USER'S REFERENCE

ADAPTEC SCSI CARD 29160N

ULTRA160 SCSI CONTROLLER

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Ultra160 SCSI Controller

User's Reference

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Overview

Ultra160 SCSI on the Adaptec SCSI Card 29160N

The Adaptec SCSI Card 29160N supports Ultra160 SCSI devices. Ultra160 is a new generation of SCSI technology that expands SCSI performance from 40 MBytes/sec to 160 MBytes/sec. In addition to providing much greater performance, Ultra160 SCSI increases the maximum allowable cable length from 3 meters to 12 meters for improved connectivity and flexibility.

The Adaptec SCSI Card 29160N combines this Ultra160 SCSI technology with Adaptec's SpeedFlex™ technology. SpeedFlex allows the Adaptec SCSI Card 29160N to be backwards compatible with previous generations of SCSI products, while allowing newer Ultra160 SCSI devices to operate at the higher 160 MBytes/sec rate and increased cable length.

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 29160N) installed in a computer and one or more SCSI devices. SCSI cables are used to connect the devices to the SCSI adapter card.

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.

Note: The Adaptec SCSI Card 29160N is designed for computer system original equipment manufacturers (OEMs). Product specifications are sometimes tailored to specific design needs from different OEMs. Use this product with the original computer system designed by the OEM. Adaptec assumes no responsibility for incompatibility or consequential damages when using this product with other systems. All support and services are provided by the system OEMs.

SCSI IDs

Each device attached to the Adaptec SCSI Card 29160N, as well as the Adaptec SCSI Card 29160N itself, must be assigned a unique SCSI ID number from 0 to 15. 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 don't have to be sequential, as long as the Adaptec SCSI Card 29160N and each device has a different number. For example, 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, 15 to 8.
- The Adaptec SCSI Card 29160N is preset to SCSI ID 7 and should not be changed. This gives it 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 29160N, the Boot Target 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 Target 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 SCSI devices come from the factory with termination disabled and cannot be changed. Proper termination for internal Ultra160 SCSI devices is provided by the built-in terminator at the end of the Ultra160 SCSI internal SCSI cable.
- Termination on non-Ultra160 internal 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 external SCSI devices usually is controlled by installing or removing a SCSI terminator. On some external devices, termination is controlled by setting a switch on the back of the SCSI device.

- By default, termination on the Adaptec SCSI Card 29160N itself is set to *Automatic* (the preferred method). We recommend that you do not change this default setting.
- Most Ultra SCSI devices come from the factory with termination enabled.

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 29160N 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 devices turned on?
- Are all SCSI cables and power cables properly connected?
- Is the Adaptec SCSI Card 29160N 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 and the Adaptec SCSI Card 29160N 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 29160N, 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 29160N 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 29160N is listed as "29160, 29160N, 29160B, CPQ29160, Ultra160 PCI SCSI Controller."

- If the driver is listed, the Adaptec SCSI Card 29160N 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 29160N software driver is disabled and isn't loading.
- If the SCSI Controller icon or the Adaptec SCSI Card 29160N software driver is not listed, reinstall the driver.

Note: In order to accommodate any special OEM system requirements, Adaptec may provide special driver software that is different from Adaptec standard driver software if the board is pre-installed. Be sure to use the driver software provided by the computer manufacturer.

An "X" inside a red circle appears with the Adaptec SCSI Card 29160N software driver in Device Manager. What does this mean?

It means that the Adaptec SCSI Card 29160N software driver is disabled and isn't loading.

To enable the driver

1 Double-click the Adaptec SCSI Card 29160N 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 29160N 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. Select **Yes** on the second screen of the Add New Hardware Wizard to have Windows search for the Adaptec SCSI Card 29160N.
3. Follow the on-screen instructions.

If Windows 95/98 does not detect the Adaptec SCSI Card 29160N, run the Add New Hardware Wizard again:

1. Double-click the **Add New Hardware** icon in Control Panel.
2. Select **No** on the second screen of the wizard.
3. Select **SCSI controllers** on the next screen.
4. Select **29160, 29160N, 29160B, CPQ29160, 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 at bootup:

"Device connected, but not ready"

The host 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 19.
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 the device. 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.

