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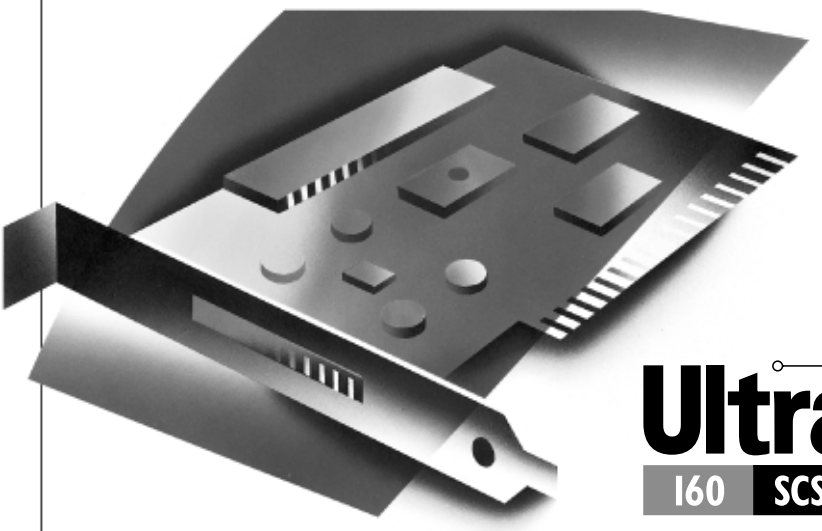
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adaptec®

INSTALLATION GUIDE



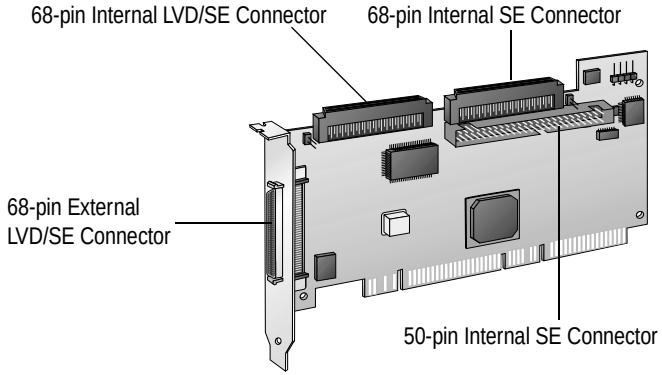


ADAPTEC SCSI CARD 29160

ULTRA160 SCSI CONTROLLER

INTRODUCTION

The Adaptec SCSI Card 29160 Ultra160 SCSI controller enables you to connect up to 15 SCSI devices—such as hard disk drives, scanners, and CD-ROM drives—to any Intel-based computer with 32-bit or 64-bit PCI expansion slots. You can connect newer LVD SCSI devices (includes Ultra160 and Ultra2) to the two 68-pin Low Voltage Differential/Single-Ended (LVD/SE) connectors. You can also connect legacy SCSI devices to the 68-pin and 50-pin internal Single-Ended (SE) connectors.



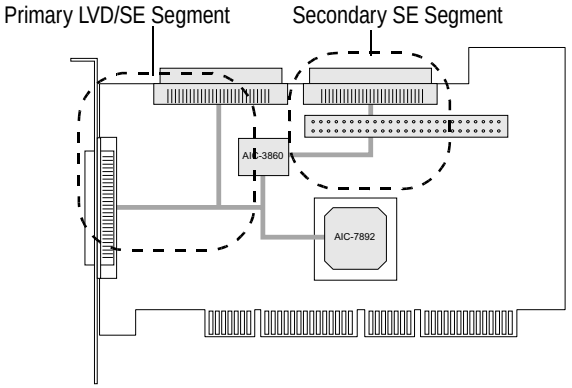
Although the Adaptec SCSI Card 29160 is a 64-bit PCI card, it also works in a 32-bit PCI slot. When installed in a 32-bit PCI slot, the card automatically runs in the slower 32-bit mode.

