



SRCU32

Hardware Installation and User's Guide, Version 2.0.4

October 2002

Order Number: 273478-005

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Getting Started

1

Intended Audience

This documentation is intended for users who are experienced in configuring computer systems with new add-in cards or have had previous experience with Intel® Integrated RAID (IIR) Controllers.

Read and adhere to all warnings, cautions, and notices in this guide and the other documents in the user documentation set supplied with this product.

1.1 Using the User Documentation Set

User documentation for this product is provided in four separate documents:

Installation Quick Start Poster

The *Installation Quick Start Poster*, or *Quick Start Poster*, provides a high level view of installing and configuring a RAID controller. Refer to the accompanying *Software Guide* for more detailed information.

Hardware Installation and User's Guide

The *Hardware Installation and User's Guide*, or *Hardware Guide*, covers instructions for installing an IIR controller and provides a guide to its features and specifications. For a particular IIR controller, its hardware guide documents compatible RAID adapters, supported operating systems, standard features and optional features.

Software Installation and User's Guide

The *Software Installation and User's Guide*, or *Software Guide*, contains:

- Quick installation of the IIR controller software on a newly created bootable host drive with commonly used operating systems.
- Detailed instructions covering more complex software installation scenarios for all supported operating systems.
- Instructions for using the RAID Software Suite, the drivers, tools and utilities of the IIR controller.

The first part of the software guide provides an overview of RAID technology and its features. Next, the guide documents various installation procedures for an IIR controller and the RAID Software Suite, depending on the chosen OS configuration. The software guide then includes descriptions of the utilities, Storage Console (StorCon) and Storage Console Plus (StorCon+), to facilitate the configuration of the RAID subsystem. Finally, the guide provides details of all product features supported by the software and firmware. For further information refer to the Optional Features section of the appropriate hardware guide since not all features are applicable to all IIR controllers.



Clustering Guide

Clustering is applicable only for those RAID controllers that support this feature. See the Hardware Guide to determine if clustering is supported.

The *Intel® Integrated RAID Controller Clustering Guide*, or *Clustering Guide*, describes how to set up clustering configurations using IIR Controllers and IIR controller software.

Information on Operating Systems, Cluster functionality, and other system details may be found in their corresponding system manuals.

1.1.1 Document Formats

All documents, with the exception of the quick start poster, are provided on the CD-ROM in both PDF and HTML format:

- **HTML**—To view online HTML documents, Click Documentation from the autorun menu or open <cdromdrive>:\docs\index.htm.
- **PDF**—Portable Document Format (PDF) documents can be opened, viewed, and printed with Adobe* Acrobat Reader* (not provided on the CD-ROM).

1.2 About This Guide

This guide contains three sections:

Chapter 1, Getting Started

This chapter covers how to use the different user documents in the user documentation set, customer support contact information should you need support for this product, and regulatory and license agreements covering this product.

Chapter 2, Hardware Installation

This chapter contains the procedures for installing the IIR controller into a computer system.

Chapter 3, Hardware Specifications and Features

This chapter covers all the hardware specifications associated with the IIR controller and its components and any optional RAID features that are supported by the RAID Software. The software guide covers in detail all software features.

1.3 Customer Support Contact Information

[Provided by RAID vendor]

1.4 Regulatory and Certification Information

Note: This card is intended for use in UL Listed computers or equivalent that has instructions detailing installation.

1.4.1 Product Regulatory Compliance

The GDT8623RZ-I (SRCU32) RAID add-in card, when correctly integrated per this guide, complies with the following safety and electromagnetic compatibility (EMC) regulations.

1.4.2 Product Safety Compliance

- CSA C22.2, No. 60950/UL 60950, 3rd Edition (US/Canada)
- EN 60 950 (European Union)
- IEC 60 950 (International)
- CE - Low Voltage Directive (73/23/EEC) (European Union)

1.4.3 Product EMC Compliance

- FCC/ICES-003, Class B Emissions (USA/Canada) Verification
- CISPR 22, 3rd Edition, Class B Emissions (International)
- EN55022, Class B Emissions
- EN55024: 1998, Immunity
- CE - EMC Directive 89/336/EEC
- AS/NZS 3548, 1995 Class B Emissions (Australia / New Zealand)
- BSMI CNS13438, Class A Emissions (Taiwan)
- RRL, MIC Notice No. 1997-41 (EMC) & 1997-42 (EMI) (Korea)

