INTRODUCTION

With the SCSI Card 3950U2, you can connect up to 30 SCSI devices, such as hard disk drives, scanners, CD-ROM drives, and tape drives, to any IBM-compatible computer with 32- or 64-bit PCI expansion slots.

This installation guide provides instructions for
- Installing the SCSI Card 3950U2
- Connecting SCSI devices
- Installing the SCSI Card 3950U2 software

The SCSI Card 3950U2 has two independent channels and each has a maximum throughput of 80 MBytes/sec. Both channels provide a total of 160 MBytes/sec when added together.

Support for Non-Ultra2 SCSI Devices

The LVD signaling used for Ultra2 devices operates differently than single-ended signaling used on Ultra, Fast, and Fast Wide SCSI devices. Ultra2 SCSI devices are designed with multimode capability so that if a single-ended device is connected to the LVD Ultra2 SCSI bus, the Ultra2 devices automatically switch to single-ended mode. When an Ultra2 SCSI device operates in single-ended mode, it is subject to the cable distance limitations and signal noise problems of that interface.

Adaptec recommends that single-ended Ultra and earlier devices be connected to a different channel than the LVD Ultra2 devices. This will permit the Ultra2 devices to operate at full speed and cable distances. Channel B has a standard Narrow SCSI (50-pin) connector to simplify connecting single-ended devices. If a single-ended device is connected to the 50-pin connector, the other connector for Channel B will default to single-ended mode and will only support Ultra and earlier speeds and cable lengths.
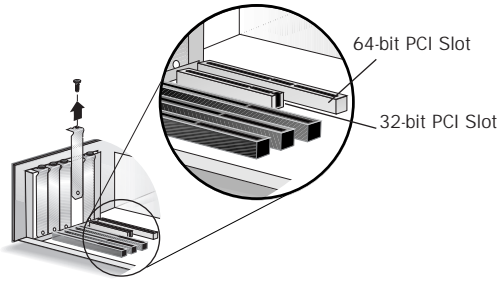
Board Layout

The following diagram shows the major connectors and jumpers for
the SCSI Card 3950U2:
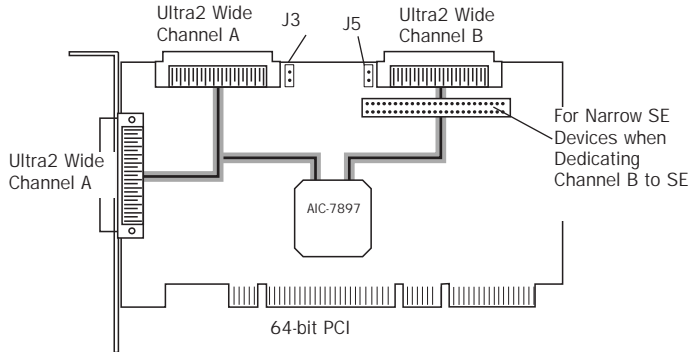
32-bit PCI Slot Support

The SCSI Card 3950U2 is a 64-bit PCI card that also works in 32-bit
PCI slots. The PCI 2.1 specification enables 64-bit PCI cards to operate
in a 32-bit PCI slot. When in a 32-bit slot, the card will automatically
drop down to 32-bit mode.


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INSTALLING THE SCSI CARD 3950U2

STEP 1

Discharge any static electricity build-up before handling your 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.

Refer to your computer manual for instructions on removing the cover.
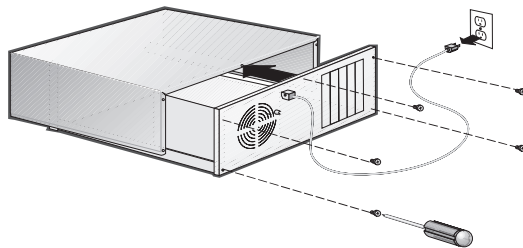
STEP 3

Locate an unused PCI expansion slot and remove the expansion slot cover. (The expansion slot must be PCI Rev. 2.1 compliant 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 allow for easier installation of the SCSI Card 3950U2.