This installation guide explains how to

- Install the Adaptec SCSI Card 29160
- Set up SCSI devices
- Connect SCSI devices

Bus Segments on the Adaptec SCSI Card 29160

The Adaptec SCSI Card 29160 features Adaptec SpeedFlex™ technology. SpeedFlex technology ensures that you get the best performance from your LVD SCSI devices by electronically isolating the primary LVD/SE segment from the secondary SE segment on the SCSI bus. This allows the Adaptec SCSI Card 29160 to support LVD SCSI devices at speeds up to 160 MBytes/sec on the primary LVD/SE segment while at the same time supporting Ultra (legacy) devices at speeds up to 40 MBytes/sec on the secondary SE segment. The following figure shows the two SCSI segments.



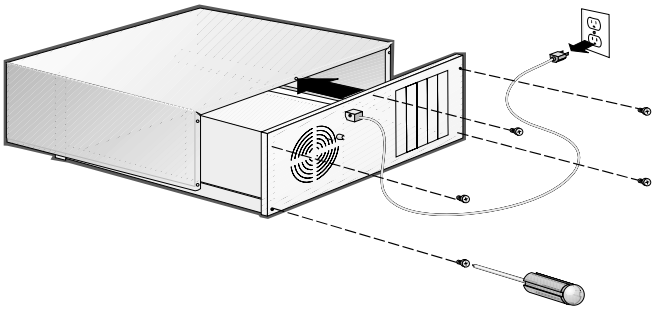
NOTE **If you attach Wide Ultra or Ultra SCSI devices to the two connectors on the Primary LVD/SE segment, the data transfer rate for all attached LVD SCSI devices will drop to Ultra SCSI performance levels. However, if you attach *only* LVD SCSI devices to the two connectors on the Primary LVD/SE segment, data will be transferred at the maximum possible rate (80 MBytes/sec for Ultra2 devices and 160 MBytes/sec for Ultra160 devices).**

INSTALLING THE ADAPTEC SCSI CARD 29160

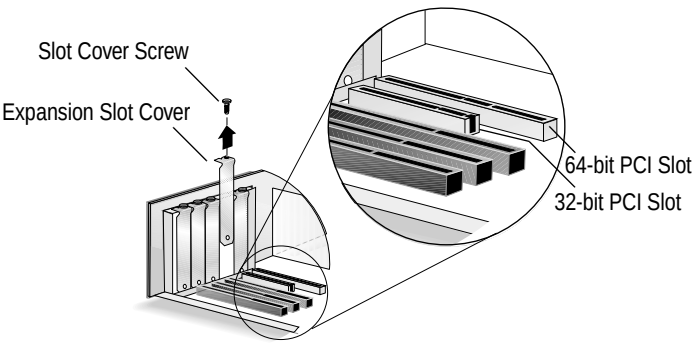
STEP 1 Discharge any static electricity build-up before handling the SCSI card by touching a grounded metal object (like the exposed metal parts on the back of your computer).

WARNING **Turn OFF power to the computer and disconnect the power cord.**

STEP 2 After you turn off your computer and unplug the power cord, remove the cover from the computer.



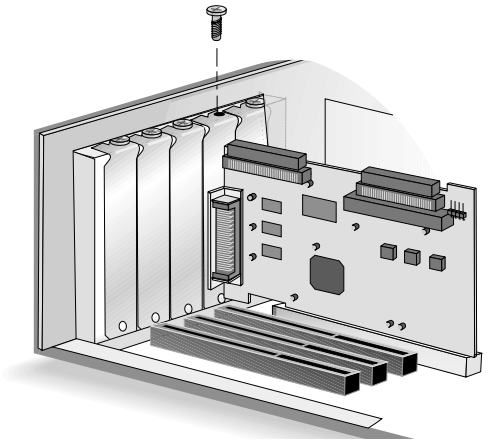
STEP 3 Locate an unused 64-bit PCI expansion slot and remove the expansion slot cover. If the computer does not have a 64-bit slot, you can install the card in a 32-bit PCI slot. (The expansion slot must be compliant with PCI Rev. 2.1 or higher and must support Bus Mastering.) Save the slot cover screw for use in Step 4.



