSI Adapter on page 2.

To use internal SCSI devices in your system, obtain the necessary cables for your system unit. Terminators are built onto the backplane within your system unit.

Chapter 3. Installing Device Driver Software

This chapter explains how to install device driver software.

Note: Additional device drivers may also be required for the SCSI devices attached to the adapter. For installation instructions, refer to the documentation provided with your devices.

AIX Device Driver Software Installation

To install the device driver software on an AIX system, do the following:

1. Read Chapter 2, "Preparing for Installation" on page 3 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 "Installing the Adapter" on page 13. When you install AIX, your adapter device driver automatically installs.
2. Turn on the system unit power.
3. At the system prompt, log in as root user.
4. Insert the media (diskette or CD-ROM) containing the device driver software into the appropriate media device.
5. To start SMIT, type `smitty install_all`, and then press Enter.
6. The Install and Update from All Available Software screen appears and highlights the **INPUT Device/directory for software** option.
7. Select or type the input device:
   - Press F4 to display the input device list. Select the name of the input device that you are using (for example, *CD-ROM*), 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 Software screen appears and highlights the **Software to Install** option.
9. Press F4 to display a list of the device software you can install.
10. To display the Find screen, type /.
11. Type `bos.diag` and then press Enter (the system finds and highlights this diagnostic driver software). A message similar to the following displays:

    ```
     bos.diag          ALL
    ```
12. Press F7 to select it.
13. Type /.
14. Type `devices.pci.00102100` and then press Enter (The system finds and highlights this device driver software). A message similar to the following is displayed:

    ```
    devices.pci.00102100        ALL
    ```
15. Press F7 to select it.

16. Press Enter.
17. The Install and Update from All Available Software screen displays. Entry data fields are automatically updated. Press Enter to accept the data.
18. The Are You Sure screen displays. Press Enter to accept the data.
19. The command Status screen displays.
20. 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.
21. Remove the installation media from the drive.
22. Press F10 to exit SMIT.
23. Go to Chapter 5, "Installing Adapter Hardware" on page 13.

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

For an RS/6000 SP system, the installation tasks must be performed on each node. You must make the installation files available and then install them on all the relevant nodes. This chapter discusses the following tasks to enable you to install the device driver on the RS/6000 SP system:

- Checking System Prerequisites
- Installing Software on the Control Workstation
- Installing Device Drivers on the SP Nodes

Perform the following tasks on the Control Workstation. You should not need to **telnet** or **rlogin** to the individual SP System nodes. If you are unfamiliar with the **dsh** command, refer to one of the following Parallel System Support Program (PSSP) publications:

- *Parallel System Support Program for AIX: Administration Guide*
- *Parallel System Support Program for AIX: Command and Technical Reference*

If you cannot use the **dsh** command because of the setup at your site, then use the **telnet** command to each node. Then perform the steps below, beginning with step 5, and omitting the dsh prefix.

Checking System Prerequisites

To check system prerequisites, perform the following:

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

___ 2. To go to a temporary directory, type cd /tmp at the system prompt, and then press Enter.

___ 3. Make a *working collective* file containing a list of the relevant nodes on which you want to perform the update. Type the following, pressing Enter after each line:

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

___ 4. To test the working collective file, type dsh date, and then press Enter. The result should look similar to the following:

```
nodename1:   Wed Apr 10 10:37:46 EDT 1999
nodename2:   Wed Apr 10 10:37:46 EDT 1999
nodename3:   Wed Apr 10 10:37:47 EDT 1999
nodename4:   Wed Apr 10 10:37:48 EDT 1999
```

If not, examine your nodelist file **./group1** to ensure that the node names are correct. Also ensure that the Kerberos ticket is current to permit **dsh** to be performed. If not, you may need to refresh it. Contact your system administrator

for assistance with Kerberos initialization. If the system administrator is unable to help you, consult your support center.

If you need to install only a few nodes, use the `dsh -w host1, host2, host3...` command format to explicitly reference groups of nodes.

