USER'S GUIDE

LSI8751SPE
PCI to Ultra SCSI
Host Adapter

Version 1.1

November 2000

LSI LOGIC®

S14023.A

Electromagnetic Compatibility Notices

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.

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 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 harmful interference to radio or television 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 the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded cables for SCSI connection external to the cabinet are used in the compliance testing of this Product. LSI Logic is not responsible for any radio or television interference caused by unauthorized modification of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by LSI Logic. The correction of interferences caused by such unauthorized modification, substitution, or attachment will be the responsibility of the user.

The LSI Logic LSI8751SPE is tested to comply with FCC standards for home or office use.

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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This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

LSI Logic Corporation
North American Headquarters
Milpitas, CA
408.433.8000

Document DB15-000111-01, Second Edition (November 2000).
This document describes the LSI Logic LSI8751SPE PCI to Ultra SCSI Host Adapter and will remain the official reference source for all revisions/releases of this product until rescinded by an update.

To receive product literature, visit us at http://www.lsilogic.com.

Preface

This book is the primary reference and user's guide for the LSI8751SPE PCI to Ultra SCSI Host Adapter. It contains a complete functional description for the LSI8751SPE and includes complete physical and electrical specifications for the LSI8751SPE.

Audience

This document assumes that you have some familiarity with microprocessors and related support devices. The people who benefit from this book are:

- Engineers and managers who are evaluating the processor for possible use in a system
- Engineers who are designing the processor into a system

Organization

This document has the following chapters and appendixes:

- Chapter 1, **Using the LSI8751SPE**, defines the interfaces and characteristics of the LSI8751SPE.
- Chapter 2, **Installing the LSI8751SPE**, provides both quick and detailed installation instructions.
- Chapter 3, **Configuring the LSI8751SPE**, describes the SCSI BIOS Configuration Utility to configure adapter and device settings.
- Appendix A, **Technical Specifications**, describes the physical and operational environments of the LSI8751SPE.
- Appendix B, **Glossary of Terms and Abbreviations**, provides definitions of various terminology that is referenced throughout this user's guide.

Related Publications

PCI Storage Device Management System SDMS 4.0 User's Guide, Order Number S14007.A

Revision Record

Revision	Date	Remarks
1.0	5/99	Final version.
1.1	11/00	All product names changed from SYM to LSI.

Contents

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Chapter 1
Using the LSI8751SPE

This chapter describes the LSI8751SPE PCI to Ultra SCSI Host Adapter interface to PCI computer systems and includes these topics:

1.1 General Description

The LSI8751SPE provides a SCSI-3, Ultra SCSI interface to PCI computer systems that require BIOS support on the add-in SCSI adapter. Installing this adapter in your PCI system allows connection of SCSI devices over a SCSI bus. It has all of the functionality of the LSI8751SP with the addition of features to enable it to comply with the Microsoft PC 97 Hardware Design Guide.

The LSI8751SPE is a 16-bit, Single-Ended (SE) SCSI interface with an on-board 128K Flash BIOS and serial EEPROM. This board can support both legacy Fast SCSI devices, and the newest Ultra SCSI devices. It is also backwards compatible with the existing LSI8251S and LSI8751SP host adapters.

The Storage Device Management System (SDMS™) software operates the board. The design of the board does not prevent other software from being written and used with it. BIOS support for this adapter is incorporated on the board in a Flash BIOS.

This guide, along with the *PCI Storage Device Management System SDMS 4.0 User’s Guide*, contains product information and installation instructions to help you gain the full benefits of the LSI8751SPE.

1.2 Features

This section provides a high level overview of the PCI Interface, the SCSI Interface, and Board Characteristics for the LSI8751SPE.

1.2.1 PCI Interface

- Full 32-bit DMA bus master
- Zero wait-state bus master data bursts
- Universal PCI bus voltage support

1.2.2 SCSI Interface

- 16-bit SE
- Automatically enabled active termination
- Three connectors:
  68-pin high density external
  68-pin right angle high density internal
  50-pin vertical low density internal
- Ultra SCSI data transfer capability
- Wide SCSI
- SCSI Plug and Play
- SCSI Configured AutoMatically (SCAM)
- Serial EEPROM for SCSI configuration information storage
- SCSI activity LED connector
- 128K Flash BIOS

1.2.3 Board Characteristics

- PCI board dimensions
  127 x 82.55 mm (5.00 x 3.25 inches)
- PCI 5 V or 3.3 V signaling environment
- ISA/EISA bracket types

1.3 Interface Descriptions

This section provides a more detailed explanation about the PCI Interface, the SCSI Interface, and Ultra SCSI.

1.3.1 The PCI Interface

PCI is a high-speed standard local bus for interfacing a number of I/O components to a PC processor and memory subsystem. The PCI functionality for the LSI8751SPE is contained within the LSI53C875JE PCI to SCSI I/O Processor chip. The LSI53C875JE connects directly to the PCI bus and generates timing protocol in compliance with the PCI Specification Revision 2.1.

The PCI interface operates as a 32-bit DMA bus master. The connection is made through edge connector J1 (see Figure 2.1). The signal definitions and pin numbers conform to the PCI Local Bus Specification Revision 2.1 standard. The LSI8751SPE conforms to the PCI universal signaling environment for a 5 V or 3.3 V PCI bus.

1.3.2 The SCSI Interface

The SCSI functionality for the LSI8751SPE is contained within the LSI53C875JE. The LSI53C875JE connects directly to the SCSI bus and generates timing and protocol in compliance with the SCSI standard.

The SCSI interface on the LSI8751SPE operates as a 16-bit, synchronous or asynchronous, SE device, and supports Ultra SCSI protocols and 16-bit arbitration. The interface is made through no more than two of the connectors J2, J3, and J4. These connectors are shown in Figure 2.1. Connector J2 is a 68-pin high density right angle

receptacle. Connector J3 is a shielded 68-pin high density right angle receptacle that protrudes through the back panel bracket. Connector J4 is a 50-pin low density vertical shrouded pin header.

SE active termination is provided on the LSI8751SPE. Termination is automatically enabled when only one of the connectors J2, J3, or J4 is used.

The LSI8751SPE supplies SCSI bus termination power (TERMPWR) through a blocking diode and a self-resetting 1.5 A short circuit protection device.

A 40 MHz oscillator is installed on the LSI8751SPE to provide the clock frequency to the LSI53C875JE that is necessary to support Wide Ultra SCSI transfers of up to 40 Mbytes/s.

1.3.3 Ultra SCSI

The LSI8751SPE fully supports Ultra SCSI. Ultra SCSI is an extension of the SCSI-3 family of standards that expands the bandwidth of the SCSI bus, allowing faster synchronous data transfers.

Special SCSI cables are specified for operation with Ultra SCSI devices. You must consider the total number of devices and length of the SCSI bus when setting up your system. See Chapter 2, “Installing the LSI8751SPE,” for a detailed explanation of SCSI bus connections.

Chapter 2
Installing the LSI8751SPE

This chapter describes installing the LSI8751SPE into PCI computer systems and includes these topics:

2.1 Quick Installation Procedure

This section is provided for the experienced computer user with prior host adapter installation and SCSI bus setup experience. If you prefer more detailed guidance in installing the LSI8751SPE, please follow the instructions in Section 2.2, “Detailed Installation Procedure.”

For safe and proper installation, check the user’s manual supplied with your computer and perform the following steps.

Step 1. *Ground yourself* before removing this host adapter board. Remove the LSI8751SPE from the packing and check that it is not damaged. An example of this host adapter board is shown in Figure 2.1.

Step 2. Switch off and unplug the system.

Step 3. Remove the cabinet cover on your computer to access the PCI slots.

Caution: *Ground yourself* by touching a metal surface before handling boards. Static charges on your body can damage electronic components. Handle plug-in boards by the edge; do not touch board components or gold connector contacts. The use of a static ground strap is recommended.

Step 4. Locate the slots for installing a PCI plug-in board. The LSI8751SPE requires a PCI slot that allows bus master operation. See Figure 2.2.

Step 5. Remove the blank bracket panel on the back of the computer aligned with the PCI slot you intend to use. Save the bracket screw.

Step 6. Carefully insert edge connector J1 of the host adapter into the PCI slot. Make sure the edge connector is properly aligned before pressing the board into place. See Figure 2.2.

Note: You may notice that the components on a PCI host adapter face the opposite way from non-PCI adapter boards you have in your system. This is correct, and the board is keyed to go in only one way.

Step 7. The bracket around the connector J3 (see Figure 2.1) should fit where the blank bracket panel was removed. Secure the bracket with the bracket screw before making the internal and external SCSI bus connections.

Step 8. If you are connecting any internal SCSI devices, plug a 68-pin connector on the *end* of the internal SCSI ribbon cable into connector J2 for Wide SCSI, or a 50-pin connector into connector J4 for an 8-bit SCSI (see Figure 2.1). Make certain to match pin 1 on all internal connectors.

Note: It is possible to use both internal connectors if no external devices are attached to the host adapter. You may use only two of the three connectors at once.

Step 9. Connect the LED cable if desired. This is designed to drive the front panel LED found on most PC cabinets to indicate activity on the SCSI bus.

Step 10. Replace the cabinet cover as described in the user's manual for your computer.

Step 11. Make all external SCSI bus connections. Finally, refer to the *PCI Storage Device Management System SDMS 4.0 User's Guide* (or the guide for the software you will use) to load the driver software for your particular operating system.

Remember: The SCSI bus requires proper termination, and no duplicate SCSI IDs.

2.2 Detailed Installation Procedure

This section provides step-by-step instructions for installing the LSI8751SPE, and connecting it to your SCSI peripherals. If you are experienced in these tasks, you may prefer to use the preceding Section 2.1, "Quick Installation Procedure." If you are not confident you can perform the tasks as described here, LSI Logic suggests getting assistance.

2.2.1 Before You Start

Before starting, look through the following task list to get an overall idea of the steps to perform.

- Open your PC cabinet and select an open PCI slot
- Insert the host adapter board
- Connect the internal and external SCSI peripherals
- Terminate the SCSI bus
- Set the SCSI IDs
- Make any configuration changes
- Close your PC cabinet
- Install the software

The SCSI host adapter acts on your computer's behalf as the host to your suite of SCSI peripherals. Each chain of SCSI peripheral devices and their host adapter work together, and are referred to as a SCSI bus.

Each SCSI host adapter that you install can act as host for up to 15 peripheral devices (depending on Ultra speeds), not including the adapter itself.

2.2.2 Inserting the Host Adapter

For safe and proper installation, check the user's manual supplied with your computer and perform the following steps.

Step 1. *Ground yourself* before removing this host adapter board. Remove the LSI8751SPE from the packing and check that it is not damaged. An example of this host adapter board is shown in Figure 2.1.

Step 2. Switch off and unplug power cords for all components in your system.

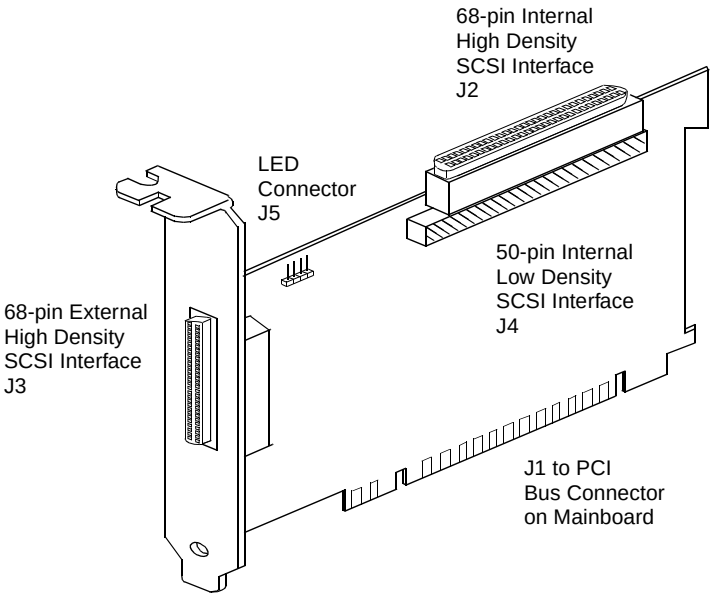
Step 3. Remove the cabinet cover from your computer to access the PCI slots.

Caution: *Ground yourself* by touching a metal surface before removing the cabinet top. Static charges on your body can damage electronic components. Handle plug-in boards by the edge; do not touch board components or gold connector contacts. The use of a static ground strap is recommended.

