

User's Manual and Installation Guide for the DU280/DU3160

64-Bit PCI Dual SCSI Host Adapter Board

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Section0

Quick Installaion Instructions

Note: The following host adapter boards are collectively referred to as the *DUxxx board* unless otherwise noted:

DU280 board (wide, LVD, dual channel, Ultra2, 64-bit PCI) containing the ISP1280 chip.

DU3160 board (wide, LVD, dual channel, Ultra3, 64-bit PCI) containing the ISP12160A chip.

Using These Instructions

Before installing your DUxxx board, take a moment to read this guide. These instructions are a condensed version of the instructions in section 2.

Termination for the DUxxx board is set automatically in most cases. See section 4.2.3 for details.

What You Need for Installation

A screwdriver (usually a Phillips #1)

One or more of the following cables:

Internal narrow (50-pin to 50-pin flat cable)

Internal wide (68-pin to 68-pin LVD flat cable)

External narrow (68-pin to 50-pin transitional round cable)

External wide (68-pin to 68-pin LVD round cable)

Installing Your DUxxx Board

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

1. Check the motherboard and make any configuration changes necessary to accommodate the DUxxx board.
2. Power down your peripheral devices, then your computer.

3. Remove the computer cover.
4. Install the DUxxx board in an appropriate PCI slot.

Note: If the DU3160 board has an ISP12160A/66 chip on it, the board can run in a 66MHz PCI slot.

Note: The DUxxx can work fine with either 32-bit or 64-bit PCI slot.

5. Connect the appropriate SCSI peripheral cables.

Note: If the DUxxx board is on a SCSI bus with any single-ended peripheral device, for example, a CD-ROM, the DUxxx board automatically operates as a single-ended, Ultra device.

Consequently, all single-ended device restrictions apply to the DUxxx board, even though it is an LVD device.

6. Replace the computer cover.
7. Power up the peripherals, then the computer.

Congratulations! You have successfully installed your new DUxxx board. See the *Software Installation Guide* on the section 5 for detailed instructions on how to install the DUxxx board's software drivers.

Section 1

Introduction

1.1 Product Description

The DUxxx board is an intelligent, high-performance, DMA bus master SCSI host adapter designed for high-end systems. The intelligence and performance are derived from the QLogic ISP chip, making the DUxxx board a high performance host adapter. The ISP chip combines a powerful RISC processor, a SCSI executive processor (SXP) (the ISP12160 chip has two), and a peripheral component interconnect (PCI) local bus interface in a single-chip solution.

The DUxxx board supports bootable devices (hard drives and CD-ROM drives) and can be used with tape drives and other SCSI devices. Installation of the DUxxx board is quick and easy.

The DUxxx board is for use only with UL listed computers that have detailed instructions for user installation of accessory cards.

The DUxxx board is designed to operate with multiple data transfer speeds under SCSI specifications (see table 1-1).

Table 1-1. SCSI Data Transfer Rates

SCSI Mode	Maximum Data Rate	Maximum Data Rate
	Narrow (8-bit)	Wide (16-bit)
SCSI (or parallel SCSI)	5 Mbytes/sec (asynchronous)	—
Fast SCSI	10 Mbytes/sec	20 Mbytes/sec
Ultra SCSI	20 Mbytes/sec	40 Mbytes/sec
Ultra2, LVD SCSI	40 Mbytes/sec	80 Mbytes/sec
Ultra3, LVD SCSI	80 Mbytes/sec	160 Mbytes/sec

Note: Only single-ended and LVD devices (Ultra2 and Ultra3) can be connected to the DUxxx board.

The DU280 board supports Ultra, Ultra2 transfer speeds.

The DU3160 board supports Ultra, Ultra2, and Ultra3 transfer speeds.

The board can connect computers to other computers or to peripheral devices such as CD-ROM drives, tape drives, and hard drives. SCSI allows connecting the following number and type of devices to a single channel by **daisy chaining**:

- 6 fast, narrow SCSI devices (DUxxx board in single-ended mode)
- 6 Ultra, narrow SCSI devices (DUxxx board in single-ended mode)
- 15 fast, wide SCSI devices (DUxxx board in single-ended mode)
- 15 Ultra, wide SCSI devices (DUxxx board in single-ended mode)
- 15 Ultra2, LVD SCSI devices
- 15 Ultra3, LVD SCSI devices (DU3160 only)

A daisy chain is a series of connections where the first device is connected to the host adapter board, the second device is connected to the first, and so on. A daisy chain can be created by using either a daisy chain cable (one cable with multiple connectors) or by using multiple cables. Each SCSI device must have a unique SCSI ID.

Because SCSI allows the computer to use a standard set of commands to communicate with peripherals, adding a variety of peripherals to your computer using one host adapter board is easy.

1.2 Features

- Compliance with Intel PCI version 2.2 specification
- Compliance with ANSI X3.131-1994 SCSI-2 standard
- Compliance with ANSI X3T10/1071D SCSI-3 Fast-20 standard (Ultra SCSI)
- Compliance with ANSI X3T10/1142D Fast-40 draft (Ultra2 SCSI)
- Compliance with ANSI T10 project 1142D, Information Technology – SCSI Parallel Interface-2 (SPI-2)
- Compliance with ANSI T10 project 855D, Information Technology – SCSI-3 Parallel Interface (SPI) [DU3160 only]
- Compliance with ANSI T10 project 1302D, Information Technology – SCSI Parallel Interface-3 (SPI-3) [DU3160 only]
- Compliance with U.S. and international safety and emissions standards
- Support for asynchronous and synchronous transfer modes
- Synchronous SCSI data transfer rates supported:
 - Ultra3, LVD SCSI (160 Mbytes/sec) [DU3160 only]
 - Ultra2, LVD SCSI (80 Mbytes/sec)
 - Ultra SCSI wide (40 Mbytes/sec)
 - Ultra SCSI narrow (20 Mbytes/sec)
 - Fast SCSI wide (20 Mbytes/sec)
 - Fast SCSI narrow (10 Mbytes/sec)

SCSI narrow (5 Mbytes/sec)

- Support for single-ended mode
- Support for LVD mode
- Support for up to 30 LVD SCSI devices (15 per channel)
- Support for logical unit numbers (LUNs) 0-15
- **Fast!UTIL BIOS utility to customize the configuration parameters on the DUxxx board and attached drives**
- Active termination
- Active negation

1.3 Mixed Peripheral Support

- Support for hard disk, removable disk, optical disk, scanner, tape drive, CD-ROM, and other SCSI devices
- Simultaneous mixed-peripheral configurations support
- Bootable device support for disk and CD-ROM
- DOS advanced SCSI programming interface (ASPI) manager for disk, tape, and other devices

Section 2

Hardware Installation

2.1 Preinstallation Procedures

Before installing your DUxxx board, take a moment to read this instruction guide.

CAUTION! Your computer, the DUxxx board, and each SCSI device must be configured properly for optimum performance. Refer to the appropriate documentation to configure your computer and SCSI devices.

Pay particular attention to the SCSI ID assignment. The DUxxx board is set at the factory for SCSI ID 7. The DUxxx board and each SCSI device attached to the board must have different SCSI IDs.

The DUxxx board contains parts that can be damaged by electrostatic discharge (ESD). Before handling the DUxxx board, use standard methods to discharge static electricity. Keep the DUxxx board in the anti-static bag until you are ready to install it. Place the board on the bag when you examine or configure it. Retain the bag for future use.

2.2 What You Need for Installation

Before you install the DUxxx board in your computer, you need the following:

- A screwdriver (usually a Phillips #1)
- One or more of the following cables:
 - Internal narrow (68-pin to 50-pin)
 - Internal wide (68-pin to 68-pin)
 - External narrow (68-pin to 50-pin)
 - External wide (68-pin)

Figure 2-1 identifies the DUxxx board components referenced throughout this section.

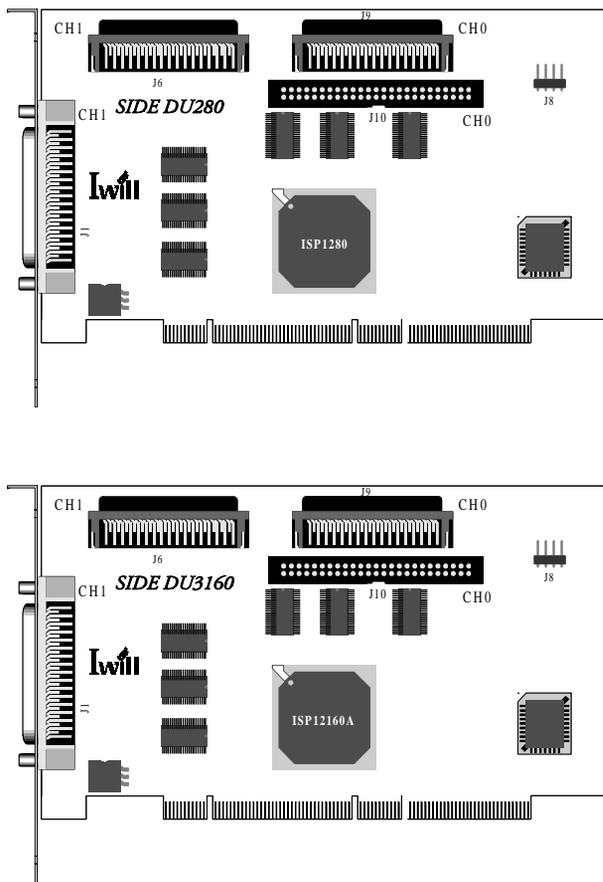


Figure2-1 DUxxxx Board Layout

2.3 Setting the SCSI Termination

Termination for the DUxxx board is set automatically in most cases. You can change the termination using the *Fast!UTIL* software (see section 4.3).

2.4 SCSI Termination Power

The DUxxx board supplies termination power to itself and to the SCSI bus. The circuit is protected by a self-restoring fuse.

2.5 Installing the Device Activity Light

If the SCSI disk is assigned as drive C (boot drive), you can connect the device activity light on the front panel of the PC to indicate boot drive activity. Connect the light to the J8 (SCSI-LED) jumper block (pins 1 and 4 are positive). If your boot drive is an integrated drive electronics (IDE) drive or connected to a different adapter, you can connect an LED to the DUxxx jumper blocks to show activity of devices connected to your DUxxx board.

