# USER'S REFERENCE

## ADAPTEC SCSI CARD 39160
### ULTRA160 SCSI CONTROLLER

▼▼▼▼ Adaptec SCSI Card 39160

**Ultra160 SCSI Controller**

**User's Reference**

Ultra
160 SCSI

adaptec®

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# Overview

## Ultra160 SCSI on the Adaptec SCSI Card 39160

The Adaptec SCSI Card 39160 enables you to connect up to 30 SCSI devices—such as very large arrays of high-performance HDDs, external storage subsystems, clustered configurations, Ultra160 hard disk drives, scanners, and CD-ROM drives—to any Intel-based computer with 64- or 32-bit PCI expansion slots. Ultra160 is a new generation of SCSI technology that increases SCSI performance from 80 MBytes/sec to 160 MBytes/sec. In addition to providing much greater performance, Ultra160 SCSI enables a maximum allowable cable length of 12 meters for optimal connectivity and flexibility.[1]

The Adaptec SCSI Card 39160 has two independent SCSI channels, each with a maximum throughput of 160 MBytes/sec.

- **SCSI Channel A** (marked "CH 1/A" on the card) has two internal connectors and one external connector.

- **SCSI Channel B** (marked "CH 2/B" on the card) has one internal connector and one external connector.

For the best data I/O performance, connect only LVD (Low Voltage Differential) devices and LVD cables to the Adaptec SCSI Card 39160. (*LVD devices* means Ultra160 and Ultra2 SCSI devices.) If you connect non-LVD devices (for example, Fast SCSI or Ultra SCSI devices), we recommend that you connect them to SCSI Channel A. This allows you to operate Ultra160 and Ultra2 devices at their max-

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[1] When only one Ultra2 or Ultra160 SCSI device is connected, the cable length can be up to 25 meters (82 feet).

imum speed on Channel B while at the same time using non-LVD SCSI devices on Channel A.

Although the Adaptec SCSI Card 39160 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 *User's Reference* provides information about troubleshooting, SCSI termination, and other important topics. It also explains how to use the built-in SCSI*Select* utility if you need to change the Adaptec SCSI Card 39160 settings.

> **Note:** Read the *Adaptec SCSI Card 39160 Installation Guide* if you need instructions on installing the SCSI Card and connecting SCSI devices to it.

## Understanding SCSI

SCSI (pronounced "scuzzy") stands for Small Computer Systems Interface. SCSI is an industry standard computer interface for connecting SCSI devices (such as a hard disk drive, CD-ROM drive, or scanner) to a common SCSI bus.

A SCSI bus is an electrical pathway that consists of a SCSI adapter card (such as the Adaptec SCSI Card 39160) installed in a computer and one or more SCSI devices. SCSI cables are used to connect the devices to the SCSI adapter card. The Adaptec SCSI Card 39160 has two independent SCSI buses (channels).

For the SCSI bus to function properly, a unique SCSI ID must be assigned to the SCSI card and each SCSI device connected to it, and the SCSI bus must be properly terminated.

# SCSI IDs

Each device attached to the Adaptec SCSI Card 39160, as well as the Adaptec SCSI Card 39160 itself, must be assigned a unique SCSI ID number from 0 to 15 for each of the two SCSI buses. A SCSI ID uniquely identifies each SCSI device on the SCSI bus and determines priority when two or more devices are trying to use the SCSI bus at the same time.

Refer to the device's documentation to set the SCSI ID. Here are some general guidelines for SCSI IDs:

- For internal SCSI devices, the SCSI ID usually is set by configuring a jumper on the device.

- For external SCSI devices, the SCSI ID usually is set with a switch on the back of the device.

- SCSI ID numbers do not need to be sequential, as long as the Adaptec SCSI Card 39160 and each device has a different number. For example, on each of the two SCSI buses you can have an internal SCSI device with ID 0, and an external SCSI device with ID 6.

- SCSI ID 7 has the highest priority on the SCSI bus. The priority of the remaining IDs, in descending order, is 6 to 0, then 15 to 8.

- On both SCSI buses (channels) the Adaptec SCSI Card 39160 is preset to SCSI ID 7 and should not be changed. This gives the card the highest priority on the SCSI bus.

- Most internal SCSI hard disk drives come from the factory preset to SCSI ID 0.

- If you have 8-bit (or Narrow) SCSI devices, they must use SCSI IDs 0, 1, 2, 3, 4, 5, or 6. SCSI ID 0 is recommended for the first SCSI hard disk drive.

- If you are booting your computer from a SCSI hard disk drive connected to the Adaptec SCSI Card 39160, the Boot SCSI ID setting in the SCSI*Select* utility must correspond to the SCSI ID of the device from which you are booting. By default, the Boot SCSI ID is set to *0*. We recommend that you do not change this setting.

- In Windows® 95/98, you can use the Device Manager to determine which SCSI ID is assigned to each installed SCSI device.

# Terminating the SCSI Bus

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

Since the method for terminating a SCSI device can vary widely, refer to the device's documentation for instructions on how to enable or disable termination. Here are some general guidelines for termination:

- Internal Ultra160 and Ultra2 SCSI devices come from the factory with termination disabled and cannot be changed. Proper termination for these internal devices is provided by the built-in terminator at the end of the 68-pin internal LVD SCSI cable.

