Installation Guide

AHA-2910Bi

PCI-to-Fast SCSI Host Adapter

PCI-to-Fast SCSI Host Adapter with SCSI*Select*

adaptec®

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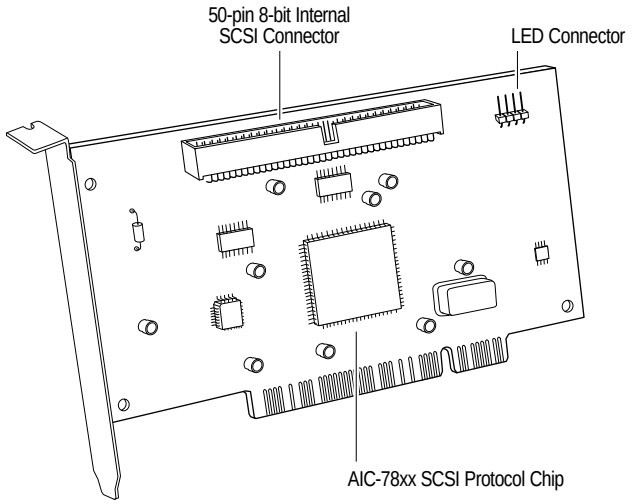
Introduction

This guide provides the following information:

- Installing and setting up your AHA®-2910Bi host adapter
- Configuring SCSI devices
- Configuring disk drives
- Installing multiple adapters
- Windows® 95 driver installation
- Using the SCSI*Select*® utility
- Troubleshooting the installation
- Common problems and solutions

The AHA-2910Bi host adapter provides a powerful multitasking interface between your computer's PCI bus and internal SCSI devices (disk drives, CD-ROM drives, tape drives, removable-media drives, etc.). The host adapter supports the SCAM (SCSI Configured AutoMatically) protocol, which automatically assigns SCSI IDs to SCAM compatible devices. The following figure shows the major components of the 2910Bi host adapter.



Adaptec's software drivers enable you to use AHA-2910Bi host adapters in computers running DOS/Windows®, OS/2, Windows 95, MacOS, Windows NT™, UNIX, and NetWare.

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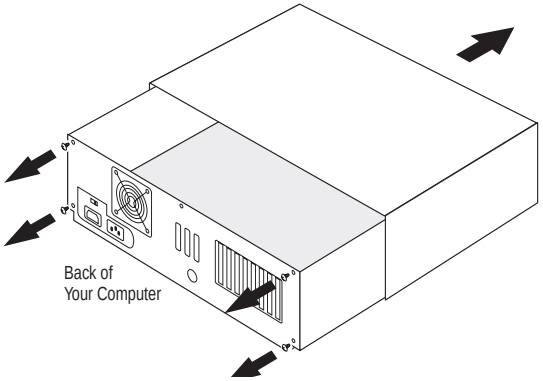
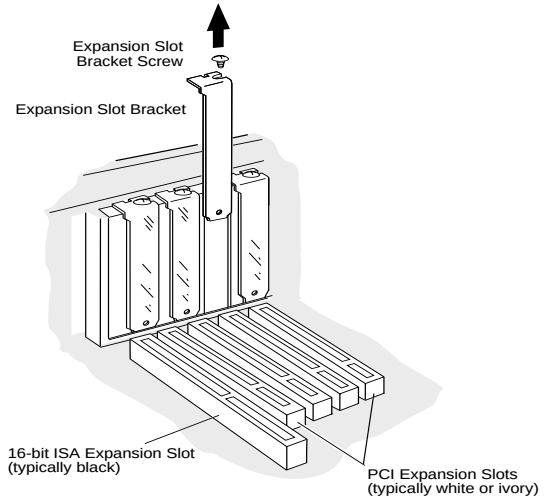
Installation

WARNING: Before beginning the installation, turn OFF power to the computer and peripheral devices and disconnect the power cords.

Step 1: Remove the cover from the computer case. (If necessary, refer to your computer documentation.)

