

QLA[®] 4010/4010C User's Guide

1-Gb iSCSI to PCI-X Host Bus Adapters

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Table of Contents

Section 1	Introduction	
1.1	How to Use this Guide	1-1
1.2	General Description	1-1
1.3	Features	1-2
1.4	Technical Support	1-2
1.4.1	Availability	1-2
1.4.2	Training	1-2
1.4.3	Contact Information	1-3
Section 2	QLA4010/4010C	
2.1	Installation in the Computer	2-1
2.2	Specifications	2-3
2.3	Label	2-3
2.4	Agency Certification	2-4
2.4.1	QLA4010	2-4
2.4.2	EMI and EMC Requirements	2-4
2.4.3	Product Safety Requirements	2-5
2.4.4	QLA4010C	2-5
2.4.5	EMI and EMC Requirements	2-5
2.4.6	Product Safety Requirements	2-6

Tables

Table		Page
2-1	QLA4010/4010C HBA Operating Environment	2-3
2-2	QLA4010/4010C HBA Specifications	2-3

Section 1

Introduction

1.1

How to Use this Guide

The SANblade™ QLogic® host bus adapters (HBAs) supported in this document are described in the following paragraphs:

- **QLA® 4010** (single channel, full-height bracket, optical media)
- **QLA® 4010C** (single channel, full-height bracket, copper media)

The QLA4010 HBA is 32/64-bit, 33/66/133-MHz PCI-X to iSCSI over Gigabit Ethernet on optical media. The QLA4010C HBA is 32/64-bit, 33/66/133-MHz PCI-X to iSCSI over Gigabit Ethernet on twisted-pair copper media.

This guide contains installation instructions for the hardware (QLA4010/4010C HBA) supported software drivers, and BIOS configuration utility (*Fast!UTIL*). Install these components in the following order:

1. Install the QLA4010/4010C HBA in your PC.
2. Install the software driver according to the directions in the appropriate section.

NOTE: For a Solaris SPARC system the driver must be installed before installation of the HBA.

3. Optionally, you can customize the QLA4010/4010C HBA and its attached devices using the Fast!UTIL BIOS utility. See the associated readme.txt file for detailed instructions.

1.2

General Description

The QLA4010/4010C is an iSCSI HBA that provides PCI connectivity to SCSI using the iSCSI protocol. This release of the QLA4010/4010C HBA implements draft 20 of the IETF iSCSI standard, which creates a new industry standard SAN technology based on internet protocols: TCP/IP. Any updates to the standard will be available for downloads to the HBA. iSCSI enables new IP-based SANs, which are similar to Fibre Channel SANs, as well as a new set of storage applications, for example, remote storage.

The QLA4010/4010C HBA implements the complete protocol stack, including TCP/IP, on the HBA and off-loads the host of any I/O protocol processing. Off-loading the host frees the system to perform other tasks and deliver optimum total system performance. The QLA4010/4010C HBA handles complete SCSI transactions, iSCSI, TCP/IP, and Ethernet.

1.3 Features

- Compliance with *PCI Local Bus Specification* revision 2.2 and *PCI-X Specification* revision 1.0a
- Supports the IETF iSCSI standard, with soft upgrades as the standard evolves
- 32/64-bit, 33/66/133-MHz universal PCI-X
- 1-Gbps, full-duplex Ethernet
- Complete TCP/IP protocol off-load
- iSCSI initiator and target modes
- RJ45 Gigabit Ethernet connector (QLA4010C HBA)
- Small form factor (LC) fiber optic connector (QLA4010 HBA)

1.4 Technical Support

Customers should contact their authorized maintenance provider for technical support of their QLogic HBA products. QLogic-direct customers may contact QLogic Technical Support; others will be redirected to their authorized maintenance provider.

Visit the QLogic support Web site listed in [section 1.4.3](#) for the latest firmware and software updates.

1.4.1 Availability

QLogic Technical Support is available from 7:00 AM to 7:00 PM Central Standard Time, Monday through Friday, excluding QLogic-observed holidays.

1.4.2 Training

QLogic offers certification training for the technical professional for both the SANblade HBAs and the SANbox switches. From the training link at www.qlogic.com, you may choose Electronic-Based Training or schedule an intensive "hands-on" Certification course.