- Termination on Wide SCSI, Narrow SCSI, and Ultra SCSI devices usually is controlled by manually setting a jumper or a switch on the device, or by physically removing or installing one or more resistor modules on the device.

- Termination on most external SCSI devices is controlled by installing or removing a SCSI terminator. However, termination on some external SCSI devices is enabled or disabled by setting a switch on the back of the SCSI device.

- By default, termination on the Adaptec SCSI Card 39160 itself is set to *Automatic* (the preferred method). We recommend that you do not change this default setting.

# Troubleshooting

Most problems can be resolved by following the recommendations in the Troubleshooting Checklist below. If you still experience problems after following the recommendations, continue with the rest of this section.

## Troubleshooting Checklist

Most problems with using the Adaptec SCSI Card 39160 result from errors in preparing and connecting devices on the SCSI bus. If you have problems, check these items first.

> **Note:** If you have problems with a specific SCSI device when other connected SCSI devices are working correctly, please contact the manufacturer of the problem device for troubleshooting information.

- Are all SCSI cables and power cables properly connected?

- Are all SCSI devices turned on?

- Have you connected SCSI devices to *no more than two* of the three SCSI Channel A connectors? If you connected devices to all three connectors, *disconnect* devices from one connector!

- Is the Adaptec SCSI Card 39160 firmly seated and secured in the PCI expansion slot?

- Is the PCI expansion slot compliant with PCI Rev. 2.1 or higher, and does it support Bus Mastering?

- Are all SCSI devices on each SCSI bus assigned unique SCSI IDs?

- Are all SCSI devices terminated properly?

# Troubleshooting in Windows 95/98

**When I start Windows 95/98, the system locks up when the Windows logo is displayed. How can I get the system to start so that I can verify that the SCSI card is functioning normally?**

**1** Start or restart your computer.

**2** (*For Windows 95:*) When the message "Starting Windows 95" appears, press and release the **F8** function key while the text is on your screen.
(*For Windows 98:*) When the message "Starting Windows 98" appears, press and release the **Ctrl** key while the text is on your screen.

**3** From the menu that is displayed, select **Safe Mode.** (It may take several minutes for Windows 95/98 to load.)

**4** If the system completes the boot to the desktop, the core software is functional; resources, software conflicts, and/or hardware need to be checked.

**5** If the system still fails to boot, and the boot drive is connected to an EIDE controller, shut down the system, remove the Adaptec SCSI Card 39160, and restart the computer.

**6** Verify that an IRQ is available by viewing resources in System Properties.

**7** Under the Control Panel, verify that the operating system is set to **Optimal Performance** by checking the Performance tab under System Properties. (Make sure you are not in Safe Mode.)

**How can I tell if the Adaptec SCSI Card 39160 driver is loading properly?**

**1** Right click on the **My Computer** icon on the Windows desktop.

**2** Select **Properties** from the menu.

**3** Click the **Device Manager** tab.

**4** Double-click the **SCSI Controller** icon. The software driver for the Adaptec SCSI Card 39160 is listed as 29160(N), 39160, AHA-3960D, AIC-7892/7899 Ultra160 PCI SCSI Controller.

- If the driver is listed, the Adaptec SCSI Card 39160 driver is loading properly.

- If the driver is listed but has an exclamation mark inside a yellow circle the software driver may conflict with other hardware using the same resources. Double-click the icon to see the device status and possible solutions.

- If the driver is listed but has an "X" inside a red circle, the Adaptec SCSI Card 39160 software driver is disabled and isn't loading.

- If the SCSI Controller icon or the Adaptec SCSI Card 39160 software driver is not listed, reinstall the driver. (For instructions on how to do this, refer to the *Ultra160 Family Manager Set User's Guide.*)

**An "X" inside a red circle appears with the Adaptec SCSI Card 39160 software driver in Device Manager. What does this mean?**
It means that the Adaptec SCSI Card 39160 software driver is disabled and isn't loading.

To enable the driver

**1** Double-click the Adaptec SCSI Card 39160 software driver in Device Manager.

**2** Under the General tab, click the **Original Configuration (current)** box.

**What if there is no SCSI Controller icon under Device Manager, or the software driver for the Adaptec SCSI Card 39160 does not appear under Device Manager?**
If the SCSI Controller icon or the software driver do not appear

**1** Double-click the **Add New Hardware** icon in Control Panel.

**2** Click **Next** to begin installing your new hardware.

**3** Select **Yes (recommended)** and click **Next** to have Windows search for the Adaptec SCSI Card 39160.

**4** Follow the on-screen instructions.

If Windows 95/98 does not detect the Adaptec SCSI Card 39160, get the driver disk or CD included with the SCSI card and run the Add New Hardware wizard again:

**1**   Double-click the **Add New Hardware** icon in Control Panel.

**2**   Click **Next** to begin installing your new hardware.

**3**   Select **No** and click **Next** to select the type of hardware you want to install.

**4**   Select **SCSI controllers** and click **Next**.

> **Note:** The 39160 will not appear on the Models list when **Adaptec** is selected from the Manufacturers list.

