



Symbios SYM8751SPE Data Sheet

SYM8751SPE

PCI-to-Ultra SCSI Host Adapter

The SYM8751SPE host adapter combines high performance and Ultra SCSI data transfer rates with the speed of a PCI system bus. As part of the Symbios® host adapter family built around the SYM53C875E PCI-SCSI controller, the SYM8751SPE supports 8-bit (narrow) and 16-bit (wide) legacy SCSI and SCSI-2 (Fast) devices. It also supports Ultra SCSI devices. The SYM8751SPE is the next generation of the SYM8751SP PCI-Ultra SCSI host adapter. It provides all the functionality of its predecessor and adds Microsoft PC97 compliance.

To connect up to 15 SCSI devices in standard systems, simply plug in the host adapter and load the drivers. Setting up hard drives, scanners, CD-ROMs, CD-recorders, CD jukeboxes, tape backups, and removable media peripherals (MO, SyQuest™ or Iomega Zip™ drives) is fast and easy with the SYM8751SPE's built-in SCAM (SCSI configured automatically) and SCSI bus configuration utilities. The board's PCI bus interface provides Plug-and-Play installation with no jumpers, switches, IRQs, system DMA or addresses to set. For the greatest flexibility, the SYM8751SPE can be configured for clustered systems applications or external 8-bit peripherals, all the while maintaining industry standards with Microsoft PC97 compliance.

The SYM8751SPE provides scalability and flexibility and does not limit the entire SCSI bus performance

to the slowest device on the bus. Whether connecting SCSI, Fast or Ultra SCSI devices, the SYM8751SPE matches its transfer rates to the highest rate of each device on the bus. The host adapter is flexible and grows as the system is upgraded and expanded.

For critical data handling applications, Symbios host adapters offer data and product reliability, software and hardware compatibility and easy installation. Extensive host adapter and software testing by Symbios and its technology partners ensures OEM compatibility with all major operating systems and SCSI, Fast SCSI-2, and Ultra SCSI devices.

The powerful Symbios SCSI Device Management System (SDMS) software, on-board BIOS and configuration utility make SCSI I/O subsystem installation easy and virtually automatic.

Applications

- Upgrade existing Fast SCSI hard disk systems to Ultra-level performance, while supporting legacy SCSI devices and existing systems
- High performance desktop PCs and workstations
- Intersystem connections: server and workstation to RAID, network management
- Adding Ultra SCSI hard drives to servers, clustered servers, workstations and RAID

Bus Interface	PCI Mode	Plug-and-Play	SCSI Rate	SCSI Bus	FIFO Size	Bootable
3.3/5V PCI	Bus Master	Yes	40 MBps synchronous 14 MBps asynchronous	8-bit, 16-bit Single-Ended	536 bytes	Yes

Table 1. SYM8751SPE PCI-to-Ultra Wide SCSI host adapter

Features and Benefits

Performance:

- SCSI Bus
- Synchronous: up to 40 MBps Ultra SCSI and up to 10 MBps Fast SCSI
- Asynchronous: up to 14MBps
- PCI Bus
- Direct (bus master) memory access for low overhead with 32-bit burst data transfers at 133 MBps PCI data transfer rates
 - Zero wait state PCI transfers
- Up to 64-bit PCI burst size to maximize the PCI data transfer rate

Hardware Features:

- Comes from factory pre-configured as direct SYM8751SP replacement/upgrade

PCI Bus

- Complies with PCI specification 2.1
- Supports PCI extended access cycles
- Supports 32-bit, 33-MHz PCI bus
- Functions as full 32-bit PCI DMA bus master
- Operates on 3.3V or 5V PCI buses

SCSI Bus

- Improved support for large block transfers at Ultra SCSI speeds
- Supports wide variety of 8-bit and 16-bit SCSI peripherals simultaneously
- Prefetches up to 8 dwords of SCRIPTS™ instructions to save PCI bus overhead
- Includes 4 KB internal RAM for SCRIPTS instruction storage to reduce or eliminate instruction fetches over the PCI bus
- On-board serial NVROM for SCSI configuration and supports SCSI SCRIPTS load and store instructions for more efficient moving of data between memory and chip register space

- Termination:
 - SCSI termination power supplied through self-resetting current limiting device
 - Automatic termination determined by cabling environment provides increased ease-of-use for the OEM or end user
 - User's choice of automatic or manual control of termination
- Any drive in a disk array can be used as a boot device
- Available SCAM (SCSI Configured AutoMatically) Level I functionality for SCSI Plug-and-Play support
- Uses Symbios PC-97 compliant, proprietary SYM53C875E Ultra SCSI I/O RISC processor, an extension of the industry standard SYM53C8xx family
- On-board, 128k FLASH ROM for field upgradable BIOS
- Features TolerANT™ active negation and input signal filtering on the SCSI signal lines for improved data integrity in unreliable cabling environments

PC97 Compliance:

- Microsoft's PC97 initiative addresses product identification on the PCI bus, PCI extended capabilities, and power management requirements. The SYM8751SPE adds the necessary features to meet PC97 compliancy requirements.
- Provides PCI subsystem ID (SSID) and subsystem vendor ID (SSVID). SSID identifies Symbios as the host adapter manufacturer and SSVID is the particular board adapter identifier
 - Supports DO and D3 power management states. Reports DO (full power on) and D3 (minimum power or power off) states
 - Extended capabilities register provide information on adapter capabilities reporting, including power status reporting, setting the power state, and system wake-up

