



# QLE2460

## Single-Port, 4Gbps Fibre Channel-to-PCI Express Host Bus Adapter

### High Performance

- 150,000 IOPS delivers high I/O transfer rates for storage applications.
- Intelligent interleaved DMA (iiDMA) ensures maximum utilization of data links.
- Out-of-order frame reassembly (OoOFR) reduces congestion and retransmissions.

### Superior Scalability

- Multi-ID and N\_Port virtualization ready. Allows physical ports to be part of multiple logical networks.
- Cisco® VSAN ready. Allows physical ports to be part of multiple logical networks.
- Comprehensive operating system (OS) driver support including Windows®, Linux®, Solaris®, NetWare®, Mac OS®, Citrix®, Oracle®, and VMware®.
- Universal boot support manages multiple hardware platforms and boot options.

### Enhanced Reliability

- Overlapping protection domains for continuous protection of internal data paths.
- T10 cyclic redundancy check (CRC) ensures end-to-end data integrity across SANs.
- Three LEDs display real-time status and link activity information.



**QLE2460 Host Bus Adapter.** The QLE2460 is the industry's first, true enterprise class, 4Gbps-to-PCI Express® x4 adapter. The QLE2460 delivers unprecedented levels of performance and availability, as well as intelligent networking features specific to enterprise class data centers.

**Enterprise Class Features.** The QLE2460 adapter is the highest performing and most reliable adapter in the industry. It delivers unmatched performance by leveraging a single ASIC design, combining a unique hardware architecture to deliver over 150,000 IOPS, nearly 800MBps throughput, and support for PCI Express x4 bus speeds. More importantly, the QLE2460 adapter provides new intelligent storage networking features that redefine the enterprise class adapter, providing increased data protection, advanced frame routing, and enterprise-wide management capabilities.

**Simplified Setup.** Point-and-click installation and configuration wizards simplify the adapter setup process. Storage administrators can quickly deploy adapters across a SAN using standard adapter management tools and device utilities. The QLE2460 is fully compatible with SNIA API and SMI-S, thereby allowing administrators to manage QLogic adapters using third-party software applications.

**Comprehensive OS Support.** QLogic offers the broadest range of support for all major operating systems to ensure OS and hardware server compatibility. Drivers are available for all major operating systems and hardware server platforms. A single driver strategy per OS allows storage administrators to easily deploy and manage adapters in heterogeneous SAN configurations.

**Guaranteed Interoperability.** Storage partner certifications, combined with agency and regulatory testing, ensures that all products meet world compliance hardware and software specifications. All adapters are tested extensively with third-party hardware, along with multiple software applications, to ensure best-in-class SAN interoperability and compatibility. You can be confident purchasing QLogic adapters to meet your Fibre Channel storage networking needs.

**Investment Protection.** For over 15 years, QLogic has been a technological leader with products that address the customer's current needs. In addition, QLogic provides strong investment protection to support emerging technologies and standards. QLogic stands alone in the industry with its product portfolio depth and experience in successfully delivering technological solutions that address the needs of today and tomorrow.

## QLE2460 Single-Port, 4Gbps Fibre Channel-to-PCI Express Host Bus Adapter

## Host Bus Interface Specifications

## Bus interface

- PCI Express x4

## Memory

- 1MB SRAM, 1MB flash (SPI), and 2KB NVRAM (SPI)

Hardware platforms<sup>1</sup>

- IA32 (x86), IA64, IEM64T, AMD Opteron™ 64, Sun™ SPARC®, Apple® G5 (Xserve® and Power Mac®)

## Compliance

- PCI Express Base Specification, revision 1.0a, PCI Express Card Electromechanical Specification rev. 1.0, PCI Bus Power Management Interface Specification revision 1.1

## Fibre Channel Specifications

## Data rate

- 4/2/1Gbps auto-negotiation (4.2480/ 2.1240/ 1.0625Gbps)

## Performance

- 150,000 IOPS

## Topology

- Point-to-point (N\_Port), arbitrated loop (NL\_Port), switched fabric (N\_Port)

## Logins

- Support for F\_Port and FL\_Port login: 2,048 concurrent logins and 2,048 active exchanges