1.4.4 Product Regulatory Compliance Markings

The GDT8623RZ-I RAID add-in card is marked with the following regulatory markings:

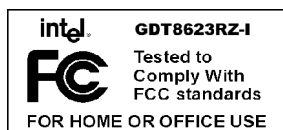
cUL_{US} Listing Marks



CE Mark



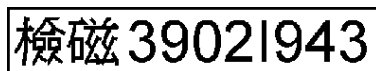
FCC Marking (Class B)



Australia C-Tick Mark



Taiwan BSMI Marking (Class A)



Korea RRL, MIC Mark



In addition, the GDT8623RZ-I RAID add-in card meets the following regulations:

Canada EMC Marking (Class B)

CANADA ICES-003 CLASS B

CANADA NMB-003 CLASS B

1.4.5 Electromagnetic Compatibility Notices

1.4.5.1 FCC Verification Statement (USA)

Product Type: GDT8623RZ-I

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals that are not shielded and grounded may result in interference to radio and TV reception.

1.4.5.2 ICES - 003 (Canada)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadian des Communications.

(English translation of the notice above.) This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the interference causing equipment standard entitled "Digital Apparatus," ICES-003 of the Canadian Department



of Communications.

1.4.5.3 CE Declaration of Conformity (Europe)

This product has been tested in accordance to, and complies with the Low Voltage

Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

1.4.5.4 BSMI (Taiwan)

The BSMI ID certification number is located on the primary (top) side of the product.

1.5 Warnings and Cautions

This guide and all associated guides in the user documentation set (the Quick Start Guide, the Hardware Guide, and the Software Guide) should be used by qualified technical personnel with experience installing and configuring PCI adapter cards.

Read and adhere to all warnings, cautions, and notices in this guide and all the guides in the *user documentation set* supplied with this product.

Warnings

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If the equipment has more than one interface connector, do not leave cables connected to unused interfaces unless otherwise instructed to do so in the user manual.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Cautions

Take precautions to prevent electrostatic discharge (ESD) damage before handling the IIR adapter.

ESD can damage adapter components. Perform the described procedures in this guide only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Hardware Installation

2

About this Chapter

This chapter provides information on installing the IIR controller, installing/removing the SDRAM, programming the Flash memory, setting the adapter's termination mode, and general SCSI termination information.

2.1 Installation Procedures

Warning: Shock hazards may be present inside the computer in which this card is being installed. Disconnect all power cords to the computer before the removal of any covers.

Follow the warnings noted in your computer's user manual before installing PCI add-in adapters.

ONLY after reinstallation of all the covers should you reconnect the power cords and power up the computer.

Note: Take precautions to prevent electrostatic discharge (ESD) damage before handling the IIR controller.

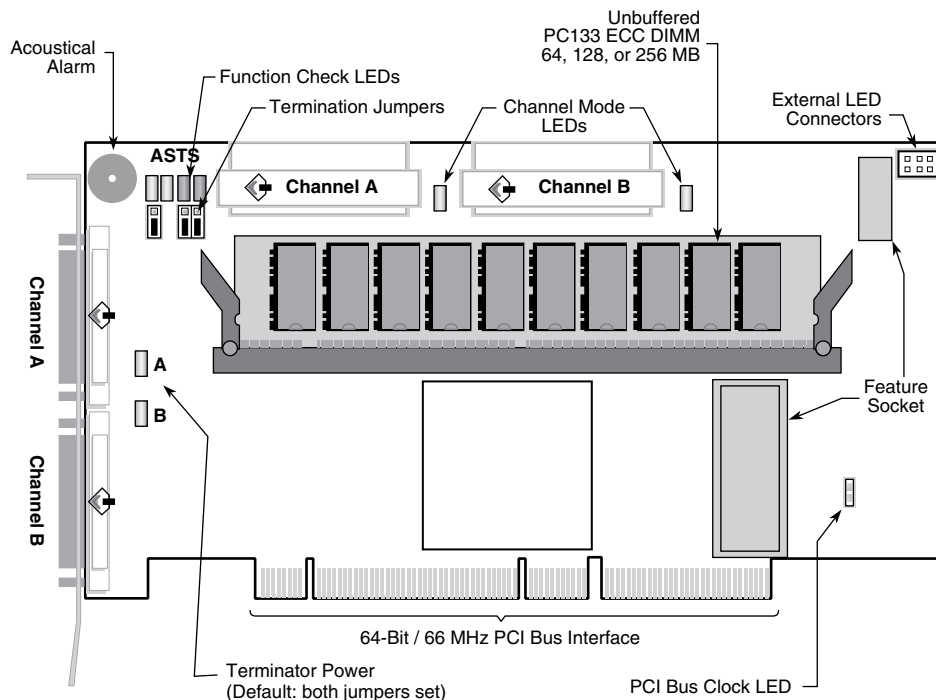
2.1.1 Computer System Hardware Requirements