Slot Cover Screw

Expansion Slot Cover

PCI Expansion Slots (Typically White or Ivory)

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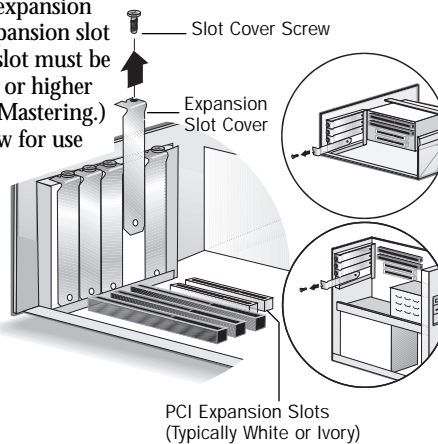
STEP 4 Insert the SCSI Card 3950U2 into the 64- or 32-bit PCI expansion slot; press down firmly until it clicks into place, then replace the slot cover screw. When installed properly, the card should appear level with the expansion slot.

SCSI Card 3950U2 Installed in a PCI Expansion Slot
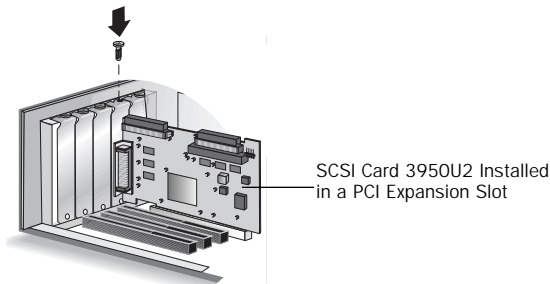
SETTING UP SCSI DEVICES

Setting up SCSI devices before attaching them to the SCSI Card 3950U2 typically involves setting SCSI IDs and termination, mounting internal devices inside your computer, and connecting power cables to each device. Since setup can vary from device to device, always refer to the device's documentation for specific instructions. Below are some guidelines for setting SCSI IDs and termination on your devices.

NOTE **If you refer to the device's documentation for installation instructions, be sure to return to this document to continue with installation of the software included in the package.**

Check the SCSI IDs

The SCSI Card 3950U2 and each device you connect to it requires a unique SCSI ID number ranging from 0 to 15 on each channel. ID numbers don't have to be sequential, as long as the SCSI Card 3950U2 and each device has a different number for each channel.

The SCSI Card 3950U2 is preset to ID 7 for each channel and should not be changed. If you will be booting from a SCSI hard disk, it's best to set the disk's ID at 0 or 1. Most SCSI hard disks come from the factory preset to ID 0. The IDs for internal devices are usually set with jumpers; 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). The devices between the ends of each cable must have the terminator removed (or disabled).

> **NOTE** **When connecting Ultra2 SCSI devices, the SCSI bus must be terminated either on the end of the cable (with a permanent terminator) or with a separate terminating connector. Ultra SCSI and earlier single-ended devices had the ability to terminate the bus directly from the device. If you use an Ultra SCSI terminator on an LVD Ultra2 SCSI bus, the bus will be forced to single-ended mode, limiting the speed and cable distance. For this reason, ensure that you have the necessary Ultra2 cable or terminator before installing the Ultra2 SCSI devices.**

CONNECTING SCSI DEVICES

A total of 30 SCSI devices can be connected to the SCSI Card 3950U2, with 15 on each channel. Before connecting devices to the SCSI Card 3950U2, be sure to also review *Setting Up SCSI Devices* on page 4.

## *Connecting Internal Cables for Ultra2 SCSI Devices*

When connecting internal Ultra2 SCSI devices there are special SCSI cables are needed to sustain the higher speeds of LVD signaling. If your cables are not marked, you can identify most Ultra2 SCSI cables as having twisted pairs of the flat ribbon cable in between the device connectors. These cables will usually have a terminator built into the end of the cable.

The SCSI Card 3950U2 has two separate Ultra2 SCSI channels. Each channel will connect to a separate cable. Follow these steps to connect your internal devices:

> **NOTE** **We recommend keeping your Ultra2 devices separate from your non-Ultra2 devices. Connecting a non-Ultra2 device to an Ultra2 SCSI bus forces the Ultra2 SCSI channel and any attached devices to drop down to Ultra SCSI performance levels (40 MBytes/sec). (See *Board Layout* on page 2.)**
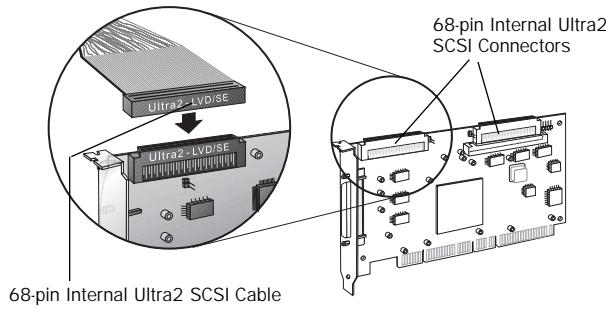
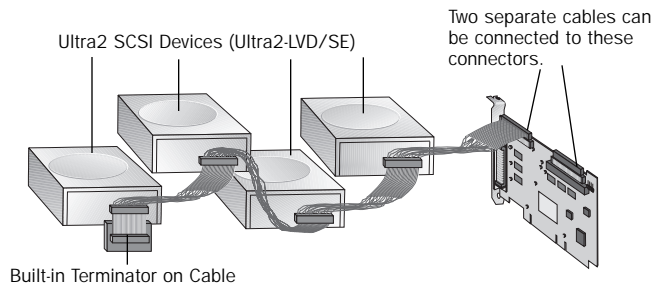**STEP 1** Locate a 68-pin internal Ultra2 SCSI cable. (It should look similar to the cable below.)

Connect to
SCSI Card 3950U2

Connect to Ultra2 Devices

Built-in Terminator
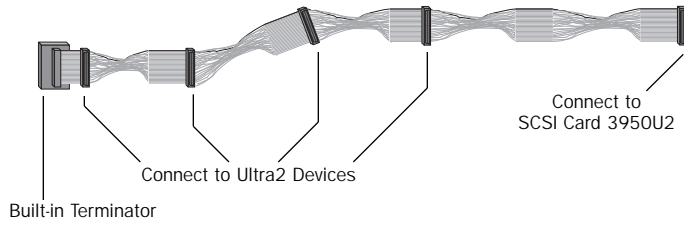
STEP 2 Plug the long end of the cable(s) to the Ultra2 connector(s) on the SCSI Card 3950U2.

68-pin Internal Ultra2
SCSI Connectors

Ultra2 - LVD/SE

Ultra2 - LVD/SE

68-pin Internal Ultra2 SCSI Cable

STEP 3 Plug the remaining connectors to your internal Ultra2 SCSI devices.

Two separate cables can
be connected to these
connectors.

Ultra2 SCSI Devices (Ultra2-LVD/SE)

Built-in Terminator on Cable

NOTE **Internal Ultra2 SCSI devices come from the factory without termination. Proper termination is provided by the built-in terminator at the end of the Ultra2 internal SCSI cable.**
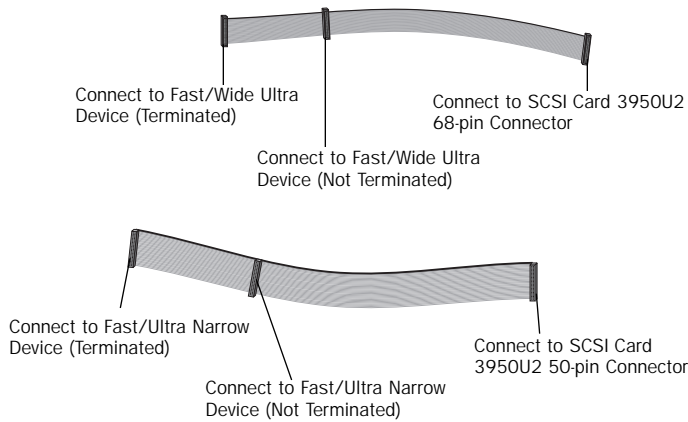
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Connecting Internal Cables for Non-Ultra2 SCSI Devices

Internal cables for single-ended SCSI devices do not have special twists or terminators built into the cable ends. If you are connecting non-Ultra2 SCSI devices to this adapter, use a channel separate from the Ultra2 SCSI devices you just connected. Channel B has a special 50-pin narrow connector to more easily support narrow Ultra and earlier devices if you so choose.

If you are connecting Wide SCSI devices you will need a 68-pin cable. If you are connecting Narrow SCSI devices you will need a 50-pin cable. When connecting the 50-pin cable to devices ensure that the colored edge of the cable connects to pin 1 of both the device and the SCSI Card 3950U2.

STEP 1 Locate a 68-pin or 50-pin internal Ultra SCSI cable.

Connect to Fast/Wide Ultra
Device (Terminated)

Connect to SCSI Card 3950U2
68-pin Connector

Connect to Fast/Wide Ultra
Device (Not Terminated)

Connect to Fast/Ultra Narrow
Device (Terminated)

Connect to SCSI Card
3950U2 50-pin Connector

Connect to Fast/Ultra Narrow
Device (Not Terminated)

STEP 2 Plug the long end of the cable to the 68-pin or 50-pin internal Ultra SCSI connector on the SCSI Card 3950U2.