Technical Certification courses include installation, maintenance and troubleshooting QLogic SAN products. Upon demonstrating knowledge using live equipment, QLogic awards a certificate identifying the student as a Certified Professional. The training professionals at QLogic may be reached by email at tech.training@qlogic.com.

1.4.3

Contact Information

Address:	QLogic Corporation 6321 Bury Drive Eden Prairie, Minnesota 55346 USA
Telephone:	+1 952-932-4040
Fax:	+1 952-932-4018
Email: Technical Service Technical Training	support@qlogic.com tech.training@qlogic.com
HBA Support Web Site:	support.qlogic.com

Notes

Section 2

QLA4010/4010C

2.1

Installation in the Computer

NOTE: For a Solaris SPARC operating system, the driver must be installed before installation of the HBA. See the associated readme.txt file for detailed instructions on how to install the driver.

Before you install the QLA4010/4010C HBA in your computer, you need the following:

- A screwdriver (usually a Phillips #1)
- An optical multimode cable with an LC-style duplex connector for the QLA4010 HBA.
- A Cat5e or Cat6 straight-through cable (not cross-over cable) with an RJ45 connector for the QLA4010C HBA.

CAUTION! The QLA4010/4010C HBA contains parts that can be damaged by ESD. Before handling the QLA4010/4010C HBA, use standard methods to discharge static electricity. Keep the QLA4010/4010C HBA in the antistatic bag until you are ready to install it. Place the HBA on the bag when you examine or configure it. Retain the bag for future use.

Perform the following steps to install the QLA4010/4010C HBA in your PC:

1. Check the motherboard and make any configuration changes necessary to accommodate the QLA4010/4010C HBA.

The QLA4010/4010C HBA is self-configuring; however, some motherboards require manual configuration. For example, some systems have a **PCI Device Configuration** menu in the motherboard setup BIOS where you must enable HBAs, bus master slots, and IRQ levels. If the motherboard supports triggering, use *level triggering* for the QLA4010/4010C HBA. See the documentation supplied with your computer, or contact your computer dealer to determine if your motherboard requires configuration.

2. Power down the peripherals, then the computer.
3. Remove the computer cover and save the screws.
4. Choose any PCI bus slot that supports bus mastering. Most motherboards automatically assign an IRQ level and interrupt line; if your motherboard does not, you must assign the IRQ level and use *interrupt line A* for this slot.

NOTE:

- Some motherboards have two kinds of PCI bus slots: master and slave. The QLA4010/4010C HBA must be in a PCI bus master slot. (Some motherboards have PCI bus master slots that are shared with onboard devices. QLA4010/4010C HBAs do not work in shared slots.)
 - PCI connectors vary among system HBA manufacturers. The QLA4010/4010C HBA is a 64-bit PCI device that can function in a 32-bit PCI slot as long as the slot conforms to the PCI specification (the rear edge of the PCI slot is notched). If you try to install the QLA4010/4010C HBA into a PCI slot that does not conform to the PCI specification, you may damage the QLA4010/4010C HBA.
 - PCI and PCI-X slots look the same. If the PC contains both PCI and PCI-X slots, refer to the PC manufacturer's instructions to determine the slot type.
 - The QLA4010/4010C HBAs are designed and tested to operate at PCI bus speeds of up to 66 MHz and PCI-X bus speeds of up to 133 MHz.
5. Remove the slot cover for the slot in which you will install the QLA4010/4010C HBA.
 6. Place the QLA4010/4010C HBA into the slot. Carefully press the HBA into the slot until it seats firmly.
 7. Secure the QLA4010/4010C HBA to the chassis. Follow the PC manufacturer's instructions.
 8. Connect the appropriate cable from the devices to the corresponding connector.
 9. Carefully reinstall the computer cover. Insert and tighten the computer cover screws.
 10. Power up the PC.

For Solaris SPARC systems, restart the system with the following command:

```
reboot -- -r
```

In addition, modify the system `sd.conf` file (`/kernel/drv/sd.conf`) for the operating system (OS) to recognize new targets. QLogic recommends adding up to 255 targets. The QLA4010 supports up to 128 devices. The QLA4010 does not support booting from a target attached to QLA4010.

11. Install the appropriate driver. See the associated `readme.txt` files for detailed instructions on how to install the software drivers.

Optionally, you can customize the QLA4010/4010C HBA and its attached devices using the Fast!UTIL BIOS utility. See the associated `readme.txt` file for detailed instructions.

