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SRCMRU

Hardware Installation and User's Guide, Version 1.1.3

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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 have instructions detailing installation.

1.4.1   Product Regulatory Compliance

The IIRZN0CHXX (SRCMRU) 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 A Emissions (USA/Canada) Verification
- CISPR 22, 3rd Edition, Class A Emissions (International)
- EN55022, Class A Emissions
- EN55024: 1998, Immunity
- CE - EMC Directive 89/336/EEC
- VCCI, Class A Emissions (Japan)
- AS/NZS 3548, Class A 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 IIRZN0CHXX RAID add-in card will be marked with the following regulatory markings:

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_CUL_{US} Listing Marks

CE Mark

FCC Marking (Class A)

This device complies with Part 15 of the FCC Rules. Operation of this device 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. Manufactured by Intel Corporation.

Australia C-Tick Mark

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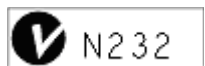
**Taiwan BSMI Marking
(Class A)**

檢磁 3902I921
警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，
可能會造成射頻干擾，在這種情況下，使用者會
被要求採取某些適當的對策

Korea RRL MIC Mark

In addition, the IIRZN0CHXX RAID add-in card meets the following regulations:

**Canada EMC Marking
(Class A)**

CANADA ICES-003 CLASS A
CANADA NMB-003 CLASSE A

**Japan VCCI Marking
(Class A)**

この装置は、クラス A 情報技術
装置です。この装置を家庭環境で
使用すると電波妨害を引き起こす
ことがあります。この場合には使
用者が適切な対策を講ずるよう要
求されることがあります。VCCI-A

1.4.5   Electromagnetic Compatibility Notices

1.4.5.1   FCC Verification Statement (USA)

Product Type: IIRZN0CHXX

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.

Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124-6497
Phone: 1-800-628-8686

This equipment has been tested and found to comply with the limits for a Class A 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.

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- 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 Aprescrites 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 A 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   VCCI (Japan)

この装置は、情報処理装置等電波障害白主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

1.4.5.5   BSMI (Taiwan)

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

檢磁 3902I921
警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，
可能會造成射頻干擾，在這種情況下，使用者會
被要求採取某些適當的對策

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 controller.

• ESD can damage adapter card 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**

2.1   About this Chapter

This chapter provides information on installing the IIR controller, programming the Flash memory, and general SCSI termination information.

2.2   Installation Procedures

Warning: **Do not attempt to insert your RAID controller into any non RAIDIOS-enabled PCI slot. Doing so may cause damage to your controller and/or your computer. Please consult your motherboard documentation about availability of RAIDIOS-enabled PCI slots.**

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 this board. 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.

2.2.1   Computer System Hardware Requirements

- Computer with CD-ROM drive (not attached to the IIR controller)
- One available 64bit, 66MHz, universal-keyed *RAIDIOS-enabled* PCI slot.
- PCI 2.2 compliant System BIOS

Figure 2-1. IIR Controller Component Layout
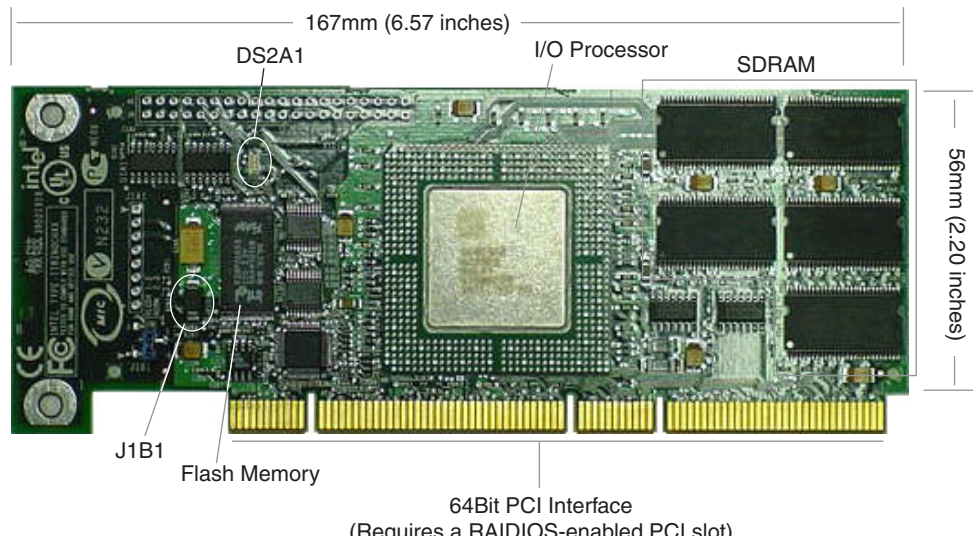
2.2.2 Installing the IIR Controller

1. Power-off the computer system.

2. Disconnect power cord(s) and remove the system cover.

3. Install the IIR controller into an available RAIDIOS-enabled PCI slot. See Figure 2-2.

   Note: The computer system (with RAIDIOS-enabled PCI slot) illustrated in Figure 2-2 may not be representative of your system. Consult your system docs for the exact location of the RAIDIOS-enabled PCI slot.

