

Appendix A

Fast!UTIL

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A.1

Introduction

This appendix provides detailed configuration information for advanced users who want to customize the configuration of the QLA1xxx board and the connected devices.

The QLA1xxx 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 A.5 for more information.

The board can be configured using *Fast!UTIL*. Access *Fast!UTIL* by pressing <ALT>-<Q> during the QLA1xxx board BIOS initialization (it may take a few seconds for the *Fast!UTIL* menu to appear). If you have more than one QLA1xxx 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 QLA1xxx board will not function properly.

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

A.2 Configuration Settings

The first selection on the *Fast!UTIL Options* menu is *Configuration Settings*. These settings configure the SCSI devices and the QLA1xxx board to which they are attached.

A.2.1 Host Adapter Settings

From the *Configuration Settings* menu in *Fast!UTIL*, select Host Adapter Settings. The default settings for the QLA1xxx host adapter board are listed in table A-1 and described in the following paragraphs.

Table A-1. Host Adapter Settings

Setting	Options	Default
Host adapter	<i>Enabled or Disabled</i>	<i>Enabled</i>
Host adapter BIOS	<i>Enabled or Disabled</i>	<i>Enabled</i>
Host adapter SCSI ID	<i>0-15</i>	<i>7</i>
PCI bus DMA burst	<i>Enabled or Disabled</i>	<i>Enabled</i>
CDROM Boot	<i>Enabled or Disabled</i>	<i>Disabled</i>
SCSI bus reset	<i>Enabled or Disabled</i>	<i>Enabled</i>
SCSI bus reset delay	<i>0-15 seconds</i>	<i>5 seconds</i>
Concurrent command/data	<i>Enabled or Disabled</i>	<i>Enabled</i>
Drivers load RISC code	<i>Enabled or Disabled</i>	<i>Enabled</i>
Adapter Configuration	<i>Auto, Manual, Safe</i>	<i>Auto</i>
SCSI termination ^a	<i>Auto, Enabled^b, Disabled, High only</i>	<i>Auto</i>

Table Notes

^aSCSI termination does not apply to the QLA1041/1240D boards (see appendix B).

^bThis option does not apply to the QLA1240 board.

- ❑ **Host adapter.** When this setting is enabled, the system BIOS and drivers recognize the QLA1xxx board. When this setting is disabled, the BIOS and drivers ignore the board. The default is *Enabled*.
- ❑ **Host adapter BIOS.** When this setting is disabled, the ROM BIOS on the QLA1xxx board is disabled, freeing space in upper memory. The RAM BIOS and other drivers still recognize the QLA1xxx board. Do not disable this setting if you are booting from a SCSI disk drive attached to the QLA1xxx board. The default is *Enabled*.
- ❑ **Host adapter SCSI ID.** This setting defines the SCSI ID of the QLA1xxx board. The default is *SCSI ID 7*.
- ❑ **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*.
- ❑ **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 five seconds.
- ❑ **Concurrent command/data.** When this setting is enabled, both the data DMA and the command DMA execute concurrently. When this setting is disabled, either the data DMA or the command DMA is operational. To maximize bus transfer performance, the default is *Enabled*.
NOTE: This setting is not available and has no effect on older versions of the ISP chip.
- ❑ **Drivers load RISC code.** When this setting is enabled, the host adapter 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.

❑ Adapter Configuration

- ❑ *Auto* (default). The ROM BIOS automatically configures the QLA1xxx 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 A.2.3) 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.

❑ SCSI termination (QLA1040)

NOTE: The last SCSI device on each end of the SCSI bus must be terminated.

- ❑ *Auto* (default). SCSI termination requirements are sensed by the board and set automatically. For example, if you have devices connected to J1, J2, or P2, termination is enabled. If you have wide devices connected to J1 and J2 or P2, termination is disabled.
- ❑ *Disabled*. SCSI termination is disabled. This setting overrides termination requirements sensed by the board. Use this setting when J1 or J2 is not at one end of the SCSI bus. For example, use this setting if you have wide devices daisy chained to J1 or J2 with a single cable and J1 or J2 is not at the end of the cable.
- ❑ *Enabled*. SCSI termination is enabled. This setting overrides termination requirements sensed by the board. Use this setting when you have wide devices connected to J1, J2 or P2 (same result as using *Auto*).
- ❑ *High only*. High termination is enabled. This setting overrides termination requirements sensed by the board. Use this setting when you have a wide device connected to one connector (J1, J2 or P2) and a narrow device connected to the other.

SCSI termination (QLA1080/1240/1280)

Termination for the QLA1080/1240/1280 boards can be set in one of three ways:

- Automatic (default)
- Manual (through *Fast/UTIL*)
- Jumpers

NOTE: The last SCSI device on each end of the SCSI bus must be terminated.