Step 4. Locate the slots for PCI plug-in board installation. Refer to the user's manual for your computer to confirm the location of the PCI slots. The LSI8751SPE requires a PCI slot that allows bus master operation.

Step 5. Remove the blank bracket panel on the back of the computer aligned with the PCI slot you intend to use. Save the bracket screw.

Figure 2.1 Hardware Connections for the LSI8751SPE

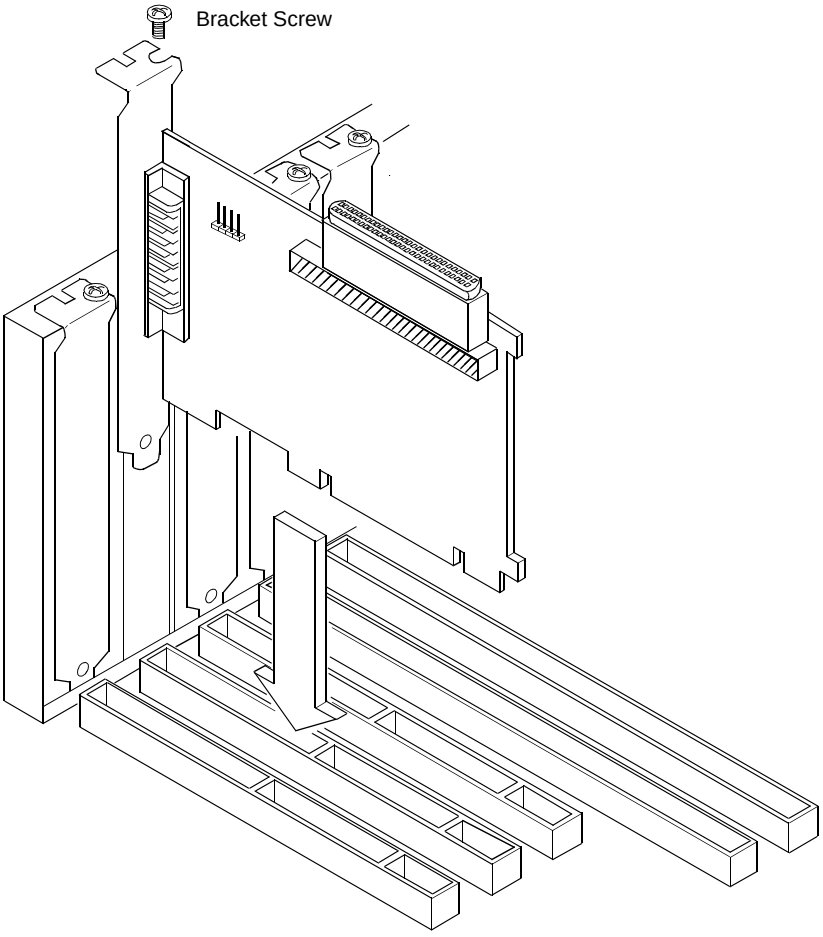


WARNING: Never use more than two SCSI interface connectors simultaneously

Step 6. Carefully insert the edge connector J1 (see Figure 2.1) of the host adapter into the PCI slot. Make sure the edge connector is properly aligned before pressing the board into place as shown in Figure 2.2.

You may notice that the components on the PCI host adapter face the opposite way from non-PCI adapter boards you have in your system. This is correct, and the board is keyed to go in only one way.

Figure 2.2 Inserting the Host Adapter



Step 7. The bracket around the connector J3 (see Figure 2.1) should fit where you removed the blank panel. Secure it with the bracket screw (see Figure 2.2) before making the internal and external SCSI bus connections.

2.2.3 Connecting the SCSI Peripherals

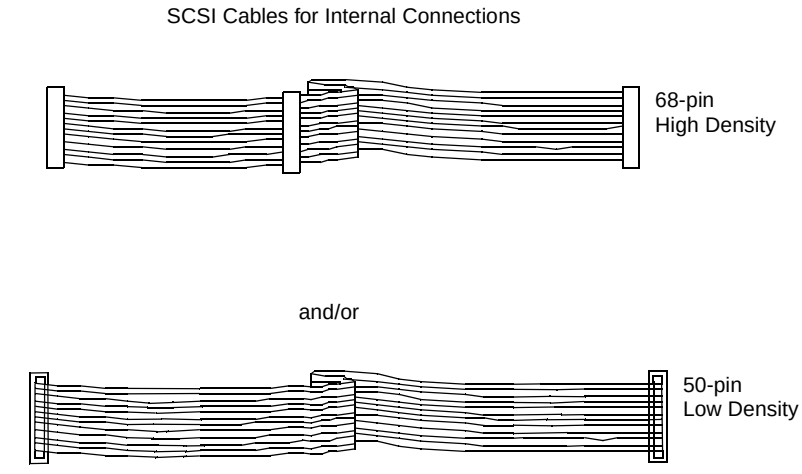
SCSI bus connections to the LSI8751SPE inside your computer are made with an unshielded, 68- or 50-conductor ribbon cable (see Figure 2.3). One edge of this cable is marked with a color to indicate the pin-1 side. Sometimes the connectors on this cable are keyed to ensure proper pin-1 connection.

All external SCSI bus connections to the LSI8751SPE are made with high quality shielded 68-conductor cables (see Figure 2.3). The connectors on this cable are always keyed to ensure proper pin-1 connection.

You can connect up to eight SCSI, Fast SCSI, and Ultra SCSI devices on a SE Ultra SCSI bus only if they are evenly spaced on a 1.5-meter Ultra SCSI cable (0.19 m between devices).

You can connect up to four Ultra devices if they are evenly spaced on a 3-meter Ultra SCSI cable (0.75 m between devices). Your SE SCSI bus should not exceed 3 meters (total internal and external cable lengths), even with fewer than four devices.

Figure 2.3 SCSI Cables

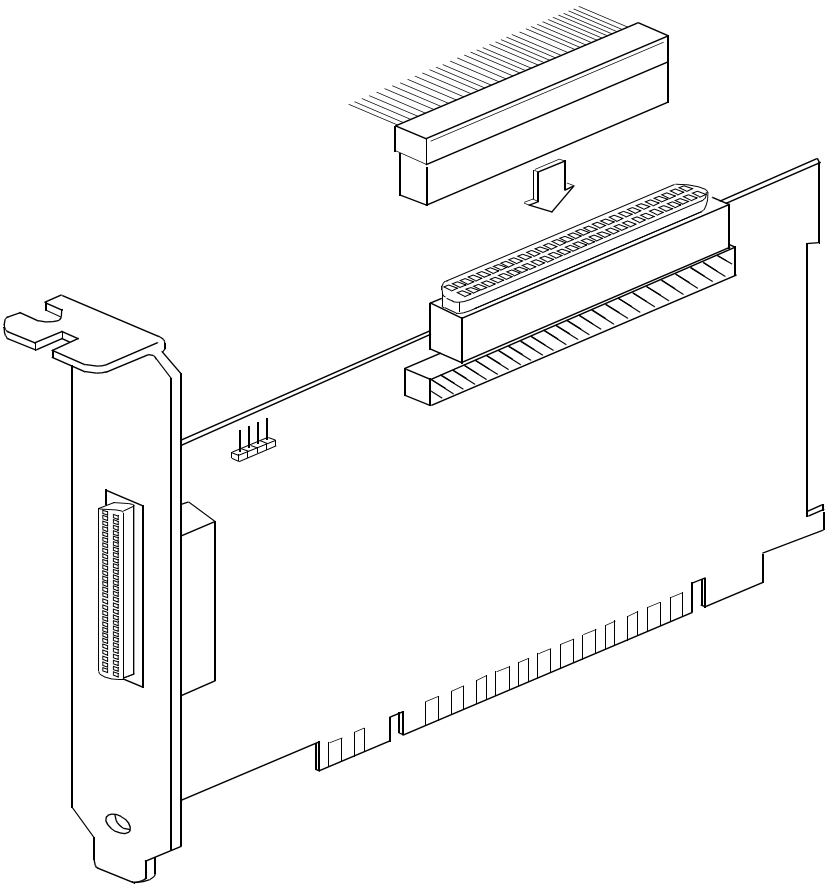


2.2.4 Making Internal SCSI Bus Connections

This section provides step-by-step instructions about making internal SCSI bus connections.

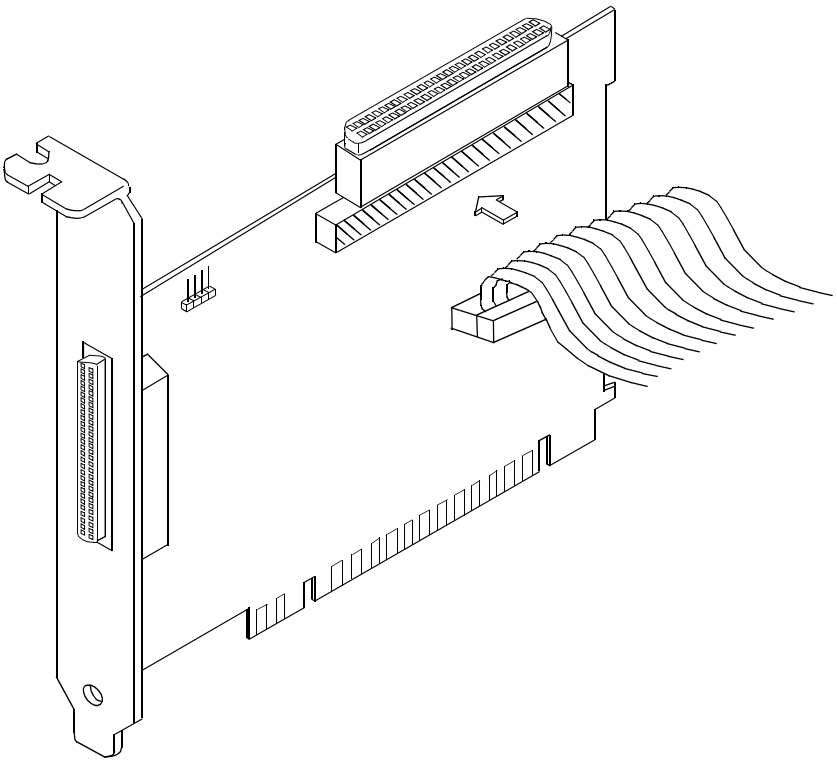
Step 1. To connect an internal Wide SCSI device, plug the 68-pin connector on one *end* of a wide internal SCSI ribbon cable into the connector J2 (see Figure 2.4).

Figure 2.4 Internal Wide SCSI Ribbon Cable to Host Adapter



Step 2. To connect an 8-bit internal SCSI device, plug the 50-pin connector on one end of an 8-bit internal SCSI ribbon cable into the connector J4 (see Figure 2.5). Make certain to match pin 1 on both connectors.

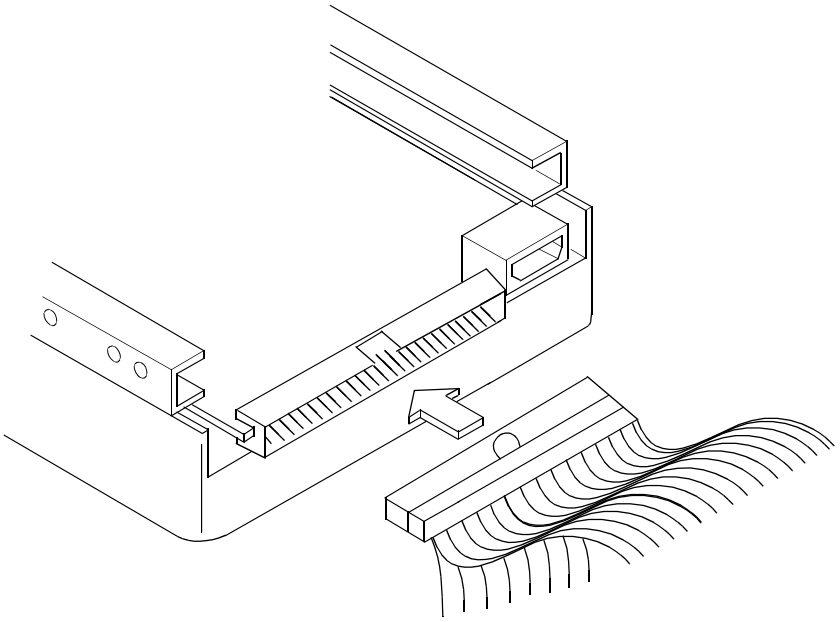
Figure 2.5 Internal SCSI Ribbon Cable to Host Adapter Connection



Step 3. Plug the 68- or 50-pin connector on the other end of the internal SCSI ribbon cable into the SCSI connector on your internal SCSI device.