Computers may have vertical or horizontal expansion slots. Refer to your computer manual to locate the PCI slots. If your computer is a tower model, lay it on its side to make it easier to install the Adaptec SCSI Card 29160.

WARNING **Be careful when inserting the Adaptec SCSI Card 29160 in a PCI slot. Some 32-bit slots will not accommodate it, and the card may break if you force it into the slot.**

STEP 4 Insert the Adaptec SCSI Card 29160 into the PCI expansion slot; press down firmly until the card clicks into place, then replace the slot cover screw. When installed properly, the card should appear level with the expansion slot, as shown below.



SETTING UP SCSI DEVICES

There are several things you may need to do to your SCSI devices before you connect them to the Adaptec SCSI Card 29160:

- Check the SCSI IDs
- Terminate the Ends
- Mount the Devices

Since setup can vary from device to device, always refer to the device's documentation for specific instructions.

Below are some guidelines for checking SCSI IDs, setting termination, and mounting devices in your computer. Refer to the *Adaptec SCSI Card 29160 User's Reference* for more information on these topics.

Check the SCSI IDs

The Adaptec SCSI Card 29160 and each device you connect to it must have a unique SCSI ID number ranging from 0 to 15. No two devices can have the same number.

The Adaptec SCSI Card 29160 is preset to SCSI ID 7 and should not be changed. If your computer will boot from a SCSI hard disk, make sure the SCSI ID of that hard disk is set to 0. (Most SCSI hard disks are preset to SCSI ID 0 at the factory.) The SCSI IDs for internal devices are usually set with jumpers; SCSI IDs for external devices are usually set with a switch on the back of the device.

Terminate the Ends

To ensure reliable communication on the SCSI bus, the device at the end of each cable, or the end of the cable itself, must have a terminator installed (or enabled). Terminators must be removed, or termination must be disabled, on devices between the ends of each cable.

Terminating LVD SCSI Devices

LVD SCSI devices are automatically un-terminated. If you are using internal LVD SCSI devices, a special 68-pin internal LVD cable is required to connect the devices. Internal LVD cables

usually have a terminator built into the end of cable. With this type of cable, it is not necessary to terminate individual internal Ultra160 and Ultra2 devices.

If you are using external LVD devices, be sure to use an LVD terminator to terminate the last device in the chain. If you use a single-ended, active terminator (sometimes called an Ultra SCSI terminator) the SCSI devices will not operate at their maximum speed and you will be limited to shorter total cable lengths.

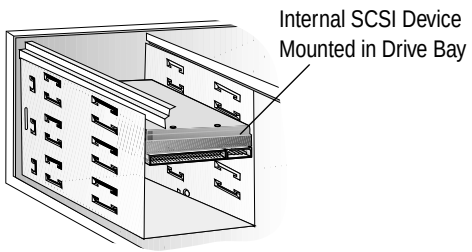
Terminating Ultra SCSI and Fast/Wide SCSI Devices

On most internal Ultra SCSI and Fast/Wide SCSI devices, the termination setting is controlled by setting a jumper or a switch, or by physically removing or installing a resistor module(s). If you are using an internal SCSI cable that has a built-in terminator, you must disable termination on all internal devices connected to the cable.

On most external Ultra SCSI and Fast/Wide SCSI devices, termination is controlled by installing or removing a terminating plug. For more information, refer to the documentation for each SCSI device.

Mount the Devices

If you have internal SCSI devices, mount each device in an available drive bay inside your computer, as shown below. Refer to your computer and device documentation for instructions on installing devices inside your computer.



CONNECTING SCSI DEVICES

You can connect up to 15 SCSI devices to the Adaptec SCSI Card 29160. Before connecting devices, be sure to review *Setting Up SCSI Devices* on page 7. For additional details on connecting devices, refer to the *Adaptec SCSI Card 29160 User's Reference*.