"Attention! Too many devices are terminated on the SE connectors"[1]

The SCSI card BIOS has detected that more than two devices have been terminated on the narrow SE SCSI segment. Verify the termination on the devices connected to the internal and external 50-pin connectors. Terminate *only* the SCSI device at the ends of the cable. Remove or disable the terminators on the SCSI devices between the ends of the cable.

[1] The termination detection feature is only implemented on the 50-pin internal Fast / Ultra-SE connectors. The 68-pin LVD / SE connector does not support this feature.

"Attention! Insufficient termination detected on the SE connectors"[2]
The SCSI card BIOS has detected that either *only one* or *no* devices have been terminated on the narrow SE SCSI segment. Verify the termination on the devices connected to the internal and external 50-pin connectors. Terminate the SCSI devices at the ends of the cable and leave the other devices unterminated.

[2] The termination detection feature is only implemented on the 50-pin internal Fast / Ultra-SE connectors. The 68-pin LVD / SE connector does not support this feature.

Using the Adaptec SCSI Card 29160N and SCSI Devices

This section provides useful information on using the Adaptec SCSI Card 29160N and your SCSI devices. For specific information, refer to the SCSI device documentation.

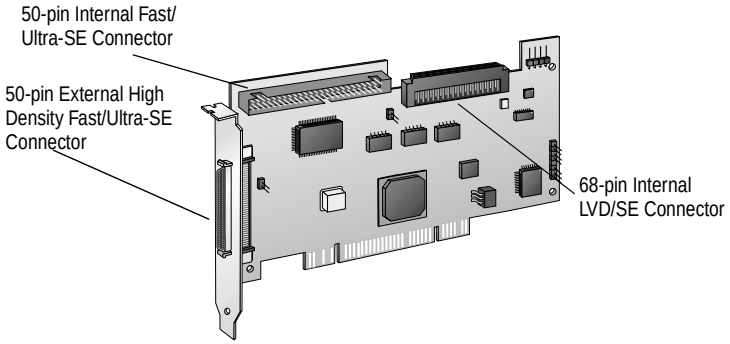
Using SCSI Devices

SCSI Hard Disk Drives

- Every SCSI hard disk drive must be physically low-level formatted, partitioned, and logically formatted before it can be used to store data. If your SCSI hard disk drive has not already been formatted at the factory, and if your system 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.
- If your PC boots from a SCSI hard disk drive, ensure that the Hard Disk (or Drives) setting in your computer's CMOS setup program is set to **None** or **No Drives Installed**, as is required for SCSI hard disk drives. See your computer documentation for details.
- If both SCSI and non-SCSI disk drives are installed, then the non-SCSI disk drive is typically the boot drive. If your computer supports BBS (BIOS Boot Specification), both SCSI and non-SCSI disk drives can coexist and you can specify which drive to boot from. Refer to your computer documentation for more information.

Ultra160 Hard Disk Drives

- We recommend keeping your Ultra160 SCSI devices separate from your non-Ultra160 SCSI devices. Connecting a non-Ultra160 SCSI hard disk drive to the Ultra160 SCSI connector on the Adaptec SCSI Card 29160N causes the Ultra160 SCSI segment of the SCSI bus to drop down to Ultra SCSI performance levels (40 MBytes / sec).
- Be sure to connect your Ultra160 SCSI hard disk drives to the LVD / SE SCSI connector on the Adaptec SCSI Card 29160N if you want Ultra160 performance (160 MBytes / sec).



- Internal 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 Ultra160 SCSI cable.

Scanners

If you connect a scanner to the SCSI Card 29160N, you must install the scanner manufacturer's proprietary software drivers. See your scanner's documentation for details.

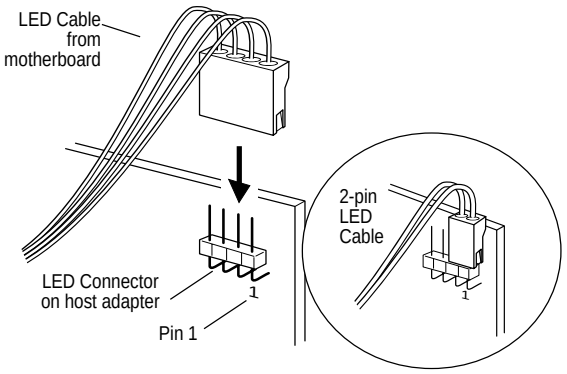
Installing Multiple SCSI Cards

- 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, enable the BIOS on the boot SCSI card only; disable the 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 are using non-SCSI disk drives, you may prefer not to connect your computer's LED to the SCSI card, since the LED will then no longer indicate disk activity on the other disk drives.