2.6 Installation in the Computer

If you changed the termination on the DUxxx board, double check the new setting prior to installation.

Perform the following steps to install the DUxxx board in your PC:

- Step1. Check the motherboard and make any configuration changes necessary to accommodate the DUxxx board.

Note: The DUxxx board 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 host adapter boards, bus master slots, and interrupt request (IRQ) levels. If the motherboard supports triggering, use level triggering for the DUxxx board. See the documentation supplied with your computer, or contact your computer dealer to determine if your motherboard requires configuration.

- Step2. Power down the peripherals, then the computer.
- Step3. Remove the computer cover and save the screws.
- Step4. 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 DUxxx board must be in a PCI bus master slot. (Some motherboards share PCI bus master slots with onboard devices. DUxxx boards do not work in shared slots.)

Note: If your board is labeled DU3160, it can run in a 66MHz PCI slot.

Step5. Unscrew and remove the slot cover. Retain the screw; you will use it when you install the DUxxx board.

Step6. Place the DUxxx board into the slot. Carefully press the board into the slot until it seats firmly.

Note: DUxxx boards are designed with the components on the opposite side compared to non-PCI boards.

Step7. Secure the DUxxx board with the slot cover screw.

Step8. Install the cable.

Internal:

Connect the cable from the devices to the J6, J9 and/or J10 connector on the DUxxx board.

External:

Connect a SCSI cable from the devices to the J1 connector.

Note: If you are attaching an external device, you must provide your own cable.

Step9. Carefully reinstall the computer cover. Insert and tighten the computer cover screws.

Step10. Power up all external SCSI devices, then power up the PC and observe the monitor. The BIOS lists all SCSI devices attached to the DUxxx board. For example:

QLogic Corporation

PCI SCSI ROM BIOS Version X.XX

Copyright (C) QLogic Corporation 1999 All rights reserved.

Press <Alt-Q> for Fast!UTIL

Using IRQ number X

Device Number	Device Type	Adapter Number	SCSI ID	SCSI LUN	Vendor ID	Product ID	Product Revision
81	Disk	0	0	0	SEAGATE	ST32550	7394

Section 2 *Hardware Installation*

It is a good idea to write down and store the SCSI device information for future use. You can access the same information using *Fast!UTIL* (see section 4) . This information is helpful for troubleshooting or when you install other devices.

If you don't have a hard drive attached to your computer, a **ROM BIOS NOT INSTALLED** message displays after the device listing.

If the information displayed on your monitor is correct (all installed devices are listed with the correct SCSI ID, device type, etc.), congratulations! You have successfully installed the DUxxx board in your computer.

See the *Software Installation Guide* on the section 5 for detailed instructions on how to install the DUxxx board's software drivers.

If the information displayed is not correct and you have checked the DUxxx board configuration, see section 3 for troubleshooting information.

2.7 **Installation Help**

If your system has an IDE fixed disk device, make sure you program the system BIOS to point to the appropriate boot drive. If your system does not have an IDE disk device, the first bootable SCSI disk device configured (the one with the lowest SCSI ID) is assigned device number 80 and is the boot device.

For a motherboard BIOS that does not support SCSI disk booting, you can use settings in *Fast!UTIL* to select the system's boot device attached to the DUxxx board. If the boot device is a CD-ROM, see the CDROM Boot setting in table 4-1. If the boot device is a disk, see section 4.2.5 about selectable boot settings.

SCSI ID numbers must be unique. If not, the BIOS list of SCSI devices displayed on your monitor will not be correct. For example, if you give one of your devices the same SCSI ID as the DUxxx board, that device will be listed for all SCSI IDs, or if you have two devices with the same SCSI ID, only one of the devices will be listed. If the BIOS list is not correct, power down the computer and recheck the configuration. Be sure to check the DUxxx board, which uses SCSI ID 7. If you do not see your device listed on the BIOS listing, see section 3.

If you do not have an IDE drive, set the motherboard BIOS parameters to None or Not Installed. The ROM BIOS on the SCSI controller automatically configures the SCSI peripherals.

If the DUxxx board is on a SCSI bus with any single-ended peripheral device, for example, a CD-ROM, the DUxxx board automatically operates as a single-ended, Ultra device. Consequently, all single-ended device restrictions apply to the DUxxx board, even though it is an LVD device (see table 3-1).

Section 3

Troubleshooting

3.1 Problems After Installation

There are three basic types of installation problems that can cause your DUxxx board to function incorrectly: hardware problems, system configuration problems, and SCSI problems. The following section provides itemized checklists to help you determine why your DUxxx board is not functioning.

Note: The latest versions of the release notes, software drivers, flash BIOS, and documentation are available on the Iwill web site, <http://www.iwill.net>.

3.2 Hardware Problem Checklist

- Are all of the circuit cards installed securely in the PC?
- Are all of the cables securely connected to the correct connectors?
- Is the DUxxx board installed correctly in the PC slot? Is it seated firmly in the slot?
- Are all external peripherals properly powered up? See section 4 for information about displaying attached devices.

3.3 System Configuration Problem Checklist

- Check the motherboard for proper configuration (see section 2.6).
See the documentation supplied with your computer, or contact your computer dealer to determine if your motherboard requires configuration.
- If the system message **Missing Operating System** or No ROM BASIC, System Halted appears, the disk drive attached to the DUxxx board is not partitioned in a format compatible with the board.

The proper geometry for use with the DUxxx boards is the Microsoft standard.

Drives less than one gigabyte are 64 heads, 32 sectors per track

Drives greater than one gigabyte are 255 heads, 63 sectors per track

If the drive is not formatted with this geometry, repartition and format the drive

using the **DOS FDISK** and **FORMAT** utilities.

3.4 SCSI Problem Checklist

- Make sure that the SCSI bus termination for the DUxxx board is set correctly (see section 4.2.3).
- Make sure that the termination for all devices on the SCSI bus is set correctly.
- Were all of the SCSI devices powered up before you powered up the PC?
- Does each device have a unique SCSI ID? Each device must have its own unique ID between 0 and 15. The DUxxx board is set for SCSI ID 7 at the factory.
- Check the cable lengths. Make sure that the total length for the cables connected to the DUxxx board don't exceed the limits listed in table 3-1.

Table 3-1. Maximum Cable Length

Board and Mode	Cable Length
point to point	25 meters
15 nodes	12 meters
single-ended Ultra mode	9.8 feet (3 meters)(a)
	4.9 feet (1.5 meters)(b)

Table Notes

If you are mixing Ultra and non-Ultra SCSI devices, the total length of the cables cannot exceed the maximum cable length established for Ultra SCSI devices.

(a) For four or less devices connected to the board.

(b) For up to six devices connected to the board.

Section 4

Fast!UTIL

4.1 Introduction

This appendix provides detailed configuration information for advanced users who want to customize the configuration of the DUxxx board and the connected devices.

The DUxxx board is configured at the factory to provide maximum performance. When your board is operating at maximum performance, it may not be 100% compatible with some older SCSI-1 devices. If you are using a SCSI-1 device, see section 4.7 for more information.

The board can be configured using *Fast!UTIL*. Access *Fast!UTIL* by pressing <ALT><Q> during the DUxxx board BIOS initialization (it may take a few seconds for the *Fast!UTIL* menu to appear). If you have more than one DUxxx board, *Fast!UTIL* asks you to select the board you want to configure. After changing the settings, *Fast!UTIL* reboots your system to load the new parameters.

CAUTION! If the configuration settings are incorrect, your DUxxx board will not function properly.

The following sections describe the *Fast!UTIL* options.

4.2 Configuration Settings

The first selection on the *Fast!UTIL Options* menu is *Configuration Settings*. These settings configure the SCSI devices and the DUxxx board to which they are attached.

4.2.1 Host Adapter Settings

From the *Configuration Settings* menu in *Fast!UTIL*, select *Host Adapter Settings*. The default settings for the DUxxx host adapter board are listed in table 4-1 and described in the following paragraphs.

Table 4-1. Host Adapter Settings

Setting	Options
<i>Host adapter BIOS</i>	<i>Enabled or Disabled</i>
<i>PCI bus DMA burst</i>	<i>Enabled or Disabled</i>
<i>CDROM Boot</i>	<i>Enabled or Disabled</i>
<i>Adapter Configuration</i>	<i>Auto, Manual, Safe</i>
<i>Drivers Load RISC Code</i>	<i>Enabled or Disabled</i>
<i>>4Gbyte Addressing</i>	<i>Enabled or Disabled</i>
<i>Fast Command Posting</i>	<i>Enabled or Disabled</i>

• **Host adapter BIOS**

When this setting is disabled, the ROM BIOS on the DUxxx board is disabled, freeing space in upper memory. The RAM BIOS and other drivers still recognize the DUxxx board. Do not disable this setting if you are booting from a SCSI disk drive attached to the DUxxx board. The default is Enabled.

• **PCI bus DMA burst**

When this setting is enabled, burst transfers are performed. When this setting is disabled, data is transferred in nonburst mode, with each cycle initiated by a new address phase. The default is Enabled.

• **CDROM Boot**

When this setting is enabled, the ROM BIOS boots from the attached SCSI CD-ROM if a bootable compact disk is installed. If no bootable CD-ROM is found, the system boots from the first bootable SCSI drive. When this setting is disabled, the ROM BIOS does not boot from the CD-ROM. The default is Disabled.

• **Adapter Configuration**

Auto (default)

The ROM BIOS automatically configures the DUxxx board to match any SCSI device attached to the board and selects optimum performance.

Manual

You can manually control the configuration settings for each SCSI device. If you choose

Manual, you have the option of running Autoconfigure (see section 4.2.4) to have Fast!UTIL configure the devices.

Note: Changing any value can cause performance problems or incorrect device operation.

Safe

All optimal configuration settings are turned off and all attached devices work in minimal configuration (narrow, asynchronous mode).

Note: Safe mode is primarily for troubleshooting SCSI devices that are not operating properly during normal system operation.