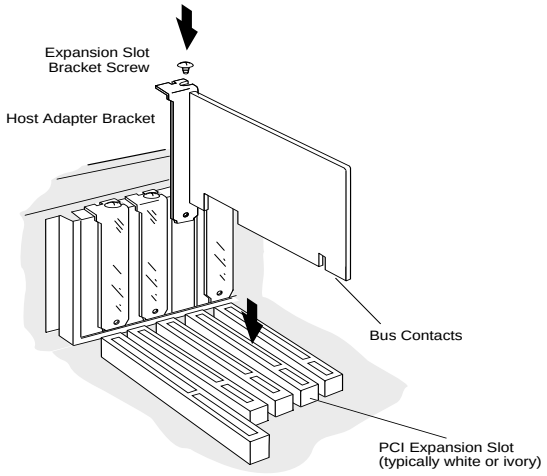


Step 2: Locate an unused PCI expansion slot. (This slot is typically white or ivory.) Unscrew the expansion slot bracket that covers the card-slot opening.

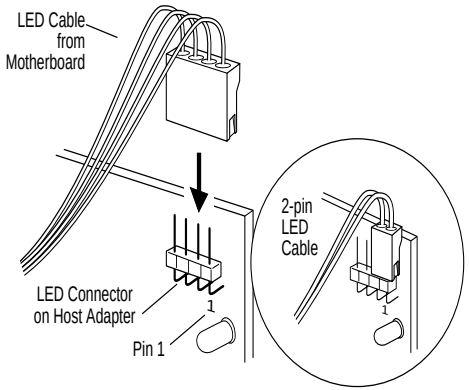


The PCI slot must support 5-volt Bus Master data transfers (refer to your computer documentation or contact your vendor).

Step 3: Insert the host adapter in the PCI expansion slot. Press it down firmly so that the contacts are securely seated in the slot and secure it with the screw that you removed in step 2.



Step 4: **OPTIONAL**-Connect the host adapter to the LED on the computer so that it will light whenever there is activity on the SCSI bus. To do this disconnect the LED cable from the LED connector on the motherboard and connect it to the LED connector on the host adapter.



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Step 5: Make sure that all SCSI devices have unique SCSI ID's from 0 to 6. (Refer to your device documentation for SCSI ID settings and instructions on manually changing the default settings.)

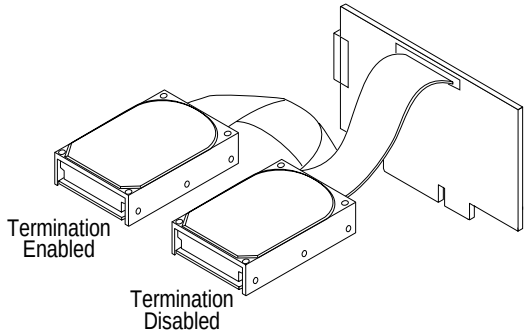
Caution: AHA-2910Bi host adapters support only *single-ended SCSI* devices. *Differential SCSI* devices may be damaged if you connect them to the host adapter. Most SCSI devices are single-ended. Read the device documentation.

Step 6: Install or enable terminators on the device that you plan to install at the end of the internal cable. Then remove or disable terminators on all remaining devices. However, never terminate more than two devices on the SCSI bus. The AHA-2910Bi detects installed SCSI devices on the bus and sets its own termination automatically.

WARNING: If you decide to attach your host adapter *between* two terminating SCSI devices on the internal SCSI connector, you must disable host adapter SCSI termination using the SCSI*Select* utility that comes with the AHA-2910Bi product.

On most internal SCSI devices, you control termination by setting a jumper or a switch, or by physically removing or installing a resistor module(s).

Refer to the device's documentation to determine how to enable or disable termination on your particular device.



Step 7: Install and mount each internal SCSI device inside your computer. (Refer to your computer and device documentation for instructions.)

If you purchased your AHA-2910Bi as part of an Adaptec kit, the kit includes one 50-pin internal SCSI cable that allows you to connect up to two internal SCSI devices.

Step 8: Plug one end of your 50-pin internal SCSI cable into the host adapter's internal SCSI connector. To connect more than two internal devices, use a SCSI cable with enough connectors to accommodate all of your devices.