__ 5. To determine if the AIX operating system on each relevant node is at the required level, type the following at the AIX operating system prompt:

```
dsh oslevel
```

OR

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

Press Enter. <host1,host2> is a list of the host names for the nodes on which the adapter will be installed. The required AIX level is 4.3.3 or later.

If the nodes are *not* at a supported AIX level, upgrade the AIX level on the nodes. Contact the system administrator for assistance.

__ 6. To determine if the PSSP level on each node is at the required level, type `/usr/lpp/ssp/bin/splstdata -G -b`, and then press Enter. The results display for all nodes and 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. The required PSSP level is 2.4 or later.

If the nodes are *not* at a supported PSSP level, upgrade the PSSP level on the nodes. Contact the system administrator for assistance.

__ 7. Record the name that appears below `lppsource_name` for each node on which the adapters are being installed. You will use this information later.

__ 8. To verify that the device driver is installed in the lppsource directory, type the following at the system prompt:

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

<lppsource_name> was recorded in the previous step. Once you are in this directory, verify that the fileset is in the lppsource directory by typing the following at the prompt:

```
ls devices.pci.00102100.*
ls devices.pci.00100f00.*
ls devices.common.IBM.scsi.*
```

If the device driver is not in the lppsource directory, proceed to "Installing Software on the Control Workstation" on page 10 to install the software.

___ 9. To update the SPOT (Shared Product Object Tree), perform the following:

    a. Type `smitty nim_res_op` at the system prompt. The Resource Name screen displays with the following highlighted:

```
boot              resources     boot
```

    b. Move the cursor down until **SPOT resource** is highlighted. The SPOT resource should look similar to the following:

```
spot_AIX433      resources      spot
```

    The format of the SPOT name is: spot_<lppsource_name>. <lppsource_name> was the name that you recorded in a previous step.

    c. When **SPOT resource** is highlighted, press Enter to select this option. The Network Install Operation to Perform screen displays with the **reset** option highlighted for selection.

    d. Move the cursor until **cust** is highlighted, and then press Enter to select this option. The Customize a SPOT screen displays with **Source of Install Images** highlighted for selection.

    e. Press F4 to display the list of installation images and select the appropriate lppsource.

    f. Move the cursor until the appropriate lppsource is displayed. For example:

```
lppsource_AIX433      resources       lpp_source
```

    Press Enter.

    g. Move the cursor to **fileset names** and type `devices.pci.00102100`.

    h. To start the SPOT update, press Enter. This operation can take up to 15 minutes.

    i. Repeat steps 9.g and 9.h for all device drivers you have selected:

```
devices.pci.00102100
devices.pci.00100f00
devices.common.IBM.scsi
```

__ 10. To verify that the device driver is already installed on the node(s), type the following at the system prompt:

```
dsh "lslpp -l devices.pci.00102100* 2>&1" |more
dsh "lslpp -l devices.pci.00100f00* 2>&1" |more
dsh "lslpp -l devices.common.IBM.scsi* 2>&1" |more
```

__ 11. If the device driver is already installed on the node, contact your service provider to have the adapter installed.

OR

If the device driver is not installed on the node, proceed to "Installing Device Drivers on the SP Nodes" on page 11.

Installing Software on the Control Workstation

Note: If your system is *partitioned*; that is, there is more than one operating system among the nodes, you can *only* install this adapter in nodes that have AIX 4.3.3 or later.

__ 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 "Checking System Prerequisites" on page 7.

__ 2. Insert the installation media into the drive of the Control Workstation.

__ 3. Transfer the files to the Control Workstation's lppsource, as follows:

a. Type smitty bffcreate, and then press Enter.

b. Select the input device/directory and press F4. Move the cursor to the appropriate input device, and then press Enter.

c. Move the cursor to **SOFTWARE Package to Copy** and press F4 to select the software to be installed. Use the F7 key to select the following device driver(s) at the system prompt:

```
devices.pci.00102100
devices.pci.00100f00
devices.common.IBM.scsi
```

Press Enter.

d. Move the cursor down to **DIRECTORY for Storing Software Package** and type the appropriate lppsource destination directory as follows, using the <lppsource_name> you recorded earlier:

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

e. To begin copying the files, press Enter.