The QLA1240/1280 boards are dual port host adapters. Each port is a separate SCSI bus and must be terminated independently. The port one and two connectors are as follows:

QLA1240 board:

- Port one: J2 and J3
- Port two: J1

QLA1280 board:

- Port one: J1 and J3
- Port two: J2

The following text explains automatic and manual termination. See sections B.4 (QLA1240), B.5 (QLA1080), and B.6 (QLA1280) for jumper termination instructions.

- Auto* (default). SCSI termination requirements are sensed by the board and set automatically.

With the QLA1240/1280 boards, the Auto setting assumes that port one is at one end of the SCSI bus and enables termination for port one. If you are using only one port one connector, the Auto setting assumes that port one is at the end of the SCSI bus and enables termination for port one. If you have devices connected to both port one connectors, the Auto setting disables termination for port one.

- Disabled*. SCSI termination is disabled. This setting overrides termination requirements sensed by the board. Use this setting when J2, J1, or J3 (QLA1240/1280 boards) is not at one end of the SCSI bus. For example, use this setting if you have wide devices daisy chained to the QLA1240/1280 J1, J2, or J3 connector with a single cable and the J1, J2, or J3 connector is not at the end of the cable.

- Enabled* (QLA1080). SCSI termination is enabled. This setting overrides termination requirements sensed by the board. Use this setting for the QLA1080 board when you have a wide device connected to J1 or J2.
- High only*. High termination is enabled. This setting overrides termination requirements sensed by the board.

Use this setting for the QLA1080 board when you have a wide device connected to one connector and a narrow device connected to the other.

Use this setting for the QLA1240/1280 boards' port one when you have a wide device connected to one connector and a narrow device connected to the other connector. Use this setting for the QLA1240/1280 boards' port two if the port two connector 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.

A.2.2

SCSI Device Settings

After changing the host adapter settings for the QLA1xxx 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 A.3).

NOTE: The Adapter Configuration setting in the Host Adapter Settings (see section A.2.1) controls which device settings you can change.

The options and defaults for the SCSI device settings are listed in table A-2 and described in the following paragraphs.

Table A-2. SCSI Device Settings

Setting	Options	Default	Adapter Configuration Setting
Disconnects OK	<i>Yes or No</i>	<i>Yes</i>	<i>Auto, Safe, Manual</i>
Check Parity	<i>Yes or No</i>	<i>Yes</i>	<i>Auto, Safe, Manual</i>
Enable LUNs	<i>Yes or No</i>	<i>Yes</i>	<i>Auto, Safe, Manual</i>
Enable Device	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>
Negotiate Wide	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>
Negotiate Synchronous	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>

Table A-2. SCSI Device Settings (Continued)

Setting	Options	Default	Adapter Configuration Setting
Tagged Queuing	<i>Yes or No</i>	<i>Yes</i>	<i>Manual</i>
Sync Offset	<i>00, 02, 04, 06, 08, 12</i>	<i>08</i>	<i>Manual</i>
Sync Period	<i>10, 12, 25, 50</i>	<i>12</i>	<i>Manual</i>
Exec Throttle	<i>1, 4, 8, 16, 32, 64, 128, 255</i>	<i>16</i>	<i>Auto, Safe, Manual</i>

NOTE: 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 QLA1xxx 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 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 QLA1xxx board negotiates synchronous data transfers with the device. When set to *No*, the QLA1xxx 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. The valid values for this field are: *00, 02, 04, 06, 08,* and *12*. The default is *08*.
- Sync Period.** This field specifies the minimum REQ/ACK period (in 4-ns increments) for a synchronous data transfer. The valid values for this field are *10* (80 Mbytes/sec, LVD [QLA1080/1280 boards]), *12* (40 Mbytes/sec, Ultra), *25* (20 Mbytes/sec, fast), and *50* (10 Mbytes/sec). The default is *12*.
- Exec Throttle.** This field specifies the maximum number of commands executing on any one port. When a port'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*.

A.2.3

Scan and Configure SCSI Devices

NOTE: You must set the Adapter Configuration setting in the Host Adapter Settings to *Manual* (see section A.2.1) to use Autoconfigure; otherwise, all changes made with Autoconfigure are reset when your system is rebooted.

The QLA1xxx 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 QLA1xxx 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 A.2.2 for more information about the SCSI device settings and section A.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 QLA1xxx board.

A.2.4

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.

A.2.5

Restore Default Settings

The *Restore Defaults* option from the *Configuration Settings* menu restores the QLA1xxx board default settings. The default settings are displayed on the *SCSI Device Settings* screen. Use the arrow keys to change the settings. See section A.2.2 for more information about the SCSI device settings and section A.2.1 for host adapter settings.

A.2.6

Raw NVRAM Data

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.

A.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 QLA1xxx board and attached devices.

A.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.

A.5

Using SCSI-1 Devices

The QLA1xxx 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 QLA1xxx 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 *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.
4. If your SCSI device is still having problems, repeat steps 1 through 3. 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've changed all parameters in steps 3 and 4 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 A.2.1).