**5**   Click **Have Disk...** and follow the directions that appear on the screen to install the driver software.

**6**   Select **29160(N), 39160, AHA-3960D, AIC-7892/7899 Ultra160 PCI SCSI Controller**.

**How can I check the status of a resource such as IRQ, Memory, or I/O?**

**1**   Right click on **My Computer**.

**2**   Select **Properties** from the menu.

**3**   Click the **Device Manager** tab.

**4**   Double-click the **Computer** icon.

**5**   On the View Resources tab, click the option button for the type of resource you want to check:

- Interrupt Request (IRQ)
- Input/Output Address (I/O)
- Direct Memory Access (DMA)
- Memory

**6**   The setting and the hardware using the setting are displayed.

- If a specific resource is not listed, the resource is not used by a device.

- If a resource is listed more than once, the resource is used by more than one device.

- If a resource is used by an unknown device, the resource is used but the device using the resource cannot be detected. (This condition is most common.)

**7** Click **Cancel** to close the windows, then close Control Panel.

### How do I use the Hardware Conflict Troubleshooter in Windows 95/98?

**1** Click the **Start** button, then click **Help**.

**2** From the Contents tab, double-click **Troubleshooting**. (In Windows 98, click **Troubleshooting** and then click **Windows 98 Troubleshooting**.)

**3** Double-click **if you have a hardware conflict**.

**4** Follow the step-by-step instructions in Windows Help.

# Common Error Messages

Here is what you should do if the following messages appear on the screen at bootup:

**"Device connected, but not ready"**
The host computer received no answer when it requested data from an installed SCSI device.

**1** Run SCSI*Select*® and set the Send Start Unit Command to **Yes** for the particular SCSI device ID. See *Starting SCSISelect* on page 18.

**2** Ensure that the device is set to spin up when the power is switched on. The spin up option is typically set by a jumper. (See the documentation for the device.)

**"Start unit request failed"**
The SCSI card BIOS was unable to send a Start Unit Command to one of the installed SCSI devices. Run SCSI*Select* and disable the Send Start Unit Command for the device.

**"Time-out failure during..."**
An unexpected time-out occurred.

**1** Verify that the SCSI bus is properly terminated.

**2** Verify that all cables are properly connected.

Try disconnecting the SCSI device cables from the SCSI card and then starting the computer. If the computer successfully restarts, one of the SCSI devices may be defective.

# Using the Adaptec SCSI Card 39160 and SCSI Devices

This section provides useful information on using the Adaptec SCSI Card 39160 and your SCSI devices. For more information about a specific SCSI device, refer to the documentation for that device.

## Using SCSI Devices

> **Caution:** *Do not* connect SCSI devices to more than two of the three SCSI Channel A connectors at the same time.

### Using SCSI Hard Disk Drives

- If you connect a SCSI hard disk drive to the Adaptec SCSI Card 39160 that was previously connected to a different SCSI card, you must low-level format the drive before you can use it. Back up the data on the drive before you move it! (See *Using SCSI Disk Utilities* on page 24 for information on using the SCSI*Select* format utility.)

    > **Caution:** A low-level format destroys all data on the drive. Be sure to back up the data before performing a low-level format.

- Every SCSI hard disk drive must be physically low-level formatted, partitioned, and logically formatted before it can be used to store data. Most SCSI drives are pre-formatted at the factory. If your SCSI hard disk drive has *not* been pre-formatted at the factory, and if your computer is running under DOS, Windows® 3.x, or Windows 95/98, you can format the disk with the DOS Fdisk and Format commands. (See the DOS and Windows documentation for more information.) To format

SCSI hard disk drives running under other operating systems, see the operating system documentation.

## Using Ultra160 Hard Disk Drives

■ We recommend that you connect your LVD (Ultra160 and Ultra2) SCSI devices to SCSI Channel B and your non-LVD SCSI devices (if any) to SCSI Channel A. This allows the LVD SCSI devices to run at their maximum performance levels of 160 MBytes/sec or 80 MBytes/sec. Or you can connect LVD SCSI devices to both SCSI channels. If you combine LVD and non-LVD SCSI devices on the same SCSI channel, the data transfer rate of the LVD SCSI devices will drop down to non-LVD SCSI performance levels of up to 40 MBytes/sec.
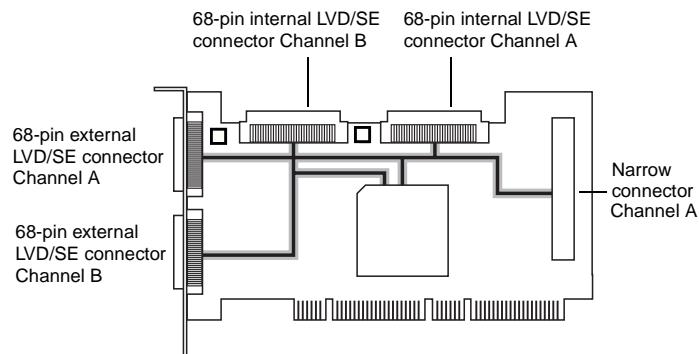


■ Internal Ultra2 and Ultra160 SCSI devices come from the factory with termination disabled and cannot be changed. Proper termination is provided by the terminator at the end of the internal LVD SCSI cable.