• Drivers Load RISC Code

When this setting is enabled, the DUxxx board uses the RISC firmware that is embedded in the software driver. When this setting is disabled, the software driver loads the latest version of RISC firmware found on the system. The default is *Enabled*.

Note: The driver being loaded must support this setting. If the driver does not support this setting, the result is the same as disabled regardless of the setting. Leaving this option enabled guarantees a certified combination of software driver and RISC firmware.

• >4Gbyte Addressing

When this setting is enabled, the DUxxx board will operate with PCI 64-bit mode. When this setting is disabled, the DUxxx board run at PCI 32-bit mode. The default is *Disabled*.

• Fast Command Posting

When this setting is enabled, the DUxxx board execute the Fast Command Posting and get a better system performance. The default is *Enabled*.

4.2.2 SCSI Device Settings

After changing the *Host Adapter Settings* for the DUxxx board, you can modify the device parameters for SCSI devices connected to the board. From the

Configuration Settings menu in **Fast!UTIL**, select *SCSI Device Settings*. The settings are linked to the device's SCSI ID (0-15). If you make changes, be sure the SCSI ID matches the device whose settings you want to change. Select *Scan SCSI Bus* from the **Fast!UTIL Options** menu to see the SCSI IDs assigned on

your system (see section 4.3).

Note: The *Adapter Configuration* setting in the *Host Adapter Settings* (see section 4.2.1) controls which device settings you can change.

The options and defaults for the *SCSI Device Settings* are listed in table 4-2 and described in the following paragraphs.

Table 4-2. SCSI Device Settings

Setting	Options	Default	Adapter Configuration Setting
<i>Disconnects OK</i>	<i>Yes or No</i>	<i>Yes</i>	<i>Auto, Safe, Manual</i>
<i>Check Parity</i>	<i>Yes or No</i>	<i>Yes</i>	<i>Auto, Safe, Manual</i>
<i>Enable LUNs</i>	<i>Yes or No</i>	<i>Yes</i>	<i>Auto, Safe, Manual</i>
<i>Enable PPR</i>	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>
<i>Enable Device</i>	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>
<i>Negotiate Wide</i>	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>
<i>Negotiate Synchronous</i>	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>
<i>Tagged Queuing</i>	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>
<i>Sync Offset</i>	<i>00, 02, 04, 06, 08, 10, 12</i>	<i>08</i>	<i>Manual</i>
<i>Sync Offset</i>	<i>00, 02, 04, 06, 08, 10, 12, 14, 16, 18, 20, 22, 24</i>	<i>24</i>	<i>Manual</i>
<i>Sync Period</i>	<i>10, 12, 25, 40</i>	<i>10</i>	<i>Manual</i>
<i>Sync Period</i>	<i>9, 10, 12, 25, 40</i>	<i>9</i>	<i>Manual</i>
<i>Exec Throttle</i>	<i>1, 4, 8, 16, 32, 64, 128, 255</i>	<i>16</i>	<i>Manual</i>

These settings apply to each SCSI ID individually.

- **Disconnects OK**

When set to *Yes*, the device is notified that it can optionally disconnect from the host adapter. When the drive is ready to continue executing the command, it must reestablish the link through a reconnect cycle. When set to *No*, disconnects are not allowed. The default is *Yes*.

If you have more than one device attached to the DUxxx board, set Disconnects OK to *Yes* for best performance.

- **Check Parity**

When set to *Yes*, odd parity is checked and passed to the SCSI FIFO when data is received from the SCSI bus. When set to *No*, the received SCSI parity is ignored and odd parity is generated for the SCSI FIFO. The default is *Yes*.

- **Enable LUNs**

When set to *Yes*, multiple LUNs are supported. When set to *No*, multiple LUNs are not supported. LUN support is typically required for CD-ROM changers or redundant array of independent disks (RAID) boxes that use LUNs to map drives. The default is *Yes*.

- **Enable PPR (DU3160 only)**

When set to *Yes*, the DU3160 board attempts to negotiate for parallel protocol request (PPR) transfers. When set to *No*, the board does not negotiate for PPR transfers. The default is *Yes*.

- **Enable Device**

When set to *Yes*, the system BIOS recognizes the device at this SCSI ID. When set to *No*, the system BIOS ignores the device at this SCSI ID. The default is *Yes*.

- **Negotiate Wide**

When set to *Yes*, the device supports 16-bit, wide (68-pin cable) SCSI data transfers. When set to *No*, only 8-bit (50-pin cable) SCSI data transfers are supported. The default is *Yes*.

- **Negotiate Synchronous**

When set to *Yes*, the DUxxx board negotiates synchronous data transfers with the device. When set to *No*, the DUxxx board only uses asynchronous data transfers. The default is *Yes*.

- **Tagged Queuing**

When set to *Yes*, the device queues multiple commands. When set to *No*, multiple queues are not supported. The default is *Yes*.

- **Sync Offset**

This field specifies the maximum number of requests (REQ) that can be sent during a synchronous data transfer before an acknowledge (ACK) is received.

For DU280, the valid values for this field are: *00, 02, 04, 06, 08, 10, 12*. The default is *08*.

For DU3160, the valid values for this field are: *00, 02, 04, 06, 08, 10, 12, 14, 16, 18, 20, 22, 24*. The default is *24*.

- **Sync Period**

This field specifies the minimum REQ/ACK period (in 4-ns increments) for a synchronous data transfer.

For DU280, the valid values for this field are *10* (80M bytes/sec, Ultra2), *12* (40M bytes/sec, Ultra), *25* (20M bytes/sec, fast), and *40* (12.5M bytes/sec). The default is *10*.

For DU3160, the valid values for this field are *9* (160M bytes/sec, Ultra3), *10* (80M bytes/sec, Ultra2), *12* (40M bytes/sec, Ultra), *25* (20M bytes/sec, fast), and *40* (12.5M bytes/sec). The default is *9*.

- **Exec Throttle**

This field specifies the maximum number of commands executing on any one channel. When a channel's execution throttle is reached, no new commands are executed until the current command finishes executing. The valid values for this field are: *1, 4, 8, 16, 32, 64, 128, and 255*. The default is *16*.

4.2.3 SCSI Bus Settings

From the *Configuration Settings* menu in *Fast!UTIL*, select *SCSI Bus Settings*. The settings are linked to the device's SCSI channel (0-1). If you make changes, be sure the SCSI channel whose settings you want to change.

The options and defaults for the *SCSI Bus Settings* are listed in table 4-3 and described in the following paragraphs

Table 4-3. SCSI Bus Settings

Setting	Options
<i>SCSI Bus SCSI ID</i>	<i>0-15</i>
<i>SCSI Bus Reset</i>	<i>Enabled or Disabled</i>
<i>SCSI Bus Reset Delay</i>	<i>0-15 seconds</i>
<i>SCSI Bus Termination</i>	<i>Auto, High only, Enabled, Disable</i>

- **SCSI Bus SCSI ID**

This setting defines the SCSI ID of the DUxxx board. The default is SCSI ID 7.

- **SCSI Bus Reset**

This setting enables or disables resetting the SCSI bus when the system is powered up. The default is *Enabled* (the SCSI bus is reset at system power up). Disable this setting when you have two or more host adapter boards on the SCSI bus to prevent unwanted SCSI bus resets.

- **SCSI Bus Reset Delay**

After resetting the SCSI bus, the firmware does not initiate any SCSI activity for the number of seconds specified in this setting. The default is *5 seconds*.

- **SCSI Bus Termination**

The following sections describe how to set termination for the DUxxx board. The text and illustrations describe multiple SCSI devices daisy chained onto a single connector on the board. When daisy chaining narrow and wide SCSI devices, always have a wide SCSI device at the end of the chain.

Termination for the DUxxx board can be set in one of two ways:

Automatic (default)

Manual (*through Fast!UTIL*)

Note: The first and last physical SCSI devices on each end of the SCSI bus must be terminated. Some cables have multiple connectors for connecting several devices to one of the board's connectors. If the board uses a connector that is not on either end of the cable, then the board is not at one end of the SCSI bus and you need to change the termination setting.

The DUxxx board is a dual channel host adapter. Each channel is a separate SCSI bus and must be terminated independently. The channel zero and one connectors are as follows:

Channel zero: J9 (68-pin, Internal) and J10 (50-pin, Internal)

Channel one: J1 (68-pin, External) and J6 (68-pin, Internal)

The following text explains automatic and manual termination.

Auto (default)

SCSI termination requirements are sensed by the board and set automatically.

With the DUxxx board, if you are using only one connector of one channel, the Auto setting assumes that the channel is at the end of the SCSI bus and enables termination for that channel. If you have devices connected to both connectors of one channel, the Auto setting disables termination for that channel.

Disabled

SCSI termination is disabled. This setting overrides termination requirements sensed by the board. Use this setting when one of the following configurations occurs.

1. You have wide devices daisy chained to both connectors of channel 1 (J1 and J6) simultaneously.
2. You have wide devices daisy chained to the J1 connector and J1 connector is not at the end of the cable (In this case, J6 must be empty).
3. You have wide devices daisy chained to the J6 connector and J6 connector is not at the end of the cable (In this case, J1 must be empty).
4. You have wide devices daisy chained to the J9 connector and J9 connector is not at the end of the cable (In this case, J10 must be empty).
5. You have narrow devices daisy chained to the J10 connector and J10 connector is not at the end of the cable (In this case, J9 must be empty).

High only

High termination is enabled. This setting overrides termination requirements sensed by the board. Use this setting when one of the following configurations occurs.

1. You have all wide devices connected to one connector of channel 1 (J1 or J6) and all narrow devices connected to the other connector of channel 1.

Note: The DUxxx version 1.2 will not set the channel 1 termination properly with this configuration. All other configurations work fine.

2. The channel 0 connector J9 is not at one end of the SCSI bus and you have narrow devices at one end of the bus and wide devices at the other end.
3. You have all wide devices connected to J9 connector of channel 0 and all narrow devices connected to J10 connector of channel 0.

4.2.4 Autoconfigure SCSI Devices

You must set the *Adapter Configuration* setting in the *Host Adapter Settings* to *Manual* (see section 4.2.1) to use Autoconfigure; otherwise, all changes made with Autoconfigure are reset when your system is rebooted.