Note: This step may take several minutes while the directory table of contents is updated.

__ 4. To update the SPOT (Shared Product Object Tree), perform the following:

a. Type smitty nim_res_op at the system prompt. The Resource Name screen displays with the following highlighted:

```
boot            resources    boot
```

    b. Move the cursor down until **SPOT resource** is highlighted. The SPOT resource should look similar to the following:

```
spot_AIX433    resources    spot
```

       The format of the SPOT name is: spot_<lppsource_name>. <lppsource_name> was the name that you recorded in a previous step.

    c. When **SPOT resource** is highlighted, press Enter to select this option. The Network Install Operation to Perform screen displays with the **reset** option highlighted for selection.

    d. Move the cursor until **cust** is highlighted, and press Enter to select this option. The Customize a SPOT screen displays with the **Source of Install Images** highlighted for selection.

    e. Press F4 to display the list of installation images and select the appropriate lppsource.

    f. Move the cursor until the appropriate lppsource is displayed. For example:

```
lppsource_AIX433    resources    lpp_source
```

       Press Enter.

    g. Move the cursor to **fileset names** and type `devices.pci.00102100`.

    h. To start the SPOT update, press Enter. This operation can take up to 15 minutes.

    i. Repeat steps 4.g and 4.h for all device drivers you have selected:

```
devices.pci.00102100
devices.pci.00100f00
devices.commom.IBM.scsi
```

Proceed to "Installing Device Drivers on the SP Nodes"

Installing Device Drivers on the SP Nodes

To install device drivers on the SP nodes, perform the following:

___ 1. To make sure that the lppsource directory is exported to the nodes, type `showmount -e` at the system prompt. If the directory is exported to the nodes, the result should look similar to the following:

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

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

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

___ 3. To perform an NFS mount of the lppsource directory, type the following:

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

<controlwks> is the name of the Control Workstation recognized by the nodes. <lppsource_name> is the name you recorded earlier in "Checking System Prerequisites" on page 7.

____ 4. To preview the files to be installed on the nodes, type the following at the system prompt:

```
dsh "installp -p -g -acqXd /mnt devices.pci.00102100 2>&1" | more
```

You should see:

```
 devices.pci.00102100
 devices.pci.00100100
 devices.pci.00100f00
 devices.common.IBM.scsi
```

____ 5. To install the device driver, type the following at the system prompt:

```
dsh "installp -g -acqXd /mnt devices.pci.00102100 2>&1" | more
```

After the device driver is installed on the node, contact your service provider to have the adapter installed.

Chapter 5. Installing Adapter Hardware

This chapter provides instructions for installing a PCI adapter and connecting your SCSI devices. Before you begin, be sure you have read "Handling Static-Sensitive Devices" on page vii. Also refer to the *PCI Adapter Placement Reference*, order number SA38-0538.

Attention: Do not remove the PCI Dual Channel Ultra3 SCSI Adapter from its antistatic package at this time.

Installing the Adapter

To install the adapter, do the following:

1. Read Chapter 2, "Preparing for Installation" on page 3 to determine:
   - If you should install your PCI 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 5. Return here to install your hardware.
2. Determine if you are installing your adapter for external or internal connection:
   - For external connections, refer to your system unit installation guide for PCI adapter installation instructions. Reinstall the covers after the installation is complete. Return here and go to "Connecting External Devices".
   - For internal connections, refer to your system unit installation guide for PCI adapter installation instructions. Do not reinstall the covers after the installation is complete. Return here and go to "Connecting Internal Devices" on page 14.

Connecting External or Internal Devices

To connect external or internal devices, use the following procedures.

Note: Attachment cables are usually shipped with the attaching subsystem or device.

Connecting External Devices

Note: Depending on your system unit, you may not need to shut down the system before connecting external devices. For more information, refer to the documentation provided with your system unit.