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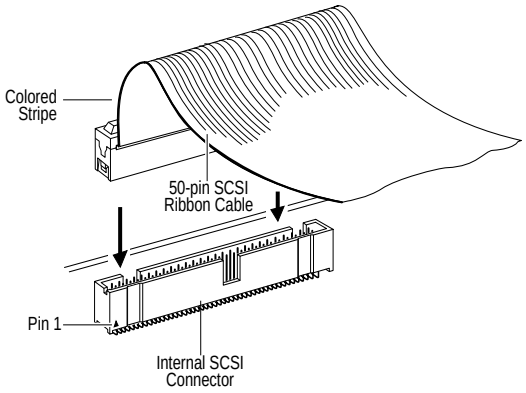
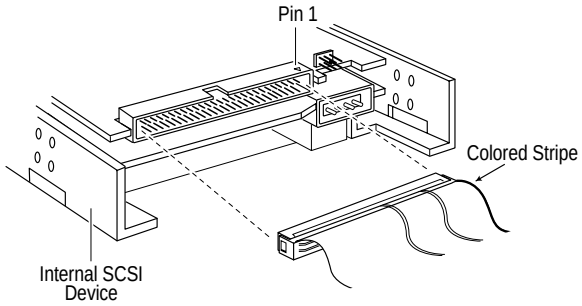
Make sure that the colored stripe on one side of the cable is aligned with pin-1 of the host adapter's connector. Pin-1 of the connector is usually designated by a small triangle (▲), or a "1" on the connector.

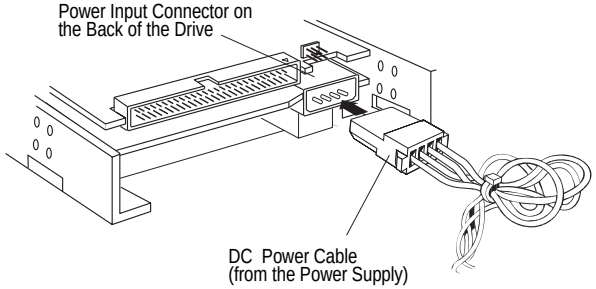


Step 9: Plug the other end of the 50-pin internal SCSI cable into one of the connectors on the last internal SCSI device in the chain. This device must be terminated. Make sure the colored stripe on the side of the cable is aligned with pin-1 of the SCSI device's connector.



Step 10: Plug the remaining cable connectors into any remaining internal devices. These devices must *not* be terminated.

Step 11: Connect a DC power cable from your computer's power supply to the power connector on the SCSI device.



Step 12: Replace the computer chassis cover.

Step 13: Reconnect the power cables to your computer and peripherals, turn on your external SCSI devices, and then turn on your computer.

Step 14: If your system CMOS setup requires you to enable PCI bus parameters, do so now.

Note: The PCI bus usually assigns IRQs and I/O port addresses automatically. However, in some cases you may need to manually edit the PCI bus parameters in your CMOS setup. See your computer documentation.

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Step 15: Install the appropriate host adapter device driver for your operating system.

- **DOS and Windows 3.x:** DOS and Windows 3.x does not have embedded driver support for your AHA-2910Bi product, so you must load them yourself. If your host adapter came with Adaptec's EZ-SCSI® software, see the EZ-SCSI software documentation for driver installation instructions.
- **Windows 95:** To verify that your AHA-2910Bi device driver has been properly installed under Windows 95, see *Windows 95 Driver Installation* on page 7.

Note: After installing your AHA-2910Bi product and restarting Windows 95, the system prompts you through the rest of the installation.

- **Windows NT:** Windows NT 4.0 has embedded driver support for the Adaptec AHA-2910Bi product. *However, earlier versions of Windows NT do not have embedded driver support, so you must load the driver yourself.*

  If your AHA-2910Bi came with Adaptec EZ-SCSI software (v4.01 or later), install the Windows NT driver from the diskette provided for your AHA-2910Bi to support previous versions of Windows NT. (Refer to the Adaptec EZ-SCSI documentation.) Otherwise, if your host adapter came with Adaptec's 7800 Family Manager Set software (v1.3), see the 7800 Family Manager Set software documentation for driver installation instructions.
- MacOS: MacOS does not have embedded driver support for the AHA-2910Bi product, so you must install the Mac driver yourself using the diskette provided with your AHA-2910Bi.
- **NetWare, OS/2, and UNIX:** Drivers for these operating systems are *not* embedded, so you must load them yourself. If your host adapter came bundled with Adaptec's 7800 Family Manager Set software (v1.3), see the 7800 Family Manager Set software documentation for driver installation instructions.