The DUxxx board is designed to sense and configure the devices connected to your board. With the Adapter Configuration set to Manual, the Autoconfigure option gives you control of when the bus is scanned and configured. Selecting the Autoconfigure SCSI Devices option from the Configuration Settings menu causes the DUxxx board to scan the devices on the SCSI bus and set the following options, based on the capabilities of each device:

Enable Device

Disconnects

Negotiate Wide

Negotiate Synchronous

Tagged Queuing

Enable LUN Support

The settings are displayed in the *SCSI Device Settings* screen. Use the arrow keys to change the settings. See section 4.2.2 for more information about the SCSI device settings and section 4.2.1 for host adapter settings.

If you use Autoconfigure to configure your system, you should run **Fast!UTIL** and select Autoconfigure SCSI Devices after adding or reconfiguring devices attached to the DUxxx board.

4.2.5 Selectable Boot Settings

The *Selectable Boot Settings* option is accessed from the *Configuration Settings* menu. If you enable this option, you can select the SCSI ID from which you want to boot. SCSI ID values range from 0-15. Once enabled, this option forces the system to boot on the selected SCSI drive, ignoring any IDE drives attached to your system. If you disable this option, the system looks for an IDE drive from which to boot. If an IDE drive is not found, the system looks for the first bootable SCSI drive. In disabled mode, the SCSI Boot ID and SCSI Boot LUN parameters have no effect.

Note: This option applies only to disk devices; it does not apply to CD-ROMs, tape drives, and other nondisk devices.

4.2.6 Restore Default Adapter Settings

The *Restore Default Adapter settings* option from the *Configuration Settings* menu restores the DUxxx board default settings.

4.2.7 RawNVRAMData

This option displays the adapter's nonvolatile random access memory (NVRAM) contents in hexadecimal format. This is a troubleshooting tool; you cannot modify the data.

4.3 Scan SCSI Bus

This option scans the SCSI bus and lists all the connected devices by SCSI ID. Information about each device is listed, for example, vendor name, product name, and revision. This information is useful when configuring your DUxxx board and attached devices.

4.4 SCSI Disk Utility

This option scans the SCSI bus and lists all the connected devices by SCSI ID. You can select a disk device and perform a low-level format or verify the disk media.

CAUTION! Performing a low-level format destroys all data on the disk.

4.5 Select Host Adapter

This option scans all the DUxxx adapters in the system and lists all the adapters in the screen. You can select an adapter and perform any *Fast!UTIL* function as you want.

4.6 Exit *Fast!UTIL*

This option lets you exit the *Fast!UTIL* utility.

4.7 Using SCSI-1 Devices

The DUxxx board is configured at the factory with default parameters that provide maximum performance. When the board is operating at maximum performance, it may not be 100% compatible with some older SCSI-1 devices.

If the SCSI-1 device attached to the DUxxx board is having problems, you can turn off some of the high-performance parameters to get maximum compatibility. Follow these steps:

1. When you power up the system, access *Fast!UTIL* with the <ALT>-<Q> key combination.
2. Select *Configuration Settings* from the *Fast!UTIL* Options menu.
3. Select *Host Adapter Settings*.
4. Change the *Adapter Configuration* to *Manual*.
5. Press the <ESC> key to return to the *Configuration Settings* menu.
6. Select *SCSI Device Settings*. A screen appears with the settings for each SCSI device. Make the following changes for each SCSI ID to which a SCSI-1 device is assigned.
 - a. Change the *Negotiate Wide* setting to *No*.
 - b. Save the parameters.
 - c. Exit from *Fast!UTIL*.
 - d. Reboot your system.

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7. If your SCSI device is still having problems, repeat steps 1 through 6. In step 3, change the following parameters to *No*, one at a time, rebooting after each change to check your system's performance.
 - a. *Negotiate Synchronous*
 - b. *Check Parity*
 - c. *Enable LUNs*
 - d. *Disconnects OK*

When the system operates correctly, stop changing the parameters!

If you're changed all parameters in steps 6 and 7 and things still aren't working right, follow these steps.

1. When you power up the system, access ***Fast!UTIL*** with the <ALT>-<Q> key combination when the BIOS banner appears.
2. Select *Configuration Settings* from the ***Fast!UTIL*** Options menu.
3. Select *Host Adapter Settings*.
4. Change the *PCI bus DMA burst* setting to *Disable*.
5. Exit from ***Fast!UTIL***.
6. Reboot your system.

If your devices are still not working properly, change the *Adapter Configuration settings* in the *Host Adapter Settings* to *Safe* (see section 4.2.1).

Section 5

Software Installation Guide

5.1 Before You Begin

After successfully installing your DUxxx board, you are ready to install the software drivers you need for the DUxxx board to communicate between your host machine and the desired peripherals.

These instructions are for the DU280 board (wide, LVD, dual channel, Ultra2, 64-bit PCI) containing the ISP1280 and/or DU3160 board (wide, LVD, dual channel, Ultra3, 64-bit PCI) containing the ISP12160A chip.

5.2 Before You Install

Before you install the software drivers, you need to:

- Locate the appropriate drivers for your operating system.

DUxxx drivers for the following operating systems are shipped with four diskettes. They also located on the Iwill web site <http://www.iwill.net>.

Disk1 — for DOS, Windows 95/98, Windows NT 4.0

Disk2 — for NetWare, Linux, Windows 2000

Disk3 — for Sun Solaris

Disk4 — for SCO UnixWare

Note: The version and/or location of the drivers in these diskettes may have some difference with the description in this document.

These driver files are self-extracting and meant to be downloaded onto diskettes. The installation instructions in this guide assume that these drivers reside on diskettes.

- Read through this guide to determine which drivers you want to install.

5.3 General Description

Software drivers for the following operating systems are provided for your DUxxx board:

- Microsoft MS-DOS 6.0 and above with ASPI support
- Windows 95/98
- Windows NT version 4.0
- Windows 2000
- Novell NetWare versions 4.xx and 5.xx
- Linux version 2.0.36
- Sun Solaris x86 versions 2.6 and 7
- SCO UnixWare version 7.0 and 7.1

Note:

- The DUxxx board use QLogic ISP chip, making the DUxxx board a high performance host adapter. It also adopts QLogic's drivers for your most convenience. When installing drivers, you may see the QLogic driver information or be asked to choose the QLogic's QLAXxx boards from a list. The following is the equivalent information about the products between QLogic and Iwill:

DU280 is equivalent to QLogic QLA1280 PCI DUAL LVD SCSI Adaptor.

DU3160 is equivalent to QLogic QLA12160 PCI DUAL Ultra 160M SCSI Adaptor.

- All examples and descriptions in section 5 base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160.

5.4 DOS Drivers Installation

This section provides instructions for installing the drivers for MS-DOS version 6.0 and above under the following operating system conditions:

- Initial installation of MS-DOS, a new SCSI hard drive, and the MS-DOS drivers
If you are installing a new system that has an uninitialized SCSI hard drive and no other hard drives attached, install MS-DOS version 6.0 or above according to the Microsoft DOS user manual before installing the DOS drivers.
- Initial installation of a SCSI hard drive and the MS-DOS drivers on an existing system
If you have an existing system and you are attaching a new SCSI hard drive to the DUxxx board, run the DOS FDISK and FORMAT utilities to prepare the drive for use.

5.4.1 DOS Driver Files

The following files on the Disk1 diskette are provided for installation of the DOS drivers:

Table 5-1. DOS Driver Files in Disk1

Location	File Name For DU280	File Name For DU3160	Description
\DOS\ASPI	QL28ASPI.SYS	QL26ASPI.SYS	RAM BIOS and ASPI manager driver
\DOS\ASPI	QL00CDRM.SYS	QL00CDRM.SYS	CD-ROM driver
\DOS\ASPI	README.TXT	README.TXT	Helpful hints

Be sure to review the README.TXT file for both new and changed information.

Note: All examples and descriptions in section 5.4 will base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160.

5.4.2 Installing your drivers manually

The following sections contain detailed information for manually installing the DOS drivers.

Before you install the DOS drivers, make backup copies of the CONFIG.SYS and AUTOEXEC.BAT files on your system. When installing the software drivers, copy only the files you need to your system.

Note: If you are running HIMEM.SYS and a memory manager such as EMM386.SYS, you can save low memory space by substituting DEVICEHIGH for DEVICE in your CONFIG.SYS file when installing the drivers.

5.4.2.1 DOS RAM BIOS and ASPI Manager Driver and Switch Options

The DUxxx board has an onboard BIOS flash ROM that boots the system from a SCSI disk. In addition, a RAM BIOS that includes an ASPI manager is provided. Using the RAM BIOS and ASPI manager driver gives your system enhanced performance and the additional functionality of the CD-ROM driver.

Note: Using the RAM BIOS and ASPI manager driver is mandatory when you install the CD-ROM driver.

The DOS ASPI manager provides the standard ASPI interface to the DUxxx board. Many SCSI application programs require this interface for disk backup and restore operations to SCSI tape devices, scanners, removable devices, etc.

The option switches in Table 5-2 can be appended to your RAM BIOS and ASPI manager driver DEVICE= line in your CONFIG.SYS file.

Table 5-2. DOS RAM BIOS and ASPI Manager Driver

Switch	Description
/D or /DISPLAY	When enabled, this switch displays the configuration when the driver is loaded. If SCSI configuration is not displayed.
/E	This switch disables the ASPI portio and ASPI manager driver. By default, the driver is enabled.
/NOR or /NORISC	This switch disables loading the RIS
/NOS or /NOSEEK	Some SCSI devices do not implement the seek commands. This switch disables the seek commands. By default, SCSI seek commands are enabled.

5.4.2.2 Installing the RAM BIOS and ASPI Manager Driver

Perform the following steps to install the RAM BIOS and ASPI manager driver.

Note: If you are installing NetWare, the RAM BIOS and ASPI manager driver is not required and should not be loaded.