To connect external devices, do the following:

1. If the cable from your subsystem or device has a VHDCI connector on the end going to the adapter, connect the cable directly to the external port Channel A (connector J2) or Channel B (connector J3). Use the fastening screws on the cable connector to securely attach the connector to the adapter.

   If the cable from your subsystem or device has a high-density D-shell connector on the end going to the adapter, attach it to a VHDCI to D-shell converter cable *before*

attaching it to the adapter. Then connect the cable to external port Channel A (connector J2) or Channel B (connector J3). Use the fastening screws on the cable connector to securely attach the connector to the adapter.

2. If necessary, connect additional cables to additional SCSI devices.
3. When all devices are connected, ensure that a SCSI terminator is attached to the last device if needed.
4. If you have turned off your system unit, turn it back on.
5. Turn on any external devices.
6. If you have turned off your display, turn it back on and follow any instructions on the screen.

Connecting Internal Devices

Note: For more information on connecting internal devices, refer to the documentation provided with your system unit.

To connect internal devices, do the following:

1. Attach a 16-bit cable to the adapter and the 6-position backplane.
2. Connect the adapter end of the internal cable to the correct internal connector on the PCI Dual Channel Ultra3 SCSI Adapter. Use either connector Channel B (J4) or Channel A (J6).
3. When completed, refer to your system unit installation guide to install the covers and to power on the system unit, as well as all other attached devices.

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

Verifying the Installation

To verify the initial installation, use the following procedures:

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

Verify AIX Hardware Installation

To verify that your system unit recognizes the PCI Dual Channel Ultra3 SCSI Adapter, do the following:

1. If necessary, log in as root user.
2. Type `lsdev -Cs pci | grep scsi`, and then press Enter.

Possible results are as follows:

- If the PCI Dual Channel Ultra3 SCSI Adapter did install correctly, the following is an example of the data that displays on your screen:

```
scsi1 Available 04-04 Wide/Ultra-3 SCSI I/O Controller
scsi2 Available 04-05 Wide/Ultra-3 SCSI I/O Controller
```

- If the message on your screen indicates your adapter is `Defined` instead of `Available`, shut down your machine. Check the PCI Dual Channel Ultra3 SCSI Adapter to ensure it is installed correctly. Go to "Installing the Adapter" on page 13. Then 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".

Verify AIX Software Installation

To verify that the device driver for the PCI Dual Channel Ultra3 SCSI Adapter is installed, do the following:

1. If necessary, log in as root user.
2. Type `lslpp -l devices.pci.00102100*`, and then press Enter.

Possible results are as follows:

- If the PCI Dual Channel Ultra3 SCSI Adapter device software is installed, the following is an example of the data that displays on your screen:

```
devices.pci.00102100.diag  5.1.0.0 COMMITTED SYM53C1010 PCI Ultra3 SCSI I/O
devices.pci.00102100.rte   5.1.0.0 COMMITTED SYM53C1010 PCI Ultra3 SCSI I/O
```

  If this message displays but you continue to have problems, go to "Installing the Adapter" on page 13.
- If no data displays on your screen, the PCI Dual Channel Ultra3 SCSI Adapter device driver did not install. Return to Chapter 3, "Installing Device Driver Software" on page 5. Then return to "Verify AIX Hardware Installation" on page 14.

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

Configuring the Ultra3 SCSI Adapter

The Ultra3 SCSI adapter permits use of Ultra3 adapter speeds by an external device. In LVD mode, the maximum speed is automatically set, depending on the data transfer rate supported by the attached device. You can use SMIT to control Ultra3 adapter speeds for external devices, as described in the following sections.

Run Ultra3 Devices at Ultra2 Data Transfer Rates

To run at Ultra3 data rates (160 MB/s on a 16-bit bus), parallel protocol request (PPR) must be enabled. If PPR is not enabled, then the maximum data transfer rates available will be Ultra2 (80 MB/s on a 16-bit bus).

Attention: Use this procedure when connecting either a 2104 Model DL1 or a 2104 Model TL1 Expandable Storage Plus system.