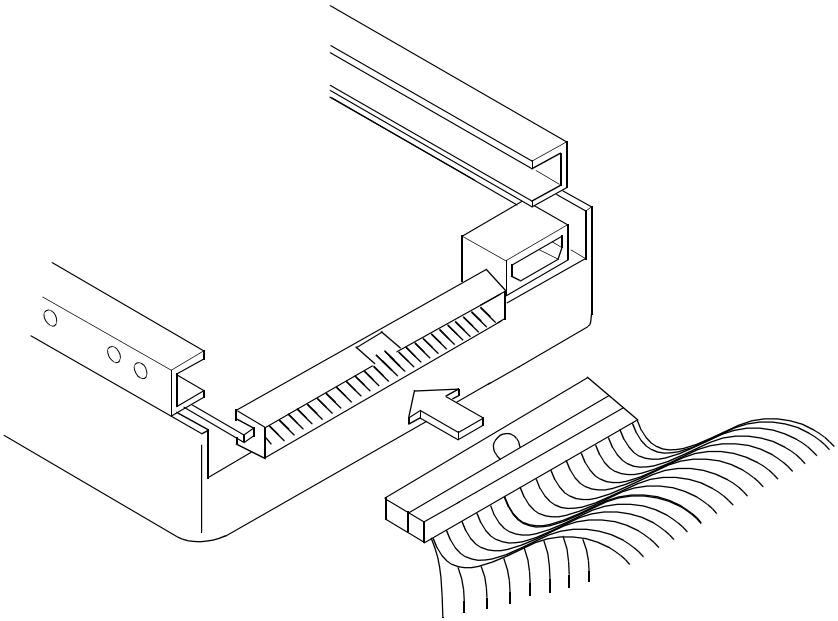
An example of this connection is shown in Figure 2.6. You must match pin 1 on all connections.

Figure 2.6 Internal SCSI Ribbon Cable to Internal SCSI Device Connection



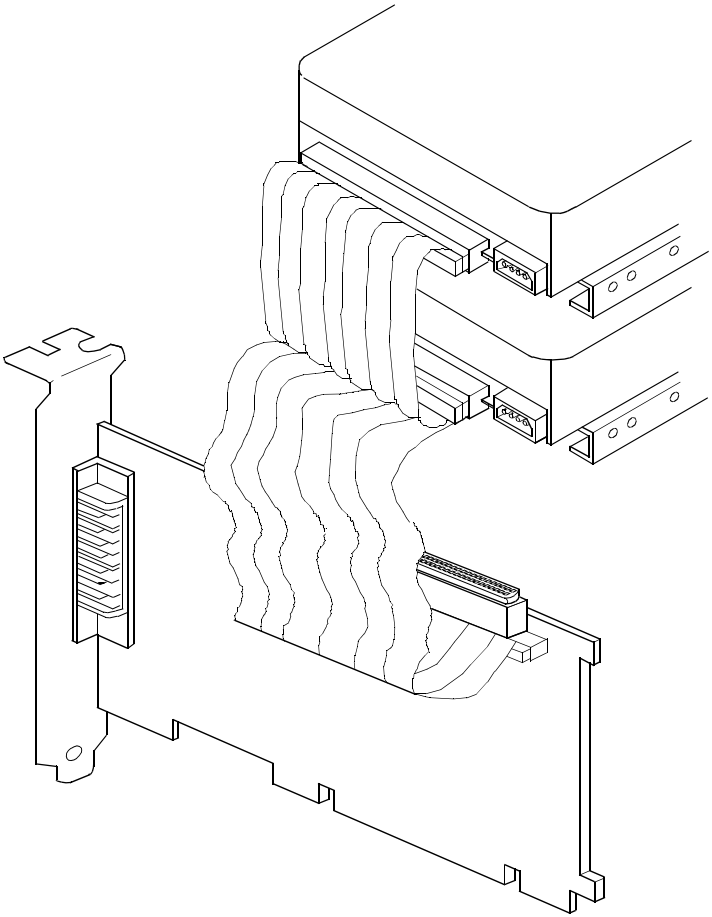
Step 4. Additional internal SCSI devices are plugged in by using an internal SCSI ribbon cable with the required number of connectors attached along its length as shown in Figure 2.7.

Figure 2.7 Connecting Additional Internal SCSI Device



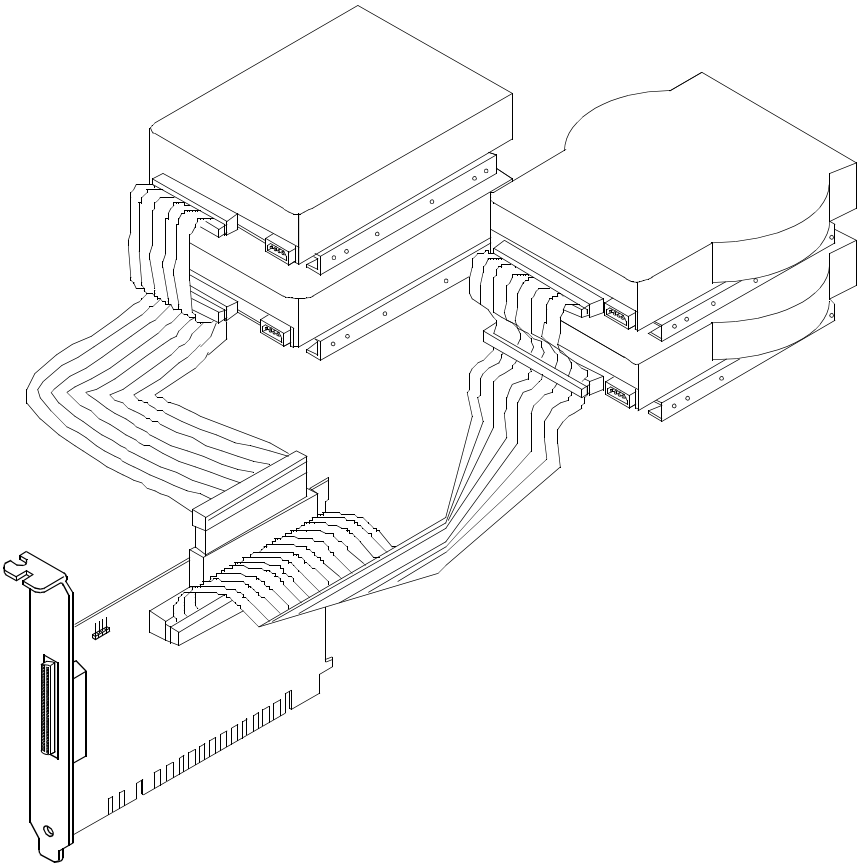
An example of this type of chained connection is shown in Figure 2.8. Make sure to match pin 1 on all connections.

Figure 2.8 Multiple Internal SCSI Devices Chained Together



Step 5. It is also possible to use both internal connectors (J2 and J4) if you do not attach any external devices to connector J3. An example of this configuration is shown in Figure 2.9.

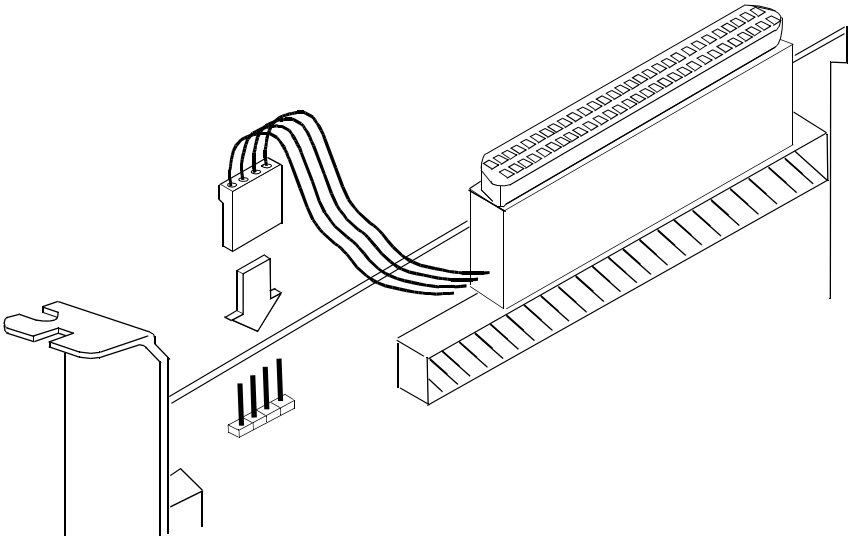
Figure 2.9 Using Both Internal Connectors



Step 6. Most PC cabinets are designed with a front panel LED. You may connect the LED cable to connector J5 on the host adapter, as shown in Figure 2.10. This causes the front panel LED to indicate activity on the SCSI bus.

Connector J5 is not keyed. The orientation of the LED cable does not matter as long as all four pins are connected.

Figure 2.10 SCSI LED Connector



Some LED cables have only two wires. In this case, place the connector on one end or the other of J5. If the LED does not light during SCSI bus activity from this host adapter, you may have to rotate the LED cable 180° on J5.

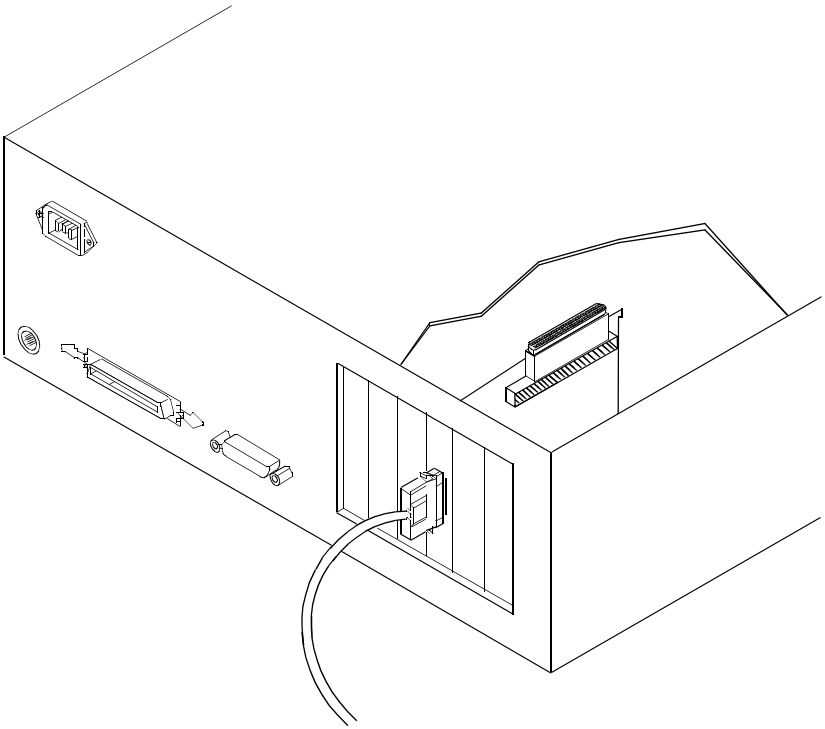
2.2.5 Making External SCSI Bus Connections

This section provides step-by-step instructions about making external SCSI bus connections.

Step 1. To connect external SCSI devices to the LSI8751SPE, plug the 68-pin connector on one end of a shielded external SCSI cable (see Figure 2.3) into the host adapter connector J3 (see Figure 2.1).