NOTE **SCSI devices can be connected to all four SCSI connectors on the Adaptec SCSI Card 29160 at the same time.**

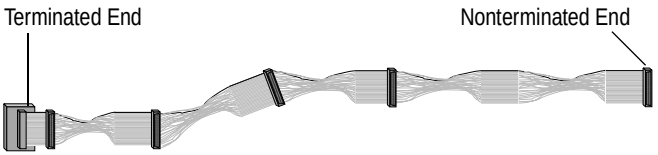
Connecting Internal LVD SCSI Devices

Connect internal LVD SCSI devices to the internal LVD/SE connector on the Adaptec SCSI Card 29160. To do this, use a 68-pin internal LVD cable like the one shown in Step 1 below.

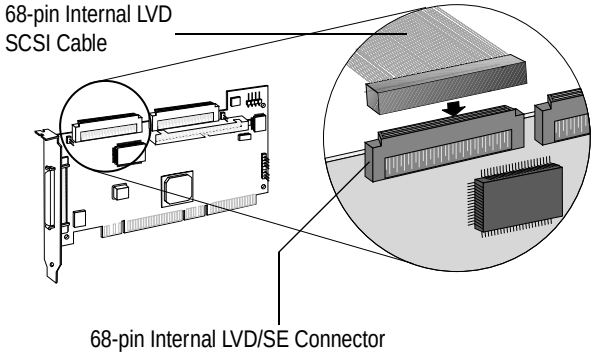
Follow these steps to connect the devices:

NOTE **We recommend that you keep your LVD SCSI devices separate from your SE (Ultra SCSI) devices. This allows LVD SCSI devices to transfer data at their maximum speed. (See *Bus Segments on the Adaptec SCSI Card 29160* on page 4.)**

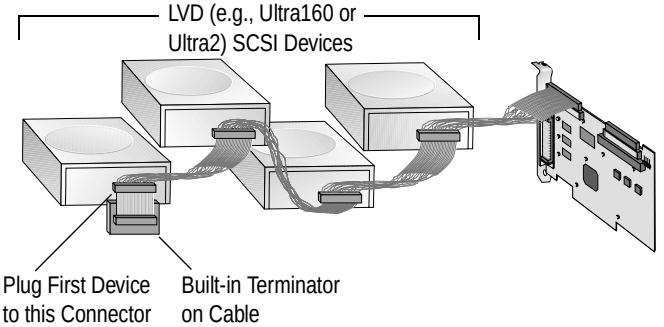
STEP 1 Locate a 68-pin internal LVD SCSI cable, which may have either twisted wires as shown below or flat, laminated wires.



STEP 2 Plug the nonterminated end of the cable to the internal LVD/SE connector.

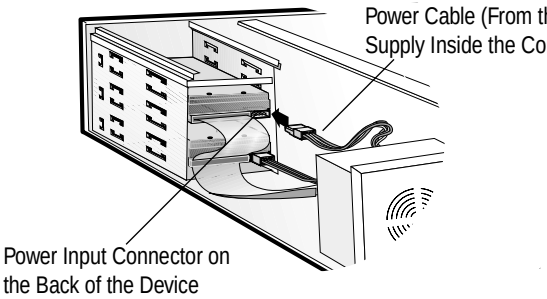


STEP 3 Plug the internal LVD SCSI devices to the other cable connectors, starting with the connector at the terminated end of the cable.



NOTE **Internal LVD SCSI devices come from the factory with termination disabled and cannot be changed. Proper SCSI bus termination is provided by the terminator at the end of the LVD SCSI cable. See *Terminate the Ends* on page 7 for more information.**

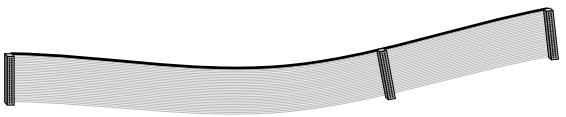
STEP 4 Connect a power cable from your computer's internal power supply to each internal SCSI device.