Notes:

1. To enable PPR, the wide attribute must be set.
2. Both the PPR and wide attributes are enabled by default.

To run Ultra3 devices at Ultra2 data transfer rates by disabling PPR, do the following:

1. At the command prompt, type `smitty scsia`, and press Enter.
2. Select **Change / Show Characteristics of a SCSI Adapter**.
3. Select your 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                                     scsi4
Description                                      Wide/Ultra-3 SCSI I/O
Status                                           Available
Location                                         20-58
PCI-SCSI I/O Processor type                      53C1010
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       64
DMA bus memory LENGTH                            (0x200000)
Target mode bus memory length                    (0x40000)
Ultra speed on SE bus with external cable           disable
Bus mode limiting wide transfer with 2 cables  SE
Parallel protocol request enabled..............yes
Domain validation enabled......................yes
Apply change to DATABASE only                    no
```

4. Select **Parallel protocol request enabled**.
5. Press F4.
6. Select **no**, and press Enter.
7. Press Enter again.
8. If the change was successful, press F10 to exit SMIT.

Enable Ultra Speed (on External Devices) during Single-Ended Operation

When the SCSI adapter detects any external single-ended devices on the SCSI bus, it defaults to 10 MHz operation. Use this procedure to override the default speed and run at the Ultra signalling rate of 20 MHz (40 MB/s on a 16-bit bus).

To enable Ultra speed on external devices during single-ended operation, do the following:

1. At the command prompt, type `smitty scsia`, and press Enter.
2. Select **Change / Show Characteristics of a SCSI Adapter**.
3. Select your 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                                scsi4
   Description                                 Wide/Ultra-3 SCSI I/O
   Status                                      Available
   Location                                    20-58
   PCI-SCSI I/O Processor type                 53C1010
   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  64
   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
   Parallel protocol request enabled..............yes
   Domain validation enabled.....................yes
   Apply change to DATABASE only               no
   ```

4. Select **Ultra speed on SE bus w/external cable**.
5. Press F4.
6. Select **enable**, and press Enter.
7. Press Enter again.
8. If the change was successful, press F10 to exit SMIT.

If you were not successful using the procedure discussed in "Enable Ultra Speed (on External Devices) during Single-Ended Operation" on page 17, do 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. To reboot your system, type `shutdown -Fr` at the command prompt.

Limit Adapter Speed

You can limit adapter speed by changing the maximum synchronous data-transfer rate.

To limit adapter speed, do the following:

1. At the command prompt, type `smitty scsia`, and press Enter.
2. Select **Change / Show Characteristics of a SCSI Adapter**.
3. Select your adapter from the list.

   Note: For an example, see step 3 on page 16.
4. Select **Maximum synchronous data transfer rate (MHz)**.
5. Press F4.
6. Select the desired rate: **5, 10, 20**, or **40** million data cycles per second, and press Enter.
7. Press Enter again.
8. If the change was successful, press F10 to exit SMIT.

If you were not successful using the "Limit Adapter Speed" procedure, do 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. To reboot your system, type `shutdown -Fr` at the command prompt.

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- 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

FC 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 becaome 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.

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

The manufacturer may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the manufacturer.

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law: THIS MANUAL IS PROVIDED ″AS IS″ WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. The manufacturer may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Information concerning products made by other than the manufacturer was obtained from the suppliers of those products, their published announcements, or other publicly available sources. The manufacturer has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to products made by other than the manufacturer. Questions on the capabilities of products made by other than the manufacturer should be addressed to the suppliers of those products.

# Appendix C. Connecting SCSI Devices to the Adapter

SCSI devices are attached to a SCSI adapter in a chain. Devices in a 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: A terminator is required at each end of the SCSI chain. Each channel on the adapter has a terminator that is automatically enabled when a cable is attached to either the external or internal connector.

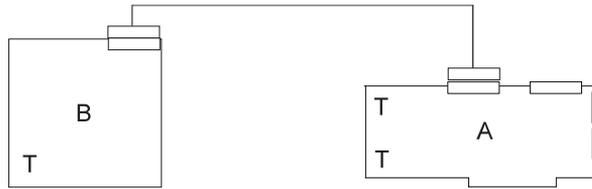To share a subsystem with a second adapter, see the following figure.

