SATARaid[™] Serial ATA RAID Management Software



09/26/03

Silicon Image, Inc.

1060 East Arques Ave. Sunnyvale CA 94085

(408) 616-4000

www.siliconimage.com





Copyright © 2003, Silicon Image, Inc. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, or translated into any language or computer format, in any form or by any means without prior written permission of:

Silicon Image, Inc. 1060 East Arques Ave. Sunnyvale CA 94085

Silicon Image, Inc. reserves the right to make changes to the product(s) or specifications to improve performance, reliability, or manufacturability. Information furnished is believed to be accurate and reliable, but Silicon Image, Inc. shall not be responsible for any errors that may appear in this document. Silicon Image, Inc. makes no commitment to update or keep current the information contained in this document.

However, no responsibility is assumed for its use; nor any infringement of patents or other rights of third parties which may result from its use. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

Silicon Image, Inc. products are not designed or intended for use in Life Support Systems. A Life Support System is a product or system intended to support or sustain life, which if it fails, can be reasonably expected to result in significant personal injury or death. If Buyer or any of its direct or indirect customers applies any product purchased or licensed from Silicon Image, Inc. to any such unauthorized use, Buyer shall indemnify and hold Silicon Image, Inc., its affiliates and their respective suppliers, harmless against all claims, costs, damages and expenses arising directly or indirectly, out of any such unintended or unauthorized use, even if such claims alleges that Silicon Image, Inc. or any other person or entity was negligent in designing or manufacturing the product.

Specifications are subject to change without notice.

SATARaid is a trademark of Silicon Image, Inc. JAVA is a trademark of Sun Microsystems, Inc. Windows is a trademark of Microsoft Corp. for their family of computer operating systems.

Revision History:

Revision	Comment	Date
1.00	Initial creation of document	09/26/03

Table of Contents

1	Welcome	.4
	SATARaid Features	. 4
2	An Introduction to RAID	.5
3	Installing Drivers for Windows XP/2000/98/NT	.6
4	JAVA 2 Runtime Environment Installation	.7
5	SATARaid GUI Installation	.9
6	Creating and Deleting RAID Sets1	11
	Creating RAID Sets Deleting RAID Sets. Rebuild RAID 1 Set Resolving Conflicts Low Level Formatting.	14 15 16 18
7	Allocating Partitions1	19
	Windows XP & 2000 Windows NT	24
	Windows 98 & Me	27
8		
8		32 34 35 35 35 35 35 35 35 35 35
8	SATARaid GUI Overview	32 34 35 35 35 35 35 35 35 35 35 35 35
9	SATARaid GUI Overview	32 34 35 35 34 35 35 35 35 35 35 35 35 35 36 37 46 56 62

1 Welcome

Silicon Image's SATARaidTM software provides Serial ATA RAID0 (Striping), RAID1 (Mirroring) and RAID10 (Striping and Mirroring) functionality to enhance the industry's leading PCI-to-SATA host controller products. Two major challenges facing the storage industry today are keeping pace with the increasing performance demands of computer systems by improving disk I/O throughput and providing data accessibility in the face of hard disk failures. With Silicon Image Serial ATA host controller and SATARaid, both of these problems are solved.

SATARaid software provides a Graphical User Interface (GUI) for easy-to-use configurations of the RAID Sets.

SATARaid Features

- RAID 0, RAID 1, and RAID 10 Sets are supported
- Under Win 2000 and XP only, RAID Sets can be created and deleted without exiting Windows
- Hot Spare and On-line Mirror Rebuilding
- System GUI Monitoring Utility:
 - Displays/Logs/Alerts Users to Vital RAID Set Information
 - Manages RAID Set Functions (configures, rebuilds, etc.,)
- RAID Set Accommodates Multiple Size HDDs
- HDDs Function Normally When Not in RAID Sets
- Adjustable Stripe Size for RAID 0
- Uses the Self-Monitoring, Analysis, and Reporting Technology (SMART) feature in the attached drives for automatic notification of imminent drive failures.
- Can be configured to automatically email RAID Set system events and failure reports.
- Automatically Selects Highest Available Transfer Speed for All ATA and ATAPI Devices. Supports the following:
 - UDMA up to 150MB/Sec.
 - All UDMA and PIO Modes
 - Up to 4 SATA devices
 - ACPI and ATA/ATAPI6

2 An Introduction to RAID

RAID - Redundant Array of Independent Disks

RAID technology manages multiple disk drives to enhance I/O performance and provide redundancy in order to withstand the failure of any individual member, without the loss of data. There are many different methods of implementation for RAID, with each having advantages and disadvantages. Raid levels or set types are given a numerical designator that defines its implementation such as RAID 0 or RAID 1. SATARaid provides support for three RAID Set types: Striped (RAID 0), Mirrored (RAID 1), and RAID 10 Mirrored/Striped. Other RAID types are not supported by SATARaid software and thus are not discussed.

