



SYM8951U Data Sheet

SYM8951U

PCI-to-Ultra2 SCSI Host Adapter

I2O-ready



At up to 80 MBytes/sec, the SYM8951U host adapter combines the highest Ultra2 SCSI data transfer rates with the high performance PCI system bus. Based on Symbios' industry first SYM53C895 Ultra2 SCSI I/O Processor, the SYM8951U provides Universal Low Voltage Differential (LVD) signaling for SCSI. LVDlink™ technology, Symbios' implementation of LVD transceivers, eliminates the distance and device constraints that exist in today's Ultra SCSI single-ended designs while offering higher data transfer rates.

Installing and configuring the SYM8951U host adapter could not be easier. With built-in SCAM (SCSI Configured AutoMatically) and SCSI bus configuration utilities, setting up the SCSI bus is a snap. Symbios' powerful SCSI Device Management System (SDMS) software, and on-board BIOS and configuration utility, makes installation of the SCSI I/O subsystem easy and nearly automatic. And with no jumpers, switches, IRQs, system DMA or addresses to budget, installing the SYM8951U to connect up to 15 Ultra2 devices becomes a matter of plugging in the host adapter and loading the drivers.

Whether you are migrating from either Ultra SCSI or Fast SCSI, Ultra2 SCSI provides a high performance I/O migration path while preserving your existing PCI-SCSI software investment. As compared to Ultra SCSI designs, the SYM8951U provides twice the performance and allows four times the cable length

and number of connected devices. The high SCSI bus bandwidth of Ultra SCSI, and the improvements in distance, connectivity, and reliability, make the SYM8951U an ideal host connection to a RAID controller and other demanding I/O applications in the high performance workstation and server markets.

The SYM8951U LVDlink transceivers provide the data reliability of differential signaling without the cost of high voltage differential transceivers. For critical data handling applications, Symbios offers data and product reliability, software and hardware compatibility, with easy installability. Symbios and our technology partners' extensive host adapter and software testing ensures OEM compatibility with all major operating systems and a wide variety of SCSI-1, Fast SCSI-2, Ultra SCSI and Ultra2 SCSI devices.

SYM8951U Host Adapter Overview

Bus Interface	Plug-and--Play	SCSI Rate	SCSI Bus	Bootable	Number of SCSI Devices	SCSI Connectors
3.3/5V PCI Bus Master	Yes	80 MB/s Synchronous, 14 MB/s Asynchronous, Fast / Ultra / Ultra2 SCSI	16-bit Single-ended or LVDlink	Yes	15	Internal: 68-pin External: 68-pin VHDCI

Applications

- Applications storing or transporting large block size transfers – video production and editing, medical imaging, video on demand
- Intersystem connections – Server and Workstation to RAID and network management
- Upgrading existing Fast or Ultra SCSI systems
- Adding Ultra2 SCSI hard drives to Servers, Workstations and RAID storage subsystems

LVDlink - Symbios Universal LVD Transceivers

Balancing backward compatibility with I/O performance and lower costs, the SYM53C895 integrates Symbios' Universal LVDlink transceivers with the Ultra2 SCSI I/O processor. Depending on SCSI bus connections, bus cabling conditions are sensed and the universal LVDlink transceivers automatically select single-ended or LVD SCSI modes and indicate the mode with the on-board SE or LVD LEDs. In single-ended mode, the SYM8951U performs synchronous data transfers up to Ultra SCSI rates, subject to standard Ultra SCSI cable distance and connected device constraints. In LVD mode, the host adapter supports up to 12.5-meter cables and up to 15 LVD devices with the same cables and connectors as defined in the SCSI-3 Parallel Interface ANSI standard.

LVDlink transceivers also provide fail-safe operation of the receiver by detecting when the SYM8951U is connected to a high voltage differential (HVD) signal. When connected to HVD, the SYM8951U's SCSI bus enters a high-impedance mode and activates the on-board HVD LED.

Hardware Features and Benefits

Performance

Synchronous: up to 80 MB/sec Ultra2 SCSI
up to 40 MB/sec Ultra SCSI
up to 20 MB/sec Fast SCSI

Asynchronous: up to 14 MB/sec

DMA bus mastering for low overhead with 32-bit burst data transfers at PCI data transfer rates

Zero wait state PCI transfers

Up to 64 byte PCI burst size to maximize the PCI data transfer rate

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

LVDlink transceivers meet all of the requirements of the SPI-2 standard and utilizes Symbios TolerANT® active negation technology for improved single-ended SCSI signal integrity

Prefetches up to 8 dwords of SCSI SCRIPTS™ instructions to save PCI bus overhead

Supports SCSI SCRIPTS Load and Store instructions, for more efficient moving of data between memory and chip register space

Symbios Host Adapter Compatibility and Quality

Symbios is a key developer and contributor to the original committees that defined today's SCSI and PCI standards. This leadership and dedication to the development of industry standards and work with other industry leaders of core chip sets, processors, system providers, SCSI device peripherals, BIOS, and operating systems enables Symbios to assure users the utmost compatibility and interoperability. Our product compatibility and interoperability are thoroughly tested in Symbios' and technology partners' test labs. Symbios' ISO-9001 certification assures users of the highest levels of product quality and reliability.