4. Connect one end of the SCSI cable to the on-board SCSI connector. 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 2.4 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

RAIDIOS-ENABLED PCI
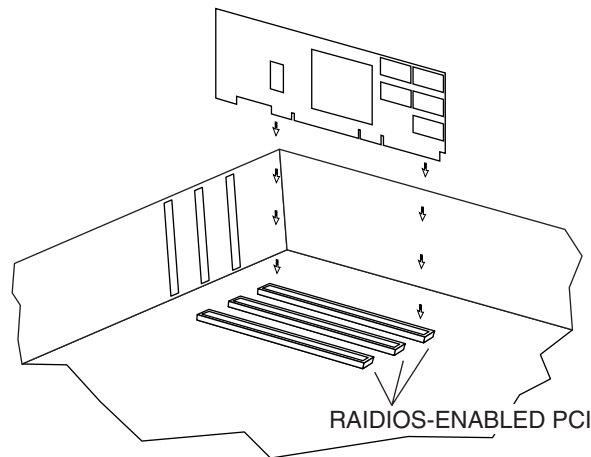
2.3 Programming the Flash Memory

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

There are 2 options for programming the firmware, Firmware Update or Firmware Recovery. Use the Firmware Update procedure to overwrite the existing firmware with a new image (see Appendix A.1). Use the Firmware Recovery procedure to resolve problems with the flash memory, for example, if the current firmware programmed in the flash is unusable or if a previous firmware update was inadvertently interrupted (see Appendix A.2).

2.4 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) should not be terminated. Only terminate each end of the bus. The modular RAID on motherboard (MROMB) design lowers cost by utilizing the SCSI controller and connectors that are integrated into the system's motherboard. With MROMB, termination occurs on the host SCSI controller.

2.5 Configurable Disk Drive 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. Most settings are set automatically and can not be configured manually. To view or configure disk drive SCSI parameters from the Storage Console, choose Advanced Setup → Configure Physical Devices → Select Physical Drive → SCSI Parameter/Initialize.

Table 2-1. Configurable Disk Drive SCSI Parameters

Parameter	Setting/ Value	Configuration	Description
Synch. Transfer	Enabled / Disabled	Automatic	This setting when enabled allows the controller to operate in synchronous transfer mode
Synch. Transfer Rate	Speed (MB/sec)	Automatic	Allows for the setting of the speed for the SCSI hard disks (up to 320 MB/sec for U320 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	Enabled / Disabled	Automatic	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	Automatic	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	Configurable	For performance reasons, the *Read Ahead* and *Write* cache of the hard disk drives should always be on. This is the default setting.

2.6 Configurable I/O Controller SCSI Parameters

When the controller starts up, its SCSI parameters are automatically set to their optimal settings. Manual configuration is not required. However, you can customize I/O SCSI parameters for each channel on the controller by using the Storage Console menu Advanced Setup > Configure Controller > Controller Settings.

Table 2-2. Configurable I/O Controller SCSI Parameters

Parameter	Setting/Value	Description
Domain Validation	On / Off	When this is set to *On*, Domain validation allows for a cyclical check of the correct data transfer at a given rate for the respective channel. For ultra320, the SRCMRU controller supports Basic, Enhanced, and Margined Domain Validation. For ultra160, the SRCMRU controller supports Basic and Enhanced Domain Validation.

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 implemented 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 processor: 100MHz, RISC 64-bit core
Cache Memory	The 80303 IOP supports up to 512 Mbytes of 64-bit 100 MHz ECC SDRAM operating at 66 MHz. It is backward compatible to support 64, 128, and 256 Mbit SDRAM technologies. Note: The SRCMRU is limited to 32MB of embedded memory.
Flash Memory	3.3v, 16Mbit (2 MB) flash memory chip is used to store the RAID firmware
I/O interface (PCI)	RAIDIOS-enabled PCI 2.2 compliant
PCI Transfer Rate	528MB/second (burst)
PCI Signaling	Capable of being used in a 5 volt or 3.3 volt slot.