Disk Striping (RAID 0)

Striping is a performance-oriented, non-redundant data mapping technique. While Striping is discussed as a RAID Set type, it is does not provide any fault tolerance. With modern SATA and ATA bus mastering technology, multiple I/O operations can be performed in parallel, enhancing data throughput. Striping arrays use multiple disks to form a larger virtual disk. The figure below illustrates a three-disk stripe set. Stripe one is written to disk one, stripe two to disk two, and so forth. RAID 0 sets can be comprised of two, three, or four drives.



Disk Mirroring (RAID 1)

Disk mirroring creates an identical twin for a selected disk by having the data simultaneously written to two disks. This redundancy provides instantaneous protection from a single disk failure. If a read failure occurs on one drive, the system reads the data from the other drive. RAID 1 sets are comprised of two drives. A third drive can be allocated as a spare in case one of the drives in the set fails.



Disk Mirroring and Striping (RAID 10)

RAID 10 combines the features of both RAID 0 and RAID 1. Performance is provided through the use of Striping (RAID 0), while adding the fault tolerance of Mirroring (RAID 1). The implementation of RAID 10 requires four drives. The drives are assigned as two sets of striped pairs.



The data is written to RAID Set A, which is striped (RAID 0). This allows maximum speed. The data is then mirrored to another RAID 0 striped set, which is Set B in the figure above. This provides data redundancy (RAID 1), and thus increased data security.

Under certain circumstances, a RAID 10 set can sustain multiple simultaneous drive failures.

SATARaid User's Manual

Silicon Image

3 Installing Drivers for Windows XP/2000/98/NT

Before installing the SATARaid software, Silicon Image Serial ATA host adapter driver must be installed. When Windows detects the newly installed SATA host adapter, it will open a Driver Installation Wizard. Click on the Next buttons until the wizard prompts for the location of the driver. Insert the Silicon Image SATA host adapter driver CD into the computer's CD-ROM drive and click on the Browse button. Select the directory on the CD in which the driver resides and click OK.

rowse for Folder	?)
Select the folder that contains driver information this device.	on (.INF file) for
E- O Desktop	
📄 🛄 My Computer	
📴 🛃 3½ Floppy (A:)	
🕀 🚍 Development (C:)	
(D:)	
🕀 😑 Data (E:)	
⊡ Installed (F:)	
⊟ 🧝 (G:) ⊡ ⊡ BIOS & Utility	
java gui	
Printers	×
OK N	Cancel
	·

Click the Next button. A window will be displayed to verify proper installation of the host adapter driver. Click Finish. When prompted to restart the computer, click Yes.

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

4 JAVA 2 Runtime Environment Installation

The Java 2 Runtime Environment is required for the SATARaid GUI. The Java 2 Runtime Installer and executable package must be downloaded from the Sun Microsystems website at http://java.sun.com/j2se/downloads.html. The computer must have an Internet connection set up before installation can proceed.

Save the installer file to a known location, such as the My Documents folder. Using Windows Explorer or by clicking on the My Computer icon on the desktop, select the installation file and open it. The installation will begin. The installer program will download the needed files from the Internet.



When a window appears asking for acceptance the license agreement, select *I accept the terms of this license agreement* and click Next.



SATARaid User's Manual

Silicon Image

Choose the Typical setup type and click Next.

👘 Java 2 Runt	ime Environment, SE v1.4.2 - Setup Type	×
Setup Type Choose the s	etup type that best suits your needs.	44
Please select	a setup type.	
• Typical	All recommended features will be installed.	
C Custom	Specify the installation directory and choose which prograto install. You can change your choice of features after i by using the Add/Remove Programs utility in the Control Recommended for advanced users.	installation
InstallShield ——	< <u>B</u> ack <u>N</u> ext >	Cancel

When the installation completes, click Finish. Restart the computer when prompted.