68-pin Internal Wide Ultra SCSI Cable

68-pin Internal Wide Ultra SCSI Connector

50-pin Internal Narrow SCSI Connector

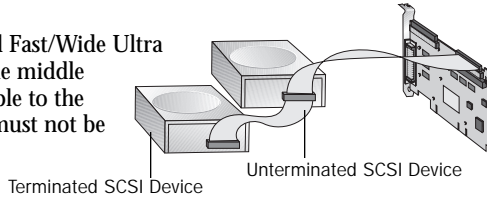50-pin Internal Narrow SCSI Cable
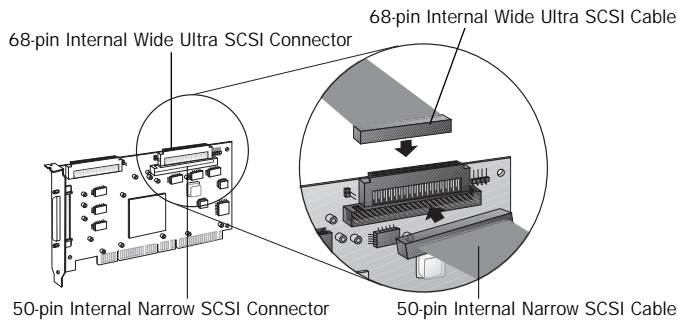
(Continued on the other side)

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

STEP 4 To connect a second Fast/Wide Ultra SCSI device, plug the middle connector of the cable to the device. The device must not be terminated.

Unterminated SCSI Device

Terminated SCSI Device

Connecting the External Cable for SCSI Devices

Use a 68-pin external Ultra2 SCSI connector to connect your external Ultra2 devices. Each Ultra2 SCSI device connects to the next in a daisy chain. Therefore each external device will require an external cable.

NOTE **You can connect either Ultra2 SCSI or Ultra SCSI (and earlier) devices externally. However, mixing both Ultra2 SCSI and non-Ultra2 SCSI on the same channel will cause all devices on that channel to operate in Ultra SCSI (single-ended) mode with the limits of the cable and speeds of that interface.**

STEP 1 Connect one end of an external SCSI cable to the external Ultra2 connector on the SCSI Card 3950U2.

High-density 68-pin
External Ultra2 SCSI Cable

68-pin External Ultra2
SCSI Connector
(Channel A)
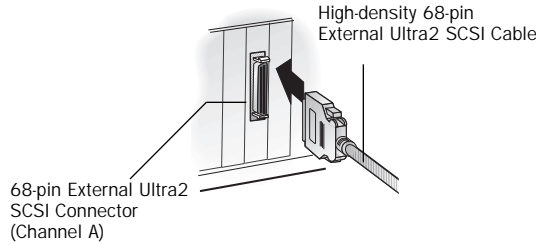
STEP 2 Connect the other end of the cable to a SCSI connector on the back of an external device. If you are installing only one external device, terminate the device and skip to Step 4.
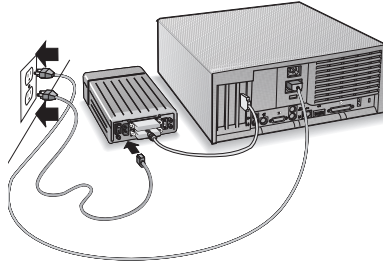
SCSI Terminator

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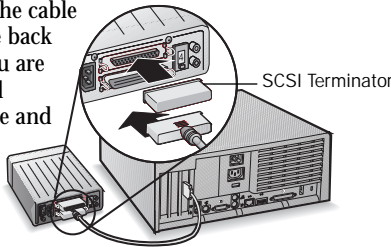
STEP 3

Connect other external devices by connecting each device to the previous one until all devices are connected. The device at the end of the chain must be the only external device terminated.

Terminated SCSI
Device
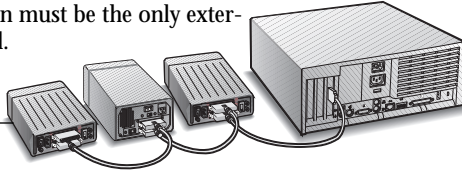
STEP 4

Connect all power cables to the external devices.