Table 3-2. Electrical Specifications

Attribute	Measurements
Voltage Requirements	+5, 3.3 Volts (all +/– 5% tolerance)
Power Consumption	+5V @ 0.25 Amps = 1.25W +3.3V @ 2.5 Amps = 8.25W

Table 3-3. Environmental Specifications

Attribute	Condition
Temperature	Operating 0° to +55° C Storage -40° to +70° C
Humidity	Operating 90% relative humidity Storage 90% relative humidity
Form Factor (physical dimensions)	Height: 56 mm (2.20 inches) Length: 167 mm (6.57 inches)

3.2 Operating System Support

The following operating systems are fully validated and supported:

- Microsoft* Windows* 2000 Advanced Server, Service Pack 2
- Novell* NetWare* 6.0
- SCO* Openserver* 5.0.6 from Caldera*
- Red Hat* Linux* 7.2 (2.4 kernel)
- Caldera OpenUnix* 8.0
- SuSe Linux 7.3 Professional

The following operating systems are supported with limited compatibility validation:

- Windows NT 4.0 Server and Enterprise Server, Service Pack 6a or higher
- Novell NetWare 5.1 (support pack 2a or higher)
- Linux (2.4 kernel)
    — Red Hat Linux 7.1
    — Debian* Linux 2.2r6
    — Caldera Linux 3.1
    — Mandrake* Linux 8.1
    — TurboLinux* 7.0 Server
- Caldera UnixWare 7.1.1
- FreeBSD* 4.0 and 4.5
- Linux (2.2 kernal)
    — Red Hat Linux 7.0

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 an MROMB application, assuming a dual channel SCSI controller on the motherboard).

The SRCMRU firmware supports the following SCSI controllers on the motherboard:

- SCSI Ultra160
  - — Adaptec* AIC-7899x dual-channel Ultra160 SCSI controller
  - — Adaptec AIC-7892x single-channel Ultra160 SCSI controller
- SCSI Ultra320
  - — Adaptec AIC-7901 single-channel Ultra320 SCSI controller
  - — Adaptec AIC-7902 dual-channel Ultra320 SCSI 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, Ultra160 LVD SCSI devices operating at up to 160MB/sec, and Ultra320 LVD SCSI devices operating at up to 320MB/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 3-4 for the maximum cable length distances that apply to each mode.

The IIR controller is designed to use an Ultra160 or Ultra320 SCSI controller implementation on the motherboard and is backward compatible with older SCSI hard drive specifications. See Table 3-4 for the SCSI standards supported.

Table 3-4. Supported SCSI Device Standards

SCSI Drive Standard	Speed (MB/Sec)	Bus Width (Bits)	Maximum Cable Length (meters) [1]		Adapter Maximum Devices per SCSI Channel
			Single-Ended	LVD	
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
Ultra 2 SCSI [2, 4]	40	8	[4]	12	8

Table 3-4. Supported SCSI Device Standards

SCSI Drive Standard	Speed (MB/Sec)	Bus Width (Bits)	Maximum Cable Length (meters) [1]		Adapter Maximum Devices per SCSI Channel
			Single-Ended	LVD	
Wide Ultra 2 [4]	80	16	[4]	12	16
Ultra160 (Ultra 3)	160	16	(4)	12	16
Ultra320	320	16	(4)	12	16

Notes:
1. May be exceeded in Point-to-Point and engineered specific applications.
2. Use of the word "Narrow", preceding SCSI, Ultra SCSI, or Ultra2 SCSI (for example, Narrow SCSI) is optional.
3. 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 singled-ended only, then the entire bus switches to single-ended mode and the distances in the single-ended column apply.
4. 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 non-direct-access SCSI devices which 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 Backups
• CD-ROMs

3.4 RAID Array Drive Roaming

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; however, not all operating systems support this feature. 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.

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Warning: **†† The SRCMRU adapter, with firmware 2.34.yy-Rzzz, is not compatible with all previous controllers and firmware versions. Do not attempt RAID Array Drive Roaming between RAID controllers that are not compatible with the SRCMRU controller. Unpredictable behavior may include, but is not limited to, data loss or corruption.**

Compatible controllers include:
- SRCU42L – Firmware version 2.34.yy-Rzzz
- SRCU31LA - Firmware version 2.3x.yy-Rzzz
- SRCU31A– Firmware version 2.3x.yy-Rzzz
- SRCU32 – Firmware version 2.3x.yy-Rzzz
- SRCMRU – Firmware version 2.3x.yy-Rzzz
- SRCZCR – Firmware version 2.3x.yy-Rzzz

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

There are no optional features for this product.