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

5 SATARaid GUI Installation

Insert the Silicon Image SATARaid Installation CD into the computer's CD-ROM drive. Using Windows Explorer or by clicking on the My Computer icon on the desktop, display the contents of the CD-ROM. The SATARaid GUI Installation program is named *Java SATARaid.exe*. Select this file and open it. The installation will begin.

Click the Next button when the Welcome window appears.



Click the Next button to install the SATARaid program in the default directory (recommended). An alternate directory may be selected if desired.

and select

SATARaid User's Manual

Click the Finish button to complete the installation.

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

6 Creating and Deleting RAID Sets

Creating and deleting RAID sets must be performed in the BIOS for operating systems other than Windows 2000 and XP. For 2000 and XP, RAID sets can be created and managed by either the BIOS utility or the SATARaid GUI. See section 10 *RAID Set Management Under Windows 2000 & XP* for information on configuring RAID Sets using the SATARaid GUI.

During bootup, a screen similar to that below will appear for about 5 seconds. Press CTRL+S or the F4 key to enter the BIOS RAID utility.

			BIOS Ver						
Copy	yright ((C) 1997-	-2003 Si	licon	Ime	ıge,	Inc.		
Pre	ss (Ctr	+\$> or 1	14 to ent	ter R	AID	util	lity		
		48686L3						78167	MB
1	ST33001	L3AS						28629	MB
z	Maxtor	4R080L3						78167	MB
3	Maxtor	40060H3						58627	MB
SiI	Raid10	Set	Maxtor ST33001		0L3				
			Maxtor	4808	0L3				
			Maxtor	4006	9H3				

The RAID Utility menu screen will be displayed. A brief description of each section is presented on the next page.



SATARaid User's Manual

Silicon Image

Main Menu

The Main Menu in the upper left corner is used to choose the operation to be performed. The selections are:

Create RAID Set Delete RAID Set Rebuild RAID1 Set Resolve Conflicts Low Level Format Logical Drive Info

Create RAID Set is used to create a new RAID Set or for allocating spare drives to a RAID 1 set.

Delete RAID Set is used to delete a RAID Set or to deallocate a spare RAID 1 drive.

Rebuild RAID 1 Set is used to initiate the rebuild of a RAID 1 set after, for example, a drive in the Set has been replaced.

Resolve Conflicts is used to automatically find the member drives of a RAID set which has been disrupted (physical drives swapped around, for example) and restore the Set to proper operation.

Low Level Format allows a single drive to have its data completely wiped out. Drives assigned to Sets or allocated as spares cannot be low level formatted.

Logical Drive Info shows the current configuration of each RAID set, allocated spare, and unallocated physical drive attached to the SATA host adapter.

These operations are detailed in the pages that follow.

Help Window

This window displays context-sensitive help and status messages.

Physical Drive Information

This window displays the model number and capacities of the drives physically attached to the SATA host adapter.

Logical Drive Information

This window displays a list of devices reported to the system BIOS.

Command Line

The bottom line of the display lists the currently active command keys:

Up and Down arrows select the menu item or action

ESC takes the user to the previous menu

Enter selects the highlighted choice

Ctrl-E exits the utility

Other keys may be active depending upon the currently selected action.

Creating RAID Sets

As previously discussed, the Silicon Image SATA host adapter supports RAID 0, 1, and 10 configurations. The selection of the RAID level to be used should be based upon factors including performance, data security, and number of drives available. It is best to carefully consider the long-term role of the system and plan the data storage strategy appropriately.

Silicon Image has made the creation of RAID sets very simple. They can be created either automatically or to allow the greatest flexibility, manually.

- 1. Select "Create RAID Set."
- 2. Choose a RAID 0 Striped, a RAID 1 Mirrored, or a RAID 10 combination set.
- 3. Select Automatically or Manually configuration of the RAID Set.
- 4. If manual configuration is selected, the chunk size of Striped Sets can be selected. For Mirrored Sets, the Source and Target drives can be selected.
- 5. The message "Are You Sure?" will display before completing the configuration. Answer "N" to abort the creation of the new RAID set, or "Y" to proceed with the RAID set creation.