- Server with CD-ROM drive (not attached to the IIR controller)
- One available 64bit, 66MHz, PCI slot.

Note: The IIR controller will work in 32bit, 33 or 66MHz slots, however, a 64bit, 66MHz PCI slot is recommended. Consult the system guide for the motherboard in which the adapter is to be installed to determine an appropriate PCI slot.

- PCI 2.2 compliant system BIOS

Figure 2-1. IIR Controller Component Layout



A9857-01

2.1.2 Installing the IIR Controller

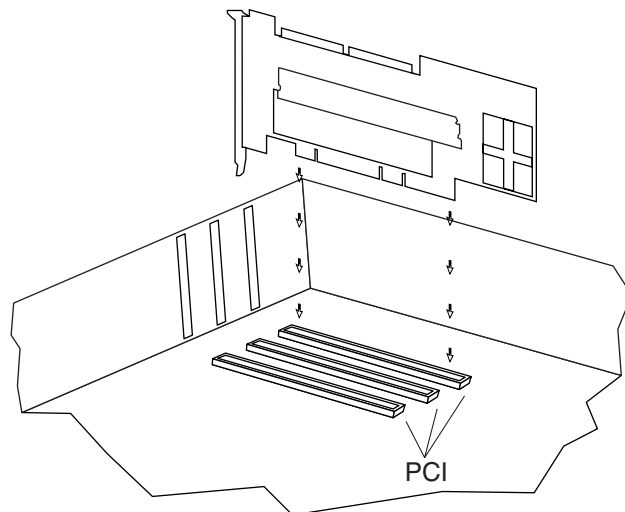
The IIR controller may or may not come with a memory module (DIMM) already installed. If the memory socket (indicated in [Figure 2-1](#)) is not populated with a DIMM, then, *before proceeding with the controller installation*, install an approved DIMM into the memory socket as indicated in [Section 2.1.3.1](#). Contact your RAID vendor for a list of approved memory modules.

1. Power-off the computer system.
2. Disconnect power cord(s) and remove the system cover.
3. Install the IIR controller into an available PCI slot. See [Figure 2-2](#).
4. Connect one end of the SCSI cable to the internal (68 pin) or external (VHDCI) SCSI connector located on the IIR controller. Connect the other end of the SCSI cable to the SCSI drives or drive enclosure.

Note: Ensure that the end of the SCSI bus is properly terminated. See [Section 2.3](#) in this guide for termination details.

5. Replace the system cover and reconnect power cord(s).

Figure 2-2. Installing the IIR Controller into a Computer System



2.1.3 Installing and Removing the SDRAM

2.1.3.1 Installing the SDRAM

Note: The IIR controller cannot be operated without an SDRAM. Minimum requirement is a 64MB ECC, non-buffered (non-registered) PC133 SDRAM. Other capacities are 128MB or 256MB.

Note: Install the SDRAM on the IIR controller only when the controller is not installed in the computer.

1. With clips in the open position (see [Figure 2-3](#)), insert the DIMM into the DIMM connector (the DIMM and connector are keyed to ensure proper insertion).

Caution: Align the DIMM carefully so as not to damage the conductor pads on the DIMM and in the connector. Apply firm pressure but do not force.

2. With your thumbs positioned on each end of the DIMM and two fingers on the DIMM connector, press your thumb and fingers firmly together until the DIMM clips snap to the close position (see [Figure 2-3](#)).

