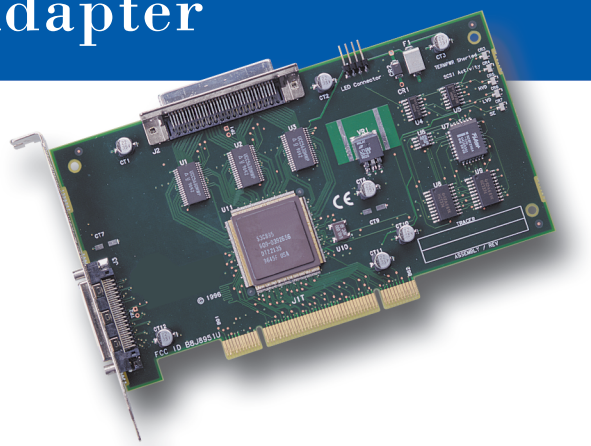
LSI8951U
SCSI Host Adapter



The LSI8951U PCI-to-Ultra2 SCSI host adapter combines Ultra SCSI data transfer rates with reliable data integrity.

KEY APPLICATIONS

- 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

Bus Interface:
3/5V PCI

PCI Mode:
Bus Master

Plug-and-Play:
Yes

SCSI Rate:
40 MBps synchronous (SE)
80 Mbps synchronous (LVD)
14 MBps asynchronous

SCSI Bus:
16-bit SE and LVD

Bootable:
Yes

No. of SCSI Devices:
15

SCSI Connectors:
Internal: 68-pin HD
External: 68-pin VHDCI

OVERVIEW

At up to 80 MBps, the LSI8951U host adapter combines the highest Ultra2 SCSI data transfer rates with the high performance PCI system bus. Based on an industry first, the LSI53C895 Ultra2 SCSI I/O processor, the LSI8951U provides Universal Low Voltage Differential (LVD) signaling for SCSI. LVDlink™ technology, the 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 LSI8951U host adapter couldn't be easier. With built-in SCAM (SCSI Configured AutoMatically) and SCSI bus configuration utilities, setting up the SCSI bus is a snap. The powerful SCSI Device Management System (SDMS) software, and on-board BIOS and configuration utility make installation of the SCSI I/O subsystem easy and virtually automatic. And with no jumpers, switches, IRQs, system DMA or addresses to budget, installing the LSI8951U 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 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 LSI8951U provides twice the performance and allows four times the cable length and number of connected devices. The high SCSI bus bandwidth of Ultra2 SCSI, along with improvements in distance, connectivity, and reliability make the LSI8951U an ideal host connection to a RAID controller. It is also suitable for other demanding I/O applications in the high performance workstation and server markets.

The LSI8951U LVDlink transceivers provide the data reliability of differential signaling without the cost of high-voltage differential transceivers. For critical data handling applications, LSI Logic offers data and product reliability, software and hardware compatibility, with easy installability. 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.

FEATURES AND BENEFITS

Performance

- Synchronous:
  up to 80 MBps Ultra2 SCSI
  up to 40 MBps Ultra SCSI
  up to 20 MBps Fast SCSI
- Asynchronous: up to 14 MBps
- 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

PCI Bus Support

- PCI 2.1 compliant
- PCI Extended Access Cycles
- 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 Support

- LVDlink transceivers meet all of the requirements of the SPI-2 standard and utilize 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 wide variety of 16-bit SCSI peripherals

SCSI DEVICE MANAGEMENT SOFTWARE (SDMS)

SDMS Software 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 GBytes
- 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 upgradeable BIOS
- On-board NVRAM for SCSI Plug-and-Play (SCAM) support

SDMS Software Support

Operating systems supported are: 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, and OS/2 (including WARP). Utilities: Install and FLASH (DOS only), SCSI format, SCSI configuration, verify.

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. Our continuing work with other industry leaders of core chip sets, processors, system providers, SCSI device peripherals, BIOS, and operating systems enables us to provide users with the utmost compatibility and interoperability. Product compatibility and

interoperability are rigorously tested and our ISO-9001 certified fabrication facilities assures users of the highest levels of product quality and reliability.