ADDITIONAL TERMINATION INFORMATION

The last physical device on the end of each SCSI bus cable must be terminated. Termination must be disabled for all other devices in the middle of the cables. Ultra2 SCSI devices *do not* have built-in termination, but Ultra and Fast/Wide devices do have termination that must be checked. For more information, refer to the owners manuals for each SCSI device.

The host adapter will automatically enable or disable its own termination as necessary.

When installed in multiple computer configurations, that is, clusters, you can force the SCSI Card 3950U2 to enable termination even when power to the computer is OFF. This would enable the other computers in the cluster to continue to operate the shared SCSI devices even when the computer supplying termination at the other end of the bus is shut down. To enable onboard termination on Channel A, place a shunt on J3. To enable onboard termination on Channel B, place a shunt on J5.

Shunt

J3   J5

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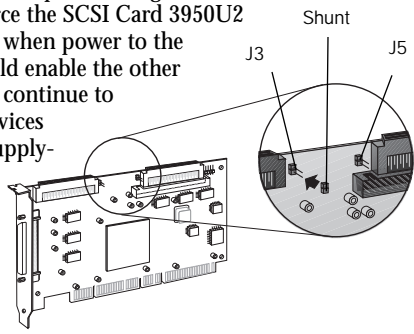
INSTALLING SCSI CARD 3950U2 SOFTWARE

To install the SCSI Card 3950U2 software (drivers), go to the section below for the operating system installed on your computer (for example, Computers with Windows® 95/98). If the operating system is not yet installed, install it now. Refer to your operating system documentation for instructions.

> **NOTE** **If you have installed a new SCSI hard drive in a computer running Windows or DOS, you must partition and format the drive with the DOS FDISK and FORMAT commands before it can be used. Refer to your Windows and DOS documentation for instructions.**

Computers with Windows 95/98

STEP 1 Turn on all external devices and then the computer. Windows 95/98 now will recognize the SCSI Card 3950U2 installed in your computer and will ask you to select which driver you want to install.

STEP 2 Select **"Driver from disk provided by hardware manufacturer,"** then click **OK**.

STEP 3 Insert the 7800 Family Manager Set setup diskette in your floppy disk drive, then click **OK**.

STEP 4 Follow the instructions that appear onscreen.

Computers with Windows NT

STEP 1 Turn on all external devices and then the computer.

STEP 2 Start Windows NT™ on your computer.

STEP 3 Insert the 7800 Family Manager Set setup diskette in your floppy disk drive.

STEP 4 Click the **Start** button, then click **Run**.

STEP 5 When the Run dialog box appears, type **a:\setup** if you are using the A drive, or **b:\setup** if you are using the B drive. Then click **OK**.

STEP 6 Follow the instructions that appear onscreen.

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Computers with NetWare, OS/2, SCO UNIX, and UnixWare

The 7800 Family Manager Set included in the package allows you to install drivers for NetWare, OS/2, SCO UNIX, and UnixWare. Refer to the *7800 Family Manager Set User's Guide* for installation instructions.

TROUBLESHOOTING

If you have any problems during the installations, 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?
- Is the SCSI chain properly terminated?

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.

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 matériel brouilleur du Canada.
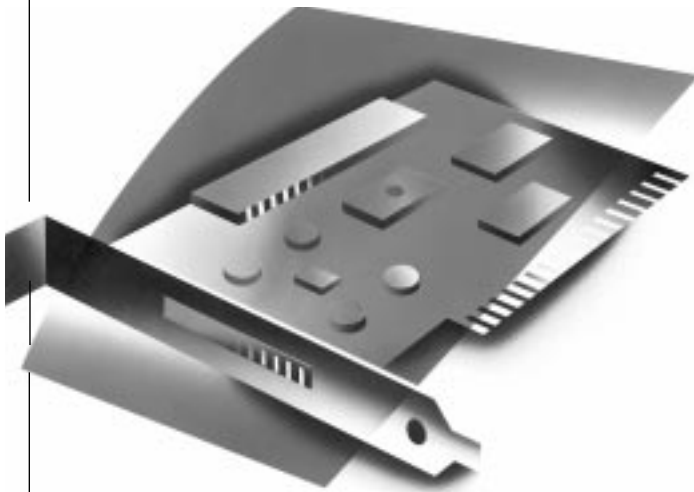
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moves **your world.™**

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INSTALLATION
GUIDE

SCSI CARD 3950U2
DUAL CHANNEL ULTRA2 SCSI HOST