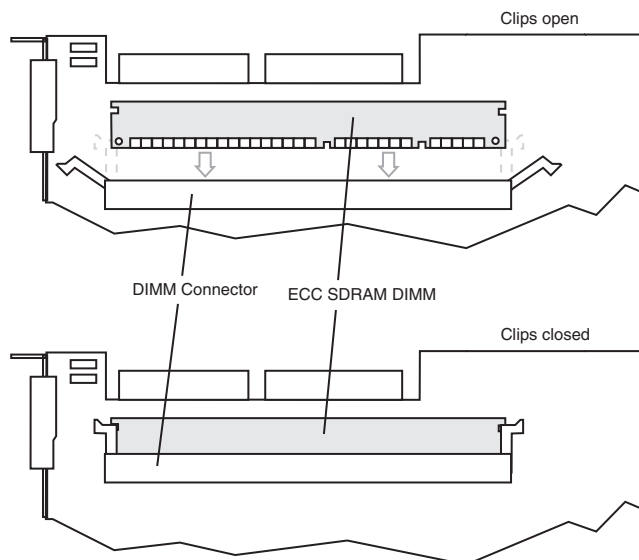
2.1.3.2 Removing the SDRAM

Note: Remove the SDRAM from the IIR controller only when the controller is not installed in the computer.

1. With your thumbs on the DIMM clips, swing the clips from the close position to the open position (see [Figure 2-3](#)).

2. Grasp the corners of the DIMM with both hands and firmly pull from the DIMM connector.

Figure 2-3. Installing the SDRAM



2.2 Programming the Flash Memory

The IIR controller normally comes ready to be installed into the computer motherboard. However, you may need to reprogram the RAID firmware that is located in the flash memory of the IIR controller.

Use the Firmware Update procedure to overwrite the existing firmware with a new image (see [Section A.1](#)). If the current firmware programmed in the flash is unusable or if a previous firmware update was inadvertently interrupted please contact your RAID controller vendor.

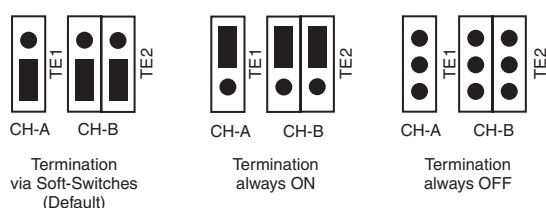
2.3 SCSI Termination

Termination is a commonly overlooked requirement when connecting SCSI devices together. When these devices are connected together, the resulting set of devices is typically referred to as a SCSI bus. SCSI devices such as hard disks and tape drives must be terminated if they are the last physical devices at either end of the SCSI bus (if nothing else is actively terminating the end of the bus such as a terminator or backplane). If a device is inserted into the middle of the SCSI bus, then it (the device itself) must not be terminated. Only terminate each end of the bus.

2.3.1 Setting the Termination Mode of the IIR Controller

The onboard termination of the RAID controller can be changed within Storage Console. The default setting is *Auto* (jumpers in *Soft-Switch* mode). In this mode, the controller automatically activates/ deactivates termination based on cable connection (if internal and external connectors are used for a specific channel then the termination is off, otherwise it is on). *On* and *Off* turns the termination on or off regardless of the connected cables. In addition to the soft-switch jumper setting, termination jumpers force termination always ON or OFF - no matter the software settings or cables detected.

Figure 2-4. Termination Jumper Settings



2.4 LED Indicators

There are a number of LED indicators on the RAID controller that indicate the various modes and/or states of the controller. See [Figure 2-1](#) for location of LED's.

2.4.1 Function Check

Indicates the activity on the controller. See [Table 2-1](#) for detail.

Table 2-1. Function Check LED's

LED	Function
A	Indicates activity on SCSI channel A
B	Indicates activity on SCSI channel B
T	Indicates Bus Master DMA transfers (the brighter the light, the more DMA's)
S	When system is powered, indicates that controller is online (i.e. installed correctly)

2.4.2 Channel Mode

A yellow LED for each Ultra160 SCSI channel indicates the current SCSI mode of the corresponding channel. If the LED is lit, the Ultra160 SCSI channel is operating in Low Voltage Differential (LVD) mode. If the LED is not lit, this channel is operating in Single-Ended (SE) mode. See [Section 3.3.1](#) for an explanation of LVD and SE modes.