2.2 Specifications

Tables 2-1 and 2-2 define the QLA4010/4010C HBA specifications.

Table 2-1. QLA4010/4010C HBA Operating Environment

Environment	Minimum	Maximum
Operating temperature	0°C/32°F	55°C/131°F
Storage temperature	-20°C/-4°F	70°C/158°F
Relative humidity (noncondensing)	10%	90%
Storage humidity (noncondensing)	5%	95%

Table 2-2. QLA4010/4010C HBA Specifications

Type	Specifications
Universal PCI specifications	<i>PCI Local Bus Specification</i> , revision 2.2 <i>PCI-X Specification</i> , revision 1.0a 32/64-bit, 33/66/133 MHz 3.3-V and 5-V buses supported (\pm five percent)
Standards	IP v.4 SCSI Architecture Model (SAM-2) SCSI-3 Command Set
Connectors	Optical multimode cable with an LC-style duplex connector (QLA4010 HBA) Cat5e or Cat6 straight-through cable (not cross-over cable) with an RJ45 connector (QLA4010C HBA)
Form factor	PCI short card
Operating power	15 watts

2.3 Label

The transceiver on the QLA4010 HBA is a Class I laser product. It complies with IEC 825-1 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated under recommended operating conditions.

CLASS I LASER PRODUCT

2.4

Agency Certification

The following sections contain a summary of EMC/EMI test specifications performed on QLA4010/QLA4010C (IS0410401/IS0510401) to comply with radiated emission, radiated immunity and product safety standards.

2.4.1

QLA4010

2.4.2

EMI and EMC Requirements

The QLA4010 conforms to the following requirements:

- FCC Part 15, Class B
 - Radiated Emission Class B
 - Conducted Emission Class B
 - ICES-003 Class B

- 89/336/EEC EMC Directive CE
 - EN55022:1998/CISPR:1997 Class B
 - Radiated Emission Class B
 - Conducted Emission Class B

 - EN55024:1998
 - Immunity Standards
 - EN61000-4-2:1995 ESD
 - EN61000-4-3:1995 RF Electro Magnetic Field
 - EN61000-4-4:1995 Fast Transient/Burst
 - EN61000-4-5:1995 Fast Surge Common/Differential
 - EN61000-4-6:1996 RF Conducted Susceptibility
 - EN61000-4-8:1994 Power Frequency Magnetic Field
 - EN61000-4-11:1994 Voltage Dips and Interrupt

 - EN61000-3-2:1995 Harmonic Current Emission
 - EN61000-3-3:1994 Voltage Fluctuation and Flicker

- VCCI, Class B
- CNS 13438, Class B
- AS/NZS 3548, Class B

2.4.3

Product Safety Requirements

- UL, cUL
 - UL60950
 - CSA C22.2 No.60950 Third Edition 2000
 - Class I laser product per DHHS 21CFR J
- 73/23/EEC Low Voltage Directive
 - TUV:
 - EV60950-1:2001
 - EN60825-1:1994+A11+A2

2.4.4

QLA4010C

2.4.5

EMI and EMC Requirements

The QLA4010C conforms to the following requirements:

- FCC Part 15, Class B
 - Radiated Emission Class B
 - Conducted Emission Class B
 - ICES-003 Class B
- 89/336/EEC EMC Directive CE
 - EN55022:1998/CISPR:1997 Class B
 - Radiated Emission Class B
 - Conducted Emission Class B
 - EN55024:1998
 - Immunity Standards
 - EN61000-4-2:1995 ESD
 - EN61000-4-3:1995 RF Electro Magnetic Field
 - EN61000-4-4:1995 Fast Transient/Burst
 - EN61000-4-5:1995 Fast Surge Common/Differential
 - EN61000-4-6:1996 RF Conducted Susceptibility
 - EN61000-4-8:1994 Power Frequency Magnetic Field
 - EN61000-4-11:1994 Voltage Dips and Interrupt
 - EN61000-3-2:1995 Harmonic Current Emission
 - EN61000-3-3:1994 Voltage Fluctuation and Flicker

- VCCI, Class B
- CNS 13438, Class B
- AS/NZS 3548, Class B

2.4.6

Product Safety Requirements

- UL, cUL
 - UL60950 Third Edition 2000
 - CSA C22.2 No.60950
- 73/23/EEC Low Voltage Directive
 - TUV:
 - EV60950-1:2001