Main Menu —		HELP	
Create RAID set Delete RAID set Rebuild Raid1 set Resolve Conflicts Low Level Format Logical Drive Info	RAIDO RAIDI RAIDIO SPARE DRIVE	RAID10=Strip	ed-Mirrored
PHYSICAL DRIVE		LOGICAL DRIVE	
0 Maxtor 4R080L3	78167MB	Maxtor 4R080L3	78167MB
1 ST330013AS	28629MB	ST330013AS	28629MB
2 Maxtor 4R080L3	78167MB	Maxtor 4R080L3	78167 M
3 Maxtor 40060H3	58627MB	Maxtor 4D060H3	58627MB

The Create RAID set option is also used to allocate a spare drive to a RAID 1 set. This spare drive can be allocated to the set using the SATARaid GUI in the event of a failure of one of the drives in the set. To allocate a spare drive, follow the procedure outlined above, choosing "SPARE DRIVE" for the set type.

Deleting RAID Sets

- 1. To remove one or more RAID sets, select "Delete RAID Set."
- 2. Select the desired set and press Enter.
- 3. Press "Y" when asked, "Are You Sure?"
- 4. The drives will be returned to the selection of logical drives from which a new RAID set can be created.

Delete Rebuild Resolve Low Lev	RAID set RAID set Raid1 set Conflicts el Format Drive Info		HELP — Press "Enter" to select the set
PHYSIC	AL DRIVE		LOGICAL DRIVE
0 Maxt	or 4R000L3	78167MB	Sil Raid10 Set
	0013AS	28629MB	
	or 4R060L3	78167MB	
3 Maxt	or 40060H3	58627MB	

Rebuild RAID 1 Set

This menu selection is used to initiate the copying of data from an existing drive to a replacement drive that has been installed in a RAID 1 set after the failure of one of the members.

- 1. Select "Rebuild RAID1 set.
- 2. Select the desired set and press Enter.
- 3. Press "Y" when asked, "Are You Sure?"
- 4. The set will be rebuilt. The status of the rebuild is displayed in the MAIN MENU window.

	RAID Configuration Utility - Silic MAIN MENU Create RAID set Delete RAID set Rebuild Raid1 set Resolve Conflicts Low Level Format Logical Drive Info Copying / 05% done		HELP Press "Enter raid1 set to	
2 Maxtor 4R060L3 78167MB 3 Maxtor 4D060H3 58627MB	0 Maxtor 4R080L3 1 ST330013AS 2 Maxtor 4R080L3	28629MB 78167MB	Sil Raid1 Set Maxtor 4R080L3	28628MB 78167MB

Resolving Conflicts

When a RAID set is created, the metadata written to the disk includes drive connection information including the channel on the host adapter to which it is connected. If after a disk failure the replacement disk was previously part of a RAID set or used in another system, it may have conflicting metadata, specifically in reference to the drive connection information. If so, this will prohibit the RAID set from being either created or rebuilt. In order for the RAID set to function properly, this old metadata must be first overwritten with the new metadata. To correct this, select "Resolve Conflict" and the correct metadata, including the correct drive connection information, will automatically be written to the replacement disk.

1. Select "Resolve Conflicts" and press Enter.



2. Select the "Conflict" entry in the Logical Drive Status window and press Enter.

Create RAID set Delete RAID set Rebuild Raid1 set Resolve Conflicts Low Level Format Logical Drive Info		Press "Enter the set	" to select
9 Maxtor 4R000L3 1 Maxtor 4R000L3 2 Maxtor 4R000L3 3 ST330013AS	78167M9 58627M9 78167M9 28629M9	LOGICAL DRIVE	58626MB 28629MB

3. Note that some conflict resolutions may result in the drive letter assignment changing; for example the RAID set may have been drive D: but after the conflict resolution, it may become drive E:. Be aware of this when performing a conflict resolution. To maintain the same drive lettering, the SATA cables connected to the drives may need to be swapped, or in the case of a SATA-based removable drive unit, the order of the drives within the chassis made need to be changed. Press 'Y' to accept the change and resolve the conflict.

Create RAID set Delete RAID set Rebuild Raid1 set <u>Resolve Conflicts</u> Low Level Format Logical Drive Info The drive letter might Are You Sure (YAM)?	be changed 1	Press "Enter" the set	' to select
- PHYSICAL DRIVE		LOGICAL DRIVE	
0 Maxtor 48000L3 1 Maxtor 40066H3 2 Maxtor 48000L3	78167MB 58627MB 78167MB	Sil Raid1 Set ST330013AS	58626 m 28629 m
3 ST330013AS	28629MB	Conflict	

4. The conflict will be resolved. The RAID Set will appear in the Logical Drive window.

Create BAID set Delete BAID set Rebuild Raid1 set Resolve Conflicts Low Level Format Logical Drive Info		Help for res conflicts	olving
 PHYSICAL DRIVE 0 Maxtor 4R000L3 1 Maxtor 4D060H3 2 Maxtor 4R000L3 3 ST330013AS 	78167 48 58627 48 78167 48 28629 48	Maxtor 4R000L3 Sil Raid1 Set ST330013AS	78167M9 58626M9 28629M9

SATARaid User's Manual

Low Level Formatting

The Low Level Format menu selection allows the complete erasure of data on a hard drive. This is not an action which typically needs to be performed as formatting the drive under Windows is usually sufficient to prepare the drive for use.