2.4.3 PCI Bus Clock

Indicates the clock speed of the PCI Bus interface. If the LED is not lit, the bus speed is 33MHz. If the LED is lit, the bus speed is 66MHz.

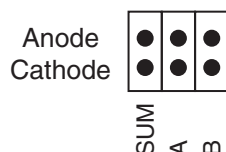
2.5 Jumpers

In addition to the Termination Jumpers described in [Section 2.3.1](#), the IIR controller has a series of jumpers that allow for specific configuration of the controller. See [Figure 2-1](#) for location of each jumper block

2.5.1 External LED Connectors

The IIR controller has a 6 pin header to allow for connection of additional LEDs. An LED connected with header A, lights up whenever there is activity on SCSI channel A. The same applies for header B. An LED connected with the SUM header, lights up whenever there is activity on any of the two SCSI channels A and B. See [Figure 2-5](#) for details.

Figure 2-5. External LED Connectors



2.5.2 Terminator Power

Determines whether termination power (per channel) is supplied by the controller. The Default is ON for both channels (both jumpers set).

2.6 Acoustical Alarm

An acoustical (audible) alarm is present on the RAID controller to indicate any of the fol-

Following events:

- State of controller upon boot-up
- Change in state of an array
- Change in controller environmental status (during normal operation)
- Hardware failure

If the cause of the event is resolved and/or removed, the audible alarm will cease. The audible alarm can also be turned off manually through StorCon or StorCon plus. If the audible alarm is silenced via management tools, it will only be disabled for the current event and will be ready to sound again at the next event.

2.6.1 Silencing the Acoustical Alarm in StorCon

In StorCon, under Advanced Setup > Configure Controller, press <F4> to silence alarm.

Note: The <F4> option is only available if the alarm has been activated.

2.6.2 Silencing the Acoustical Alarm in StorCon+

In StorCon+, in the ‘Physical Configuration’ view, right click on the icon of the controller requiring alarm deactivation. Click on ‘Silence’ to deactivate alarm.

Note: If alarm has not been activated, the ‘Silence’ option will be grayed out.

2.6.3 Beep Sequences During System Boot

During system POST, the audible alarm on the controller will produce one of a number of beep sequences to indicate the status of the controller. See [Table 2-2](#) for a description of these beep sequences.

Table 2-2. Beep Sequences

Beep Sequence	Status
beep - pause - beep, beep, beep	Controller startup was successful.
beep, beep, beep, beep,	RAID controller has a problem. A possible cause is disk failure or high temperature. To diagnose the problem, run the Storage Console to check the status of the RAID controller and array.
beep, beep - pause - beep, beep - pause -	No memory is installed on the controller, or the controller did not detect the memory. A message will also display on screen soon afterwards, and the boot process will stop. To fix the problem, install memory on the controller or try a different module.

Hardware Specifications and Features 3

This chapter covers all the hardware specifications associated with the IIR controller and its components. [Section 3.5](#) covers optional RAID features that are supported by the RAID Software Suite. The accompanying *Software Guide* covers all software features.

3.1 IIR Controller Hardware Features

This section provides a summary of the key features, configuration options and support interface technology supported by the IIR controller.

Table 3-1. Hardware Architecture Features

Component	Feature
I/O Microprocessor	The 80303 uses the 100MHz Intel 80960JT-100 core with a 100MHz/64bit internal bus with an internal throughput of up to 800MB/sec, to and from the internal IOP peripherals.
Cache Memory	The SRCU32 supports up to 256MB of 64bit ECC SDRAM operating at 100MHz. Memory is expandable to 64, 128, or 256MB.
Flash Memory	3.3v, 16Mb (2MB) flash memory chip is used to store the RAID firmware
I/O interface (PCI)	PCI 2.2 compliant, universally keyed for 3.3 and 5 volt PCI slots
PCI Transfer Rate	528MB/sec (Burst)
PCI Signaling	5 or 3.3 volt
SCSI Controller: LSI SYM53C1010	Dual channel Ultra160