1. Insert the Disk1 diskette that contains the DOS driver.
2. Create a directory on the boot drive of the computer to store the driver.
For example:

```
MKDIR C:\QLC
```

3. Copy the RAM BIOS and ASPI manager driver file to the directory created in step 2. For example:

```
COPY A:\DOS\ASPI\QL28ASPI.SYS C:\QLC\*.*
```

4. Add a RAM BIOS and ASPI manager driver DEVICE= line to your CONFIG.SYS file. When you reboot your computer, this line loads the driver into your system. For example:

```
DEVICE=C:\QLC\QL28ASPI.SYS
```

If you do not have a hard drive attached to the DUxxx board or you have disabled the SCSI BIOS flash ROM, then the QL28ASPI.SYS line must precede any memory manager line in your CONFIG.SYS file. For example:

```
DEVICE=C:\QLC\QL28ASPI.SYS
```

```
DEVICE=C:\DOS\HIMEM.SYS
```

```
DEVICE=C:\DOS\EMM386.SYS
```

If you want to use any of the option switches, append them to the RAM BIOS and ASPI manager driver DEVICE= line in your CONFIG.SYS file. For example:

```
DEVICE=C:\QLC\QL28ASPI.SYS /DISPLAY /E
```

5. Save your edited CONFIG.SYS file.
6. If you are installing more drivers, proceed to the next appropriate section; otherwise, reboot your system to load the drivers.

5.4.2.3 DOS CD-ROM Driver and Command Line Parameter

The DOS CD-ROM driver provides the interface between the MSCDEX.EXE program and the CD-ROM attached to the DUxxx board. The CD-ROM driver, RAM BIOS and ASPI manager driver, and MSCDEX.EXE program are required for accessing the CD-ROM attached to the DUxxx board.

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The DOS CD-ROM driver and the MSCDEX.EXE program require the following parameter:

/D:your drive name This name associates the MSCDEX.EXE program and the CD-ROM drive. The name can be any legal DOS name.

Note: The /D: in the parameter does not refer to the drive letter of the CD-ROM. Make sure the driver name you supply to the MSCDEX.EXE program is identical to the one you supply to the DOS CD-ROM driver parameter.

Note: The MSCDEX.EXE program is provided by Microsoft with MS-DOS version 6.0 and above. If you are running an older version of MS-DOS, contact Microsoft to obtain the program.

5.4.2.4 Installing the DOS CD-ROM Driver

Before you can install the DOS CD-ROM driver, you must first install the RAM BIOS and ASPI manager driver.

Perform the following steps to install the DOS CD-ROM driver.

1. Insert the Disk1 diskette that contains the DOS driver.
2. Copy the DOS CD-ROM driver file to the computer's boot drive. For example:

```
COPY A:\DOS\ASPI\QL00CDRM.SYS C:\QLC\*.*
```

3. Add a CD-ROM driver DEVICE= line to your CONFIG.SYS file after the line that loads the RAM BIOS and ASPI manager driver. When you reboot your computer, this line loads the driver into your system. For example:

```
DEVICE=C:\QLC\QL28ASPI.SYS
```

```
DEVICE=C:\QLC\QL00CDRM.SYS /D:QLC0000
```

If you are installing NetWare from a CD-ROM, you must copy and use the QLNWCDRM.SYS CD-ROM driver (located in the \NETWARE directory of the Disk2 diskette). For example:

```
DEVICE=C:\QLC\QLNWCDRM.SYS /D:QLC0000
```

Note: Do not load the QL28ASPI.SYS driver with the QLNWCDRM.SYS driver.

4. Save your edited CONFIG.SYS file.
5. Add a line in your AUTOEXEC.BAT file for the MSCDEX.EXE program (supplied by Microsoft). For example:

```
C:\DOS\MSCDEX.EXE /D:QLC0000
```

6. Save your edited AUTOEXEC.BAT file.
7. Reboot your system to load the driver.

5.5 Windows 9X Driver Installation

This section provides instructions for installing the Windows 9X driver under the following operating system conditions:

- Initial installation of the Windows 95 operating system and the Windows 9X driver
- Installation of the Windows 9X driver in a previously installed Windows 95 operating system
- Initial installation of the Windows 98 operating system and the Windows 9X driver
- Installation of the Windows 9X driver in a previously installed Windows 98 operating system

5.5.1 Windows 9X Driver Files

The following files on the Disk1 diskette are provided for installation of the Windows 9X driver:

Table 5-3. Win9X Driver Files in Disk1

Location	File Name For DU280	File Name For DU3160	Description
\\WIN9X	QL1280.INF	QL12160.INF	Driver installation script
\\WIN9X	QL1280.MPD	QL12160.MPD	Windows 9X driver
\\WIN9X	QL1280.CAT	QL12160.CAT	Digital signature catalog
\\WIN9X	README.TXT	README.TXT	Helpful hints

Be sure to review the README.TXT file for both new and changed information.

Note: All examples and descriptions in section 5.5 will base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160.

5.5.2 Driver Installation for Windows 95

If Windows 95 is not installed on your system, perform the installation procedure in section 5.5.2.1 (retail version) or section 5.5.2.2 (OEM version); if Windows 95 (retail or OEM) is already installed on your system, perform the installation procedure in section 5.5.2.3.

5.5.2.1 Installing Windows 95 (Retail Version) and the Windows 9X Driver

Perform the following steps to install the retail version of Windows 95 and the Windows 9X driver.

1. Make sure that MS-DOS 6.X is installed on the system boot disk.
2. Install the DUxxx board and the peripheral devices.
3. If you are installing Windows 95 from a CD-ROM attached to the DUxxx board, install the DOS CD-ROM driver (see section 5.4)
4. Run the Windows 95 SETUP program by following the instructions provided with Windows 95.
5. After Windows 95 is installed and operational, click the *My Computer* icon, then the *Control Panel* icon.
6. In the *Control Panel* window, click the *System* icon and select the *Device Manager* tab.
7. Select *PCI SCSI Bus Controller* listed under *Other Devices*, then click *Properties*.
8. Select the *Driver* tab. Click *Change Driver*.
9. Select *SCSI Controllers*. Click *OK*.
10. Insert the Disk1 diskette that contains the QLogic driver. Click *Have Disk*.
11. Enter A:\WIN9X for the path to the driver. Click *OK*.
12. Select the *QLogic QLA1280 LVD PCI Dual SCSI Adapter* then click *OK*.
13. Click *OK* once more to continue.
14. If the *Windows cannot determine. If it can remove this device safely* dialog box appears, click *Cancel*. Do not click *Test*.

CAUTION! Clicking *Test* may lock the system. Rebooting the system results in normal operation.

15. When prompted to restart your computer, click *No*.
16. Edit your CONFIG.SYS file to remove any QLogic drivers that may have been added for DOS support. These are not required for Windows 95.
17. Reboot your system.

5.5.2.2 Installing Windows 95 (OEM Version) and the Windows 9X Driver

Perform the following steps to install the OEM service release of Windows 95 and the Windows 9X driver.

1. Make sure that MS-DOS is installed on the system boot disk.
 2. Install the DUxxx board and the peripheral devices.
 3. If you are installing Windows 95 from a CD-ROM attached to the DUxxx board, install the DOS CD-ROM driver (see section 5.4)
 4. Run the Windows 95 SETUP program by following the instructions provided with Windows 95.
 5. When Windows restarts, a dialog box displays that says *Do you want to see more about your computer not being configured for optimal performance.* Click *No*.
 6. After Windows 95 is installed and operational, click the *My Computer* icon, then the **Control Panel** icon.
 7. In the **Control Panel** window, click the *System* icon and select the *Device Manager* tab.
 8. Select *PCI SCSI Bus Controller* listed under *Other Devices*, then click *Properties*.
 9. Select the *Driver* tab. Click *Update Driver*.
 10. Insert the Disk1 diskette that contains the QLogic driver and click *Yes* in the *Update Device Driver Wizard* dialog box.
 11. Click *Other Locations* when the *Update Device Driver Wizard* dialog box returns.
 12. Enter A:\WIN9X for the path to the driver. Click *OK*.
 13. Click *Finish* when the wizard finds the updated driver for the *QLogic QLA1280 LVD PCI Dual SCSI Adapter*.
 14. Click *OK* when prompted to insert the *QLogic Software Drivers*.
 15. Enter A:\WIN9X for the path to the QLogic driver. Click *OK*.
 16. If the *Windows cannot determine. If it can remove this device safely* dialog box appears, click *Cancel*. Do not click *Test*.
- CAUTION!** Clicking *Test* may lock the system. Rebooting the system results in normal operation.
17. When prompted to restart your computer, click *No*.
 18. Edit your CONFIG.SYS file to remove any QLogic drivers that may have been added for DOS support. These are not required for Windows 95.
 19. Reboot your system.

5.5.2.3 Installing the Windows 9X Driver in a previously installed Windows 95 system

Perform the following steps to install the Windows 9X driver on a system with the **Windows 95 retail** package already installed.

1. Shut down Windows 95 and install your DUxxx board and peripheral devices.
2. Reboot your system. The *New Hardware Found* window pops up after detecting the *PCI SCSI Bus Controller*.
3. Insert the Disk1 diskette that contains the QLogic driver.
4. Select the option to *Load driver from disk provided by the hardware manufacturer*. Click *OK*.
5. Enter A:\WIN9X for the path to the driver. Click *OK*.
6. Remove the diskette from the disk drive and reboot your system.

Perform the following steps to install the Windows 9X driver on a system with the **Windows 95 OEM** service release already installed.

1. Shut down Windows 95 and install your DUxxx board and peripheral devices.
2. Reboot your system. The *New Hardware Found* window pops up after detecting the *PCI SCSI Bus Controller*.
3. Insert the Disk1 diskette that contains the QLogic driver. Click *Next*.
4. Click *Other Locations in the Update Device Driver Wizard* dialog box.
5. Enter A:\WIN9X for the path to the driver. Click *OK*.
6. Click *Finish* when the wizard finds the updated driver for the *QLogic QLA1280 LVD PCI Dual SCSI Adapter*.
7. Click *OK* when prompted to insert the *QLogic Software Drivers*.
8. Enter A:\WIN9X for the path to the driver. Click *OK*.
9. Remove the diskette from the disk drive and reboot your system.