## Using Scanners

If you connect a scanner to the Adaptec SCSI Card 39160, you must install the scanner manufacturer's proprietary software drivers. See your scanner's documentation for details.

# Combining SCSI and Non-SCSI Devices

You can install the Adaptec SCSI Card 39160 in a computer that already has a non-SCSI controller, such as an EIDE controller. However, you cannot cross-connect the disk drives and other devices: SCSI devices must be connected to the Adaptec SCSI Card 39160, EIDE devices must be connected to the EIDE controller, and so on.

When you install the Adaptec SCSI Card 39160 and SCSI disk drives in a computer that boots from a non-SCSI disk drive, the computer will continue to boot from the non-SCSI disk drive unless you change the computer's CMOS configuration. You do not need to change the configuration if you just want to use the SCSI drives for additional file storage space.

If your computer's motherboard BIOS supports the BIOS Boot Specification (BBS) feature, you can select a different boot device without much difficulty. (To determine if the motherboard BIOS supports BBS, read the computer documentation or contact your motherboard manufacturer.)

The following table shows what to do, after you physically install the SCSI card and SCSI devices, to use different kinds of disk drives in the same computer:

| Does computer BIOS support BBS? | Want computer to boot from SCSI drive? | Then do this: |
| --- | --- | --- |
| No | No | No action required. SCSI drives and non-SCSI drives can be used together. |
| No | Yes | Run CMOS Setup program. Change primary Hard Disk setting to **None** or **No Drives Installed** (see computer documentation). *You will not be able to use the non-SCSI drive(s) at all* when you boot from the SCSI drive. |
| Yes | No | No action required. SCSI drives and non-SCSI drives can be used together. |
| Yes | Yes | Run CMOS Setup program and select SCSI drive as boot device. SCSI drives and non-SCSI drives can be used together. |

## Installing Multiple SCSI Cards

- You can install multiple SCSI cards in your computer; you are limited only by the available system resources (for example, IRQ settings, I/O port addresses, BIOS addresses, and so forth).

- Each SCSI card you install forms a separate SCSI bus with a different set of SCSI devices. SCSI IDs can be reused as long as the ID is assigned to a device on a different SCSI card (for example, each SCSI card can have a device with SCSI ID 2).

- If you have two or more SCSI cards and your computer boots from a SCSI disk drive, leave the host adapter BIOS enabled on the SCSI card to which the boot disk drive is connected. Use SCSI*Select* to disable the host adapter BIOS on the other SCSI cards.

## Connecting the LED Connector

(*Optional feature*) Most computers have an LED disk activity light on the front panel of the system case. If you choose to disconnect the cable from the LED connector on the motherboard and connect it to the LED connector on the SCSI card as shown in the diagram below, the LED on the front panel of the computer will light whenever there is activity on the SCSI bus.

> **Note:** If you connect the LED cable to the SCSI card, the LED disk activity light will no longer indicate disk activity on the non-SCSI disk drives.
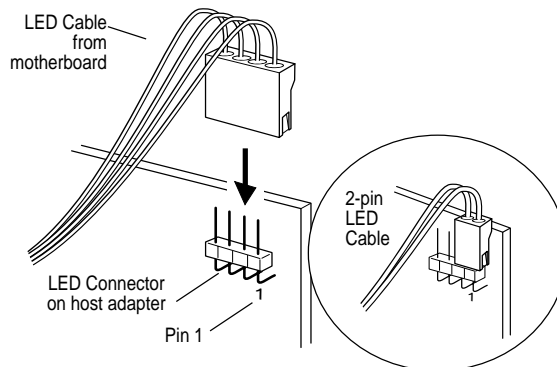
# Overriding SCSI Termination Settings

You use SCSI*Select* to control the termination of the two SCSI channels on the Adaptec SCSI Card 39160. The default termination setting for both channels is *Automatic*. This setting allows the SCSI card to adjust SCSI termination automatically, depending on which connectors have SCSI devices attached to them.

Regardless of the SCSI*Select* termination setting, the SCSI card termination is always disabled when the power is turned off. If you want SCSI card termination to be enabled when the power is turned off, you must terminate the SCSI channels manually.

To manually terminate Channel A, place a shunt on jumper J5. To manually terminate Channel B, place a shunt on jumper J3. The following diagram shows where the jumpers are located on the SCSI card:
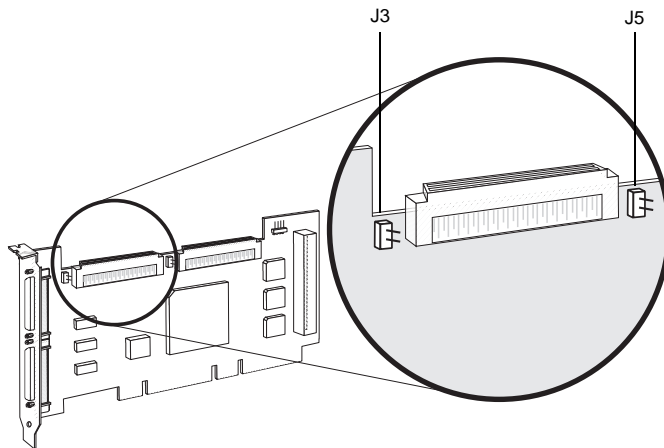


You might want to manually terminate the SCSI card if the Adaptec SCSI Card 39160 is connected to one or more external SCSI devices that are also connected to a SCSI card in another computer. The devices can be shared between the two computers if one SCSI card is terminated when it is powered off, while the computer with the other SCSI card is using the SCSI devices.