Table 3-2. Environmental Specifications

Attribute	Condition
Operating Temperature	0° C to +55° C
Storage Temperature	-40° C to +70° C
Form Factor (physical dimensions)	Height: 98 mm (3.86 inches) Length: 200 mm (7.87 inches)
Weight	.35 kg (.77 lb)

3.2 Operating System Support

The following operating systems (OS) are fully validated and supported:

- Microsoft* Windows* 2000 Advanced Server (service pack 2a or higher)
- Microsoft Windows NT* 4.0 Server Enterprise Edition (service pack 6a or higher)
- Novell* NetWare* 5.1 (support pack 2a or higher)
- SCO* UnixWare* 7.1.1
- Red Hat* Linux* 7.1 (2.4 kernel)
- Red Hat Linux 6.2 SBE2

The following operating systems are supported with limited compatibility validation:

- Windows 2000 Server and Professional
- Windows NT 4.0 Server, Terminal Server, and Workstation

3.3 Supported SCSI Technology

The RAID adapter supports up to 15 SCSI devices per SCSI channel. It supports up to 15 hard disk drives (or 14 hard disks drives if one of the SCSI ID's is occupied by a SAF-TE processor) per channel of the SCSI controller (30 disk drives total for the dual channel SRCU32 controller).

3.3.1 Supported Hard Drive Technology

The IIR controller supports both Single-ended (SE) and Low Voltage Differential (LVD) devices but it is recommended that you use only one type of drive technology (SE or LVD) on any one channel at a time.

The IIR controller supports single-ended drives which operate at up to 40MB/sec depending upon the speed of the drives attached.

The IIR controller supports Ultra-2 LVD SCSI devices operating at up to 80MB/sec and Ultra160 LVD SCSI devices operating at up to 160MB/sec.

Note: If both SE and LVD devices are attached to the same channel/bus, the entire bus will operate at the single ended speed of the slowest device. See [Table 3-3](#) for the maximum cable length distances that apply to each mode.

The IIR controller is designed to use Ultra160 SCSI hard drives and is backward compatible with older SCSI hard drive specifications. See [Table 3-3](#) for the SCSI standards supported.

Table 3-3. SCSI Drive Standards

SCSI Drive Standard	Speed (MB/Sec)	Bus Width (Bits)	Maximum Cable Length (meters) ⁽¹⁾ Single-Ended	Adapter Maximum LVD	SCSI Drive Devices per SCSI Channel
SCSI-1 ⁽²⁾	5	8	6	⁽³⁾	8
Fast SCSI ⁽²⁾	10	8	3	⁽³⁾	8
Fast Wide SCSI	20	16	3	⁽³⁾	16
Ultra SCSI ⁽²⁾	20	8	1.5	⁽³⁾	8
Ultra SCSI ⁽²⁾	20	8	3	N/A	4
Wide Ultra SCSI	40	16	N/A	⁽³⁾	16
Wide Ultra SCSI	40	16	1.5	N/A	8
Wide Ultra SCSI	40	16	3	N/A	4
Ultra2 SCSI ^(2, 4)	40	8	⁽⁴⁾	12	8
Wide Ultra2 ⁽⁴⁾	80	16	⁽⁴⁾	12	16
Ultra160 (Ultra3)	160	16	⁽⁴⁾	12	16

NOTES:

- May be exceeded in Point-to-Point and engineered specific applications.
- Use of the word "Narrow", preceding SCSI, Ultra SCSI, or Ultra2 SCSI (for example, Narrow SCSI) is optional.
- LVD was not defined in the original SCSI standards for this speed. If all devices on the bus support LVD, then 12-meters operation is possible at this speed. However, if any device on the bus is single-ended only, then the entire bus switches to single-ended mode and the distances in the single-ended column apply.
- Single-ended is not defined for speeds beyond Ultra.

After Ultra2 all new speeds are wide only.

3.3.2 Support for Non-Hard-Disk-Drive SCSI Devices (Non-Direct Access Devices)

The RAID controller will pass through to the host operating system direct access to nondirect-access SCSI devices that are connected to a SCSI bus (channel) of the RAID controller. The RAID controller passes through all control of these devices to the host operating system.

