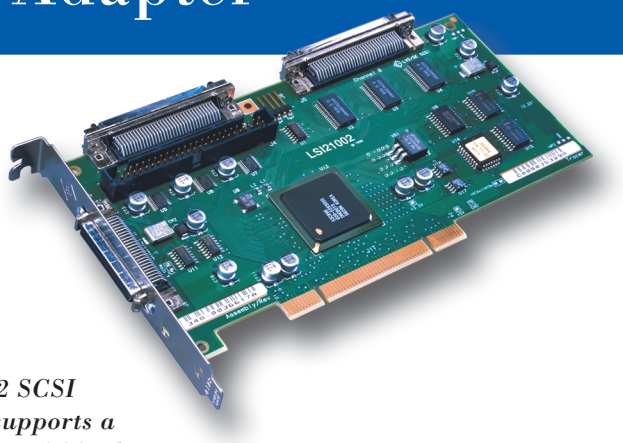
LSI21002
SCSI Host Adapter



The LSI21002 PCI-to-Ultra2 SCSI dual channel host adapter supports a wide variety of Fast and Ultra SCSI devices.

KEY APPLICATIONS

- Workstations, high-end desktops and servers that require high I/O performance and legacy peripheral support
- Ideal for desktop configurations that require high performance data I/O while simultaneously supporting existing peripherals (CDs, scanners)
- Supporting mixed single-ended and LVD SCSI devices system applications

BENEFITS

- Increased performance with support of existing systems
- Complete host adapter solution for quicker OEM time-to-market
- True multi-function, single-chip device provides better performance than discrete PCI-to-PCI bridge solutions or single-channel devices supporting dual SCSI interfaces
- Improved reliability with single-chip solution
- Complete software support with BIOS and drivers for all major operating systems
- Features LSI Logic's LVDlink universal LVD technology

OVERVIEW

The LSI21002 dual channel PCI-to-Ultra2 SCSI host adapter board by LSI Logic is designed for systems using high performance disks as well as supporting a wide variety of Fast and Ultra SCSI devices. By using the LSI53C896 dual channel PCI-to-Ultra2 SCSI controller chip to directly interface to the PCI and SCSI buses, the LSI21002 is able to provide the high reliability and cost effectiveness of a single-chip design. By having two complete and separate SCSI channels, the LSI21002 can dedicate one channel, with full connectivity, to high performance devices and the other channel, also with full connectivity, to legacy SCSI devices.

Matching the performance of the 32-bit PCI bus to two independent SCSI channels, the LSI21002 host adapter provides up to 120 MBps aggregate SCSI throughput. With LSI Logic's LVDlink™ (Low Voltage Differential) and TolerANT™ technology, the LSI21002 provides unmatched performance, device connectivity and signal reliability. LVDlink is LSI Logic's implementation of the Universal

Low Voltage Differential standard. At last, one board provides a powerful dual channel, scalable, multi-tasking interface for high performance SCSI disk drives, CD-Rs, CD-RWs, scanners, interconnect, and other single-ended or LVD SCSI devices. The dual channels increase to connectivity to up to 30 devices without utilizing an additional PCI slot or PCI load.

Designing systems with the LSI21002 is easy with one channel dedicated to high performance LVD devices and the second dedicated to supporting single-ended legacy devices. Or both channels can be used to support single-ended devices.

LSI LOGIC®

HOST ADAPTERS

BENEFITS (Continued)

- Ultra2 SCSI provides increased connectivity (cable length and number of SCSI devices supported) over Ultra SCSI
- Automatic termination determined by cabling environment provides improved ease-of-use for the OEM and the end user
- Termination power supplied through self-resetting current limiting device
- Any drive in a disk array can be used as the boot device
- On-board BIOS supports greater than 8 GB disk drives

SCSI FEATURES

- SCSI buses feature two true, independent SCSI buses:
  - Channel A - Legacy Fast/Ultra SCSI 8- and/or 16-bit bus

    Single-ended mode (only)
    Supports Fast/Ultra SCSI bus speeds of up to 20 or 40 MBps with mixed Fast/Ultra SCSI peripherals on the bus

    Supports 8- and/or 16-bit peripherals simultaneously

    Supports up to 7 8-bit devices and/or 15 16-bit devices

    Connectors
    Internal: 50-pin LD, 68-pin HD
    External: 50-pin latching, HD

The LSI21002 is a zero wait-state DMA bus master in 32-bit PCI bus systems and supports PCI 64-bit Dual Address Cycles for greater system memory addressability. Built to the PCI Universal board standards, the LSI21002 works in 3.3 or 5 V PCI bus systems. The LSI21002 includes an on-board configuration utility, allowing the viewing and changing of default configuration settings for the host adapter and attached SCSI devices. It also provides advanced ease-of-use features such as automatic termination (depending on cable configuration) on the single-ended channel.