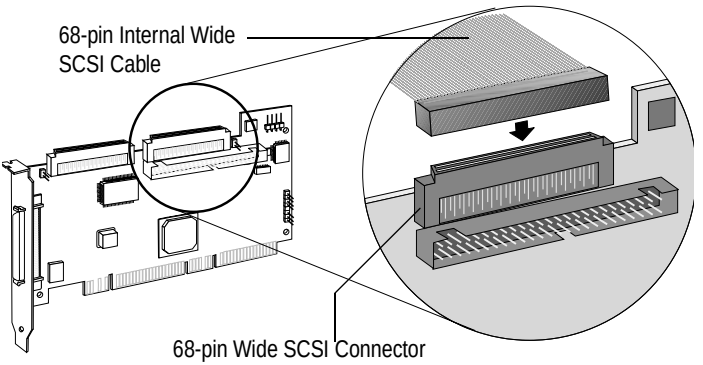
Connecting Internal Ultra/Wide SCSI Devices

Connect internal Ultra/Wide SCSI devices to the 68-pin internal SE Wide SCSI connector. To do this, use a 68-pin Wide SCSI cable like the one shown in Step 1 below. Follow these steps to connect the devices:

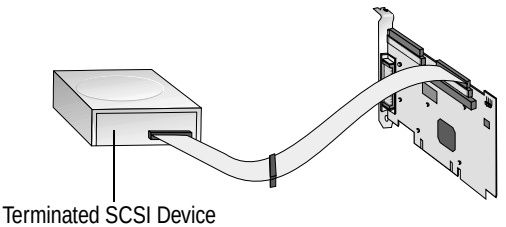
STEP 1 Locate a 68-pin internal Wide SCSI cable.



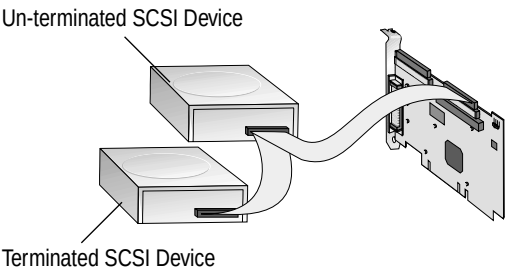
STEP 2 Plug one end of the cable to the Wide SCSI connector on the Adaptec SCSI Card 29160.



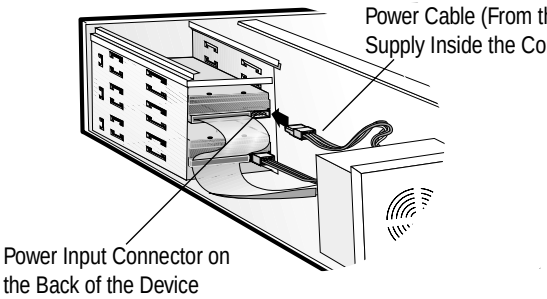
STEP 3 Plug the other end of the cable to a *terminated* Ultra/Fast Wide SCSI device.



STEP 4 If you have other Ultra/Fast Wide SCSI devices, attach them to the connectors between the two ends of the cable. Be sure these other devices are *un-terminated*.



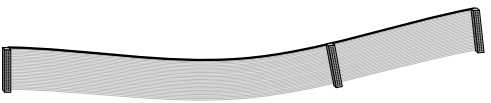
STEP 5 Connect a power cable from your computer's internal power supply to each internal device.



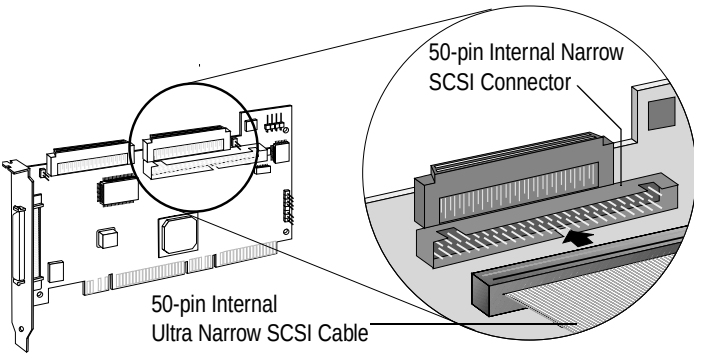
Connecting Internal Ultra/Fast Narrow Devices