Note: If you purchased your host adapter from a third-party vendor, you can use the drivers they provide. (Refer to the third-party documentation for installation instructions and problem resolution.) To obtain any of the Adaptec device drivers, contact Adaptec directly.

Congratulations! You have completed the installation of your host adapter. For additional information on configuring your host adapter, see *Helpful Hints*.

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Helpful Hints

This section contains useful information on configuring and using your host adapter.

Configuring SCSI Devices

Your host adapter can transfer data up to 10 MBytes/sec when connected to devices that support Fast SCSI. SCSI devices can coexist on the same cable and each will transfer data at its own negotiated or assigned transfer rate. However, in order to reliably transfer data at the transfer rate of Fast SCSI, the following requirements must be met:

- The internal cable must be terminated with an *active* terminator, either provided by the SCSI device at the end of the cable or by a separate terminating plug. The terminator on the AHA-2910Bi is an active terminator.
- Be sure to use a high-quality internal SCSI cable to ensure reliable data transfer for SCSI devices connected to the host adapter.

Note: Cables with a 25-pin DB-25 style connector will affect automatic termination (see *Host Adapter SCSI Termination* on page 8). Always leave parity checking enabled to verify reliable data transfers.

- When one or more Fast SCSI devices are connected to the host adapter, the combined length of all cables must not exceed 3 meters (9.8 feet) to ensure reliable operation and data transfers of up to 10 MBytes/sec.
- Your host adapter can support the SCSI Configured AutoMatically (SCAM) protocol, which automatically assigns SCSI IDs dynamically and resolves SCSI ID conflicts. To enable or disable SCAM support, see *Advanced Configuration Options* on page 9.

Configuring Disk Drives

- The AHA-2910Bi product does not support the boot option. To boot your system, use an IDE board or a second SCSI host adapter with boot capabilities.
- Every SCSI hard disk must be physically low-level formatted, partitioned, and logically formatted before you can use it to store data. SCSI hard disks are physically formatted at the factory and do not need to be physically formatted again.

  If you connected a new SCSI hard disk drive to your host adapter, you must partition and logically format the drive. For DOS and Windows (3.x and 95) use the AFDISK and FORMAT commands (see your computer and DOS documentation). For other operating systems, see your operating system documentation.

Installing Multiple Adapters

- You can install multiple SCSI host adapters if the system resources are available (e.g., I/O port must be unique).
- Each host adapter you install forms a separate SCSI bus with a different set of SCSI devices.
- SCSI IDs can be reused as long as a unique ID is assigned to a device on a different host adapter (e.g., each host adapter can have a device with SCSI ID 0).

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Windows 95 Driver Installation

To make sure that your AHA-2910Bi driver software has been properly installed and is operating under Windows 95, do the following:

1. On the Win95 desktop press **Start**. An options menu appears.
2. On the options menu click on **Setting** and select **Control Panel**.
3. Click on **System.** The System Properties window appears.
4. Click on **Device Manager**.
5. Click on the **SCSI Controllers** icon.
6. If the Adaptec AIC-7850 PCI SCSI Controller is not listed, follow the instructions in the EZ-SCSI or the 7800 Family Manager Set documentation for installing driver support.

   OR

   If you see a yellow exclamation point or red **X** in front of the listing for the AIC-7850 Controller, double click on the icon to see the error message and correct the problem.

Using SCSI*Select*

The SCSI*Select* configuration utility allows you to change host adapter settings without opening the computer case. SCSI*Select* also contains SCSI disk utilities that allow you to perform a low-level format or verify the disk media of your SCSI hard disk drives.