The advanced features of the LSI21002 32-bit host adapter make it the right choice for high-performance desktops, workstations and servers.

SCSI DEVICE MANAGEMENT SOFTWARE (SDMS)

SDMS Software Features

- Multiple host adapter support
- Scatter/gather
- Tagged command queuing for peak performance in multi-tasking environments
- Shared interrupts and shared memory to allow multiple PCI devices in a single-interrupt system
- Multiple LUNs per SCSI ID for RAID and media changer capability
- ASPI interface support
- Multi-initiator in most operating systems
- Disconnect/reselect support
- Target initiated negotiation
- On-board, field upgradeable BIOS in Flash ROM
- On-board serial EEPROM for SCSI bus configuration storage

SDMS Software Support

Operating systems supported are: DOS (with ASPI support), Windows 3.1, Windows for Workgroups 3.11, Windows 95, 98, Windows NT 3.51 & 4.0, Novell NetWare 3.2 & 4.1X, SCO UNIX Open Server 5.0.2 and above, UNIXWare 2.1 & 7, OS/2.4X, and Solaris 2.6. Utilities: Install, Flash utility (DOS only), SCSI format, SCSI configuration, verify.

SCSI AUTOMATIC TERMINATION

The LSI21002 PCI-to-Ultra2 SCSI host adapter automatically determines if cables are attached to Channel A's (single-ended only) SCSI connectors and then properly enables/disables that channel's SCSI terminators. Channel B (LVD/SE channel) is always terminated.

PCI FEATURES

- Direct (bus master) memory access for low overhead with 32-bit burst data transfers at 133 MBps for 32-bit PCI data transfer rates
- 33 MHz bus master with zero wait-state PCI transfers
- Up to 128 dword PCI burst rate to maximize the PCI data transfer rate
- Functions as one, 32-bit PCI DMA bus master
- Two independent DMA channels with internal arbitration
- Supports PCI write and invalidate, read Line, and read multiple commands
- Supports Dual Address Cycles (DAC) for system memory addressability > 4GB
- Complies with PCI bus power management specification, version 1.1

INTERRUPTS

The host adapter provides separate interrupts for each channel (channel A routed to INTA# pin and channel B routed to INTB# pin).

SUBSYSTEM ID

The on-board LSI53C896 controller provides PCI configuration registers for Subsystem ID and Subsystem Vendor ID. However, it is possible for OEMs to develop custom software and store different numbers in the on-board serial EEPROM while maintaining a standard board configuration.

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

SCSI FEATURES (Continued)

– Channel B - high performance 16-bit bus

Low Voltage Differential mode: Uses LVDlink technology which supports Ultra/Ultra2 bus speeds of up to 40 or 80 MBps

Supports up to 15 Ultra and Ultra2 LVD devices (within the SCSI cable limits)

Single-ended mode
Supports Fast/Ultra SCSI bus speeds up to 20 or 40 MBps with mixed Fast/Ultra SCSI peripherals on the bus

Supports up to 15 Fast or Ultra devices (within the SCSI cable limits)

Connectors
Internal - 68-pin high-density

- 64K byte BIOS ROM standard

  Optional 256K byte ROM for custom BIOS applications

- Uses LSI Logic's SCSI TolerANT active negation SCSI driver and receiver technology to provide highest signal integrity in noisy cabling environments
- Available SCAM (SCSI Configured AutoMatically) Level 1 functionality for SCSI plug-and-play support

LSI21002 SCSI Host Adapter

LSI21002 KIT CONTENTS

- LSI21002 PCI-to-Ultra2 SCSI dual channel host adapter
- SCSI Device Management System (SDMS) software with a full range of operating system support and SCSI configuration utilities
- LSI21002 Users Guide
- SDMS Users Guide
- Complete internal cable solution: 50-pin Ultra cable for 2 devices, 68-pin Ultra cable for 2 devices, and 68-pin SE/LVD Ultra?Ultra2 cable with built-in LVD termination for 4 devices

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	4" x 7.5"	
Bracket	ISA/EISA	
Certification Level	PCI 2.1 compliant	
SCSI Bus	16-bit SE SCSI-1, 16-bit LVD/SE SCSI-2	
SCSI Processor	LSI53C896	
Connectors	**External**	**Internal**
	50-pin, HD	50-pin, LD and (2) 68-pin, HD
Termination	Auto termination or manual	
Termination Power	Self-resetting, current limited	
LED Indicators	4-pin header for off-board LEDs	
Environments	**Operating**	**Storage**
Temperature	0°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	
Compliances	CE, VCCI, FCC and CISPR class B, UL 94VO	

Software Support

OS Support	Versions
DOS	with ASPI support
Windows	3.1, Workgroups 3.11, 95, 98, NT3.51 & 4.0
NetWare	3.2 and 4.1X
UnixWare	2.1 & 7
SCO Unix	Open Server 5.0.2 and above
OS/2	2.4X
Solaris	2.6
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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