Logical Drive Information

This menu item allows the display of the assignment of physical drives within a logical set (RAID set, RAID 1 spare, or unassigned). It is a display-only function. Use the up and down arrow keys to scroll between the drives in the Logical Drive Properties window. Press the ESC key when done viewing logical drive information.

RAID Configuration Utility - Silico	n Image Inc. Copyright (C) 2003
MAIN MENU Create RAID set Delete RAID set Rebuild Raid1 set Resolve Conflicts Low Level Format Logical Drive Info	HELP Press "Enter" and select logical drive to display information in detail
PHYSICAL DRIVE 0 Maxtor 48080L3 78167MB 1 ST330013AS 28629MB 2 Maxtor 48080L3 78167MB 3 Maxtor 48080L3 58627MB	- LOGICAL DRIVE
11:Select Menu ESC:Previous Menu Enter:S RAID Configuration Utility - Silico MAIN MENU Create RAID set Delete RAID set Rebuild Raid1 set Resolve Conflicts Low Level Format Logical Drive Info	movementes : Tobel kan del versigilar.
PHYSICAL DRIVE 0 Maxtor 4R000L3 64K/CURRENT 1 ST330013AS 64K/CURRENT 2 Maxtor 4R000L3 64K/CURRENT 3 Maxtor 4D060H3 64K/CURRENT	- LOGICAL DRIVE

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

7 Allocating Partitions

After the Raid set(s) have been created, the BIOS reports the new set(s) as a new drive attached to the system. This drive must have a partition defined on it, then the drive must be formatted in preparation for use under Windows.

Windows XP, 2000, and NT use the Disk Management utility that is part of the Operating System. There are enough nuances that make it important to follow the procedure specific to the Operating System.

Windows 98 and Me use a significantly different procedure; defining the partitions is accomplished by booting the system to a DOS prompt and using the FDISK utility. Formatting and naming of the partitions is performed under Windows.

Windows XP & 2000

Before creating any partitions, RAID sets must first be created using the BIOS RAID Utility or the SATARaid GUI. Once the sets have been created, allow the system to load Windows. Once Windows is running, open the Disk Management window located at:

Control Panel> Administrative Tools> Computer Management> Storage> Disk Management

A window similar to the following should appear:



This window has three main sections:

- 1) System listing of all formatted and available disks/RAID Sets.
- 2) Report of physical connection of disks/RAID Sets.
- 3) Report of partition status, disk letter, and volume name.

SATARaid User's Manual

Silicon Image

In the physical connection window, every disk should report as:

Basic

Disk Size (the actual available disk space will be reported here)

Online

Instead of "Basic," a disk may also report as either "Unknown" or "Dynamic." If the disk reports as "Unknown" right-click on the disk icon and click "Write Signature." A window will appear with the disk in question (all "Unknown" disks may appear in this window). Make sure the box next to each disk is checked, then click OK. The disk should now report as "Basic."

If a disk reports as "Dynamic," right-click on the icon of that disk, and click on "Convert to Basic Disk..." Within seconds the disk should report as Basic.

Creating the Partitions

In the Report of physical connection of disks/RAID Sets section, the order in which the drives are displayed corresponds directly to the order the Sets appear in the BIOS. Therefore, the first Unallocated Partition represents Set 1, and so on.

1. In this example, there are two disks with unallocated partitions. Right-click on the partition of the first disk and click on "New Partition."

Ca ² Disk 2 Basic 152.66 GB Online	152.66 GB Unallocat New Partition
CP Disk 3 Basic 27.95 GB Online	Properties 27.95 GB Help Unallocated
CD-ROM 0 CD-ROM 10 MB Online	NEW (D:) 10 MB CDFS Healthy

- 2. The "Create Partition Wizard" should appear. The first window is an introductory window to the Wizard. Click Next.
- 3. The second window designates the partition type. Choose primary partition and click Next.