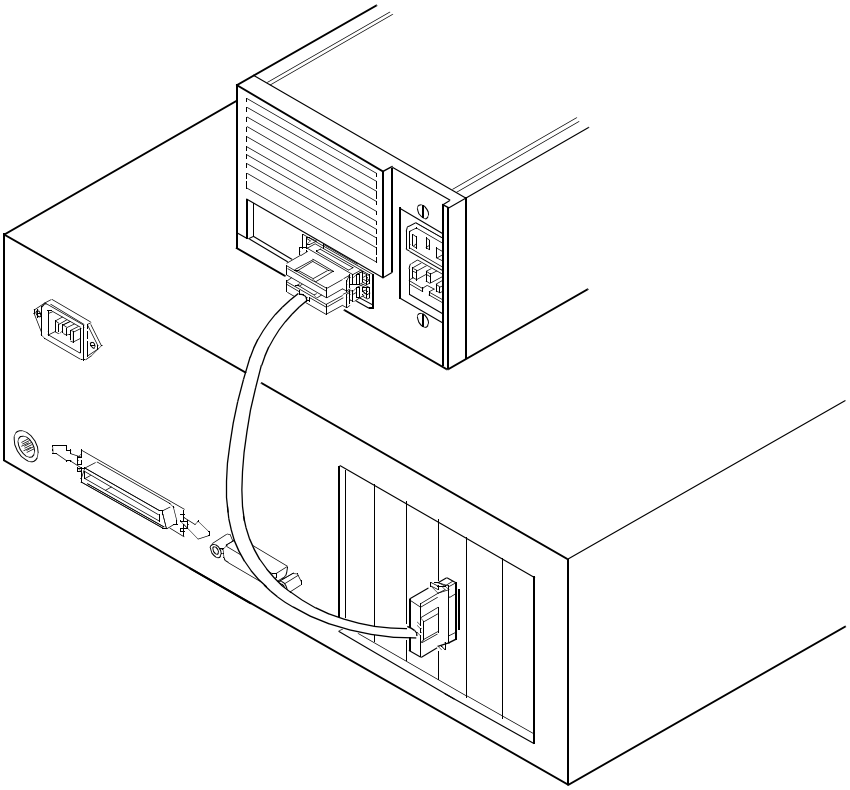
This connector is in the bracket attached to the back panel of your computer. Figure 2.11 shows how this connection is made.

Figure 2.11 External Cable to Host Adapter



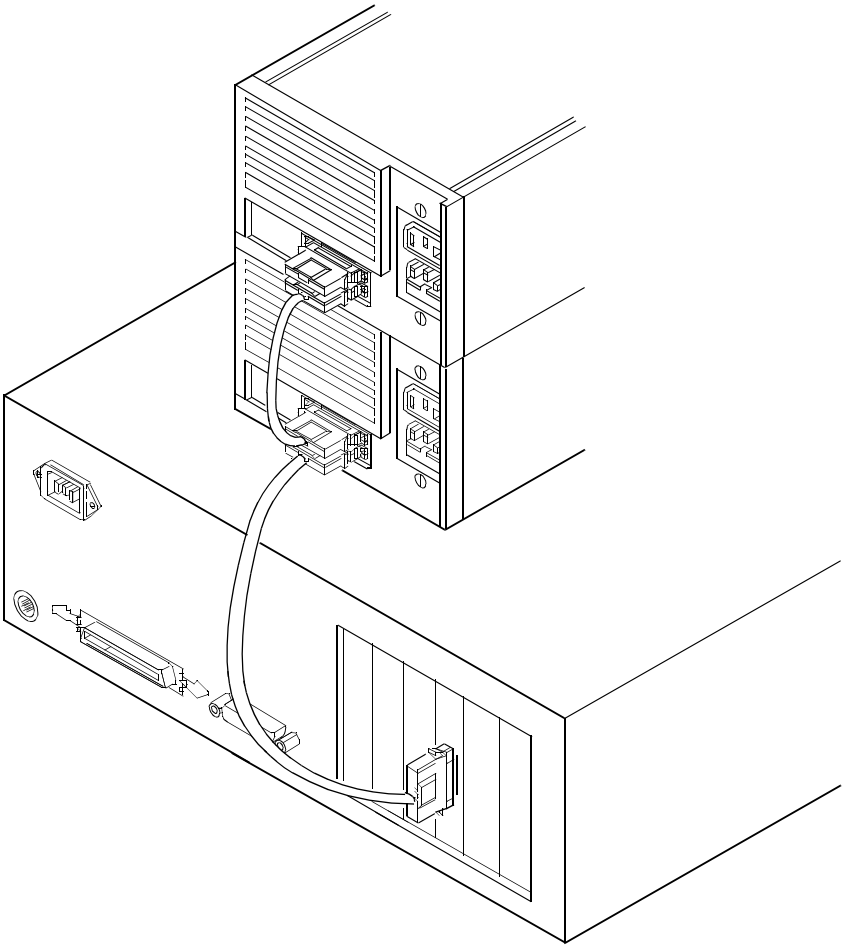
Step 2. Plug the 68-pin connector on the other end of the shielded external SCSI cable into the SCSI connector on your external SCSI device. An example of this connection is shown in Figure 2.12.

Figure 2.12 External Cable to External SCSI Device



Step 3. To connect more than one external SCSI device to the host adapter, you must chain them together with shielded external SCSI cables. An example of these chained connections is shown in Figure 2.13.

Figure 2.13 Multiple External SCSI Devices Chained Together



2.2.6 SCSI Bus Termination

The devices making up the SCSI bus are connected serially (chained together) with SCSI cables. The first and last physical SCSI devices connected on the ends of the SCSI bus must have their terminators active. All other SCSI devices on the bus must have their terminators removed or disabled. Remember that the LSI8751SPE is also on the SCSI bus—its termination is automatically enabled when it is connected to the end of the bus.

The peripheral device terminators are usually set with jumpers, resistor modules, or with a switch on the peripheral. Refer to the peripheral manufacturer's instructions and to the user's manual for your computer for information on how to identify the terminator setting of each device and how to change it.

Caution: The autoenable/disable sensing feature on the LSI8751SPE may enable termination erroneously if it is directly cabled to another SCSI device or host adapter using the same sensing method. The LSI8751SPE senses the presence of SCSI devices by detecting the ground signal on conductor 22 of a 50-conductor SCSI cable, or conductor 50 of a 68-conductor SCSI cable.

The LSI8751SPE has two shunts on the host adapter board:

- A two position shunt labelled LOWER is used for termination control of the terminator, which has the lower data bits 0–7 and the control lines.
- A 3-pin shunt labelled UPPER is used for controlling the terminator, which has the upper data bits 8–15.

The termination may be controlled manually by turning the terminators off or leaving the upper terminator on. To turn off UPPER or LOWER termination, remove its shunts from the host adapter board. To leave the upper termination on at all times, move the UPPER shunt from the pins with the inked box (left most and center) to the right (center and right most pins).

The LSI8751SPE automatically controls SCSI bus termination for four different bus configurations, depending on the use of connectors J2, J3, and J4 on the host adapter (see Figure 2.1). The shunts (UPPER and LOWER) are to remain in the box for automatic termination control. The four bus configurations are:

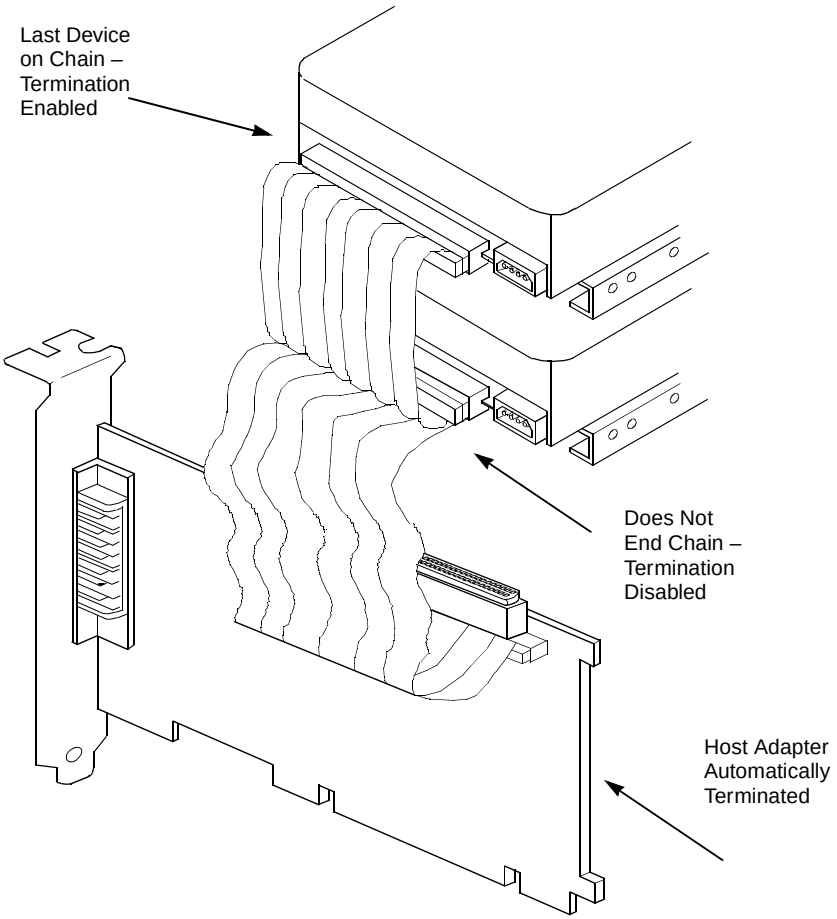
- Only internal SCSI connections,
- Only external SCSI connections,
- Internal and external SCSI connections, and
- Connections to both internal connectors.

2.2.7 Internal SCSI Connections

If only internal SCSI device connections to the host adapter have been made, terminate the last internal device on the SCSI bus. You must disable the termination on all other devices. Termination on the host adapter is automatically enabled in this case.

Figure 2.14 shows an example of how termination is determined for this SCSI bus configuration.

Figure 2.14 Internal SCSI Device Termination

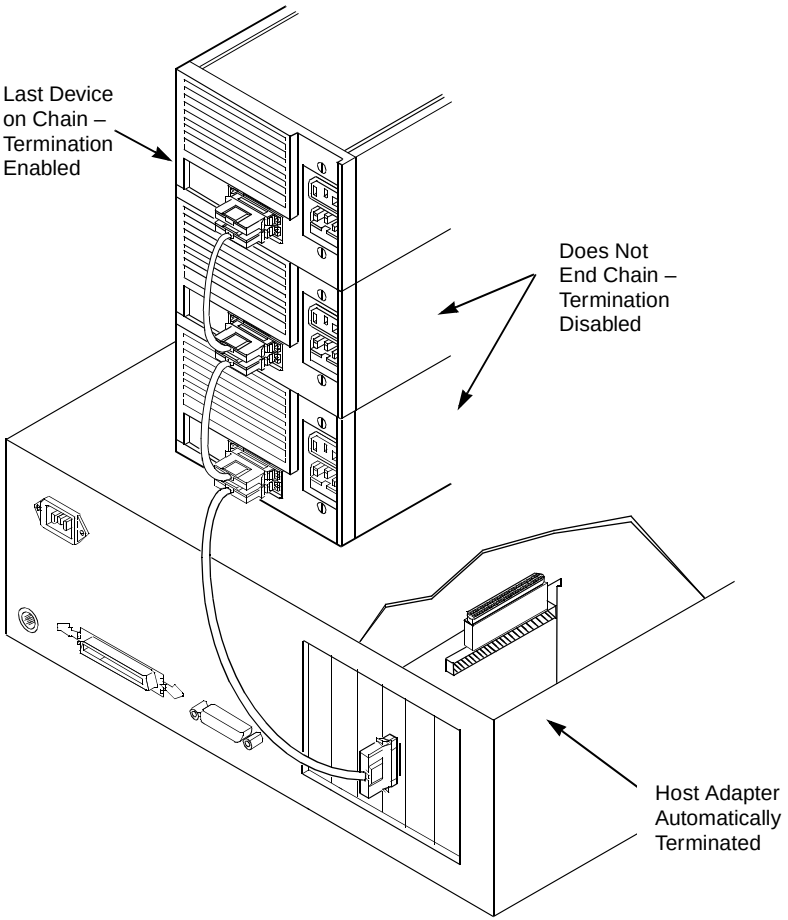


2.2.8 External SCSI Connections

If only external SCSI device connections to the host adapter have been made, then terminate the last external device on the SCSI bus. You must disable the terminators on all other devices. Termination on the host adapter is automatically enabled in this case.

Figure 2.15 shows an example of how termination is determined for this SCSI bus configuration.