Using SCSI and EIDE Devices

- All Adaptec SCSI cards can coexist with another controller (EIDE, RLL, etc.) installed in the computer.
- If you have both an EIDE hard disk drive and a SCSI hard disk drive, the EIDE drive is typically the boot drive. In this case, disable the BIOS on the SCSI card (see *Advanced Configuration Options* on page 22). If your computer supports BBS, both SCSI and non-SCSI disk drives can coexist and you can specify which drive to boot from. Refer to your computer documentation for more information.
- You cannot connect an EIDE device to a SCSI card, or a SCSI device to an EIDE card (controller).
- Disable the BIOS on the SCSI card if no SCSI hard disk drives are installed (see *Advanced Configuration Options* on page 22).

Replacing a Non-Adaptec SCSI Card with an Adaptec SCSI Card

SCSI is standard, but how data is translated onto a hard disk drive is not. Each SCSI card manufacturer uses its own translation schemes for writing data to a disk. To use a hard disk drive that was previously connected to a non-Adaptec SCSI card, low-level format the drive after connecting it to the Adaptec SCSI card. (See *Using SCSI Disk Utilities* on page 24.)

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

Configuring the Adaptec SCSI Card 29160N with SCSI*Select*

SCSI*Select*, included with the Adaptec SCSI Card 29160N, 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.

Note: The default settings are appropriate for most systems. Run SCSI*Select* if you need to change or view current settings, or if you would like to run the SCSI disk utilities. See the descriptions of each option starting on page 19.

SCSI*Select* Options	Available Settings	Default Setting
Basic Host Adapter Options:		
Host Adapter SCSI ID	0-15	7
SCSI Parity Checking	Enabled, Disabled	Enabled
Host Adapter SCSI Termination:		
Ultra160-LVD Connector	Automatic, Enabled, Disabled	Automatic
Fast/Ultra-SE Connector	Automatic, Enabled, Disabled	Automatic
Boot Device Settings:		
Boot Target ID	0-15	0
Boot LUN Number[1]	0-7	0
SCSI Device Configuration Options:		
Maximum Sync Transfer Rate (MBytes/sec)	160.0, 80.0, 53.4, 40.0, 32.0, 26.8, 20.0, 16.0, 13.4, 10.0, ASYN	160.0
Enable Disconnection	Yes, No	Yes (Enabled)
Initiate Wide Negotiation	Yes, No	Yes (Enabled)

SCSI*Select* Options	**Available Settings**	**Default Setting**
Send Start Unit Command	Yes, No	Yes (Enabled)
Enable Write Back Cache	Enabled, Disabled N/C (No Change)	N/C (No Change)
BIOS Multiple LUN Support	Yes, No	No (Disabled)
Include in BIOS Scan	Yes, No	Yes (Enabled)
Advanced Configuration Options:		
Reset SCSI Bus at IC Initialization	Enabled, Disabled	Enabled
Extended BIOS Translation for DOS Drives > 1 GByte[2]	Enabled, Disabled	Enabled
Verbose/Silent Mode	Verbose, Silent	Verbose
Host Adapter BIOS	Enabled Disabled: Scan Bus Disabled: Not Scan	Enabled
Domain Validation[2]	Enabled, Disabled	Enabled
Support Removable Disks Under BIOS as Fixed Disks[2]	Boot Only, All Disks, Disabled	Disabled
Display <Ctrl> <A> Messages during BIOS Initialization[2]	Enabled, Disabled	Enabled
BIOS Support for Bootable CD-ROMs[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. From the menu that appears, use the ↑ and ↓ 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 ↑ and ↓ 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.

Basic Host Adapter Options

- **Host Adapter SCSI ID**—(Default: *7*) Sets the SCSI ID for the SCSI card. The Adaptec SCSI Card 29160N 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 29160N does not support SCSI parity.
- **Host Adapter SCSI Termination**—(Default: *Automatic*) Determines the termination setting for the SCSI card. The default setting for both the Ultra160-LVD connector and Fast / Ultra-SE connector is *Automatic*. We recommend that you do not change these settings.