Connect internal Ultra/Fast Narrow SCSI devices that have standard 50-pin connectors to the 50-pin internal SE Narrow SCSI connector. To do this, use a 50-pin internal Ultra Narrow SCSI cable. Follow these steps to connect the devices:

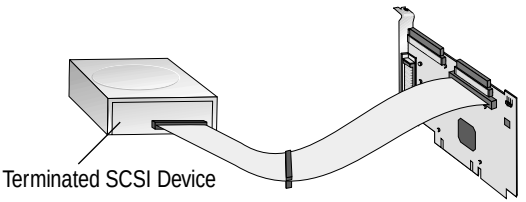
STEP 1 Locate a 50-pin internal Ultra Narrow SCSI cable.



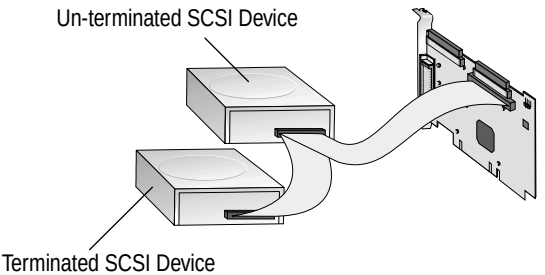
STEP 2 Plug one end of the cable to the 50-pin internal SE Narrow SCSI connector on the Adaptec SCSI Card 29160.



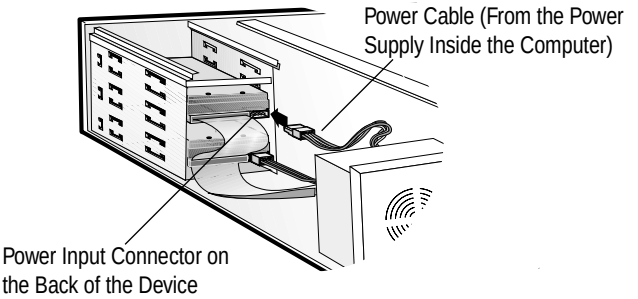
STEP 3 Plug the other end of the cable to a terminated Ultra/Fast Narrow SCSI device.



STEP 4 If you have other Ultra/Fast Narrow SCSI devices, attach them to the connectors between the two ends of the cable. Be sure these other devices are *un-terminated*.



STEP 5 Connect a power cable from your computer's internal power supply to each internal device.



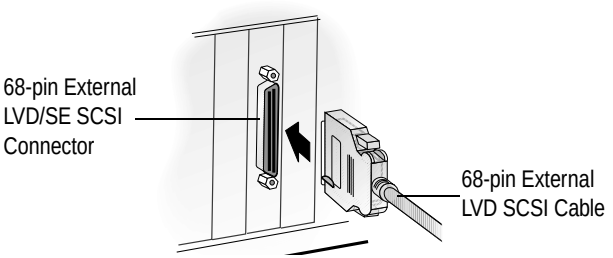
Connecting External SCSI Devices

Connect external LVD SCSI devices to the 68-pin external LVD/SE SCSI connector. Each external device will require a 68-pin external LVD SCSI cable.

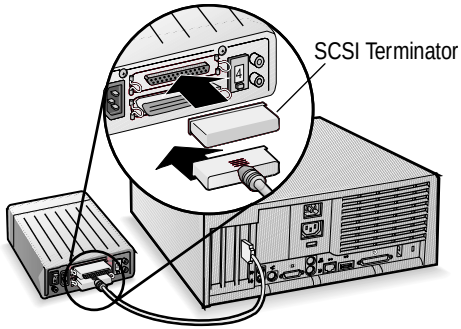
NOTE **We recommend that you connect *only* LVD SCSI devices to the external SCSI connector. If you also attach older Ultra SCSI devices, the data transfer speed of the LVD SCSI devices will drop to the speed of the older devices. (See *Bus Segments on the Adaptec SCSI Card 29160* on page 4.)**

Follow these steps to connect the external devices:

STEP 1 Connect one end of the external LVD SCSI cable to the external LVD/SE connector on the Adaptec SCSI Card 29160.