Figure 2.15 External SCSI Device Termination

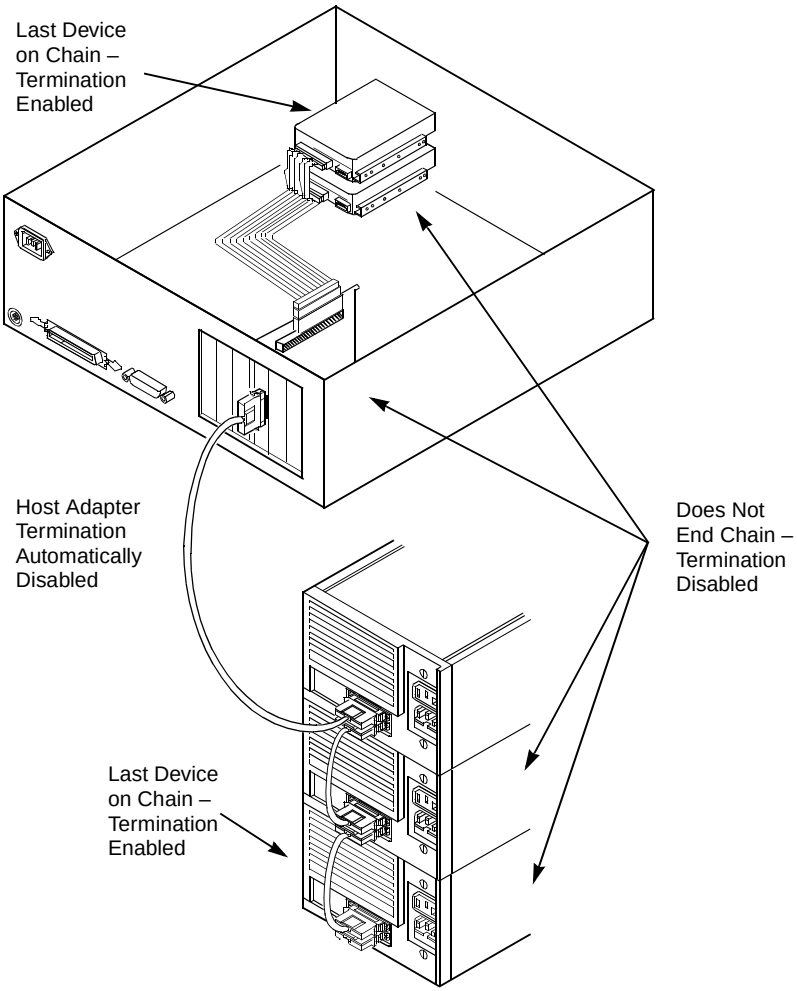


2.2.9 Internal and External SCSI Connections

If internal and external SCSI device connections to the host adapter have been made, then terminate the last internal and external devices on the SCSI bus. You must disable the termination on all other devices. Termination on the host adapter is automatically disabled in this case.

Figure 2.16 shows an example of how termination is determined for this SCSI bus configuration.

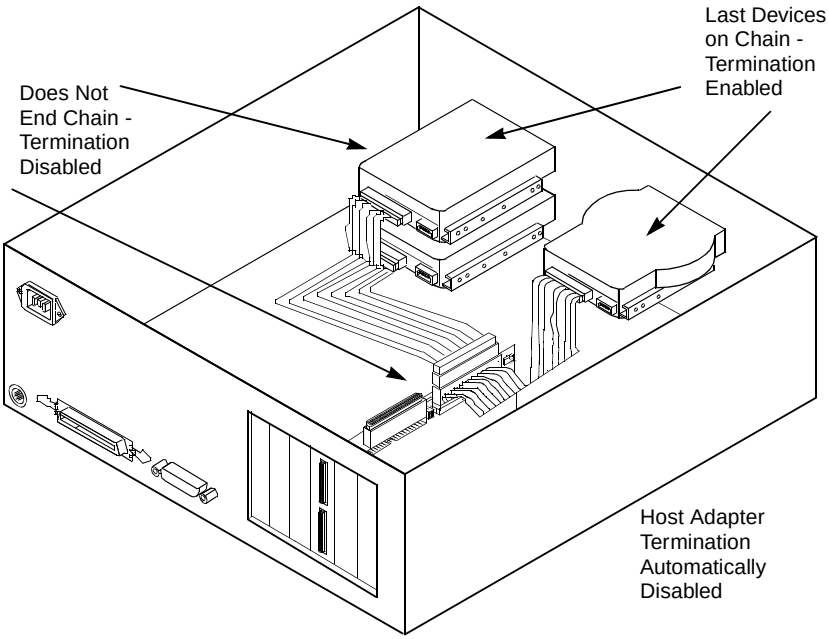
Figure 2.16 Internal and External SCSI Device Termination



If internal SCSI device connections to both internal connectors (J2 and J4) on the host adapter have been made, then terminate the internal devices on each end of the SCSI bus. You must disable the termination on all other devices. Termination on the host adapter is automatically disabled in this case. Remember, you must not use the external connector J3 if you use both internal connectors.

Figure 2.17 shows an example of how termination is determined for this SCSI bus configuration.

Figure 2.17 Internal and Internal SCSI Device Termination



2.2.10 Setting SCSI IDs

Each SCSI device and the host adapter must have a separate SCSI ID, 0–15 for a 16-bit SCSI or 0–7 for an 8-bit SCSI. SCSI ID 7 is the preset host adapter setting, giving it the highest priority on the SCSI bus. If you plan to boot your computer from a SCSI hard disk drive on the SCSI bus, that drive should have SCSI ID 0. Chapter 3, "Configuring the LSI8751SPE," explains how to set the host adapter ID using the LSI Logic SCSI BIOS Configuration Utility.

The peripheral device SCSI IDs are usually set with jumpers or with a switch on the peripheral. Refer to the peripheral manufacturer's instructions and to the user's manual for your computer to determine the ID of each device and how to change it. You must have no duplication of SCSI IDs on a SCSI bus.

Step 1. Determine the SCSI ID of each device on the SCSI bus. Note any duplications.

Step 2. Make any necessary changes to the SCSI IDs to eliminate duplicates and record the IDs for future reference. Table 2.1 is provided as a place to keep this record.

Table 2.1 SCSI ID Record

SCSI ID	SCSI Device
15	
14	
13	
12	
11	
10	
9	
8	
7	LSI8751SPE (default)
6	
5	
4	
3	
2	
1	
0	

2.3 Completing the Installation

Before replacing the cover on your computer, review this installation procedure check list. This can save you effort later.

Verify Installation Procedures	Done
Host adapter connection in PCI bus slot secure	
Internal SCSI bus connections secure (pin-1 continuity)	
External SCSI bus connections secure	
Proper SCSI bus termination established	
Unique SCSI IDs set and recorded for each device	

Step 1. Replace the cabinet cover on your computer.

Step 2. Plug in all power cords, and switch on power to all devices and your computer.

Step 3. Wait for your system to boot up.

Step 4. To change the configuration of the host adapter, see Chapter 3, "Configuring the LSI8751SPE." Finally, refer to the *PCI Storage Device Management System SDMS 4.0 User's Guide* (or the guide for the software you plan to use) to load the driver software for your particular operating system.

Chapter 3
Configuring the LSI8751SPE

This chapter describes configuring the LSI8751SPE and includes these topics:

3.1 When to Configure the LSI8751SPE

In most cases you should not need to change the default configuration of the host adapter. You may decide to alter these default values if there is a conflict between device settings, or if you need to optimize system performance.

Table 3.1 and Table 3.2 list the configuration settings you can change. The global settings affect the host adapter and all SCSI devices that are connected to it. The device settings affect only individual SCSI devices.

Table 3.1 Global Default Settings

Settings for the Host Adapter and All Devices	Default Settings
SCAM Support	Off[1]
Parity Checking	Enabled
Host Adapter SCSI ID	7
Scan Order	Low to High (0-Max)

1. Applies to BIOS version 4.09 and later.

Table 3.2 Device Default Settings

Settings for Individual SCSI Devices	Default Settings
Synchronous Transfer Rate (Mbytes/s)	40
Data Width	16
Disconnect	On
Read/Write I/O Time-out (seconds)	10
Scan for Devices at Boot Time	Yes
Scan for SCSI LUNs[1]	Yes
Queue Tags	Enabled

1. Logical Unit Number.

3.2 Starting the SCSI BIOS Configuration Utility

If you have LSI Logic SCSI BIOS Version 4.0, and it includes the LSI Logic SCSI BIOS Configuration Utility, you can change the default configuration of the SCSI host adapters. You may decide to alter these default values if there is a conflict between device settings or if you need to optimize system performance.

You can see the version number of your LSI Logic SCSI BIOS in a banner displayed on your computer monitor during boot. If the utility is available, the following message also appears on your monitor:

```
Press Ctrl-C to start LSI Logic Configuration Utility...
```

This message remains on your screen for about five seconds, giving you time to start the utility. If you decide to press “Ctrl-C,” the message changes to:

```
Please wait, invoking LSI Logic Configuration Utility...
```

After a brief pause, your computer monitor displays the Main Menu of the LSI Logic SCSI BIOS Configuration Utility.

To make changes with this menu driven utility, one or more LSI Logic SCSI host adapters must have NVRAM to store the changes.

Important: This utility is a powerful tool. If, while using it, you somehow disable all of your controllers, pressing Ctrl-A (or Ctrl-E on version 4.04 or later) after memory initialization during reboot allows you to re-enable and reconfigure.

Note: Not all devices detected by the Configuration Utility can be controlled by the BIOS. Devices such as tape drives and scanners require that a device driver specific to that peripheral be loaded. This device driver is provided by the device manufacturer.

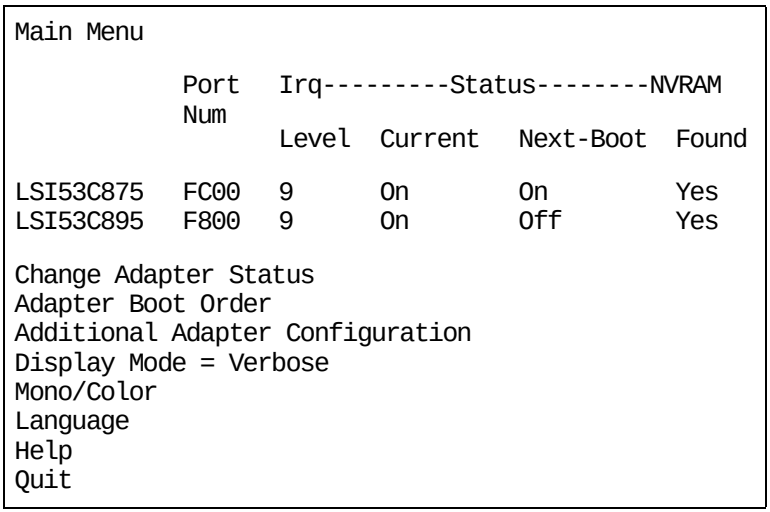
3.2.1 Configuration Utility Main Menu

When you start the LSI Logic SCSI BIOS Configuration Utility, the Main Menu appears. This menu displays a list of up to four LSI Logic PCI to SCSI host adapters and information about each of them. To select an adapter, use only the arrow keys and enter key. Then, you can view and/or change the current settings for that adapter and the SCSI devices attached to it.

You can select an adapter only if Current Status is “On”. Changes are possible since NVRAM is present on this adapter.

Figure 3.1 is an example of the Main Menu:

Figure 3.1 Main Menu



Below the list of host adapters on the Main Menu display, you see eight options. They are described in detail below. If these settings are altered, the system reboots upon exit from the Configuration Utility by using the Quit option.

3.2.1.1 Change Adapter Status

Change Adapter Status allows the user to activate or deactivate a host adapter and all SCSI devices attached to it. When this option is used to make a change, the change takes place after a reboot upon exit from the utility. Figure 3.2 is an example of the Change Status on Next Boot menu:

Figure 3.2 Change Status on Next Boot Menu

```
Main Menu

Change Status on Next Boot:

            Port   Irq---------Status--------NVRAM
            Num
                   Level  Current   Next-Boot  Found

LSI53C875   FC00   9      On        On         Yes
LSI53C895   F800   9      On        Off        Yes
```

To change an adapter's status, select it and press Enter. Then press the Escape (Esc) key to exit from this menu.

3.2.1.2 Adapter Boot Order

Adapter Boot Order allows the user to set the order in which host adapters will boot when you have more than one LSI Logic host adapter in your system. When this option is selected, the Boot Order menu appears. Figure 3.3 is an example of the Boot Order menu:

Figure 3.3 Boot Order Menu

```
 Main Menu

 BootSeq     Bus  DevFunc  BootSeq            Bus  DevFunc

0 LSI53C860  00   A0       1        LSI53C895  00   98

2 LSI53C875  00   90
```

To change an adapter's boot order, select it and press Enter. You are then prompted to enter the new boot sequence number. To remove an adapter's boot order, press Enter again rather than entering a new sequence number. While the maximum capacity is 32 adapters, only 0 through 3 can be assigned a boot order. If an invalid number is entered, an error message appears. When the adapters are ordered as desired, press the Escape (Esc) key to exit from this menu.