5.5.3 Driver Installation for Windows 98

If Windows 98 is not on your system, perform the installation procedure in section 5.5.3.1 (SCSI CD-ROM) or section 5.5.3.2 (IDE CD-ROM). If Windows 98 is already installed on your system, perform the installation procedure in section 5.5.3.3.

5.5.3.1 Installing Windows 98 and the Windows 9X Driver from a SCSI CD-ROM

Perform the following steps to install Windows 98 and the Windows 9X driver from a SCSI CD-ROM attached to the DUxxx board.

1. Install the DUxxx board and peripheral devices.
2. Create a bootable partition on your hard drive and format it.

Note: The Windows 98 bootable distribution diskette from Microsoft does not contain the necessary file (Format.com) that creates a bootable partition. To successfully install Windows 98 from a SCSI CD-ROM attached to the DUxxx board, you must create a bootable partition on your hard drive from a DOS or Windows 95 boot disk.

3. Boot to the root directory. For example:

C:\

4. Install the DUxxx DOS CD-ROM driver (see section 5.4)

Note: When you are prompted for the MSCDEX.EXE, insert the Windows 98 boot disk.

5. Reboot your system to load the drivers.
6. Insert the Windows 98 CD into the SCSI CD-ROM drive.
7. Run the Windows 98 Setup application from the CD-ROM drive. For example:

D:/SETUP.EXE

8. Install Windows 98 according to the software's instructions.
9. After Windows 98 is installed and operational, double-click the *My Computer* icon, then the **Control Panel** icon.
10. In the **Control Panel** window, double-click the *System* icon and select the *Device Manager* tab.
11. Select *PCI SCSI Bus Controller* listed under *Other devices*, then click *Properties*.
12. Click *Driver*, then click *Update Driver*.
13. Insert the Disk1 diskette that contains the QLogic driver. Click *Next* in the *Update Device Driver Wizard* dialog box.
14. Click *Display a list of all the drivers in a specific location, so you can select the driver you want* then click *Next*.
15. If you are prompted to select the device type, click *SCSI Controllers*. Click *Next*.
16. Click *Have Disk* and type A:\WIN9X for the path to the QLogic driver then click *OK*.
17. Click *QLogic QLA1280 LVD PCI Dual SCSI Adaptor*, then click *Next*.
18. Windows 98 displays your QLogic adapter choice and path to the QLogic driver. Click *Next*.
19. Click *Finish* when the wizard finds the updated driver for the *QLogic QLA1280 LVD PCI Dual SCSI Adaptor*.
20. When prompted to restart your computer, click *No*.
21. Edit your CONFIG.SYS file to remove any QLogic drivers that may have been added for DOS support. These are not required for Windows 98.
22. Remove the diskette from the disk drive and reboot your system.

5.5.3.2 Installing Windows 98 and the Windows 9X Driver from an IDE CD-ROM

Perform the following steps to install Windows 98 and the Windows 9X driver from an IDE CD-ROM.

1. Install the DUxxx board and peripheral devices.
2. Connect the IDE CD-ROM to the IDE controller.
3. Insert the Windows 98 boot disk.
4. Reboot your system.
5. The Microsoft Windows 98 Startup Menu opens and prompts you to select a startup option.
 - Microsoft Windows 98 Startup Menu
 1. Start Windows 98 Setup from CD-ROM.
 2. Start computer with CD-ROM support.
 3. Start computer without CD-ROM support.Enter a choice: 1
6. Make sure the Windows 98 CD is in the CD-ROM drive and press the <ENTER> key to accept the default.
7. Install Windows 98 according to the manufacturer's instructions.

8. After Windows 98 is installed and operational, double-click the *My Computer* icon, then the **Control Panel** icon.
9. In the **Control Panel** window, double-click the *System* icon and select the *Device Manager* tab.
10. Select *PCI SCSI Bus Controller* listed under *Other devices*, then click *Properties*.
11. Click *Driver*, then click *Update Driver*.
12. Insert the Disk1 diskette that contains the QLogic driver. Click *Next* in the *Update Device Driver Wizard* dialog box.
13. Click *Display a list of all the drivers in a specific location, so you can select the driver you want* then click *Next*.
14. If you are prompted to select the device type, click *SCSI Controllers*. Click *Next*.
15. Click *Have Disk* and type A:\WIN9X for the path to the QLogic driver, then click *OK*.
16. Click *QLogic QLA1280 LVD PCI Dual SCSI Adaptor*. Click *Next*.
17. Windows 98 displays your QLogic adapter choice and path to the QLogic driver. Click *Next*.
18. Click *Finish* when the wizard finds the updated driver for the *QLogic QLA1280 LVD PCI Dual SCSI Adapter*.
19. Remove the diskette from the drive disk and reboot your system.

5.5.3.3 Installing the Windows 9X Driver in a previously installed Windows 98 system

Perform the following steps to install the Windows 9X driver on a system with the Windows 98 operating system already installed.

1. Install the DUxxx board and peripheral devices.
2. Reboot your system. The *New Hardware Found* window pops up after detecting the *PCI SCSI Bus Controller*.
3. Insert the Disk1 diskette that contains the QLogic driver. Click *Next*.
4. Click *Display a list of all the drivers in a specific location so you can select the driver you want* then click *Next*.
5. If you are prompted to select the device type, click *SCSI Controllers*. Click *Next*.
6. Click *Have Disk* and type A:\WIN9X for the path to the QLogic driver, then click *OK*.
7. Click *QLogic QLA1280 LVD PCI Dual SCSI Adaptor*. Click *Next*.
8. Windows 98 displays your QLogic adapter choice and path to the QLogic driver. Click *Next*.
9. Click *Finish* when the wizard finds the updated driver for the *QLogic QLA1280 LVD PCI Dual SCSI Adaptor*.
10. Reboot your system.

5.6 Windows NT driver installation

This section provides instructions for installing the Windows NT driver under the following operating system conditions:

- Initial installation of the Windows NT operating system and the Windows NT driver
- Installation of the Windows NT driver in an already installed Windows NT operating system
- Installing an updated Windows NT driver in an already installed Windows NT operating system that has an older version of the driver.

5.6.1 Windows NT Driver Files

The following files on the Disk1 diskette are provided for installation of the Windows NT driver:

Table 5-4. Win.NT Driver Files in Disk1

Location	File Name For DU280	File Name For DU3160	Description
\	TXTSETUP.OEM	TXTSETUP.OEM	Driver installation script 1 initial Windows NT text setup
\	OLOGI	OLOGI	Identification file
\NT	OEMSETUP.INF	OEMSETUP.INF	Driver installation script 1 the Windows NT setup program
\NT	QL1280.SYS	QL12160.SYS	Windows NT 4.0 driver
\NT	README.TXT	README.TXT	Helpful hints

Be sure to review the README.TXT file for both new and changed information.

Note: All examples and descriptions in section 5.6 will base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160.

5.6.2 Windows NT Installation

To install Windows NT 4.0 on your system, perform the installation procedure in section 5.6.2.1. If Windows NT 4.0 is already installed on your system, perform the installation procedure in section 5.6.2.2. If a Windows NT driver is already loaded on your system and you want to install an updated version, perform the installation procedures in section 5.6.2.3.

5.6.2.1 Installing Windows NT and the Windows NT Driver

Perform the following steps to install Windows NT 4.0 on the SCSI disk drive attached to the DUxxx board. You can use these same steps to install Windows NT 4.0 from a CD-ROM attached to the DUxxx board.

1. Place the Windows NT setup diskette in an appropriate drive.
2. Reboot your system.
3. Follow the standard Windows NT installation instructions.
4. Once the standard devices have been detected and configured, select *Specify Additional Device*.
5. Select *Other*, then press <ENTER>.

6. Insert the Disk1 diskette that contains the QLogic drivers into an appropriate disk drive and press <ENTER>.
7. Windows NT detects the *QLogic QLA1280, 64 bit PCI DUAL LVD SCSI HBA*. Press <ENTER> to continue the driver installation.
8. Follow the standard Windows NT installation instructions to complete the Windows NT setup.

5.6.2.2 Installing the Windows NT Driver

Perform the following steps to add the Windows NT driver to a previously installed Windows NT 4.0 system.

1. Select *My Computer* from the desktop.
2. Select *Control Panel*.
3. Select *SCSI Adapters*.
4. Select the *Drivers* tab and click *Add*.
5. Insert the Disk1 diskette that contains the QLogic drivers into an appropriate drive and click *Have Disk*.
6. Type the path to the Windows NT driver on the diskette. For example:
A:\NT
7. Click *OK*.
8. Select *QLogic QLA1280, 64bit PCI DUAL LVD SCSI HBA* and click *OK*.
9. Remove the diskette and click *Yes* to restart the system.

5.6.2.3 Updating the Windows NT Driver

Perform the following steps if a Windows NT driver is already installed and you want to install an updated version of the driver.

1. Open a DOS command prompt window.
2. Change the current directory to the Windows NT driver directory. For example:
CD \WINNT\SYSTEM32\DRIVERS
3. Make a backup copy of the old driver. You can copy the file into the same directory with a .SAV extension indicating that it is the saved file. For example:
COPY QL1280.SYS QL1280.SAV
4. Insert the Disk1 diskette that contains the QLogic driver into an appropriate drive.
5. Copy the new driver over the old driver. For example:
COPY A:\NT\QL1280.SYS
6. Reboot your system to load the driver.

5.6.3 Enabling Enhanced Scatter/Gather

Windows NT version 4.0 includes enhanced scatter/gather list support for handling very large SCSI I/O transfers. Version 4.0 supports up to 256 scatter/gather segments of 4096 bytes each, allowing transfers of up to 1,048,576 bytes. The optimal (default) value is 256 scatter/gather segments. If you wish to change this value, refer to the README.TXT file for more information.