# Configuring the Adaptec SCSI Card 39160 with SCSI*Select*

SCSI*Select,* which is included with the Adaptec SCSI Card 39160, enables you to change SCSI settings without opening the computer or handling the card. SCSI*Select* also enables you to low-level format or verify the disk media of your SCSI hard disk drives. The following table lists the available and default settings for each SCSI*Select* option. The settings marked as "Auto-sync" are automatically synchronized for both SCSI channels—for example, if you change the Boot Channel option to **B First** on Channel A, the change will apply to Channel B as well. All other options can be set separately for each of the two SCSI channels.

The default settings are appropriate for most systems and should not be changed. Run SCSI*Select* if you need to change or view current settings, or if you need to use the SCSI disk utilities. See the descriptions of each option, starting on page 19.

| SCSI*Select* Options | | Available Settings | Default Setting |
|---|---|---|---|
| **SCSI Bus Interface Definitions:** | | | |
| Host Adapter SCSI ID | | 0-15 | 7 |
| SCSI Parity Checking | | Enabled<br>Disabled | Enabled |
| Host Adapter SCSI Termination: | | | |
| | Ch. A | Automatic<br>Low On/High On<br>Low Off/High Off<br>Low Off/High On | Automatic |
| | Ch. B | Automatic,<br>Enabled, Disabled | Automatic |
| **Boot Device Options:** | | | |
| Boot Channel *[Auto-sync]* | | A First, B First | A First |
| Boot SCSI ID *[Auto-sync]* | | 0-15 | 0 |
| Boot LUN Number[1] *[Auto-sync]* | | 0-7 | 0 |

| SCSI*Select* Options | Available Settings | Default Setting |
|---|---|---|
| **SCSI Device Configuration:** | | |
| Sync Transfer Rate (MBytes/sec) | 160, 80.0, 53.4, 40.0, 32.0, 26.8, 20.0, 16.0, 13.4, 10.0, ASYN | 160 |
| Initiate Wide Negotiation | Yes, No | Yes (Enabled) |
| Enable Disconnection | Yes, No | Yes (Enabled) |
| Send Start Unit Command | Yes, No | Yes (Enabled) |
| Enable Write Back Cache [2] | Yes, No, N/C (No Change) | N/C (No Change) |
| BIOS Multiple LUN Support [2] | Yes, No | No (Disabled) |
| Include in BIOS Scan [2] | Yes, No | Yes (Enabled) |
| **Advanced Configuration Options:** | | |
| Reset SCSI Bus at IC Initialization | Enabled, Disabled | Enabled |
| Display <Ctrl> <A> Messages during BIOS Initialization *[Auto-sync]* | Enabled, Disabled | Enabled |
| Extended BIOS Translation for DOS Drives > 1 GByte | Enabled, Disabled | Enabled |
| Verbose/Silent Mode *[Auto-sync]* | Verbose, Silent | Verbose |
| Host Adapter BIOS *[Auto-sync]* | Enabled Disabled: Scan Bus Disabled: Not Scan | Enabled |
| Domain Validation [2] *[Auto-sync]* | Enabled, Disabled | Enabled |
| Support Removable Disks Under BIOS as Fixed Disks [2] | Disabled, Boot Only, All Disks | Disabled |
| BIOS Support for Bootable CD-ROM [2] | Enabled, Disabled | Enabled |
| BIOS Support for Int 13 Extensions [2] | Enabled, Disabled | Enabled |

[1] Setting is valid only if Multiple LUN Support is enabled.
[2] Settings are valid only if host adapter BIOS is enabled.

# Starting SCSI*Select*

Follow these steps to start SCSI*Select*:

**1** Turn on or restart your system.

During the startup process, pay careful attention to the messages that appear on your screen.

**2** When the following message appears on your screen, press the **Ctrl**-**A** keys simultaneously (this message appears for only a few seconds):

Press <Ctrl><A> for SCSISelect (TM) Utility!

**3** Select SCSI Channel **A** or **B**. Most SCSI*Select* options can be set separately for each SCSI channel.

**4** From the menu that appears, use the arrow keys to move the cursor to the option you want to select, then press **Enter**.

> **Note:** If you have difficulty viewing the display, press **F5** to toggle between color and monochrome modes. (This feature may not work on some monitors.)

## Exiting SCSI*Select*

Follow these steps to exit SCSI*Select*:

**1** Press **Esc** until a message prompts you to exit (if you changed any settings, you are prompted to save the changes before you exit).

**2** At the prompt, select **Yes** to exit, then press any key to reboot the computer. Any changes you made in SCSI*Select* take effect after the computer boots.

# Using SCSI*Select* Settings

To select an option, use the arrow keys to move the cursor to the option, then press **Enter**. In some cases, selecting an option displays another menu. You can return to the previous menu at any time by pressing **Esc**.

To restore the original SCSI*Select* default values, press **F6** from the main SCSI*Select* screen.