Types of supported non-Direct-Access SCSI devices (this does not cover specific vendors and models):

- SAF-TE Processors
- Tape Devices
- CD-ROMs

3.4 Array Roaming Compatibility

Array Roaming allows the user the ability to move a complete RAID array from one computer system to another computer system and preserve the RAID configuration information and user data on that RAID array. ††Compatible RAID controllers must control the RAID subsystems of the two computer systems (see list of compatible controllers in this section). The transferred RAID array may be brought online while the target server continues to run if the hard disk drives and disk enclosure support hot-plug capabilities. The hard disk drives are not required to have the same SCSI ID in the target system that they did in the original system that they are removed from. The RAID array drive that is being roamed must not be of type Private. This includes all non-private host, array, and logical drives.

Warning: †† The SRCU32 adapter, with firmware 2.32.xx, is not compatible with some previous versions of IIR RAID FW running on IIR controllers. Only the versions listed below are compatible. Do not attempt RAID Array Drive Roaming between RAID controllers that are not compatible with the SRCU32 adapter. Unpredictable behavior may include, but is not limited to, data loss or corruption.

Compatible adapters include:

- SRCU31LA - Firmware version 2.32.xx
- SRCU31A - Firmware version 2.32.xx
- SRCU32 - Firmware version 2.32.xx
- SRCMRU - Firmware version 2.32.xx

Note: Compatibility refers only to how data and RAID configuration information are written to the hard disks. Compatible adapters have the same data file format.

3.5 Optional Features

The SRCU32 supports the following optional features as described in the Software Guide:

- PCI Hot Plug
- Configurable SCSI parameters.

3.5.1 PCI Hot Plug

The SRCU32 adapter supports PCI Hot Plug under the following OS's:

- Windows 2000 Advanced Server SP2, Windows 2000 Server, Windows 2000 Professional
- NetWare 5.1 SP2a

This IIR controller supports the PCI Hot Plug functionality for the Hot Replacement of an adapter. Hot Replacement assumes that the drivers for the adapter being replaced are already loaded.

3.5.2 Configurable SCSI Parameters

When a SCSI hard disk drive is initialized the first time by the RAID controller, its SCSI parameters are automatically set to their optimal settings. Manual configuration is not required. However, the RAID controller allows for the custom configuration of several SCSI parameters on a hard disk drive-by-hard disk drive basis. There are several settings that can be configured by using the Storage Console menu Advanced Setup -> Configure Physical Devices -> Select Physical Drive -> SCSI Parameter/Initialize:

Table 3-4. Configurable Disk Drive SCSI Parameters

Parameter	Setting/Value	Description
Synch. Transfer	Enabled / Disabled	This setting when enabled allows the controller to operate in synchronous transfer mode
Synch. Transfer Rate	Speed MB/sec	Allows for the setting of the speed for the SCSI hard disks (160MB/sec for U160 drives). No matter the setting, the SCSI bus will negotiate the fastest speed up to this setting. Lowering the setting will force the disk drive to transfer at the lower speed.
Disconnect	On / Off	Enabling this setting allows for the disk drive to disconnect from the SCSI bus when it's not participating in a transfer. This allows for optimal bus utilization by all devices on the bus.
Tagged Queues	On / Off	When enabled, this feature allows the SCSI disk drive to execute more than one command at a time.
Disk Read and Write Cache	On / Off	For performance reasons, the <i>Read Ahead</i> and <i>Write</i> cache of the hard disk drives should always be on.
Domain Validation	On / Off	Using the <F4> key while in this menu accesses this parameter. When this is set to <i>On</i> , Domain validation allows for a cyclical check of the correct data transfer at a given rate.

3.6 RAID Controller Drive Limitations (Host, Array, Logical, and Physical)

The following are limitations assuming the following:

- U160 speed
- Dual channel SCSI controller
- Cabling that meets U160 specifications

Physical drives are limited by the number of SCSI channels being controlled by the RAID controller. The SCSI bus can support up to 15 SCSI devices per channel (14 if one SCSI ID is being occupied by an intelligent enclosure processor). Therefore this 2- channel RAID controller is able to connect up to 30 disks total. An **array** drive requires a minimum of two hard disk drives (or **logical** drives) and up to a maximum of 15 arrays can be configured with on the SRCU32 controller. The firmware supports 35 components per array - i.e. all 30 disks could form one large array. However, due to performance and

drive failure issues (i.e. if so many disks are configured in one array, the possibility that a disk failure increases) the number of disks in one array should not exceed 10-12 disks. If more disks are connected to the controller, additional arrays should be configured. The firmware supports channel spanning where an array can consist of physical drives that are attached to either one or to both channels of the RAID controller. There is a minimum of at least one host drive per *array drive*. A **Host** drive (RAID Volume) can only be associated with (or reside on) a single *array drive*. Like *array drives*, host drives can reside on hard disk drives that are isolated to a single channel or span both of the channels of the RAID controller.