3.2.1.3 Additional Adapter Configuration

Additional Adapter Configuration allows the user to configure an adapter that is not assigned a boot order. When this option is selected, the Adapter Configuration menu (as shown in Figure 3.4) appears:

Figure 3.4 Adapter Configuration Menu

```
 Main Menu
 BootSeq      Bus  DevFunc  BootSeq            Bus  DevFunc
1  LSI53C875  00   A0       0        LSI53C895  00   98
   LSI53C860
```

Highlight the adapter to be configured and press Enter. The message `Resetting Adapter, Please Wait` appears, and then the system scans for devices. Finally, the Utilities menu appears and lists the available options, which are described below.

3.2.1.4 Display Mode

Display Mode determines how much information about the host adapters and SCSI devices appear on your computer monitor during boot. For more complete information, choose the verbose setting. For a faster boot, choose the terse setting.

3.2.1.5 Mono/Color

Mono/Color allows the user to choose between a monochrome or color display for the SCSI BIOS Configuration Utility. If needed, choose the mono setting to get a more readable screen on a monochrome monitor.

3.2.1.6 Language

If enabled, the Language option allows the user to select from five languages for the Configuration Utility: English, German, French, Italian, and Spanish. Call for support if you have any additional questions.

3.2.1.7 Help

The Help option displays a help screen with information about the Main Menu.

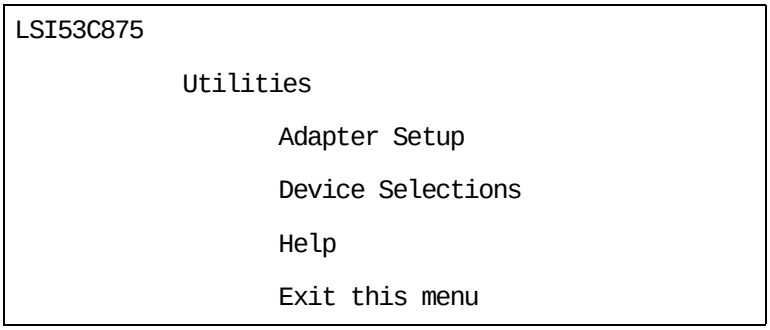
3.2.1.8 Quit

The Quit option allows exiting from the SCSI BIOS Configuration Utility when the Main Menu is displayed.

3.2.2 Utilities Menu

When you select a host adapter on the Main menu, the Utilities menu appears. Figure 3.5 is an example of the Utilities menu:

Figure 3.5 Utilities Menu



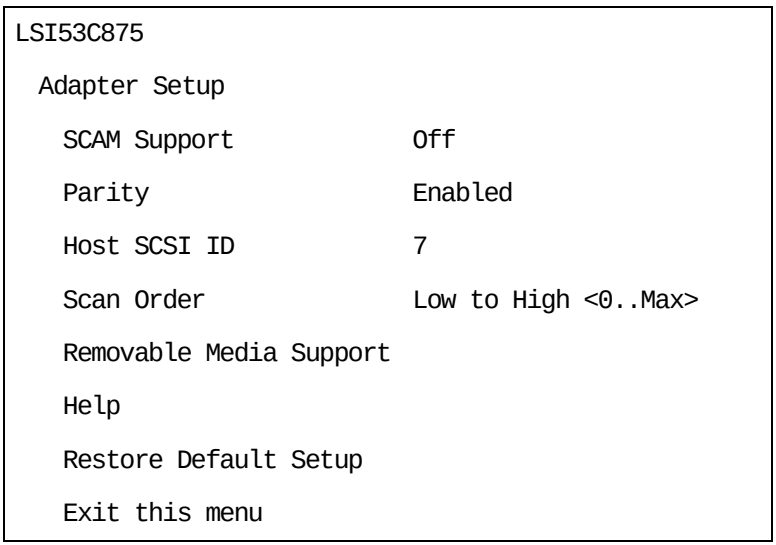
Choose Adapter Setup to view and change the selected adapter settings. Choose Device Selections to view and change settings for the devices attached to the selected adapter.

You are returned to this menu after making changes to the configuration of any host adapter or connected SCSI device. Before you exit this menu, you are prompted to save or cancel any changes.

3.2.2.1 Adapter Setup Menu

When you select Adapter Setup, the corresponding menu appears. Figure 3.6 is an example of the Adapter Setup menu:

Figure 3.6 Adapter Setup Menu



The settings in this menu are global settings that affect the selected host adapter and all SCSI devices attached to it.

SCAM Support – The LSI Logic BIOS Version 4.0 and above support the SCSI Plug and Play protocol called SCAM. SCAM support by default is off in versions 4.09 and later. You may choose to turn this on.

Parity – The LSI Logic PCI to SCSI host adapters always generate parity, but some older SCSI devices do not. Therefore, you are offered the option of disabling parity checking.

> Note: When disabling parity checking, it is also necessary to disable disconnects for all devices, as parity checking for the reselection phase is not disabled. If a device does not generate parity, and it disconnects, the I/O never completes because the reselection never completes.

Host SCSI ID – This option refers to the host adapter's SCSI ID, which is a unique number used to identify the device on the SCSI bus.

Note: In general, it is suggested that you do not change your host adapter ID from the default value of 7, as this gives it the highest priority on the SCSI bus.

Scan Order – This option allows the user to tell the SCSI BIOS and device drivers to scan the SCSI bus from low to high (0 to max) SCSI ID, or from high to low (max to 0) SCSI ID. If you have more than one device on the SCSI bus, changing the scan order changes the order in which drive letters are assigned by the system. Drive order may be reassigned differently in systems supporting the BIOS Boot Specification (BBS).

See the *PCI Storage Device Management System SDMS 4.0 User's Guide*, Chapter 2 "SCSI BIOS" for additional information regarding BBS.

Note: The scan order option may conflict with operating systems that automatically assign a drive order.

Removable Media Support – This option defines the removable media support for a specific drive. When this option is selected, a window appears with three choices:

- None
- Boot Drive Only
- With Media Installed

None indicates there is no removable media support whether the drive is selected in BBS as being first, or first in scan order in non-BBS.

Boot Drive Only provides removable media support for a removable drive if it is first in the scan order.

With Media Installed provides removable media support wherever the drive(s) actually resides.

One of these choices can be selected by highlighting it and pressing Enter.

Help – This option displays a help screen with information about the current menu.

Restore Default Setup – This option resets all device selections back to their optimal settings. Select this option to restore all manufacturing defaults for the specified adapter. Note that all user customized options will be lost upon saving after restoring default setup.

Exit this menu – This option allows the user to leave the current menu screen and return to the previous screen.

3.2.2.2 Device Selections Menu

When you select the Device Selections option, the corresponding menu appears. Figure 3.7 is an example of the Device Selections menu:

Figure 3.7 Device Selections Menu

```
LSI53C875
Device Selections 0-7
             Sync  Data   Disc  Time  Scan          Queue
             Rate  Width        Out   Bus    LUNS   Tags
0-Dev0 N/A   80    16     On    10    Yes    Yes    Enabled
1-Dev1 N/A   80    16     On    10    Yes    Yes    Enabled
2-Dev2 N/A   80    16     On    10    Yes    Yes    Enabled
3-Dev3 N/A   80    16     On    10    Yes    Yes    Enabled
4-Dev4 N/A   80    16     On    10    Yes    Yes    Enabled
5-Dev5 N/A   80    16     On    10    Yes    Yes    Enabled
6-Dev6 N/A   80    16     On    10    Yes    Yes    Enabled
LSI53C895
Device Selections 8-15
Help
Exit this menu
```

The settings in this menu affect individual SCSI devices attached to the selected host adapter. Changes made from this menu do not cause the system to reboot upon exit from the SCSI BIOS Configuration Utility.

Sync Rate (Mbytes/s) – This option defines the maximum data transfer rate the host adapter will attempt to negotiate. The host adapter and a SCSI device must agree to a rate they can both handle.

Width (bits) – This option defines the maximum SCSI data width the host adapter will attempt to negotiate. The host adapter and a SCSI device must agree to a width they can both handle. Only host adapters that can do 16-bit data transfers have this option enabled.

Disconnect – SCSI devices have the ability to disconnect from the initiator during an I/O transfer. This disconnect option frees the SCSI Bus to allow other I/O processes. This option tells the host adapter whether or not to allow a device to disconnect. Some devices run faster with disconnects enabled (typically newer devices), while some run faster with disconnects disabled (typically older devices).

Read/Write I/O Time-out (seconds) – This option sets the amount of time the host adapter waits for a read, write, or seek command to complete before trying the I/O transfer again. Since this provides a safeguard allowing the system to recover if an I/O operation fails, it is recommended that you always set the time-out to a value greater than zero.

Note: If the time-out is set to zero, then the I/O will never time-out.

Scan for Device at Boot Time – Set this option to No when there is a device you do not want to be available to the system. Also, on a bus with only a few devices attached, you can speed up boot time by changing this setting to No for all unused SCSI IDs.

Scan for SCSI Logical Units (LUNs) – Set this option to No if you have problems with a device that responds to all LUNs whether they are occupied or not. For example, if there is a SCSI device with multiple LUNs but you do not want all of those LUNs to be available to the system, then set this option to No. This will limit the scan to LUN0 only.

Queue Tags – This option allows the user to enable or disable the issuing of queue tags during I/O requests when your device driver can do this.

3.3 Exiting the SCSI BIOS Configuration Utility

Since some changes only take effect after the system reboots, it is important that the user exit from this Configuration Utility properly. Return to the Main Menu and exit by using the Quit option.

Important: Rebooting the system without properly exiting from this utility may cause some changes to not take effect.

Appendix A
Technical Specifications

This section discusses the physical environment associated with the LSI8751SPE. It includes a mechanical drawing of this board, which is shown in Figure A.1. It also includes these topics:

A.1 Physical Environment

This section discusses the physical, electrical, thermal, and safety characteristics of the LSI8751SPE. Additionally, this board is compliant with electromagnetic standards set by the FCC.

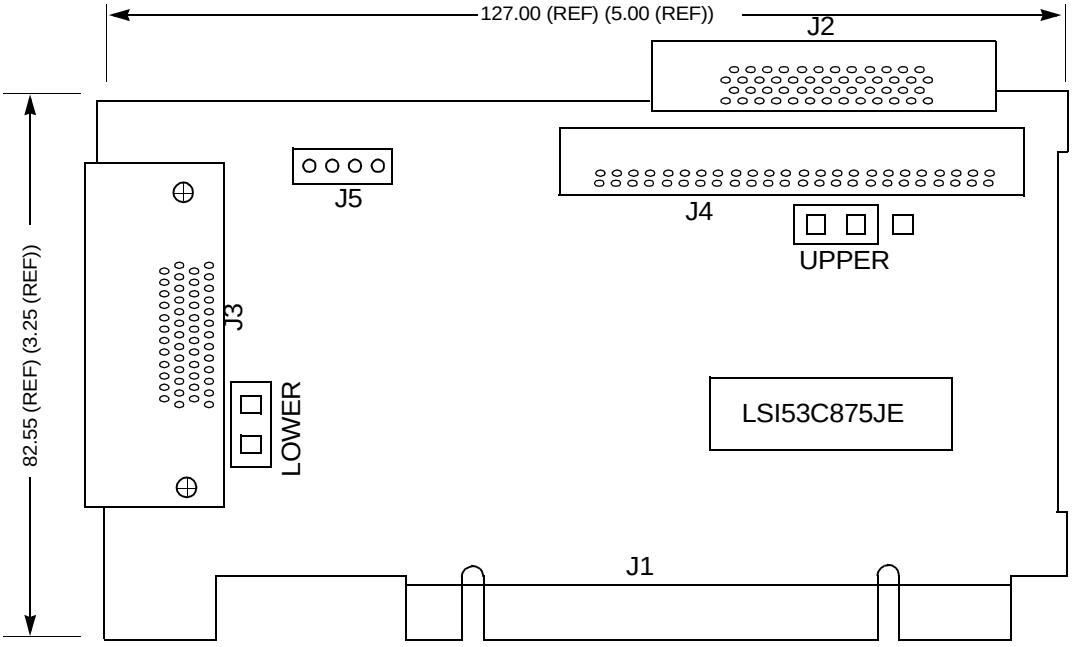
A.1.1 Physical Characteristics

The dimensions of the LSI8751SPE are 127 x 82.55 mm (5.00 x 3.25 inches). PCI connection is made through edge connector J1.