New Partition Wizard	×
Select Partition Type There are three types of partitions: primary, extended, and logical.	
Select the partition you want to create:	
Primary partition	
C Extended partition	
C Logical drive	
Description	
A primary partition is a volume you create using free space on a basic disk. Windows and other operating systems can start from a primary partition. You create up to four primary partitions or three primary partitions and an extended partition.	
< <u>B</u> ack <u>N</u> ext >	Cancel

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

4. The third window designates the partition size. Since this is a Striped RAID set utilizing 2 disk drives, the size of the partition will be approximately twice the size of the smallest single disk drive. Click Next.

New Partition Wizard Specify Partition Size Choose a partition size that is between the	e maximum and minimum sizes.
Maxium disk space in megabytes (MB): Minimum disk space in MB: <u>P</u> artition size in MB:	156328 8 156328 *
	< <u>B</u> ack <u>N</u> ext > Cancel

5. The fourth window designates the drive letter of the partition. Change the drive letter if desired. Click Next.

rive letter:	Γ	F V		
empty NTFS fold				
		wse		
letter or drive path	1			
	letter or drive path			

Silicon Image

6. The next window allows the volume label to be set and selection of the type of formatting to take place upon the creation of the partition. Make sure the *Format this partition*. . ." radio button is selected. Name the volume as desired (suggestions are generic names such as STRIPED SET or something specific to use such as FINANCIAL, CRITICAL, MISCELLANEOUS, etc.). It is recommended to use the default NTFS for the file system. Click Next.

New Partition Wizard	×
Format Partition To store data on this partition, you	u must format it first.
Choose whether you want to form	at this partition, and if so, what settings you want to use.
C Do not format this partition	
• Format this partition with th	e following settings:
<u>Fi</u> le system:	NTFS
<u>A</u> llocation unit size:	Default
<u>V</u> olume label:	Raid 0 Set
Perform a quick form	at
Enable file and folder	r compression
	< <u>B</u> ack <u>N</u> ext > Cancel

7. The last window is a summary window listing all of the selections made. After verifying that everything is correct, click Finish.

New Partition Wizard		×
	Completing the New Partition Wizard You have successfully completed the New Partition Wizard. You selected the following settings: Partition type: Primary partition Disk selected: Disk 2 Partition size: 156328 MB Drive letter or path: F: File system: NTFS Allocation unit size: Default Volume label: Raid 0 Set Quick format: No To close this wizard, click Finish.	
	< <u>B</u> ack Finish Cance	

Copyright © 2003 Silicon Image Inc.

The status of the newly created partition in the Disk Management window should change to Formatting and the percentage complete will be displayed. Depending upon the size of the partition, the format process may take several minutes. When complete, the status will change to "Healthy" and the name and drive letter will be updated. Once the disk reports Healthy, it appears in the listing in System Listing section with all of its pertinent information as well.

Computer Management										_ 🗆 X
Eile Action View Window	<u>H</u> elp									_ 8 ×
	1									
Computer Management (Local) System Tools System Tools Shared Folders Computer Viewer For Shared Folders Computer Viewer For Computer Viewer For Comp	Volume Lay (F:) Part (G:) Part DATA (C:) Part	tition Basic tition Basic tition Basic tition Basic	(E:) B NTFS System) (C:) B FAT32 B g : (36%) g : (99%) D:)	Formatting : (36 Formatting : (99	%) 27.95 GB 115.01 GB 10 MB	Free Space 152.66 GB 27.95 GB 10.21 GB 0 MB 118.59 GB	% Free 100 % 100 % 8 % 0 % 79 %	Fault Tolerance No No No No No	Overhead 0% 0% 0% 0%	
	Primary partition									
4	Trindly participit									

Repeat the above procedure as needed for any other partitions. Close the Data Management window by clicking on the small boxed "X" in the top right corner of the window. Click on the "My Computer" icon on the Desktop. The new drives will be visible and properly named. The new disks are available for use.

Silicon Image

Windows NT

Before creating any partitions, RAID sets must first be created using the BIOS RAID Utility. Once the sets have been created, allow the system to load Windows. Once Windows is running, open the Disk Management window located at:

Control Panel> Administrative Tools> Computer Management> Storage> Disk Management

A window similar to the following should appear:

🖀 Disk Administrat	or X
Partition <u>T</u> ools <u>V</u> ie	w <u>O</u> ptions <u>H</u> elp
E Disk 0	
19540 MB	Free Space 19540.MB
🖃 Disk 1	F:
19540 MB	NTFS
🖃 Disk 2	
43975 MB	Free Space 43975,MB
E Disk 3	× H:
Primary partition	n
Partition	2000 MB NTFS C:

This Write Signature window may appear first: If so, answer YES for each disk reported with no signature found.