Flash Memory Programming

A

A.1 Firmware Update Procedure via XROM StorCon

The Storage Console (StorCon) is a full-featured monitoring and configuration utility with a text-based user interface. StorCon manages all aspects of the RAID subsystem as well as many features of the RAID adapter. Refer to the Software Guide for more details about StorCon.

You can use StorCon to update the firmware image. The menu option, Firmware Update, allows you to update the firmware, BIOS and expansion ROM (XROM). StorCon currently programmed on the flash memory of the IIR controller. Because the Flash-RAM can be reprogrammed many times, the software modules can be easily updated, without having to remove the controller from its PCI slot.

The firmware, BIOS and XROM StorCon are part of the file, SRC_RXFW.xxx, where the file extension xxx indicates the version stepping. The current firmware file can be found on the RAID Software Suite CD-ROM. To get the latest firmware for the IIR controller, visit our website at: <http://support.Intel.com>.

Note: The Firmware Update option is not available when StorCon is accessing the IIR controller remotely.

Follow the procedure below to update the firmware via XROM StorCon.

1. Download the firmware image containing the latest programs/drivers from the website. Format a 3.5" HD disk (1.44MB) and copy the SRC_RXFW file onto the disk.
2. With the adapter installed in the system, boot the computer and press <Ctrl>+<G> when prompted to enter the BIOS version of StorCon.

Note: When upgrading a major firmware version number (e.g. 2.32.00 to 2.33.00), it will be necessary to boot to DOS and run StorCon.exe in order to perform your firmware upgrade.

3. Select the applicable IIR controller and press <Enter>.
4. If the Express Setup menu is displayed, press <F4> to display the Advanced Setup menu. Select the menu option, Configure Controller and press <Enter>. Insert the floppy containing the latest firmware file into the floppy disk drive.
5. From the Configure Controller submenu, select Firmware Update and press <Enter>.
6. XROM StorCon automatically searches for the firmware file from the floppy drive, a:\. After finding the file, StorCon displays the name, description and version of the firmware. Press <Enter>.
7. StorCon reads and checks the firmware file, then displays a warning. Press <Y> to confirm the firmware update.
8. StorCon programs the flash EPROM.

Warning: Do not interrupt the update process to avoid damaging the firmware image in the flash. If the firmware update is interrupted and/or the firmware becomes unusable, please contact your RAID controller vendor. See [Section A.2](#) before making decision to contact your RAID controller vendor.

After StorCon indicates that the update is complete, press any key.

9. The focus returns to the Configure Controller submenu. Press <Esc> several times to close the menus and press <Y> to quit StorCon.
10. StorCon detects the firmware update and requires a system reboot. Press any key to reboot.

When the update process has completed, reboot the computer for the change to take effect. During boot up, the system displays the updated firmware version. You can also relaunch StorCon and select the applicable IIR controller to view its new firmware version at the bottom of the console (for example, FW:2.32.00-Rxxx).

You can also use the OS version of StorCon to update the firmware. Refer to the Storage Console chapter of the Software Guide for more details.

A.2 Firmware Recovery

In the event your firmware has been corrupted, the following procedure may be helpful before contacting your RAID controller vendor:

Before you begin:

- Have a DOS bootable diskette available
- Have the DOS version of Storage Console executable (StorCon.EXE, obtained from web site or CD) available.
- IIR firmware file (e.g. SRC_RXFW.???), obtained from web site or CD (in directory \embedded\firmware) available.

Procedure:

1. Copy StorCon.EXE and the IIR firmware file on to bootable DOS diskette.
2. Place diskette in drive A: and boot your system.
3. Once booted, type "StorCon /defect" at the A:\ prompt.
4. When Storage Console loads, perform firmware update procedure, starting at step 3, as described in [Section A.1](#).



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