



# 2400 Series

## PCIe-to-4Gbps Fibre Channel Adapters

### High Performance

- 150,000 IOPS per port
- 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.
- Universal boot support manages multiple hardware platforms and boot options.

### Enhanced Reliability

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



**2400 Series.** The 2400 Series adapters are the industry's first, true enterprise class, 4Gbps-to-PCI Express® adapters. The 2400 Series adapters deliver unprecedented levels of performance and availability, as well as intelligent networking features specific to enterprise class data centers.

**Enterprise Class Features.** The 2400 Series adapters are the highest performing and most reliable adapter in the industry. Additionally, the 2400 Series adapters provide 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 2400 Series adapters are fully compatible with SNIA API and SMI-S, thereby allowing administrators to manage QLogic adapters using third-party software applications.

**Comprehensive Operating System (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.

**Interoperability.** Storage partner certifications, combined with agency and regulatory testing, ensures 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.

## 2400 Series PCIe-to-4Gbps Fibre Channel Adapters

## Host Bus Interface Specifications

## Bus Interface

- PCI Express

## Memory

- 1MB SRAM per port, 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, revision 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 per port

## 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 per port

## 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 Loop Direct Attach Technical Report (FC-PLDA),

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

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

- QLE2460: single 4Gbps Fibre Channel
- QLE2462: dual 4Gbps Fibre Channel
- QLE2464: quad 4Gbps Fibre Channel

## Form Factor

- QLE2460/QLE2462
  - Low-profile PCIe® card (6.6 in. × 2.54 in.)
- QLE2464
  - Full-height PCIe card (8 in. × 4.376 in.)

## Tools and Utilities

## Management Tools

- QConvergeConsole: a unified management tool (GUI and CLI) for Fibre Channel

## Device Utilities

- Utilities for flashing bootcode
- Linux® scripting tools

## Boot Support

- BIOS, EFI, FCode

## APIs

- SNIA HBA API V2, SMI-S, FDMI

Operating Systems<sup>1</sup>

- Microsoft® Windows Server®, XP Professional, Vista®, Red Hat® Linux; Novell® SLES, NetWare®; VMware® ESX™/ESXi; Oracle® Solaris®, Linux; Citrix® XenServer™; Apple Mac OS®

## 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 Consumption

- QLE2460: 5Watts (maximum)
- QLE2462: 6.5Watts (maximum)
- QLE2464: 16Watts (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—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

## Agency Approvals—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

## Ordering Information

- QLE2460-CK (single port)<sup>2,3</sup>
- QLE2462-CK (dual port)<sup>2,3</sup>
- QLE2464-CK (quad port)<sup>3,4</sup>

<sup>2</sup> Ships in an individually packed box with a standard-size bracket, a spare low-profile bracket, and a Quick Start Guide

<sup>3</sup> Ships with small form factor fixed (SFF) multi-mode optics with LC-style connectors

<sup>4</sup> Ships in an individually packed box with a standard-size bracket and a Quick Start Guide



**QLOGIC**<sup>®</sup>

The Ultimate in Performance



Corporate Headquarters QLogic Corporation 26650 Aliso Viejo Parkway Aliso Viejo, CA 92656 949.389.6000

[www.qlogic.com](http://www.qlogic.com)

International Offices UK | Ireland | Germany | France | India | Japan | China | Hong Kong | Singapore | Taiwan

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