SCSI Device Management System (SDMS) Software

SDMS Software Features

- Multiple host adapter support
- Scatter/gather
- Tagged command queuing for peak performance in multi-tasking environments
- Supports SCSI SCRIPTS load and store instructions, for more efficient moving of data between memory and chip register space
- Power management for DSSPM support
- Shared interrupts and shared memory to allow multiple PCI devices in a single-interrupt system
- Autoscan for ease of SCSI configuration
- Multiple LUNs per SCSI ID for RAID and media changer capability
- Supports hard drives > 8 GBytes
- ASPI interface support
- Multi-initiator in most operating systems
- Supports target disconnect and later reconnect with system interrupts for greater system throughput
- Target initiated negotiation
- CD-ROM, tape backup, hard disk, scanner and removable media support
- On-board, field upgradable BIOS
- On-board NVRAM for SCSI Plug-and-Play (SCAM) support

SDMS Software Support

Operating systems supported:

- DOS (with ASPI support), Windows 3.1, Windows for Workgroups 3.11
- Windows 95
- Windows NT 3.51 & 4.0
- Novell NetWare 3.1 & 4.x
- SCO UNIX Open Server 5.0
- UNIXWare
- OS/2 (including WARP)
- Utilities:
 - Install
 - Flash (DOS only)
 - SCSI format
 - Verify
 - Configuration

The resident, menu-driven, x86 BIOS configuration utility allows viewing and changing of the default settings for the host adapter and attached SCSI devices. The global settings affect the host adapter and all SCSI devices connected to it. The user may change the host adapter scan order if more than one Symbios SCSI host adapter is in the system.

Setting	Default	Global/Device
SCAM support	On	Global
Parity checking	Enabled	Global
Host adapter SCSI ID	7	Global
Scan order	Low to high (0-max)	Global
Synchronous transfer rate	20 Mbytes	Device
Data width	16	Device
Disconnect	On	Device
I/O time-out (sec)	10	Device
Scan for device at boot	Yes	Device
Scan for SCSI LUNs	Yes	Device
Queue tags	Enabled	Device

Table 2. BIOS configuration settings

Host Adapter Compatibility and Quality

LSI Logic is a key developer and contributor to the original committees that defined today's SCSI and PCI standards. This leadership and work with other industry leaders of core chip sets, processors, system providers, SCSI device peripherals, BIOS, and operating systems assure users the utmost compatibility and interoperability. Product compatibility and interoperability are thoroughly tested in LSI Logic and technology partners' test labs. LSI Logic's ISO-9000 certification assures users of the highest levels of product quality and reliability.

Technical Specifications

- Supported buses:
 - 32-bit, DMA bus master, 3.3/5 V PCI local bus (versions 2.0 and 2.1)
 - 8/16-bit, single-ended SCSI bus
 - SCSI asynchronous transfers
 - SCSI and Fast SCSI synchronous transfers
 - Ultra SCSI synchronous transfers
- Performance:
 - PCI transfer rates up to 133 MBps
 - SCSI synchronous up to 40 MBps
 - SCSI asynchronous rates up to 14 MBps
- SCSI bus termination:
 - Active termination
 - Configurable as automatic or manual terminating
 - Termination power: self-resetting
- SCSI bus connection: Up to 15 SCSI, SCSI-2 or Ultra peripherals
- Internal board connectors:
 - 68-pin, right angle, high density
 - 50-pin vertical, low density
 - 4-pin for off-board SCSI active LED

- External board connectors:
 - 68-pin, high-density shielded, latching connector
- Physical and environmental specifications:
 - Board size: 3.5 in. x 5.0 in.
 - Form factor: PCI 2.1 universal board
 - Bracket: ISA/EISA style
 - Operating temperature: 5°C to 55°C
 - Relative humidity range: 5 to 90% non-condensing
 - Maximum dew point temperature: 32°C
 - Storage temperature: -55°C to 85°C
- Full agency certification and compliance:
 - FCC and CISPR Class B, CE, VCCI, UL 94V0
- Electrical: 5V+A 5% (1.5 A max)
- 12V+/-5% (50 mA max)
- MTBF: > 500,000 hours

	Lower	Upper
Automatic termination control*	□ . □	□ . □ .
J2 and J3 termination disabled	□ . .	□ . . .
High byte terminated (Use for narrow device connect. J2 and J3 upper byte termination on.)	□ . □	. □ . □

*Factory default setting (SYM875 ISPE operation)

Table 3. SCSI bus termination: configurable as automatic or manual

SYM875ISPE Kit Contents

- SYM875ISPE PCI-to-Ultra SCSI host adapter
- On-board SDMS BIOS with built-in, easy-to-use SCSI configuration utility
- SCSI device management system (SDMS) software with a full range of O/S support
 - DOS/Windows 3.1/Windows for Workgroups 3.11, Windows 95, Windows NT 3.5X & 4.0, SCO UNIX Open Server 5, UNIXWare, Novell Netware 3.1X & 4.X, OS/2
 - SCSI configuration utilities
- SYM875ISPE users guide
- SDMS users guide
- 50-pin internal Ultra SCSI ribbon cable
- 68-pin internal Ultra SCSI ribbon cable

Wide SCSI Performance	Maximum Bus Length (m) SE	Maximum Devices
SCSI	6	8
Fast	6	16
Ultra SCSI	1.5/3	8/4

Table 4. SYM875ISPE performance

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