Starting the SCSISelect Utility

Use the bootable floppy diskette that is included with your AHA-2910Bi product. After starting your computer and inserting the floppy diskette, the first menu that appears displays the options for SCSI Configuration settings and the SCSI Disk Utility. At this time you may select either a color or monochrome display by pressing **F5** *(this feature may not work on all monitors)***.**

Using SCSISelect Menus

SCSI*Select* uses menus to list the options you can select. To select an option, use either the tab key or the up/down arrow keys to move the cursor. Then press **Enter**.

When you select an option by pressing **Enter**, the system may display an additional options menu. Return to the previous menu at any time by pressing **Esc**. To restore the original SCSI*Select* default values, press **F6**.

Exiting SCSISelect

To exit SCSI*Select*, press **Esc** until a message prompts you to exit (if you changed any host adapter settings, you are prompted to save the changes before you exit). 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.

Default Settings

The AHA-2910Bi has default settings appropriate for most PCI systems (see the table of settings below). *Do not* run SCSI*Select* unless you want to change a default setting.

SCSI Bus Interface Definitions	**Default**
Host Adapter SCSI ID	7
SCSI Parity Checking	Enabled
Host Adapter SCSI Termination	Enabled
SCSI Device Configuration Settings	**Default**
Initiate Sync Negotiation	Yes (Enabled)
Maximum Sync Transfer Rate	10 MBytes/sec
Enable Disconnection	Yes (Enabled)
Advanced Configuration Options	**Default**
Plug and Play SCAM Support	Disabled

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Definitions of SCSISelect Settings

This section defines the SCSI device settings for the host adapter and for each device on the SCSI bus.

SCSI Bus Interface Definitions

The following definitions are most likely to require modification.

- **Host Adapter SCSI ID**—This option sets the SCSI ID of the host adapter.

  To give the host adapter the highest priority on the SCSI bus, we recommend that you leave the host adapter at its default setting of SCSI ID *7*.

- **SCSI Parity Checking**—This option determines whether the host adapter verifies the accuracy of data transferred on the SCSI bus. The default setting is *Enabled*.

  If any SCSI device connected to the host adapter does *not* support SCSI parity, disable SCSI Parity Checking on the host adapter and all SCSI devices. To determine if a device supports SCSI parity, consult the device documentation.

- **Host Adapter SCSI Termination**—This option sets termination on the host adapter. You can set termination to *Automatic*, *Enabled*, or *Disabled*. In general, you should leave this option set to its default setting of *Enabled*.

SCSI Device Configuration Settings

SCSI device configuration settings allow you to configure parameters for each device on the SCSI bus. To configure a specific device, you must identify the SCSI ID assigned to that device. To determine the SCSI ID of a device, see *Using the SCSI Disk Utilities* on page 9.

- **Initiate Sync Negotiation**—This option determines whether synchronous data transfer negotiation between the host adapter and a device is initiated by the host adapter.

  The default setting is *Yes (Enabled)*. Set **Initiate Sync Negotiation** to **No** for devices that do not support Sync Negotiation.

- **Maximum Sync Transfer Rate**—This option sets the maximum synchronous data transfer rate that the host adapter supports. The host adapter supports rates up to 10 MBytes / sec.

  If Initiate Sync Negotiation is set to No, then the maximum synchronous transfer rate is the maximum rate that the host adapter accepts from the device during negotiation.

- **Enable Disconnection**—This option lets a SCSI device temporarily disconnect the SCSI device from the SCSI bus. This allows the host adapter to perform other operations while the SCSI device is disconnected. The default setting is *Yes*. Set **Enable Disconnection** to **Yes** if two or more SCSI devices are connected to the host adapter.

Advanced Configuration Options

Plug and Play SCAM Support—Only Windows 95 supports this option. This option allows the host adapter to automatically assign SCSI IDs to SCSI devices that support the SCAM protocol.

Caution: The default setting is *Disabled*. Most non-SCAM legacy devices tolerate the SCAM protocol, so you can enable this option even if you have a non-SCAM device.