External Low-Voltage Differential Connection
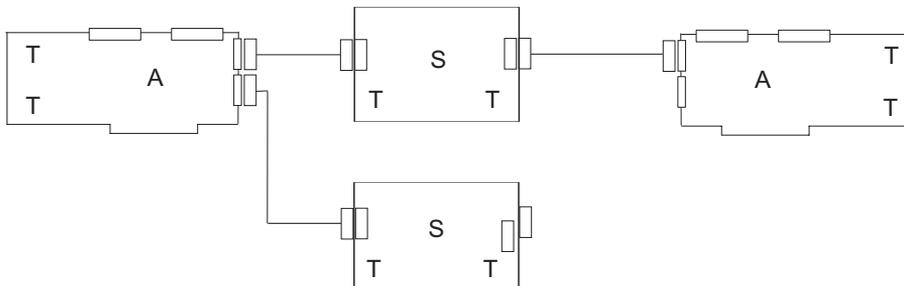
Note: The interconnection cable, which has VHDCI connectors, is provided with the external subsystem.
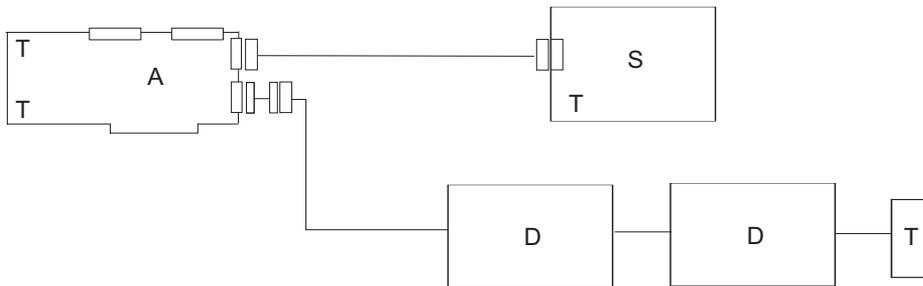**A** Adapter
S Subsystem
T Terminator

Internal Low-Voltage Differential Connection

Note: Terminators are built into the adapter and the backplane.

A   Adapter
B   Backplane
T   Terminator

Concurrent External Single-Ended Connection and Low-Voltage Differential Connection

Note: A converter cable may be used to attach VHDCI connectors on the adapter and P-shell connector on external cables. The terminator may be built into the last device or it may be externally attached.

A   Adapter
D   Device
S   Subsystem
T   Terminator

Setting SCSI Addresses

Each SCSI device requires a different 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 does not function correctly. 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 documentation that was shipped with the device to see if it specifies a default SCSI address. If a default address is not specified, check how SCSI devices 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 (on the same SCSI bus channel) should have the same SCSI address, and no device should use the address 7. Address 7 is reserved for the adapter.

In subsystems that have drives shared between two ybesystems, each port of the subsystem is connected to a different SCSI adapter. The second adapter's SCSI address must not conflict with that of any other device. It may be necessary to remove a drive to provide an address for the second adapter.

Note: System or subsystem backplane services may require an address of their own. This address is usually ID 15.

Changing SCSI Addresses

To change SCSI addresses, follow the instructions in the documentation provided 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, supply the correct terminator to the SCSI device on the device end of the chain. The adapter always terminates at one 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.

For reliable SCSI operation, active terminators are required for all installations.

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.

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

This appendix illustrates the Internal, External 68-Pin Connector (shown below), and signal information for each of its pins.
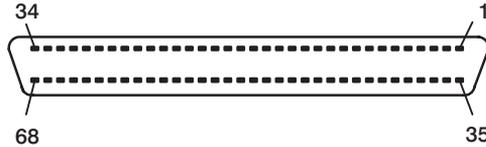
The following table shows the pinout for the internal and external 68-position, high-density plastic D-shell SCSI connectors.

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	45	-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
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 that 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 Negotiations** on the front Option Jumper Block and float the same signal lines.

- 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.

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