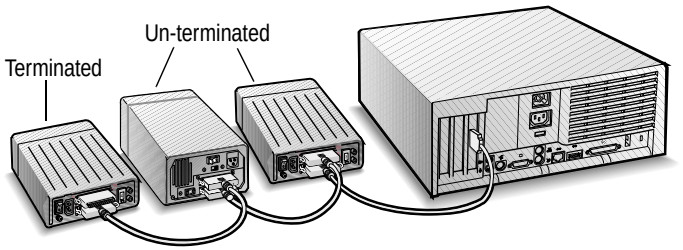
STEP 2 Connect the other end of the external SCSI cable to a SCSI connector on the back of an external SCSI device.



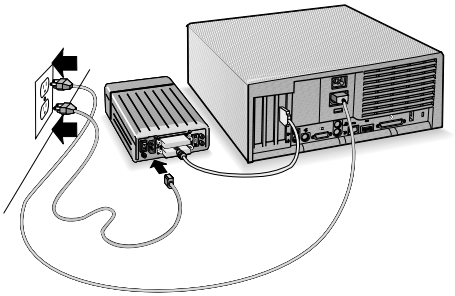
If you are installing only one external device, terminate the device and skip to Step 4.

NOTE **An LVD terminator must be used for LVD SCSI devices to ensure optimum performance. See *Terminate the Ends* on page 7 for more information.**

STEP 3 Connect other external devices by cabling each device to the previous one, as shown below. Terminate only the device at the end of the chain.



STEP 4 Connect power cables to all external devices and to the computer.



ADAPTEC SCSI CARD DRIVER SOFTWARE

To use the Adaptec SCSI Card 29160, the card's driver software must be installed for your operating system (for example, Windows® 98, Windows NT®, Novell NetWare, etc.). The Ultra160 Family Manager Set contains driver software for many of the popular operating systems.

Refer to the *Ultra160 Family Manager Set User's Guide* and *Adaptec SCSI Card 29160 User's Reference* for instructions on either installing driver software when installing your operating system, or installing driver software when the operating system is already installed.

NOTE **Operating system versions released after November, 1999, may have embedded driver support for the Adaptec SCSI Card 29160. To determine if the card is supported by the operating system you are using, read the operating system manual or contact the operating system vendor for information.**

TROUBLESHOOTING

If you have any problems while installing the Adaptec SCSI Card 29160, check the following items first:

- Are all SCSI devices powered on?
- Are all SCSI cables and power cables properly connected?
- Does each device on the SCSI bus have a unique SCSI ID?
- Does the total SCSI cable length exceed the maximum allowable length? (See the *Adaptec SCSI Card 29160 User's Reference* for more information.)
- Is the SCSI bus properly terminated?

If you are still unable to resolve a problem, refer to the *Adaptec SCSI Card 29160 User's Reference*, or the Adaptec Web site at *http:\\www.adaptec.com* for additional troubleshooting information.

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Regulatory Compliance Statements

Federal Communications Commission Radio Frequency Interference Statement

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment 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 equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.
- Use a shielded and properly grounded I/O cable and power cable to ensure compliance of this unit to the specified limits of the rules.

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.

Adaptec, Inc. Adaptec SCSI Card 29160

Tested to Comply
With FCC Standards

FOR HOME OR OFFICE USE

European Union Compliance Statement

This Information Technology Equipment has been tested and found to comply with the following European directives:

EMC Directive 89/336/EEC

EN 50081-1 (1992):
EN55022 (1994) Class B

EN 50082-1 (1992):
EN61000-4-2 (1998)
EN61000-4-3 (1998)
EN61000-4-4 (1995)

Australian/New Zealand Compliance Statement

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to the Australian/New Zealand standard AS/NZS 3548 set out by the Spectrum Management Agency.

Canadian Compliance Statement

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

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matérial brouilleur du Canada.

Japanese Compliance



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