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Using the SCSI Disk Utilities

To access the SCSI disk utilities, select the **SCSI Disk Utilities** option from the menu that appears after starting SCSI*Select*.

Once the option is selected, SCSI*Select* immediately scans the SCSI bus and displays a list of all SCSI IDs and the devices assigned to each ID. When you select a specific ID and device, a menu appears, displaying the options Format Disk and Verify Disk Media.

- **Format Disk**—This utility 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.

  The Adaptec Format Disk utility is compatible with the vast majority of SCSI disk drives.

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**—This utility 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

- **Board Control**—Use Board Control to configure the AHA-2910Bi for Power Macintosh PCI systems. For instructions, see the documentation included on the Board Control diskette.

Troubleshooting Checklist

If you have any problems during the installation, check the following items first:

- Have you installed the host adapter into a PCI Rev 2.0 compliant computer?
- Are all SCSI devices powered?
- Are all SCSI bus cables and power cables properly connected? Is pin 1 oriented correctly?
- Does the host adapter and each device on the SCSI bus have a unique SCSI ID?
- Did you install your host adapter in a bus master PCI slot? Refer to your computer's documentation for instructions or try another slot.
- Are all devices on the SCSI bus terminated properly?
- Does your system CMOS setup require you to enable PCI bus parameters? If so, refer to your computer's documentation for instructions. Check that IRQ channel assignment, board, and BIOS settings have been made.

  Some configuration options apply to a specific PCI bus slot, so if you change these options be sure you are applying them to the slot in which the host adapter is installed.

  Check your computer documentation to verify which slot corresponds to which number.

  – If there is an Interrupt Type or Interrupt Line option in the Setup program, be sure to select **Int-A** or **Interrupt Type = A**. Depending on your system design, you may also be required to change a motherboard jumper setting.

  – If there is a Triggering Interrupt option, be sure to select **Level**.

  – If there is an option to enable or disable bus mastering for the PCI slots, be sure to select **Enabled**.

  – If there is an option to enable or disable individual PCI slots, be sure the slot in which you install the host adapter is **Enabled**.

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– If your computer has a combination of ISA (or EISA) boards and PCI boards, you may need to mark the IRQs used by ISA / EISA boards as *Used* so the system BIOS will not try to assign these IRQs to other PCI boards.

– In some systems the BIOS reserves a set of available IRQs for PCI boards, and you have to assign these IRQs manually.

Common Problems and Solutions

- **Changed Values Not Loaded**—If you changed any values on the host adapter in a Setup program or on a SCSI device, select the **Saved** option to ensure that the new values are loaded.

- **Format/Verify Disk Device Utility Startup Fails**—If you tried to use the Format / Verify utility on a disk device and got an Unexpected SCSI Command Failure pop-up box with error information, the utility probably encountered a problem with the disk device or the media and therefore cannot run.

  You can probably determine from the Sense Key information (e.g., 06h - Unit attention) both the cause of the problem and its solution. Listed below are some of the more common Sense Key values and their meanings:

  02h - Not ready—The media is not ready to format. Be sure that media is inserted in the drive and that the media is spun up.

  03h - Medium error—The disk media may be defective. If it is a removable-media drive, try using a different disk media. If it is a fixed disk drive, the disk may be physically damaged. Verify and format the media with SCSI*Select*.

  04h - Hardware error—The disk drive may be defective. Consult the hardware documentation and contact the manufacturer.

  05h - Illegal request—The Adaptec formatting utility does not support a low-level format of this device; however, the device may already be low-level formatted by the manufacturer. (This error rarely occurs.)

  06h - Unit attention—The removable media may be write-protected. Disable write protection and run the utility again.

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FCC Compliance Statement

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 residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause 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
- Move the equipment away from the receiver
- Plug the equipment into an outlet on a circuit different from that to which the receiver is powered
- If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions

CAUTION: Only equipment certified to comply with Class B (computer input/output devices, terminals, printers, etc.) should be attached to this equipment, and must have shielded interface cables.

Finally, any changes or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the user's authority to operate such equipment.

Each host adapter is equipped with an FCC compliance label which shows only the FCC Identification number. The full text of the associated label follows:

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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