Symbios SYM8951U Kit Contents

- SYM8951U PCI-to-Ultra2 SCSI host adapter
- On-board SDMS BIOS with built-in, easy-to-use SCSI configuration utility
- Symbios SCSI Device Management System (SDMS) software suite with a full range of O/S support
- DOS/Windows 3.1/Windows for Workgroups 3.11, Windows 95, Windows NT 3.5X and 4.0, SCO UNIX Open Server 5, UNIXWARE, Novell NetWare 3.1X and 4.X, OS/2
- SCSI configuration utilities
- SYM8951U User's Guide
- SDMS User's Guide

Includes 4 KB internal RAM for SCRIPTS instruction storage, to reduce or eliminate instruction fetches over the PCI bus

Improved support for large block transfers at Ultra2 SCSI speeds

Termination: Active, automatic

LVDlink provides automatic switching between single-ended and LVD signaling

Automatically enters high-impedance state when connected to a high voltage differential (HVD) signal

Provides data reliability and cable distance of differential SCSI without the cost of external differential transceivers

Improves connectivity (up to 15 LVD Ultra2 SCSI devices) and cable lengths (up to 12.5 meters of Ultra SCSI - longer cables may be possible in point-to-point connections)

Uses same internal cables as Ultra SCSI and same connectors as Fast/Ultra SCSI

Supports wide variety of 16-bit SCSI peripherals

Supports SCAM (SCSI Configured AutoMatically) Level 1 functionality

Uses Symbios' SYM53C895 proprietary Ultra2 SCSI I/O RISC processor, an extension of the industry standard SYM53C8xx family

With appropriate cables, supports 8-bit hard drives, CD ROMs, tape backups, hard disks, scanners and other 8-bit SCSI devices in Fast/Ultra SE mode only

SCSI Device Management Software (SDMS)

Features

Multiple host adapter support
Scatter/Gather
Tagged command queuing for peak performance in multi-tasking environments
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 GB
ASPI interface support
Multi-Initiator in most operating systems
Disconnect/Reselect support

Target Initiated Negotiation
CD-ROM, tape backup, hard disk, scanner and removable media support
On-board, field upgradable BIOS in Flash ROM
On-board NVRAM for SCSI Plug and Play (SCAM) support

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 and FLASH (DOS only), SCSI format, SCSI Configuration, Verify

Technical Specifications

Supported Buses

32-bit, DMA Bus Master, 3.3/5 V PCI local bus (versions 2.0 and 2.1)
16-bit, Wide, SCSI Bus
Single-ended SCSI Asynchronous transfers
Single-ended Ultra SCSI Synchronous transfers
LVD Ultra2 SCSI Synchronous transfers

Performance

PCI Transfer Rates – up to 100 MB/sec
SCSI Asynchronous – up to 14 MB/sec
SCSI Synchronous Single-Ended – up to 40 MB/sec
SCSI Synchronous LVD – up to 80 MB/sec

SCSI Bus Termination

Active, automatic terminating, Universal LVDlink SCSI with automatic switching to Single-ended
Termination power: Self-resetting

SCSI bus connection

Up to 15 SCSI, SCSI-2 or SCSI-3

On-board LED Indicators

TERMPWR Shorted -Term Power short
SCSI Activity -SCSI Bus Active
HVD -HVD Sensed
LVD -LVD Mode Active
SE -Single-ended Mode Active

Board connectors

Internal: 68-pin, right angle, high density SCSI bus
4-pin for off-board SCSI Active LED
External: 68-pin, VHDCI (Very High Density Connector Interconnect) shielded, with screw jacks

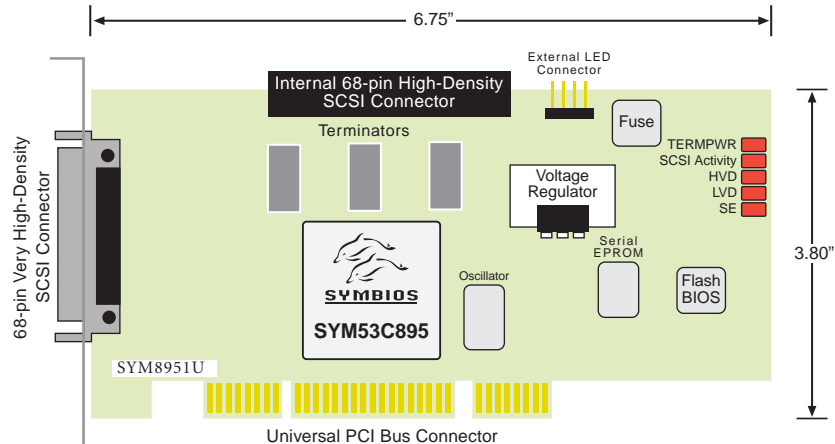
Physical and Environmental Specifications

Board Size: 3.8" x 7.0"
Form Factor: PCI 2.1 Universal Board form factor
Bracket: ISA/EISA style
Operating temperature: 5° to 55° C
Relative Humidity range: 5 to 90% non-condensing
Maximum dew point temperature: 32° C
Storage temperature: -40° to 85° C
Electrical: 5V +/- 5% (1.5 A max)
12V +/- 5% (50 mA max)
MTBF: > 500,000 hours

Full agency certification and compliance

FCC Class B and CISPR 22
CE VDE
VCCI
UL 94V0

SYM8951U Host Adapter board diagram - This block diagram shows the SYM8951U utilizing the Symbios SYM53C895 PCI-SCSI I/O processor.



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