After any required disc signatures have been written, a window similar to the following will appear:

🖀 Disk Administrat	or X
<u>Partition Tools</u> \underline{V} ier	w <u>O</u> ptions <u>H</u> elp
Disk 0	Free-Space 19540.MB
Disk 1	* F: NTFS 19540 MB
Disk 2 43975 MB	Free Space 43975MB
🖃 Disk 3	× H:
Primary partition	n
Partition	2000 MB NTFS C:

The first button on the toolbar opens the Disk Administrator Volumes window, which lists the recognizable Volumes, their capacity, free space, type of format, etc. The second button opens the Disk Configuration window (shown above), detailing all disks (or RAID Sets), partitions, and allows he user to format and name each partition and volume. Section 1 reports the size of each disk (or RAID Set). Section 2 reports each partition, and allows the user to format or delete partitions.

Creating the Partitions

- 1. If any disk in the RAID set appears to be formatted, right click on that partition (Section 2) and select Delete.
- 2. Once all disks are reporting as Free Space, right-click on each partition and select Create...
- 3. A Create Primary Partition window should now appear. Click OK.
- 4. Click Confirm.
- 5. Repeat this step for each disk.
- 6. Now, right-click on the first disk and select Mark Active.
- 7. A window will appear stating that this will take place on the next reboot. Click OK.
- 8. Repeat this step for each disk.
- 9. Close window. Confirm saving changes. Click Yes.
- 10. Disk Administrator will report that the disks were updated successfully. Click OK.
- 11. Re-open Disk Administrator.
- 12. Right-click on the first disk (this should now be the Striped Set).
- 13. Select Format... A window similar to the following window will appear:

Silicon Image

Format E:\	? ×
Cagacity:	
Unknown capacity	•
<u>F</u> ile System	
NTFS	•
Allocation Unit Size	
Default allocation size	•
Volume Label	
Format Options	
Quick Format	
Enable Compression	
<u>S</u> tart <u>C</u> lose	

- 14. Verify the settings as follows:
 - a. Capacity can not be changed.
 - b. Make sure that File System has NTFS selected.
 - c. Don't change the Default Allocation Size.
 - d. Select an appropriate name for Volume Label.
 - e. Select Quick Format.
- 15. Click on Start. The drive will be formatted.
- 16. Repeat this procedure for any remaining drives.
- 17. Close Disk Administrator and open My Computer (icon should be on Desktop).
- 18. The new disks should now appear in the My Computer window.
- 19. Close all windows and applications and Restart the computer.

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

Windows 98 & Me

Windows 98 and Me do not have a Disk Administrator or Disk Management utility. Instead, after creating RAID sets using the BIOS RAID utility and booting Windows, the partitions must be created using the FDISK program. To invoke FDISK from within Windows:

- 1. Click on the START button
- 2. Select Run...
- 3. Type fdisk in the Open.. box
- 4. Click OK

The following window will likely appear:

Your computer has a disk larger than 512 MB. This version of Windows includes improved support for large disks, resulting in more efficient use of disk space on large drives, and allowing disks over 2 GB to be formatted as a single drive.

IMPORTANT: If you enable large disk support and create any new drives on this disk, you will not be able to access the new drive(s) using other operating systems, including some versions of Windows 95 and Windows NT, as well as earlier versions of Windows and MS-DOS. In addition, disk utilities that were not designed explicitly for the FAT32 file system will not be able to work with this disk. If you need to access this disk with other operating systems or older disk utilities, do not enable large drive support.

Do you wish to enable large disk support (Y/N).....? [Y]

Press Enter. The FDISK Options window will appear:



SATARaid User's Manual

The Current Fixed Drive typically will be the System Drive (C:). In order to create partitions, the fixed drive needs to be changed. Select 5 and press Enter. A screen similar to the following will appear:

			Change	Current	Fixed	Disk	Drive	
Disk 1	Drv C: D: E:	Mbytes 38162 4095 33071 996	Free	Usage 100%				
2		57255	57255	z				
Ente	r Fix		rive Numb					
Pres	IS ESC	to retur	n to FDIS	K Uption	S			

Enter the disk number to partition and press Enter. FDISK will return to the Options screen.