## SCSI Bus Interface Definitions

- **Host Adapter SCSI ID**—(Default: *7*) Sets the SCSI ID for the SCSI card. The Adaptec SCSI Card 39160 is set at **7**, which gives it the highest priority on the SCSI bus. We recommend that you do not change this setting.

- **SCSI Parity Checking**—(Default: *Enabled*) When set to **Enabled**, verifies the accuracy of data transfer on the SCSI bus. Leave this setting enabled unless any SCSI device connected to the Adaptec SCSI Card 39160 does not support SCSI parity.

- **Host Adapter SCSI Termination**—(Default: *Automatic*) Determines the termination setting for the SCSI card. The default setting is *Automatic,* which allows the SCSI card to adjust the termination as needed. We recommend that you do not change this setting.

## Boot Device Options

- **Boot Channel**—(Default: *A First*) Specifies which of the two SCSI channels the boot device is connected to (if the computer boots from a SCSI device). If you change this setting, the change automatically applies to both SCSI channels.

- **Boot SCSI ID**—(Default: *0*) Specifies the SCSI ID of your boot device. We recommend that you do not change the default setting. If you change this setting, the change automatically applies to both SCSI channels.

- **Boot LUN Number**—(Default: *0*) Specifies which LUN (Logical Unit Number) to boot from on your boot device. This setting is not valid unless Multiple LUN Support is enabled (see *Advanced Configuration Options* on page 21). If you change this setting, the change automatically applies to both SCSI channels.

## SCSI Device Configuration Options

SCSI Device Configuration options can be set individually for each connected SCSI device.

> **Note:** To configure settings for a SCSI device, you must know its SCSI ID (see *Using SCSI Disk Utilities* on page 24).

- **Sync Transfer Rate**—(Default: *160*) Determines the maximum synchronous data transfer rate that the SCSI card supports. We recommend that you leave the maximum (default) value of 160 MBytes/sec.

- **Initiate Wide Negotiation**—(Default: *Yes*) When set to **Yes**, the SCSI card attempts 16-bit data transfer (wide negotiation). When set to **No**, the SCSI card uses 8-bit data transfer unless the SCSI device requests wide negotiation.

  > **Note:** Set Initiate Wide Negotiation to **No** if you are using an 8-bit SCSI device that hangs or exhibits other performance problems with 16-bit data transfer rate enabled.

- **Enable Disconnection**—(Default: *Yes*) When set to **Yes**, allows the SCSI device to disconnect from the SCSI bus. Leave the setting at **Yes** if two or more SCSI devices are connected to the SCSI card. If only one SCSI device is connected, changing the setting to **No** results in slightly better performance.

- **Send Start Unit Command**—(Default: *Yes*) When set to **Yes**, sends the Start Unit Command to the SCSI device at bootup.

The following three options have no effect if the SCSI Card BIOS is disabled. (The SCSI Card BIOS is normally enabled by default.)

- **Enable Write Back Cache**—(Default: *N/C*) Can be used to enable or disable the write-back cache on SCSI disk drives connected to the host adapter. Leave this option at its default setting of N/C (no change), which usually allows for optimum drive performance.

- **BIOS Multiple LUN Support**—(Default: *No*) Leave this setting at **No** if the device does not have multiple Logical Unit Numbers (LUNs). When set to **Yes**, the SCSI card BIOS provides boot support for a SCSI device with multiple LUNs (for example, a CD "juke box" device in which multiple CDs can be accessed simultaneously).

- **Include in BIOS Scan**—(Default: *Yes*) When set to **Yes**, the SCSI card BIOS includes the device as part of its BIOS scan at bootup.

## Advanced Configuration Options

> **Note:** *Do not* change the Advanced Configuration Options unless absolutely necessary.

- **Reset SCSI Bus at IC Initialization**—(Default: *Enabled*) When set to **Enabled**, the SCSI card generates a SCSI bus reset during its power-on initialization and after a hard reset.

- **Display <Ctrl> <A> Messages during BIOS Initialization**—(Default: *Enabled*) When set to **Enabled**, the SCSI card BIOS displays the Press <Ctrl> <A> for SCSISelect (TM) Utility! message on your screen during system bootup. If this setting is disabled, you can still invoke the SCSI*Select* Utility by pressing <**Ctrl**> <**A**> after the SCSI card BIOS banner appears. If you change this setting, the change automatically applies to both SCSI channels.

- **Extended BIOS Translation for DOS Drives > 1 GByte**—(Default: *Enabled*) When set to **Enabled**, provides an extended translation scheme for SCSI hard disks with capacities greater than 1 GByte. This setting is necessary only for MS-DOS 5.0 or above; it is not required for other operating systems, such as NetWare or UNIX.

> **Caution:** Changing the translation scheme destroys all data on the drive. Be sure to back up your disk drives before changing the translation scheme.

Use the MS-DOS Fdisk command to partition a disk larger
than 1 GByte controlled by the SCSI card BIOS, when using
DOS, Windows 3.1.x, or Windows 95/98.

■ **Verbose/Silent Mode**—(Default: *Verbose)* When set to **Verbose**,
the SCSI card BIOS displays the host adapter model on the
screen during system buildup. When set to **Silent**, the message
will not be displayed during bootup. If you change this setting,
the change automatically applies to both SCSI channels.