5.7 Windows 2000 driver installation

This section provides instructions for installing the Windows 2000 driver under the following operating system conditions:

- Initial installation of the Windows 2000 operating system and the Windows 2000 driver
- Installation of the Windows 2000 driver in an already installed Windows 2000 operating system

5.7.1 Windows 2000 Driver Files

The following files on the Disk2 diskette are provided for installation of the Windows 2000 driver:

Table 5-5. Windows 2000 Driver Files in Disk2

Location	File Name For DU280	File Name For DU3160	Description
\	TXTSETUP.OEM	TXTSETUP.OEM	Driver installation script for initial Windows 2000 text setup
\	QLOGIC	QLOGIC	Identification file
\W2K	OEMSETUP.INF	OEMSETUP.INF	Driver installation script for the Windows 2000 setup program
\W2K	QL1280.SYS	QL12160.SYS	Windows 2000 driver
\W2K	QL1280.CAT	QL12160.CAT	Digital signature catalog file
\W2K	README.TXT	README.TXT	Helpful hints

Be sure to review the README.TXT file for both new and changed information.

Note: All examples and descriptions in section 5.7 will base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160.

5.7.2 Windows 2000 Installation

To install Windows 2000 on your system, perform the installation procedure in section 5.7.2.1. If Windows 2000 is already installed on your system, perform the installation procedure in section 5.7.2.2. If a Windows 2000 driver is already loaded on your system and you want to install an updated version, perform the installation procedures in section 5.7.2.3.

5.7.2.1 Installing Windows 2000 and the Windows 2000 Driver

Perform the following steps to install Windows 2000 on the SCSI disk drive attached to the DUxxx board. You can use these same steps to install Windows 2000 from a CD-ROM attached to the DUxxx board.

1. Insert the Windows 2000 setup diskette or CD (if booting from a bootable CD-ROM drive) in an appropriate drive.
2. Reboot your system.
3. Follow the standard Windows 2000 installation instructions.
4. Press <F6> to *Install Additional Devices*.
5. Press s to specify an additional device.
6. Insert the Disk2 diskette that contains the QLogic drivers into an appropriate disk drive and press <ENTER>.
7. Windows 2000 detects the *QLogic QLA1280, 64 bit PCI DUAL LVD SCSI HBA*. Press <ENTER> to continue the driver installation.
8. Press <ENTER> to continue the Windows 2000 installation.
9. Follow the instructions to complete the Windows 2000 installation.

5.7.2.2 Installing the Windows 2000 Driver

Perform the following steps to add the Windows 2000 driver to a previously installed Windows 2000 system.

1. Install the DUxxx board.
2. Power up the computer. The Windows 2000 detects the DUxxx and starts the *Found New Hardware Wizard*.
3. Click *Next*.
4. Select *Display a list of the known drivers for this device so that I can choose a specific driver*, then click *Next*.
5. Select *SCSI and RAID controllers* in the *Hardware Type* list, then click *Next*.
6. Click *Have Disk*. The *Install From Disk* dialog box opens.
7. Insert the Disk2 diskette that contains the QLogic driver into an appropriate drive, then type the location of the Windows 2000 driver. For example:
A:\W2K
8. Click *OK*.
9. Select *QLogic QLA1280, 64bit PCI DUAL LVD SCSI HBA* and click *Next*. Windows 2000 indicates that the wizard is ready to install the device.
10. Click *Next*.
11. If the *Digital Signature Not Found* dialog box appears, click *Yes*.

Note: At the time of publication, Windows 2000 does not correctly identify the QLogic digital signature file (QL1280.CAT).

12. Click *Finish*.
13. Click *Yes* to restart the system.

5.7.2.3 Updating the Windows 2000 Driver

Perform the following steps if a Windows 2000 driver is already installed and you want to install an updated version of the driver.

1. Click the *Start* button on the Taskbar.
2. Select *Programs to Administrative Tools to Computer Management*.
3. Double-click *System Tools*.
4. Double-click *Device Manager*.
5. Double-click *SCSI and RAID Controllers*.
6. Double-click *QLogic QLA1280, 64 bit PCI DUAL LVD SCSI HBA*.
7. Select the *Driver* tab.
8. Click *Update Driver*. The *Upgrade Device Driver Wizard* dialog box appears. Click *Next*.
9. Select *Display a list of the known device drivers for this device so that I can choose a specific driver*. Click *Next*.
10. Click *Have Disk*. The *Install From Disk* dialog box appears.
11. Insert the Disk2 diskette that contains the QLogic driver into an appropriate drive, then type the location of the Windows 2000 driver. For example:
A:\W2K
12. Click *OK*.
13. Select *QLogic QLA1280, 64bit PCI DUAL LVD SCSI HBA* and click *Next*. Windows 2000 indicates that the wizard is ready to install the device.
14. Click *Next*.
15. If the *Digital Signature Not Found* dialog box appears, click *Yes*.

Note: At the time of publication, Windows 2000 does not correctly identify the QLogic digital signature file (QL1280.CAT).

16. Click *Finish*.
17. Click *Yes* to restart the system.

5.8 NetWare Driver Installation

This section provides instructions for installing the NetWare driver under the following operating system conditions:

- Initial installation of Novell NetWare and the NetWare driver
- Installation of the NetWare driver in an already installed Novell NetWare system

5.8.1 NetWare Driver Files and Setting Options

The following files on the Disk2 diskette are provided for installation of the NetWare 4.11, 4.2, and 5.X drivers:

Table 5-6. NetWare Driver Files in Disk2

Location	File Name For DU280	File Name For DU3160	Description
\\NETWARE	QL1280.HAM	QL12160.HAM	Driver for NetWare 4.2 and 5.X
\\NETWARE	QL1280.DDI	QL12160.DDI	
\\NETWARE	QLNWCDRM.SYS	QLNWCDRM.SYS	DOS CD-ROM driver with NetWare driver
\\NETWARE	README.TXT	README.TXT	Helpful hints

Be sure to review the README.TXT file for both new and changed information.

Note: All examples and descriptions in section 5.8 will base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160.

You can load the QL1280.HAM driver with optional switches to customize the interface between the driver and Novell NetWare. The switches are described in Table 5-7.

Table 5-7. QL1280.HAM Driver Switch Options

Switch	Description
SLOT	Specifies the logical peripheral component (PCI) slot number
/LUN	Finds all multi-logical unit number (LUN) load

5.8.2 Initial Installation of NetWare and the NetWare Driver

If you have installed your DUxxx board with a CD-ROM attached and you are installing NetWare from the CD-ROM, you must first install the DOS operating system, then install the DOS CD-ROM driver (see section 5.4), and then install NetWare.

NOTE:

- Do not load the QL28ASPI.SYS driver with the QLNWCDRM.SYS driver.
- After installing the DOS operating system and the DOS CD-ROM driver, verify that the CD-ROM is accessible from DOS.

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Perform the following steps to install NetWare 4.11, 4.2, or 5.X.

1. Boot the system to DOS.
2. Insert the Disk2 diskette that contains the QLogic driver into an appropriate drive.
3. Create a directory on the boot drive of the computer to store the driver.
For example:

```
MD C:\QLC
```
4. Copy the NetWare CD-ROM driver file from the diskette to the directory created in step 3. For example:

```
COPY A:\NETWARE\QLNWCDRM.SYS C:\QLC\*.*
```
5. Add a CD-ROM driver DEVICE= line to your CONFIG.SYS file. When you reboot your computer, this line loads the driver into your system. For example:

```
DEVICE=C:\QLC\QLNWCDRM.SYS /D:QLC0000
```
6. Save your edited CONFIG.SYS file.
7. Add a line in your AUTOEXEC.BAT file for the MSCDEX.EXE program.
For example:

```
C:\DOS\MSCDEX.EXE /D:QLC0000 /M:10
```
8. Save your edited AUTOEXEC.BAT file.
9. Remove the diskette from the disk drive and reboot your system to load the CD-ROM driver.
10. Place the NetWare CD into the CD-ROM drive.
11. At the DOS prompt, type (drive):INSTALL and press <ENTER>.
12. When prompted for installation type, select Custom Installation. Press the <ENTER> key to continue.
13. When prompted to Choose the Server Drivers – Disk Driver, press <INSERT> to install an unlisted driver.
14. Insert the Disk2 diskette that contains the QLogic driver into an *appropriate* drive.
15. Press <ENTER> to select the QL1280.HAM driver.
16. Follow the standard NetWare installation instructions to complete the installation.

5.8.3 Installing the NetWare Driver

If you have installed your DUxxx board with a CD-ROM attached and you are installing NetWare from the CD-ROM, you must first install the DOS CD-ROM driver (see section 5.4), then continue with this procedure.

NOTE:

- Do not load the QL28ASPI.SYS driver with the QLNWCDRM.SYS driver.
- The QL1280.HAM driver is not compatible with NetWare versions 4.10 and earlier.
- The LOAD command lines can be entered in your NetWare STARTUP.NCF file to load the driver automatically when the NetWare server is started.

Perform the following steps to install the NetWare driver on a previously installed NetWare 4.11, 4.2, or 5.X system.

1. Start NetWare and load the NetWare Install program from the NetWare server prompt (:).

Type the following command if you are using NetWare 4.11 or 4.2:

```
LOAD INSTALL
```

Type the following command if you are using NetWare 5.X:

```
LOAD NWCONFIG
```

2. Select *Driver options* from the main menu.
3. Select *Configure disk and storage device drivers*.
4. Select *Select an additional driver*.
5. Press <INSERT> to install an unlisted driver.
6. Insert the Disk2 diskette that contains the QLogic driver into an appropriate drive.
7. Press <ENTER> to select the QL1280.HAM driver.
8. Select *Yes* to copy the driver from the diskette to the server directory.
9. If you have a CD-ROM attached to the DUxxx board, you must also load CDROM.NLM, which is provided with NetWare to mount CD-ROM volumes on the server. For example:

```
LOAD CDROM.NLM
```

10. If you are installing multiple DUxxx boards, add the SLOT setting to the LOAD line. Replace the X in the load line example with the logical slot number of the slot in which the board is installed.

```
LOAD QL1280.HAM SLOT=X
```

11. If you are attaching multiple LUN devices, such as tape changers, add the /LUN switch to the LOAD line. For example:

```
LOAD QL1280.HAM SLOT=X /LUN
```

12. If ASPI support is required for the SCSI devices, you must load the Nwaspi.CDM module, which is provided by NetWare. For example:

```
LOAD Nwaspi.CDM
```

5.9 Sun Solaris Driver Installation

This section provides instructions for installing the SUN Solaris driver under the following operating system conditions:

- Installation of the Solaris driver in an already installed SUN Solaris system

Note: the Disk3 diskette is not a DOS format, you can not access it under DOS system.

