



#### APPLICATIONS

- Internal storage connections
- 1U/2U rack servers
- Mid to high-end servers
- High performance workstations

#### TYPICAL USES

- Direct-attach internal SAS or SATA hard disk drives and solid state drives
- Internal enclosures

#### KEY FEATURES

- 6Gb/s per port data transfer rate
- One x4 Mini-SAS internal connector (SFF8087)
- Integrated RAID 0, 1, 1E and 10
- MD2 small form factor
- x4 PCI Express 2.0 host interface
- Allows up to 256 SAS or SATA endpoint devices
- High performance IOP
- PowerPC 440 @ 533MHz
- Power management support
- Supports SSP, SMP, STP and SATA protocols
- Fusion-MPT architecture drives more than 290,000 I/Os per second
- Consistency Check
- Hot Spare Support
- SMART error detection
- Environmentally-friendly due to low-power consumption

## LSI™ SAS 9211-4i

### Four-Port 6Gb/s PCI Express SATA+SAS Host Bus Adapter

Unsurpassed Internal Storage Connectivity With SATA and SAS Drives

#### KEY ADVANTAGES

- High performance with 6Gb/s data transfer rates
- PCI Express® 2.0 host interface drives superior system performance
- Integrated RAID avoids additional host CPU overhead
- Flexible SATA+SAS array architecture optimizes cost
- Complete kit package includes necessary cables and bracket

#### 6Gb/s SATA+SAS Advantage

The LSI SAS 9211-4i host bus adapter (HBA) provides the greatest available throughput to internal server storage arrays through eight internal 6Gb/s ports, driving up to 256 SAS and SATA physical devices. This HBA offers dynamic SAS functionality including dual-port drive redundancy and SATA compatibility. Utilizing an SFF8087 Mini-SAS connector, the low-profile SAS 9211-4i is an excellent fit for 1U and 2U servers.

LSI SATA+SAS HBAs are able to connect to SATA and SAS hard disk drives and solid state drives, allowing for tiered storage that optimizes costs and performance. SAS drives are optimal when speed and reliability are of the utmost concern while SATA drives are appropriate when capacity and cost are more important.

Featured enhancements on the LSI SAS 9211-4i include End-to-End CRC with Advanced Error Reporting, power management, and hot plug support. This HBA automatically negotiates between SAS and SATA data transfer rates of 1.5, 3 and 6Gb/s speeds. Other features include the T-10 Protection Model for early detection of and recovery from data corruption, and Spread Spectrum Clocking for EMI reductions. All of these improvements combine to provide an extremely powerful and dependable HBA that is designed to meet all of your unique requirements.

#### Low Overhead Integrated RAID Architecture

LSI Integrated RAID (IR) is a low-cost, hardware RAID solution made possible by Fusion-MPT™ architecture, which can achieve over 290,000 IOs per second. IR is a processor-based RAID solution designed for systems requiring redundancy and high-availability where a full-featured RAID implementation is not desired or may be cost-prohibitive. The LSI SAS 9211-4i employs the LSISAS2008 controller to perform these RAID functions. By providing RAID at the hardware level, the host CPU does not perform RAID calculations allowing for more efficient system operation.

LSI advanced Integrated RAID options include Integrated Striping (RAID 0), Integrated Mirroring (RAID 1), Integrated Mirroring Enhanced (RAID 1E), and Integrated Mirroring and Striping (RAID 10). By limiting the RAID configurations possible, Integrated RAID is one of the most affordable hardware RAID options available.



LSI SAS 9211-4i

## SAS Leadership

LSI offers the broadest SAS product portfolio in the industry with true end-to-end solutions including controllers, expanders, active-active multiplexers, ROCs, host bus adapters, RAID solutions, and external storage. LSI's proven SAS core has completed extensive stress and interoperability testing resulting in the

industry's most robust, interoperable solution. LSI has supplied leading edge serial technology to systems throughout the world for over seven generations, making LSI the most experienced enabler of serial interconnect for storage in the world. Integrators can be assured that their LSI adapter is providing the most advanced and robust serial technology available.

## Operating System Support

The LSI SAS 9211-4i host adapter supports Microsoft® Windows®, Linux® (SuSE®, Red Hat®), Solaris®, and VMware operating systems. All OS drivers are backed by extensive testing and validation to ensure optimum system performance.

For a list of the most current supported drivers, visit [lsichannelgateway.com/support](http://lsichannelgateway.com/support).