■ **Host Adapter BIOS (Configuration Utility Reserves BIOS
Space)**—(Default: *Enabled*) Enables or disables the SCSI card
BIOS. If you change this setting, the change automatically
applies to both SCSI channels.

■ Leave at **Enabled** to enable the SCSI card BIOS and allow it
to scan and initialize all SCSI devices.

■ Set to **Disabled: Not scan** if the devices on the SCSI bus (for
example, CD-ROM drives) are controlled by software driv-
ers and do not need the BIOS, and you do not want the
BIOS to scan the SCSI bus.

■ Set to **Disabled: Scan Bus** if you do not need the BIOS, but
you want it to scan the SCSI devices on the bus and you
need to spin up the device.

The following four options have no effect if the SCSI Card BIOS is
disabled. (The SCSI Card BIOS is normally enabled by default.)

■ **Domain Validation**—(Default: *Enabled*) Determines the opti-
mal transfer rate for each device on the SCSI bus and sets
transfer rates accordingly. Displays the resulting data transfer
rate. If you change this setting, the change automatically
applies to both SCSI channels.

■ **Support Removable Disks Under BIOS as Fixed Disks**—
(Default: *Disabled*) Determines which removable-media drives
are supported by the SCSI card BIOS. The options are as
follows:

■ **Disabled**— No removable-media drives are treated as hard
disk drives. Software drivers are required because the
drives are not controlled by the BIOS.

⚠️ **Caution:** *You may lose data* if you remove a removable-media cartridge from a SCSI drive controlled by the SCSI card BIOS while the drive is on. If you want to be able to remove the media while the drive is on, install the removable-media software driver and set Support Removable Disks Under BIOS as Fixed Disks to **Disabled**.

- ■ **Boot Only**—Only the removable-media drive designated as the boot device is treated as a hard disk drive.

- ■ **All Disks**—All removable-media drives supported by the BIOS are treated as hard disk drives.

■ **BIOS Support for Bootable CD-ROM**—(Default: *Enabled*) When set to **Enabled**, the SCSI card BIOS allows the computer to boot from a CD-ROM drive.

■ **BIOS Support for Int 13 Extensions**—(Default: *Enabled*) When set to **Enabled**, the SCSI card BIOS supports Int 13h extensions as required by Plug-and-Play. The setting can be either enabled or disabled if your system is not Plug-and-Play.

# Using SCSI Disk Utilities

To access the SCSI disk utilities, follow these steps:

**1**  Select the **SCSI Disk Utilities** option from the menu that appears after starting SCSI*Select*. SCSI*Select* scans the SCSI bus (to determine the devices installed) and displays a list of all SCSI IDs and the devices assigned to each ID.

**2**  Use the ↑ and ↓ keys to move the cursor to a specific ID and device, then press **Enter**.

**3**  A small menu appears, displaying the options Format Disk and Verify Disk Media.

■  **Format Disk**—Allows you to perform a low-level format on a hard disk drive. *Most SCSI disk devices are preformatted at the factory and do not need to be formatted again.*

> ⚠ **Caution:** A low-level format destroys all data on the drive. Be sure to back up your data before performing this operation. You *cannot* abort a low-level format once it is started.

■  **Verify Disk Media**—Allows you to scan the media of a hard disk drive for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select *yes*, those blocks are no longer used. You can press **Esc** at any time to abort the utility.

# Connecting SCSI Devices

Here are some examples of how you can connect internal and external SCSI devices to the Adaptec SCSI Card 39160. To achieve maximum performance, attach the first device to the end connector of the cable (furthest from the SCSI card); attach other devices to the connectors that are closer to the SCSI card.

The first example shows Ultra160 and Ultra2 SCSI devices connected to internal and external SCSI connectors of both SCSI channels. Note the built-in terminators at the end of the internal LVD SCSI cables. The last external SCSI device on each SCSI channel must be terminated with an LVD/SE terminator plug to ensure that all devices will operate at their maximum speed.
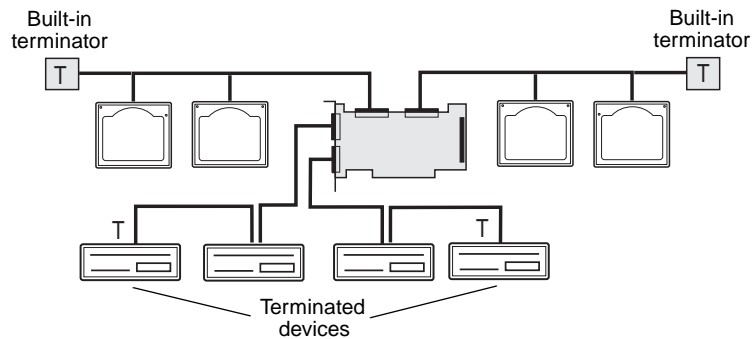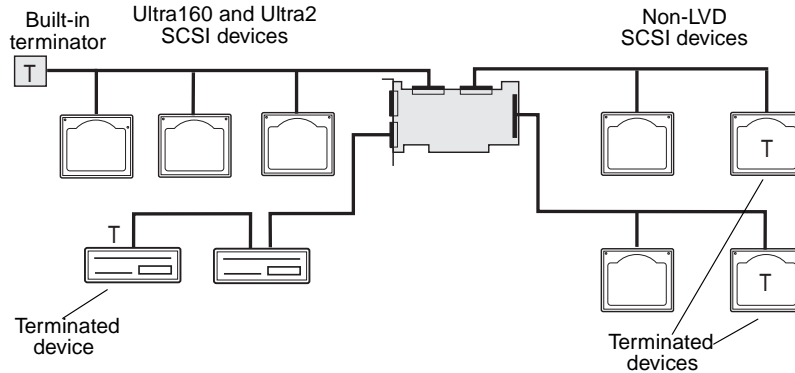