Note: All examples and descriptions in section 5.9 will base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160.

5.9.1 Installing the Sun Solaris Driver in a previously installed Solaris system

Perform the following steps to install the QLA1280 driver in a previously installed Sun Solaris x86 v2.6 and v7 system.

Note: To install the QLA1280 driver, you must have super-user privileges.

1. Logon to the system as a superuser.
2. Insert the Disk3 diskette that contains the QLogic driver in the first floppy drive.

Note: The latest version of the software driver for Solaris is available on the Iwill web site. Perform the following step to get the image file and create your own driver diskette.

- a. Login as root.
- b. Change directory to a temporary directory:

```
cd /tmp
```
- c. Obtain the package image file, QLA1280.Z from Iwill web site and deposit into a working directory (your source directory). Copy the QLA1280.Z file into the /tmp directory:

```
cp <source directory>/qla1280.Z .
```
- d. Uncompress QLA1280.Z with the command:

```
uncompress qla1280
```

This step yields the uncompressed file, QLA1280. The compressed file QLA1280.Z is replaced by the uncompressed file QLA1280.

- e. Create a diskette contains the QLA1280 in pkg format with:

```
dd if=qla1280 of=/dev/rdiskette0
```

- 3.. Enter the following text to stop the volume check program:
`/etc/init.d/volmgt stop`
4. Enter the following text to run the package add (pkgadd) program:
`pkgadd -d /dev/rdiskette0`
5. You are prompted to insert a diskette. For example:
Insert diskette into Floppy Drive.
Type [go] when ready,
Or [e] to eject the diskette,
Or [q] to quit:
6. Type go and press <ENTER> to continue.
7. You are prompted to select a driver package. For example:
The following packages are available:
1 QLA1280 QLogic QLA1280 driver
(x86) Solaris 2.6-7, Rev=1.00
Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:
8. Type 1 and press <ENTER> to continue.
9. You are prompted to select the directory where the driver will be installed. For example:
Processing package instance <QLA1280> from </vol/dev/rdiskette0/unlabeled>
QLogic QLA1280 driver
(x86) Solaris 2.6-7, Rev=1.00
Copyright (c) 1999, by QLogic Corporation. All rights reserved.
Where do you want the driver object installed (default=/kernel/drv):
10. Press <ENTER> to accept the default.
11. The pkgadd program performs a series of checks, then posts a script warning and asks whether or not to continue the installation. For example:
Using </kernel/drv> as the package base directory.
Processing package information.
Processing system information.
Verifying disk space requirements.
Checking for conflicts with packages already installed.
Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission during the process of installing this package.
Do you want to continue with the installation of <QLA12160> [y, n,?]

12. Type `y` and press `<ENTER>` to continue the driver installation. The `pkgadd` program notifies you when the driver installation is complete. For example:

```
Installing QLogic QLA1280 driver as <QLA1280>
```

```
## Installing part 1 of 1.
```

```
/kernel/drv/qla1280.conf
```

```
[ verifying class <none> ]
```

```
## Executing postinstall script
```

```
Installation of <QLA1280> was successful.
```

13. You are prompted to select a driver package. For example:

```
The following packages are available:
```

```
1  QLA1280  QLogic QLA1280 driver
```

```
(x86) Solaris 2.6-7, Rev=1.00
```

```
Select package(s) you wish to process (or 'all' to process all  
packages). (default: all) [?,??.q]:
```

14. Type `q` and press `<ENTER>` to quit the installation process.

15. Remove the diskette that contains the QLogic driver.

16. Enter the following text to reboot and reconfigure the system:

```
reboot — -r
```

5.10 SCO UnixWare 7 Driver Installation

This section provides instructions for installing the SCO UnixWare 7 driver under the following operating system conditions:

- Installation of the UnixWare driver in an already installed SCO UnixWare 7.0 or 7.1 system
The installation of host adapter boards and devices is covered in detail in the SCO UnixWare documentation. See the following topics for more information.

Using boot-time loadable drivers (*Installation Guide*)

Adding hard disks and CD-ROM drives (*System Administrator Guide*)

Note: the Disk4 diskette is not a DOS format, you can not access it under DOS system.

Note: All examples and descriptions in section 5.10 will base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160.

5.10.1 Installing the UnixWare Driver in an already installed SCO UnixWare 7.0 or 7.1 system

If you download the newest drive file from web site, you should first create your own HBA diskette by executing the following steps:

1. Logon as root.
2. Uncompress the file you downloaded. For example:
`uncompress qlc1280.Z`
3. Create the HBA diskette. For example:
`dd if=qlc1280 of=/dev/fd0`

Perform the following steps to install the UnixWare driver in a previously installed SCO UnixWare 7.0 or 7.1 system.

1. Make sure you have root privileges.
2. Enter the following text at the prompt to run the pkgadd program:
`pkgadd -d diskette1`
3. The following prompt appears:
Insert diskette into Floppy Drive 1.
Type [go] when ready,
or [q] to quit: (default: go)
4. Insert the Disk4 diskette that contains the QLogic driver into drive 1 and press the return key to select [go].
5. You are prompted to select a driver package. For example:
Installation in progress. Do not remove the diskette.
The following packages are available
1 qlc1280QLogic QLA1280 IHV HBA (i386) 3.01
Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??.quit]:
6. Type 1 and press the return key to install the UnixWare driver.
7. When the driver is installed, the following prompt appears:
Installation of QLogic QLA1280 IHV HBA (qlc1280) was successful.
Insert diskette into Floppy Drive 1.
Type [go] when ready,
or [q] to quit: (default: go)
8. Type q and press the return key to exit the installation program.
9. Remove the diskette that contains the QLogic driver.
10. Reboot the system to load the driver.

5.11 Linux Driver Installation

This section provides instructions for installing the Linux driver under the following operating system conditions:

- Installation of the Linux driver on an already installed Red Hat 6.0 Linux kernel (version 2.2.5 and above). (The kernel is not on the SCSI hard drive attached to the DUxxx board.)

Note: The Linux version module support does not detect incompatibility between symmetric multiprocessing (SMP) and non-SMP modules, so be sure you don't install the SMP module on a non-SMP configured machine.

The installation of host adapter boards and devices is covered in detail in the Red Hat documentation. See the following topic for more information.

Making an Initrd Image (*Installation Guide*)

5.11.1 Linux Driver Files

The following files on the Disk2 diskette are provided for installation of the Linux driver:

Table 5-8. Linux Driver Files in Dis

Location	File Name For DU280	File Name For DU3160	
\\i	qla1x80src.tgz	qla1x80src.tgz	C a

Note: All examples and descriptions in section 5.11 will base on the file name for DU280 board. If you have the DU3160 board, please replace the file name to the corresponding one for DU3160

5.11.2 Extracting and Loading the Linux Driver

Perform the following steps to install and load the Linux driver in an already installed Linux kernel.

Follow these steps to uncompress and extract the Linux driver.

1. Login as Root.
2. Create a directory on the boot drive of the computer to store the driver. For example:

```
mkdir /home/qla1x80
```
3. Insert the Disk2 diskette that contains the QLogic driver.
4. Change the current directory to the Linux driver directory. For example:

```
cd /home/qla1x80
```
5. Copy the Linux driver file to the directory created in step 2. For example:

```
mcopy a:* /home/qla1x80
```

6. Uncompress and extract the two modules from the tar archive. For example:

```
tar -xyz < qla1x80src.tgz
```

7. Compile the drivers. For example:

For an uni-processor system:

```
make
```

Note: The Tar utility extracts the following files:

qla1x80.o – uni-processor version of the driver for DU280

qla1x160.o –uni-processor version of the driver for DU3160

For a multi-processor system:

```
make all SMP=1
```

Note: The Tar utility extracts the following files:

qla1x80smp.o – multi-processor version of the driver for DU280

qla1x160smp.o – multi-processor version of the driver for DU3160

8. Copy the module into the subdirectory under `/lib/modules/kernel_release/scsi`, where **kernel_release is the kernel version. For example:**

For an uni-processor system:

```
cp qla1x80.o /lib/modules/2.2.5-15/scsi
```

For a multi-processor system:

```
cp qla1x80smp.o /lib/modules/2.2.5-15/scsi
```

Installing and removing the QLogic driver module is quick and easy because the driver is created as a Linux dynamically loadable module. The module is loaded using the *insmod* (loadable kernel module installation facility) utility and removed using the *rmmod* (remove module) utility.

Follow this step to load the Linux driver.

Type the following command after the Linux shell prompt to load the Linux driver. For example:

```
insmod qla1x80
```

If you are running on an SMP system, load the SMP version of the driver `qla1x80smp`. For example:

```
insmod qla1x80smp
```

Note: This method loads the Linux driver for the current operating session. When you reboot the system, you must reload the QLogic driver. If you want the driver to load automatically each time the system boots, follow the instructions in section 5.11.3.

5.11.3 Installing the Driver Using a Ramdisk Image

The Linux kernel does not automatically load the qla1x80 driver when the system reboots. You can load the qla1x80 driver at boot time using a ramdisk image. For more information, refer to the Red Hat installation guide.

Perform the following steps to load the qla1x80 driver using a ramdisk image.

1. Add the following line to the file `/etc/conf.modules`. For example:

```
alias scsi_hostadapter qla1x80
```
2. Build a new ramdisk image that contains the `qla1x80.o` object file. For example:

```
/sbin/mkinitrd /boot/newinitrd-image 2.2.5-15
```

Note: The 2.2.5-15 file is the subdirectory under `/lib/modules/kernel_release` where the `qla1x80.o` module resides.

3. Modify the `/etc/lilo.conf` file to load the new ramdisk image. Add or modify the `initrd =` line anywhere after the bootable kernel label. For example:

```
initrd=/boot/newinitrd-image
```
4. Load a new lilo file by running `/sbin/lilo`.
5. Reboot your system.