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

The following are limitations assuming the following:
- U160 or U320 speed depending on the SCSI controller on the motherboard
- Dual channel SCSI controller
- Cabling that meets U160 or U320 specifications depending on the SCSI controller

Physical drives are limited by the number of SCSI channels being controlled by the RAID controller. The firmware/software supports a maximum of **15** *hard disk drives per channel* (or 14 if one SCSI ID is being occupied by an intelligent enclosure processor).

The maximum number of **array drives** is limited to 35 by the RAID firmware. The actual maximum limit of the SRCMRU RAID controller is **15**, see Table 3-5. 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. An array drive requires a minimum of two hard disk drives (or logical drives). Therefore the maximum array limitation for each RAID controller is the *physical drive* limit of that RAID controller divided by two. An array drive can contain (or have reside on it) up to a maximum of **2** *host drives*.

RAID firmware limits the controller to a maximum of **30** *host drives (RAID volumes)* per controller. There is a minimum of at least one host drive per *array drive*. A host drive 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.

Table 3-5. RAID Controller Drive Maximum Limitations (SRCMRU)

Drive Type	Maximum Per Channel	Maximum Per Controller	Maximum Per Array Drive	Maximum Per Host Drive
Physical Disk Drives	15	30	30 (2 minimum)	30
RAID Array Drives	7	15		1
RAID Host Drives		30	2	

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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.

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 is interrupted you will need to follow the firmware recovery process in the next section.**

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 Procedure via Flash Recovery Utility (FRU)

1. Set the IIR controller's IOP to Reset (Flash Recovery) mode:

Warning: **Shock hazards may be present inside the unit in which this card is being installed. Disconnect all power cords to the unit before removal of any covers. Follow the warnings noted in your computer's user or service manual before installing this board. ONLY after all the covers are reinstalled should you reconnect the power cords and power up the unit for the software installation and use.**

   a. Take all precautions to prevent ESD damage before handling the IIR controller.

   b. Power off all system components and disconnect their power cords.

   c. Remove the cover from the system to gain access to the RAIDIOS PCI slots.

   d. Remove the IIR controller from your system.

   e. On jumper block J1B1, move the jumper from position 2-3 to position 1-2 (see Figure A-1). Re-install the adapter in the RAIDIOS PCI slot in which it was previously installed.

   f. Replace the cover, reconnect all power cords and power up the system.

Figure A-1. Jumper Positions for Flash Update and Recovery
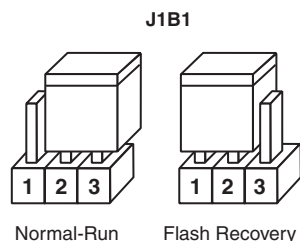
2. Change your computer's BIOS setting so that your system boots from the CD-ROM.

3. Use the RAID Software Suite CD-ROM to flash the firmware.

   a. Boot the computer with the bootable RAID Software Suite CD-ROM that contains the version of the RAID firmware that you wish to recover.

   b. At the ROM-DOS Startup menu, select the option, Flash Recovery Utility, and press <Enter>.

   c. The Flash Recovery Utility detects any IIR controllers that are in reset mode and lists them in the order that they are found.

      Note: Any IIR controllers that are not in reset mode will not be listed. If no controllers are listed, your controller may not be in reset mode. Shut down the system and start again with step 1 above. Refer to Figure A-1 to set the jumper in reset mode.

   d. Type a controller number to start the recovery process for the firmware on that controller. You do not need to press Enter after typing the number. You will see the messages shown below during a successful recovery. Each message provides a percent complete status while the action is in progress. The entire process may take several minutes.

      ```
      Erasing flash memory
      Downloading data to flash memory
      Verifying flash content with input file
      Flash upload complete
      SUCCESS: Operation completed successfully
      Download complete in <duration of flash recovery>
      ```

4. Reset the jumper to run mode.

   a. Power off all system components and disconnect power cords.

   b. Remove the system cover.

   c. Remove the IIR controller from your system.

   d. On Jumper block J1B1 move jumper from position 1-2 to position 2-3 (see Figure A-1). Reinstall the IIR controller in the RAIDIOS PCI slot in which it was previously installed. Reconnect the SCSI drives to the adapter card.

   e. Replace the cover, reconnect all power cords and power up the system.

5. Change your computer's system BIOS setting so that your system boots normally (not from the CD-ROM).

Note: A firmware recovery returns the controller to the default settings.

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