## Class of service

- Class 2 and 3

## Protocols

- FCP (SCSI-FCP), FC-TAPE (FCP-2)

## Compliance

- SCSI-3 Fibre Channel Protocol (SCSI-FCP), Fibre Channel Physical and Signaling Interface (FC-PH), Fibre Channel 2nd Generation (FC-PH-2), Third Generation Fibre Channel Physical and Signaling Interface (FC-PH-3), Fibre Channel-Arbitrated Loop (FC-AL-2), Fibre Channel Fabric Loop Attachment Technical Report (FC-FLA), Fibre Channel-Private

<sup>1</sup> Subject to availability of OS and hardware from respective OEMs.

Loop Direct Attach Technical Report (FC-PLDA), Fibre Channel Tape (FC-TAPE) profile, SCSI Fibre Channel Protocol-2 (FCP-2), Second Generation FC Generic Services (FC-GS-2), Third Generation FC Generic Services (FC-GS-3), Fibre Channel Framing and Signaling (FC-FS)

## Physical Specifications

## Ports

- Single 4Gbps Fibre Channel

## Connections

- Small form factor fixed (SFF) multimode optic with LC-style connector

## Form factor

- Low-profile PCI Express card: 16.765 cm × 6.89 cm (6.6 in. × 2.713 in.)

## Bracket size

- Standard: 1.84 cm × 12.08 cm (.73 in. × 4.76 in.)
- Low-profile: 1.84 cm × 8.01 cm (.73 in. × 3.15 in.)

## Tools and Utilities

## Management tools

- SANsurfer® Fibre Channel HBA Manager

## Device utilities

- Command line interface; utilities for firmware, driver, boot code, NVRAM

## Boot support

- BIOS, EFI, FCode

## APIs

- SNIA HBA API V2, SMI-S, FDMI

Operating systems<sup>1</sup>

- Windows Server® 2003, 2008, 2008 R2; Windows 2000; Windows XP Pro; Windows Vista®; Solaris 10; OpenSolaris™ 2008, 2009; Red Hat® RHEL 3, 4, 5; Novell® SLES 8, 9, 10, 11; Novell NetWare® 6.5; Mac OS X; Citrix XenServer® 3.2–4.1, 5.0, 5.5; Oracle Enterprise Linux 4, 5; VMware ESX™/ESXi 3.5, 4.0

## Environment and Equipment Specifications

## Airflow (no airflow required)

## Temperature

- Operating: 0°C/32°F to 55°C/131°F
- Storage: –20°C/–4°F to 70°C/158°F

## Humidity

- Relative (non-condensing): 10% to 90%
- Storage: 5% to 95%

## Power dissipation

- 5.0W (maximum)

## Cable distances

- 1Gbps: 500 meters 50/125 µm fiber, 300 meters 62.5/125 µm fiber
- 2Gbps: 300 meters 50/125 µm fiber, 150 meters 62.5/125 µm fiber
- 4Gbps: 150 meters 50/125 µm fiber, 70 meters 62.5/125 µm fiber

## Agency Approvals—Product Safety

US and Canada :UL, cUL: UL60950, CSA C22.2 No.60950, Class 1 Laser Product per DHHS 21CFR J

## Europe:

- 73/23/ECC Low Voltage Directive
  - TUV: EN60950-1: 2001, EN60825-1: 1994+A1+A2, EN60825-2: 1994 +A1

## Agency Approvals—EMI and EMC

US: FCC Part 15, Class B

Canada: Industry Canada ICES-003, Class B

Europe: 89/336/EEC EMC Directive CE Mark, EN55022: 1998/CISPR22:1997 Class B, EN55024: 1998, EN61000-3-2:1995, EN61000-3-3:1994

Japan: VCCI, Class B

Taiwan: CNS 13438 Class B

New Zealand and Australia: AS/NZS 3548 Class B

Korea: MIC

## Ordering Information

## QLE2460-CK

- Ships in an individually packed box with a standard size bracket, a spare low-profile bracket, a SANsurfer Fibre Channel HBA Manager CD, and a Quick Start Guide

## QLE2460-BK

- Ships in a bulk box in quantities of 20 and 50 with standard size brackets



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