Boot Device Options

- **Boot Target ID**—(Default: *0*) Specifies the SCSI ID of your boot device.
- **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 22).

SCSI Device Configuration Options

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

- **Maximum Sync Transfer Rate**—(Default: *160.0*) Determines the maximum synchronous data transfer rate the SCSI card supports. Use the maximum value of 160.0 MBytes / sec. If your device is not Ultra160, select a transfer rate of 10.0 MBytes / sec.
- **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.

- **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.

- **Send Start Unit Command**—(Default: *Yes*) When set to **Yes**, sends the Start Unit Command to the SCSI device at bootup.
- **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.
- **BIOS Multiple LUN Support**—(Default: *No*) Leave this setting at **No** if the device does not have multiple LUNs. When set to **Yes**, the SCSI card BIOS provides boot support for a SCSI device with multiple LUNs.
- **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.
- **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.

  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.

  Caution: Back up your disk drives before changing the translation scheme.

- **Verbose/Silent Mode**—(Default: *Verbose)* When set **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.
- **Host Adapter BIOS (Configuration Utility Reserves BIOS Space)**—(Default: *Enabled*) Enables or disables the SCSI card BIOS.
  - 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 drivers 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.

- **Domain Validation**—(Default: *Enabled*) Determines what kinds of SCSI devices are connected and reduces data transfer speed if it detects older non-Ultra160 devices. Displays the resulting data transfer rate.
- **Support Removable Disks Under BIOS as Fixed Disks**—(Default: *Disabled*) Determines which removable-media drives are supported by the SCSI card BIOS. Choices are as follows:
  - **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.
  - **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: *Do not* remove a removable-media cartridge from a SCSI drive controlled by the SCSI card BIOS while the drive is on. You may lose data. To allow removability of 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**.

- **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.
- **BIOS Support for Bootable CD-ROMs**—(Default: *Enabled*) When set to **Enabled**, the SCSI card BIOS allows booting 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.

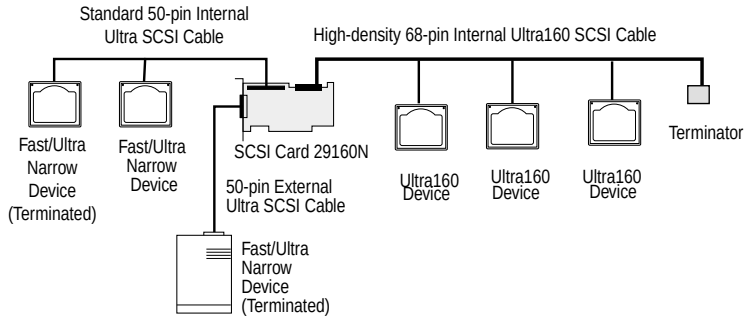
   - **Verify Disk Media**—Allows you to scan the media of a hard disk drive for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select *yes*, those blocks are no longer used. You can press **Esc** at any time to abort the utility.

Connecting SCSI Devices

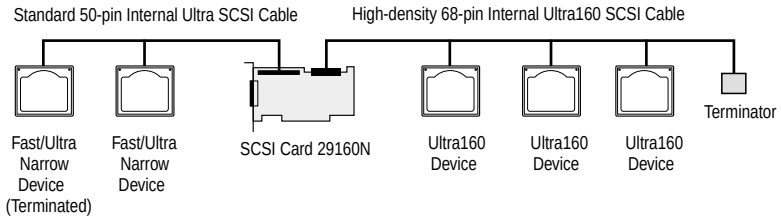
Here are some examples of how you can connect internal and external SCSI devices to the SCSI Card 29160N.

To achieve maximum performance, attach the first device to the end connector (furthest from the SCSI card); attach other devices to the connectors that are closer to the SCSI card.

The following example shows SCSI devices connected to all three connectors.



The following example shows SCSI devices connected to the two internal connectors.



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.

Maximum Cable Length	Data Transfer Rate	Maximum Devices Supported
12 m (39.4 ft)	Ultra160 SCSI (160 MBytes/sec)[1]	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)	5-8[2]

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

[2] Ultra SCSI data transfer rates do not currently support more than eight devices.

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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. SCSI Card 29160N

FC Tested To Comply With FCC Standards

FOR HOME OR OFFICE USE

Canadian Compliance Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference of Industry Canada.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appariel.

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)
EN5022 (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.

Japanese Compliance Symbol

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