> **Caution:** *Do not* connect SCSI devices to more than two of the three SCSI Channel A connectors at the same time.

The following example shows Ultra160 and Ultra2 SCSI devices connected to the internal connectors of both SCSI channels.
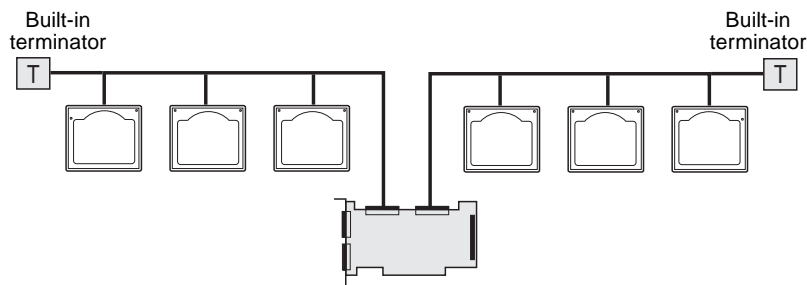
The following example shows LVD (Ultra160 and Ultra2) SCSI devices on Channel B and non-LVD SCSI devices on Channel A.



## Maximum Cable Lengths

The total length of cabling (internal and external) on the SCSI bus cannot exceed the maximum lengths listed in the following table. The third column lists the maximum number of SCSI devices you can connect to the SCSI card.

| Maximum Cable Length | Data Transfer Rate | Maximum Devices Supported |
|---|---|---|
| 25 m (82.0 ft) | Ultra160 SCSI (160 MBytes/sec) and Ultra2 SCSI (80 MBytes/sec) | 1 |
| 12 m (39.4 ft) | Ultra160 SCSI (160 MBytes/sec)[1] and Ultra2 SCSI (80 MBytes/sec) | 15 |
| 3 m (9.8 ft) | Fast Wide SCSI (20 MBytes/sec) | 15 |
| 3 m (9.8 ft) | Fast SCSI (10 MBytes/sec) | 7 |
| 3 m (9.8 ft) | Ultra SCSI (40 MBytes/sec for 16-bit, 20 MBytes/sec for 8-bit) | 4 |
| 1.5 m (4.9 ft) | Ultra SCSI (40 MBytes/sec for 16-bit, 20 MBytes/sec for 8-bit) | 5-7[2] |

[1] Mixing Fast/Ultra devices with Ultra160 and Ultra2 SCSI devices causes the entire SCSI bus to default to Ultra SCSI speeds and cable length requirements.

[2] Ultra SCSI data transfer rates do not currently support more than seven devices connected to the SCSI card.

## Adaptec Customer Support

If you have questions about installing or using your Adaptec product, check this User's Reference first—you will find answers to most of your questions here. If you need further assistance, please contact us. We offer the following support and information services.

### Technical Support Identification (TSID) Number

- The TSID is a 12-digit number that can be found on the white label included in the box with your product. It helps to provide more efficient service to you by accurately identifying your product and support status. The TSID is required when you contact Technical Support.

- Affix your TSID label here:

### Contacting Support

Technical information including product literature, answers to commonly asked questions, and information on software upgrades is available through the following:

- For information about Adaptec's support options, call 408-945-2550, 24 hours a day, 7 days a week.

- Search the Adaptec Support Knowledgebase (A.S.K.) at http://ask.adaptec.com for articles, troubleshooting tips, and frequently asked questions for your product.

- Connect to the File Transfer Protocol (FTP) server at ftp://ftp.adaptec.com.

- For email support, send technical questions to Adaptec's Technical Support Specialists via WebMail at http://www.adaptec.com/ support/webmail.html.

- To speak with a Technical Support Specialist, call 408-934-7274, Monday–Friday, 6:00 A.M. to 5:00 P.M., Pacific Time.

- After-hours, weekend, and holiday support is available for a fee at 800-416-8066.

## Sales and Ordering Information

- For pre-sales assistance with Adaptec products; to place an order for software, hardware, or cables; or to request additional documentation for Adaptec products, call 800-442-7274 or 408-957-7274, Monday–Friday, 6:00 A.M. to 5:00 P.M., Pacific Time.

- For sales information in Europe, call
    - France: +33 1 34 523434
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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 39160 │
│                                            │
│       FC    Tested to Comply               │
│             With FCC Standards             │
│                                            │
│                                            │
│       FOR HOME OR OFFICE USE               │
└──────────────────────────────────────────┘
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### CE  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 matériel brouilleur du Canada.

**Japanese Compliance**

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