Internal 16-bit SCSI connection is made through the 68-pin high density connector J2. Internal 8-bit SCSI connection is made through the 50-pin low density connector J4. External SCSI connection is made through the 68-pin high density connector J3. The J3 connector extends external to the cabinet the LSI8751SPE is installed in through a bracket attached to the face of the connector. The bracket is a standard ISA type with a cutout to accommodate connector J3.

The J5 connector is used for the Busy LED connection using a 4-pin one row right angle header. The component height on the top and bottom of the board conform to the PCI Specification Revision 2.1.

Figure A.1 LSI8751SPE Mechanical Drawing



A.1.2 Electrical Characteristics

The LSI8751SPE maximum power requirements, including SCSI TERMPWR, under normal operation are as follows:

Table A.1 Maximum Power Requirements

+5 V DC	±5%	1.5 A	Over the operating range 5–55 °C
+3.3 V	±0.3 V	130 mA	Over the operating range 5–55 °C when operating in a 3.3 V PCI slot

Under abnormal conditions such as a short on SCSI TERMPWR, + 5 V current may be higher. At temperatures of at least 25 °C a current of 4 A will be sustained no longer than 30 seconds before the self-resetting TERMPWR short circuit protection device opens.

The PCI PRSNT1/ and PRSNT2/ pins are set to indicate a 7.5 W maximum configuration.

A.1.3 Thermal, Atmospheric Characteristics

The board is designed to operate in an environment defined by the following parameters:

- Temperature range: 5 °C to 55 °C (dry bulb)
- Relative humidity range: 5% to 90% noncondensing
- Maximum dew point temperature: 32 °C
- Storage specification: – 40 °C to + 85 °C with 0% to 95% RH noncondensing 10 °C

A.1.4 Electromagnetic Compliance

The board is designed and implemented so as to minimize electromagnetic emissions, susceptibility, and the effects of electromagnetic discharge. The board meets the requirements of FCC and CISPR Class B limits and is marked with the FCC and CE mark logos.

A.1.5 Safety Characteristics

The bare board meets or exceeds the requirements of UL flammability rating 94 V0. The bare board is also marked with the supplier's name or trademark, type, and UL flammability rating. Since this board is installed in a PCI bus slot, all voltages are below the SELV 42.4 V limit.

A.2 Operational Environment

The LSI8751SPE is designed for use in PCI computer systems with an ISA/EISA bracket type. The SDMS software operates the board, but the design of the board does not prevent the use of other software.

A.2.1 The PCI Interface

The PCI interface operates as a 32-bit DMA bus master. The connection is made through edge connector J1, which provides connections on both the top and bottom of the board. The signal definitions and pin numbers conform to the PCI Local Bus Specification Revision 2.1 standard. Table A.2 and Table A.3 show the signal assignments.

Note: The + 3.3 V pins are tied together and decoupled with high frequency bypass capacitors to ground. No current from these 3.3 V pins is used on the board. The PCI portion of the LSI53C875JE chip is powered from the 3 V/5 V pins.

Table A.2 PCI Connector J1 (Top)[1]

Signal Name	Pin	Signal Name	Pin	Signal Name	Pin
–12 V	1	GND	22	SERR/	42
TCK	2	AD27	23	+3.3 V	43
GND	3	AD25	24	C_BE1/	44
TDO	4	+3.3 V	25	AD14	45
+5 V	5	C_BE3/	26	GND	46
+5 V	6	AD23	27	AD12	47
INTB/	7	GND	28	AD10	48
INTD/	8	AD21	29	GND	49
GND (PRSNT1/)	9	AD19	30	KEYWAY	50
RESERVED	10	+3.3 V	31	KEYWAY	51
GND (PRSNT2/)	11	AD17	32	AD08	52
KEYWAY	12	C_BE2/	33	AD07	53
KEYWAY	13	GND	34	+3.3 V	54
RESERVED	14	IRDY/	35	AD05	55
GND	15	+3.3 V	36	AD03	56
CLK	16	DEVSEL/	37	GND	57
GND	17	GND	38	AD01	58
REQ/	18	LOCK/	39	3 V/5 V	59
3 V/5 V	19	PERR/	40	ACK64/	60
AD31	20	+3.3 V	41	+5 V	61
AD29	21			+5 V	62

1. Shaded signals are not connected.

Table A.3 PCI Connector J1 (Bottom)[1]

Signal Name	Pin	Signal Name	Pin	Signal Name	Pin
TRST/	1	AD28	22	GND	42
+12 V	2	AD26	23	PAR	43
TMS	3	GND	24	AD15	44
TDI	4	AD24	25	+3.3 V	45
+5 V	5	IDSEL	26	AD13	46
INTA/	6	+3.3 V	27	AD11	47
INTC/	7	AD22	28	GND	48
+5 V	8	AD20	29	AD09	49
RESERVED	9	GND	30	KEYWAY	50
3 V/5 V	10	AD18	31	KEYWAY	51
RESERVED	11	AD16	32	C_BE0/	52
KEYWAY	12	+3.3 V	33	+3.3 V	53
KEYWAY	13	FRAME/	34	AD06	54
RESERVED	14	GND	35	AD04	55
RST/	15	TRDY/	36	GND	56
3 V/5 V	16	GND	37	AD02	57
GNT/	17	STOP/	38	AD00	58
GND	18	+3.3 V	39	3 V/5 V	59
RESERVED	19	SDONE	40	REQ64/	60
AD30	20	SBO/	41	+5 V	61
+3.3 V	21			+5 V	62

1. Shaded signals are not connected.

A.2.2 The SCSI Interface

The SCSI interface operates as 16-bit, synchronous or asynchronous, SE, and supports SCSI-3 protocols and 16-bit arbitration. The interface is made through connectors J2, J3, and J4. Connector J2 is a 68-pin high density right angle receptacle used for internal connections (16-bit SCSI). Connector J3 is a 68-pin high density
right angle receptacle that protrudes through the back panel bracket. Connector J4 is a 50-pin low density shrouded header used for internal connections (8-bit SCSI).

Active SE SCSI termination is provided automatically. SCSI termination power is also supplied by the board. Table A.4 and Table A.5 show the signal assignments for J2, J3 and J4.

Note: You may use no more than two connectors at any one time.

Table A.4 SCSI Connectors J2 and J3

Signal Name	Pin	Signal Name	Pin	Signal Name	Pin
GND	1	GND	24	SD7/	47
GND	2	GND	25	SDP/	48
GND	3	GND	26	GND	49
GND	4	GND	27	CPRSNT_A-B/[1]	50
GND	5	GND	28	TERMPWR	51
GND	6	GND	29	TERMPWR	52
GND	7	GND	30	N/C	53
GND	8	GND	31	GND	54
GND	9	GND	32	SATN/	55
GND	10	GND	33	GND	56
GND	11	GND	34	SBSY/	57
GND	12	SD12/	35	SACK/	58
GND	13	SD13/	36	SRST/	59
GND	14	SD14/	37	SMSG/	60
GND	15	SD15/	38	SSEL/	61
GND	16	SDP1/	39	SC_D/	62
TERMPWR	17	SD0/	40	SREQ/	63
TERMPWR	18	SD1/	41	SI_O/	64
N/C	19	SD2/	42	SD8/	65
GND	20	SD3/	43	SD9/	66
GND	21	SD4/	44	SD10/	67
GND	22	SD5/	45	SD11/	68
GND	23	SD6/	46		

1. *CPRSNT_A/* (J2) and *CPRSNT_B/* (J3) are used to sense the connection of a standard SCSI device by sensing SCSI standard GND on this pin.

Table A.5 SCSI Connector J4

Signal Name	Pin	Signal Name	Pin
GND	1	SD0/	2
GND	3	SD1/	4
GND	5	SD2/	6
GND	7	SD3/	8
GND	9	SD4/	10
GND	11	SD5/	12
GND	13	SD6/	14
GND	15	SD7/	16
GND	17	SDP/	18
GND	19	GND	20
GND	21	CPRSNT_C/[1]	22
N/C	23	N/C	24
N/C	25	TERMPWR	26
N/C	27	N/C	28
GND	29	GND	30
GND	31	SATN/	32
GND	33	GND	34
GND	35	SBSY/	36
GND	37	SACK/	38
GND	39	SRST/	40
GND	41	SMSG/	42
GND	43	SSEL/	44
GND	45	SC_D/	46
GND	47	SREQ/	48
GND	49	SI_O/	50

1. *CPRSNT_C/* is used to sense the connection of a standard SCSI device by sensing SCSI standard GND on this pin.

A.2.3 The LED Interface

The LED interface on the LSI8751SPE is a four-wire arrangement that allows the user to connect an LED harness to the board. The LED+ line (maximum output low voltage 0.4 V and minimum output low current 16 mA) is pulled low to complete the circuit when a harness with an LED is attached. The connector on the LSI8751SPE is J5.

Table A.6 LED Connector J5

Signal Name	Pin
LED+	1
LED–	2
LED–	3
LED+	4

Appendix B
Glossary of Terms and Abbreviations

ASPI	Advanced SCSI Programming Interface. A specification for a common structured method of supporting SCSI peripherals. ASPI provides an interface between host adapters and SCSI device drivers.
Asynchronous Data Transfer	A method of transmission which does not require a common clock, but separates fields of data by stop and start bits. It is slower than synchronous data transfer.
BIOS	Basic Input/Output System. Software that provides basic read/write capability. Usually kept as firmware (ROM based). The system BIOS on the mainboard of a computer is used to boot and control the system. The SCSI BIOS on the adapter acts as an extension of the system BIOS.
Bit	A binary digit. The smallest unit of information a computer uses. The value of a bit (0 or 1) represents a two-way choice, such as on or off, true or false, and so on.
Bus	A collection of unbroken signal lines across which information is transmitted from one part of a computer system to another. Connections to the bus are made using taps on the lines.
Bus Mastering	A high-performance way to transfer data. The host adapter controls the transfer of data directly to and from system memory without interrupting the computer's microprocessor. This is the fastest way for multitasking operating systems to transfer data.
Byte	A unit of information consisting of eight bits.
CISPR	A special international committee on radio interference (Committee, International and Special, for Protection in Radio).

Configuration	Refers to the way a computer is set up; the combined hardware components (computer, monitor, keyboard, and peripheral devices) that make up a computer system; or the software settings that allow the hardware components to communicate with each other.
CPU	Central Processing Unit. The “brain” of the computer that performs the actual computations. The term Microprocessor Unit (MPU) is also used.
DMA	Direct Memory Access.
DMA Bus Master	A feature that allows a peripheral to control the flow of data to and from system memory by blocks, as opposed to PIO (Programmed I/O) where the processor is in control and the flow is by byte.
Device Driver	A program that allows a microprocessor (through the operating system) to direct the operation of a peripheral device.
Dword	A double word is a group of four consecutive bytes or characters that are stored, addressed, transmitted, and operated on as a unit. The lower two address bits of the least significant byte must equal zero in order to be dword aligned.
EEPROM	Electronically Erasable Programmable Read Only Memory. A memory chip typically used to store configuration information. See NVRAM.
EISA	Extended Industry Standard Architecture. An extension of the 16-bit ISA bus standard. It allows devices to perform 32-bit data transfers.
External SCSI Device	A SCSI device installed outside the computer cabinet. These devices are connected in a continuous chain using specific types of shielded cables.
Fast SCSI	A standard for SCSI data transfers. It allows a transfer rate of up to 10 Mbytes/s over an 8-bit SCSI bus and up to 20 Mbytes/s over a 16-bit SCSI bus.
FCC	Federal Communications Commission.
File	A named collection of information stored on a disk.
Firmware	Software that is permanently stored in ROM. Therefore, it can be accessed during boot time.
Hard Disk	A disk made of metal and permanently sealed into a drive cartridge. A hard disk can store very large amounts of information.