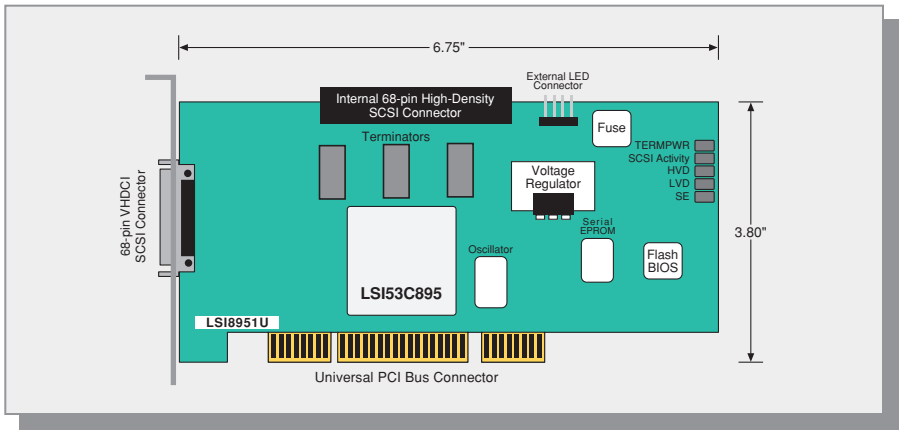
LVDLINK - UNIVERSAL LVD TRANSCEIVERS

Balancing backward compatibility with I/O performance and lower costs, the LSI53C895 integrates our 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 LSI8951U 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 LSI8951U is connected to a high voltage differential (HVD) signal. When connected to HVD, the LSI8951U's SCSI bus enters a high-impedance mode and activates the on-board HVD LED.

LSI8951U KIT CONTENTS

- LSI8951U PCI-to-Ultra2 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 operating system support and SCSI configuration utilities
- LSI8951U Users Guide
- SDMS Users Guide



LSI8951U host adapter diagram

SCSI Bus Support (Continued)

- Supports SCSI SCRIPTS load and store instructions for more efficient moving of data between memory and chip register space
- 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 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 SCAM (SCSI Configured AutoMatically) Level 1 functionality
- Uses LSI53C895 proprietary Ultra2 SCSI I/O RISC processor
- 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

LSI8951U SCSI Host Adapter

Technical Specifications

PCI Bus	32-bit, 3.3/5 V local bus (versions 2.0 and 2.1)	
PCI Modes	Bus master DMA	
PCI Transfer Rate	up to 133 MBps	
SCSI Asynchronous	up to 14 MBps	
SCSI Synchronous SE	up to 40 MBps	
SCSI Synchronous LVD	up to 80 MBps	
PCI Voltage	+5V ±5% (1.5 A max), 12V ±5% (50mA max)	
PCI Form Factor	3.8" x 7.0"	
Bracket	ISA/EISA	
Certification Level	PCI 2.1 compliant	
SCSI Bus	16-bit wide	
SCSI Processor	LSI53C895	
Connectors	**External**	**Internal**
	68-pin VHDCI	68-pin HD
Termination	Active, automatic terminating, universal LVDlink SCSI with automatic switching to single-ended	
Termination Power	Self-resetting	
LED Indicators	On-board: TERMPWR shorted, SCSI Activity, HVD, LVD, and SE Off-board: 4-pin header	
Environments	**Operating**	**Storage**
Temperature	5°C to 55°C	-40°C to +85°C
Relative Humidity	5 to 90% non-condensing	5 to 90% non-condensing
Max Dew Point Temp	32°C	
MTBP	>500,000 hours	
Compliances	CE VDE, VCCI, FCC and CISPR class B, UL 94VO	

Software Support

OS Support	**Versions**
DOS	with ASPI support
Windows	95, 98, Me, 2000, NT4.0 SP4 and above
NetWare	4.2, 5.0 and 5.1
UnixWare	2.1 & 7.x
SCO Unix	Open Server 5.x
OS/2	Warp 4.x
Utilities	Install, Flash (DOS only, SCSI format, SCSI configuration, verify

For more information please visit the LSI Logic web site at:
http://storageio.lsilogic.com

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