### LSI SAS 9211-8i HOST BUS ADAPTER

|                                |                                                                                                                                                                       |                                                                                                                    |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| PCI Bus                        | 8-lane, 5 GT/s PCI Express 2.0                                                                                                                                        |                                                                                                                    |
| PCI Modes                      | Bus Master DMA                                                                                                                                                        |                                                                                                                    |
| PCI Data Burst Transfer Rates  | Half Duplex<br>X8 PCIe 4000 MB/s                                                                                                                                      | Full Duplex<br>X8 PCIe 8000 MB/s                                                                                   |
| SAS Bandwidth                  | Half Duplex<br>Single Lane- 600MB/s<br>Wide port (2 lanes) – 1200MB/s<br>Wide port (3 lanes) – 1800MB/s<br>Wide port (4 lanes) – 2400MB/s<br>Wide port (2x4)-4800MB/s | Full Duplex<br>Single lane- 1200MB/s<br>Wide port (2 lanes)- 2400MB/s<br>Wide port (4 lanes)- 4800MB/s             |
| PCI Card Type                  | 3.3V Add-in Card                                                                                                                                                      |                                                                                                                    |
| PCI Voltage                    | +12V ±10%                                                                                                                                                             |                                                                                                                    |
| PCI Form Factor                | 6.6" x 2.536" (MD2 Low-Profile)                                                                                                                                       |                                                                                                                    |
| PCI Power                      | 13.5W                                                                                                                                                                 |                                                                                                                    |
| Brackets                       | Full Height and Low-Profile                                                                                                                                           |                                                                                                                    |
| Certification Level            | PCI Express 2.0                                                                                                                                                       |                                                                                                                    |
| I/O Bus                        | 1 x 4 6Gb/s SAS/SATA port                                                                                                                                             |                                                                                                                    |
| SAS Controller                 | LSISAS2008                                                                                                                                                            |                                                                                                                    |
| Connectors                     | Internal<br>One X4 Mini-SAS SFF8087 (horizontal orientation)                                                                                                          |                                                                                                                    |
| LED Indicators                 | Internal<br>Activity/Fault per x4 port – Heartbeat                                                                                                                    |                                                                                                                    |
| Integrated RAID                | Integrated RAID 0, 1, 1E and 10                                                                                                                                       |                                                                                                                    |
| Max Number of Physical Devices | Non-RAID<br>Integrated RAID (IR)<br>RAID 0<br>RAID 1<br>RAID 1E<br>RAID 10                                                                                            | 256<br>14 spread across 2 volumes<br>10 per volume<br>2 per volume plus hotspare<br>10 per volume<br>10 per volume |
| Environments                   | Operating<br>0°C to 70°C<br>5 to 90% Non-condensing                                                                                                                   | Storage<br>-45°C to 105°C<br>5 to 90% Non-condensing                                                               |
| MTBF                           | >2,000,000 Hours                                                                                                                                                      |                                                                                                                    |
| Compliances                    | EMC: Class B-US (CFR 47, P15B); Canada (ICES-003); Japan (V-3/02.04); Europe (EN55022/EN55024); Australia/New Zealand (AS/NZS 3548); Safety: EN60950                  |                                                                                                                    |
| OS Support                     | Microsoft® Windows®, Linux® (SuSE®, Red Hat®), Solaris®, VMware®. See <a href="http://www.lsi.com/support">www.lsi.com/support</a> for details on versions.           |                                                                                                                    |
| Ordering Information           | LSI SAS 9211-8i Single Pack P/N: LSI00190, LSI SAS 9211-8i Kit P/N: LSI00191                                                                                          |                                                                                                                    |
| Warranty                       | 3 years, advanced replacement option, free technical support at <a href="http://lsi.com/support">lsi.com/support</a>                                                  |                                                                                                                    |



LSI, LSI and Design Logo and Fusion-MPT are trademarks or registered trademarks of LSI Corporation. All other brand and product names may be trademarks of their respective companies.

LSI Corporation reserves the right to make changes to any products and services herein at any time without notice. LSI does not assume any responsibility or liability arising out of the application or use of any product or service described herein, except as expressly agreed to in writing by LSI; nor does the purchase, lease, or use of a product or service from LSI convey a license under any patent rights, copyrights, trademark rights, or any other of the intellectual property rights of LSI or of third parties.

Copyright ©2009 by LSI Corporation. All rights reserved.  
Sept 2009