Host	The computer system in which a SCSI host adapter is installed. It uses the SCSI host adapter to transfer information to and from devices attached to the SCSI bus.
Host Adapter	A circuit board or integrated circuit that provides a SCSI bus connection to the computer system.
Internal SCSI Device	A SCSI device installed inside the computer cabinet. These devices are connected in a continuous chain using an unshielded ribbon cable.
IRQ	Interrupt Request Channel. A path through which a device can get the immediate attention of the computer's CPU. The PCI bus assigns an IRQ path for each SCSI host adapter.
ISA	Industry Standard Architecture. A type of computer bus used in most PCs. It allows devices to send and receive data up to 16-bits at a time.
Kbyte	Kilobyte. A measure of computer storage equal to 1024 bytes.
Local Bus	A way to connect peripherals directly to computer memory. It bypasses the slower ISA and EISA buses. PCI is a local bus standard.
Logical Unit	A subdivision, either logical or physical, of a SCSI device (actually the place for the device on the SCSI bus). Most devices have only one logical unit, but up to eight are allowed for each of the eight possible devices on a SCSI bus.
LUN	Logical Unit Number. An identifier, zero to seven, for a logical unit.
Mainboard	A large circuit board that holds RAM, ROM, the microprocessor, custom integrated circuits, and other components that make a computer work. It also has expansion slots for host adapters and other expansion boards.
Main Memory	The part of a computer's memory which is directly accessible by the CPU (usually synonymous with RAM).
Motherboard	See Mainboard. In some countries, the term Motherboard is not appropriate.
Multitasking	The executing of more than one command at the same time. This allows programs to operate in parallel.
Multithreading	The simultaneous accessing of data by more than one SCSI device. This increases the data throughput.

NVRAM NonVolatile Random Access Memory. Actually an EEPROM (Electronically Erasable Programmable Read Only Memory chip) used to store configuration information. See EEPROM.

Operating System A program that organizes the internal activities of the computer and its peripheral devices. An operating system performs basic tasks such as moving data to and from devices, and managing information in memory. It also provides the user interface.

Parity Checking A way to verify the accuracy of data transmitted over the SCSI bus. One bit in the transfer is used to make the sum of all the 1 bits either odd or even (for odd or even parity). If the sum is not correct, an error message appears.

PCI Peripheral Component Interconnect. A local bus specification that allows connection of peripherals directly to computer memory. It bypasses the slower ISA and EISA buses.

Peripheral Devices A piece of hardware (such as a video monitor, disk drive, printer, or CD-ROM) used with a computer and under the computer's control. SCSI peripherals are controlled through a SCSI host adapter.

Pin-1 Orientation The alignment of pin 1 on a SCSI cable connector and the pin-1 position on the SCSI connector into which it is inserted. External SCSI cables are always keyed to insure proper alignment, but internal SCSI ribbon cables sometimes are not keyed.

PIO Programmed Input/Output. A way the CPU can transfer data to and from memory using the computer's I/O ports. PIO is usually faster than DMA, but requires CPU time.

Port Address Also Port Number. The address through which commands are sent to a host adapter board. This address is assigned by the PCI bus.

Port Number See Port Address.

Queue Tags A way to keep track of multiple commands that allows for increased throughput on the SCSI bus.

RAM Random Access Memory. The computer's primary working memory in which program instructions and data are stored and are accessible to the CPU. Information can be written to and read from RAM. The contents of RAM are lost when the computer is turned off.

RISC Core LSI Logic SCSI chips contain a RISC (Reduced Instruction Set Computer) processor, programmed through microcode scripts.

ROM Read Only Memory. Memory from which information can be read but not changed. The contents of ROM are not erased when the computer is turned off.

SCAM SCSI Configured AutoMatically. A method to automatically allocate SCSI IDs using software when SCAM compliant SCSI devices are attached.

SCSI Small Computer System Interface. A specification for a high performance peripheral bus and command set. The original standard is referred to as SCSI-1.

SCSI-2 The current SCSI specification which adds features to the original SCSI-1 standard.

SCSI-3 The SCSI specification which adds features to the SCSI-2 standard.

SCSI Bus A host adapter and one or more SCSI peripherals connected by cables in a linear chain configuration. The host adapter may exist anywhere on the chain, allowing connection of both internal and external SCSI devices. A system may have more than one SCSI bus by using multiple host adapters.

SCSI Device Any device that conforms to the SCSI standard and is attached to the SCSI bus by a SCSI cable. This includes SCSI host adapters and SCSI peripherals.

SCSI ID A way to uniquely identify each SCSI device on the SCSI bus. Each SCSI bus has eight available SCSI IDs numbered 0 through 7 (or 0 through 15 for Wide SCSI). The host adapter usually gets ID 7 giving it priority to control the bus.

SDMS Storage Device Management System. An LSI Logic software product that manages SCSI system I/O.

STA SCSI Trade Association. A group of companies that cooperate to promote SCSI parallel interface technology as a viable mainstream I/O interconnect for commercial computing.

Single-Ended SCSI	A hardware specification for connecting SCSI devices. It references each SCSI signal to a common ground. This is the most common method (as opposed to differential SCSI which uses a separate ground for each signal).
Synchronous Data Transfer	One of the ways data is transferred over the SCSI bus. Transfers are clocked with fixed frequency pulses. This is faster than asynchronous data transfer. Synchronous data transfers are negotiated between the SCSI host adapter and each SCSI device.
System BIOS	Controls the low-level POST (Power-On Self-Test), and basic operation of the CPU and computer system.
Termination	The electrical connection required at each end of the SCSI bus, composed of a set of resistors. It improves the integrity of bus signals.
Ultra SCSI	A standard for SCSI data transfers. It allows a transfer rate of up to 20 Mbytes/s over an 8-bit SCSI bus and up to 40 Mbytes/s over a 16-bit SCSI bus. STA (SCSI Trade Association) supports using the term “Ultra SCSI” over the term “Fast-20”.
VCCI	Voluntary Control Council for Interference.
Wide SCSI	A SCSI-2 feature allowing 16-bit or 32-bit transfers on the SCSI bus. This dramatically increases the transfer rate over the standard 8-bit SCSI bus.
Word	A two byte (or 16-bit) unit of information.

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1-2-27 Shiromi
Chuo-ku, Osaka 540-6014
♦ Tel: 81.6.947.5281
Fax: 81.6.947.5287

Sales Offices and Design Resource Centers (Continued)

Korea
Seoul
LSI Logic Corporation of Korea Ltd
10th Fl., Haesung 1 Bldg.
942, Daechi-dong,
Kangnam-ku, Seoul, 135-283
Tel: 82.2.528.3400
Fax: 82.2.528.2250

The Netherlands
Eindhoven
LSI Logic Europe Ltd
World Trade Center Eindhoven
Building 'Rijder'
Bogert 26
5612 LZ Eindhoven
Tel: 31.40.265.3580
Fax: 31.40.296.2109

Singapore
Singapore
LSI Logic Pte Ltd
7 Temasek Boulevard
#28-02 Suntec Tower One
Singapore 038987
Tel: 65.334.9061
Fax: 65.334.4749

Sweden
Stockholm
LSI Logic AB
Finlandsgatan 14
164 74 Kista
♦ Tel: 46.8.444.15.00
Fax: 46.8.750.66.47

Taiwan
Taipei
LSI Logic Asia, Inc.
Taiwan Branch
10/F 156 Min Sheng E. Road
Section 3
Taipei, Taiwan R.O.C.
Tel: 886.2.2718.7828
Fax: 886.2.2718.8869

United Kingdom
Bracknell
LSI Logic Europe Ltd
Greenwood House
London Road
Bracknell, Berkshire RG12 2UB
♦ Tel: 44.1344.426544
Fax: 44.1344.481039

♦ Sales Offices with Design Resource Centers

International Distributors

Australia
New South Wales
Reptechnic Pty Ltd
3/36 Bydown Street
Neutral Bay, NSW 2089
♦ Tel: 612.9953.9844
Fax: 612.9953.9683

Belgium
Acal nv/sa
Lozenberg 4
1932 Zaventem
Tel: 32.2.7205983
Fax: 32.2.7251014

China
Beijing
LSI Logic International Services Inc.
Beijing Representative Office
Room 708
Canway Building
66 Nan Li Shi Lu
Xicheng District
Beijing 100045, China
Tel: 86.10.6804.2534 to 38
Fax: 86.10.6804.2521

France
Rungis Cedex
Azzurri Technology France
22 Rue Saarinen
Sillic 274
94578 Rungis Cedex
Tel: 33.1.41806310
Fax: 33.1.41730340

Germany
Haar
EBV Elektronik
Hans-Pinsel Str. 4
D-85540 Haar
Tel: 49.89.4600980
Fax: 49.89.46009840

Munich
Avnet Emg GmbH
Stahlgruberring 12
81829 Munich
Tel: 49.89.45110102
Fax: 49.89.42.27.75

Wuennenberg-Haaren
Peacock AG
Graf-Zepplin-Str 14
D-33181 Wuennenberg-Haaren
Tel: 49.2957.79.1692
Fax: 49.2957.79.9341

Hong Kong
Hong Kong
AVT Industrial Ltd
Unit 608 Tower 1
Cheung Sha Wan Plaza
833 Cheung Sha Wan Road
Kowloon, Hong Kong
Tel: 852.2428.0008
Fax: 852.2401.2105

Serial System (HK) Ltd
2301 Nanyang Plaza
57 Hung To Road, Kwun Tong
Kowloon, Hong Kong
Tel: 852.2995.7538
Fax: 852.2950.0386

India
Bangalore
Spike Technologies India Private Ltd
951, Vijayalakshmi Complex,
2nd Floor, 24th Main,
J P Nagar II Phase,
Bangalore, India 560078
♦ Tel: 91.80.664.5530
Fax: 91.80.664.9748

Israel
Tel Aviv
Eastronics Ltd
11 Rozanis Street
P.O. Box 39300
Tel Aviv 61392
Tel: 972.3.6458777
Fax: 972.3.6458666

Japan
Tokyo
Daito Electron
Sogo Kojimachi No.3 Bldg
1-6 Kojimachi
Chiyoda-ku, Tokyo 102-8730
Tel: 81.3.3264.0326
Fax: 81.3.3261.3984

Global Electronics Corporation
Nichibei Time24 Bldg. 35 Tansu-cho
Shinjuku-ku, Tokyo 162-0833
Tel: 81.3.3260.1411
Fax: 81.3.3260.7100
Technical Center
Tel: 81.471.43.8200

Marubeni Solutions
1-26-20 Higashi
Shibuya-ku, Tokyo 150-0001
Tel: 81.3.5778.8662
Fax: 81.3.5778.8669

Shinki Electronics
Myuru Daikanyama 3F
3-7-3 Ebisu Minami
Shibuya-ku, Tokyo 150-0022
Tel: 81.3.3760.3110
Fax: 81.3.3760.3101

Yokohama-City
Innotech
2-15-10 Shin Yokohama
Kohoku-ku
Yokohama-City, 222-8580
Tel: 81.45.474.9037
Fax: 81.45.474.9065

Macnica Corporation
Hakusan High-Tech Park
1-22-2 Hadusan, Midori-Ku,
Yokohama-City, 226-8505
Tel: 81.45.939.6140
Fax: 81.45.939.6141

The Netherlands
Eindhoven
Acal Nederland b.v.
Beatrix de Rijkweg 8
5657 EG Eindhoven
Tel: 31.40.2.502602
Fax: 31.40.2.510255

Switzerland
Brugg
LSI Logic Sulzer AG
Mattenstrasse 6a
CH 2555 Brugg
Tel: 41.32.3743232
Fax: 41.32.3743233

Taiwan
Taipei
Avnet-Mercuries Corporation, Ltd
14F, No. 145,
Sec. 2, Chien Kuo N. Road
Taipei, Taiwan, R.O.C.
Tel: 886.2.2516.7303
Fax: 886.2.2505.7391

Lumax International Corporation, Ltd
7th Fl., 52, Sec. 3
Nan-Kang Road
Taipei, Taiwan, R.O.C.
Tel: 886.2.2788.3656
Fax: 886.2.2788.3568

Prospect Technology Corporation, Ltd
4Fl., No. 34, Chu Luen Street
Taipei, Taiwan, R.O.C.
Tel: 886.2.2721.9533
Fax: 886.2.2773.3756

Wintech Microeletronics Co., Ltd
7F., No. 34, Sec. 3, Pateh Road
Taipei, Taiwan, R.O.C.
Tel: 886.2.2579.5858
Fax: 886.2.2570.3123

United Kingdom
Maidenhead
Azzurri Technology Ltd
16 Grove Park Business Estate
Waltham Road
White Waltham
Maidenhead, Berkshire SL6 3LW
Tel: 44.1628.826826
Fax: 44.1628.829730

Milton Keynes
Ingram Micro (UK) Ltd
Garamonde Drive
Wymbush
Milton Keynes
Buckinghamshire MK8 8DF
Tel: 44.1908.260422

Swindon
EBV Elektronik
12 Interface Business Park
Bincknoll Lane
Wootton Bassett,
Swindon, Wiltshire SN4 8SY
Tel: 44.1793.849933
Fax: 44.1793.859555

♦ Sales Offices with Design Resource Centers