With the Current fixed drive set at the disk needing to be partitioned, Select 1 and press Enter to create the partition on the drive. The following window will appear:

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual



Press Enter to select Create Primary DOS Partition. FDISK will scan the drive and the following window will appear. Press Enter to confirm use of the entire drive capacity for the partition.

Create Primary DOS Partition
Current fixed disk drive: 2
Do you wish to use the maximum available size for a Primary DOS Partition (Y/N)? [Y]
Press Esc to return to FDISK Options

While the partition is being created, a progress indication appears at the bottom of the screen. Once the percentage counter reaches 100%, the following window will appear:

SATARaid User's Manual

Silicon Image



Press the Esc key to return to the FDISK Options menu. Repeat the process for any remaining drives that need to be partitioned. When all drives have been partitioned, return to the FDISK Options menu, then press Esc to exit FDISK. The computer will need to be rebooted.

After restarting the computer and booting Windows double-click on the My Computer icon. Right-click on each new drive and select Format.



Select Full Format, enter the Label (name) for the drive or RAID set if desired and click OK.

Copyright © 2003 Silicon Image Inc.

Silicon Image

57255.0 Mb	-7
C Quick (erase)	, v
	20
G E.J	
C Copy system files only	
RAID Set	
No label	
Display summary when finished	
Copy system files	

The following window will likely appear. Click OK to proceed.



Repeat for each new drive. The new drives are now ready to be used.

Silicon Image

8 SATARaid GUI Overview

The SATARaid GUI Installation program configures the SATARaid GUI to automatically start when Windows is started. If the SATARaid GUI does not automatically start or is closed by the user, choose the JAVA SATARaid program from the Start Menu to launch the GUI.

The SATARaid GUI monitors the system's RAID Set in the background. It runs minimized in the System Tray. To open the main window, click the icon located on the taskbar.



The main window will display:



Devices and Information Windows

The Devices window identifies the computer running SATARaid, SATA host adapters, SATA devices, and configured RAID sets. Selecting each component in the configuration tree displays in the Information window data that is unique to that component. Selecting a specific device channel will show that channel's information. Selecting a specific drive reports all

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

pertinent information for that drive, including the drive's serial number, firmware version, ATA version and current mode as well as Configuration and Disk Identification information. Selecting Sets lists the Sets in the configuration tree and provides information on RIO Version.

Selecting a specific RAID set, such as Set 0, and the type of RAID set, the number of members and capacity is reported (A).

찯 Configuration for SATARaid			
<u>File A</u> dvanced <u>H</u> elp		вс	P
🗾 🙆 🦻 🖨 🖬 🐜	Î	Î Î	
Silicon-image ⊡-₩ SI-3114U-0	Sil RAID 0 Set	Members Smart Configuratio	n Identify Data
🖻 🚭 Channel 0	Туре:	Striped Se	t
⋳–⊜ Channel 1 │ └─ॐ Device ⋳–⊜ Channel 2	State:	Online	
Channel 2	Members:	2	
E⊢∰ Sets └─∰ Sil RAID 0 Set	Location:	Channel 1	Device
Ŀ\$	Meta Version:	2.10	
	Capacity:	117252ME	3
	Stripe Size:	65536 BY1	res
		1	
Event Viewer	Туре	Time	Description
	Information	2003 09 20 at 21:03:44	SATARaid Configuration tool started

The Members tab of this window (**B**) reports the device identification (corresponding with the information in the BIOS) and the state of each device. The State of the "destination" drive that is being rebuilt may report as Rebuild for a long period of time depending on the size of the disk.

SMART and Configuration information is displayed by selecting the Smart Configuration tab (**C**). Also in this section is a selection for automatically adding a hot spare and initiating a rebuild in the event of a fault on a RAID 1 set. Note that the spare drive must have previously been allocated in the RAID BIOS configuration screen.

Support	Yes	
Enabled	Yes	
Status	ок	
Univ valid for mirrored sets		
Only valid for mirrored sets		

Data Identification can be displayed by selecting the Identify Data tab (D).

SATARaid User's Manual

Event Viewer and Events Windows

The Event Viewer and Events Windows display SATA device-related events that occur while SATARaid is running. Selecting categories in the Event Viewer window applies a filter to the Events window so that only messages of the type selected are displayed. This allows only Warning or Error messages to be seen, for example.

Event Viewer	Туре	Time	Description
- 🤄 Information	Information	2003.09.20 at 21:03:44	SATARaid Configuration tool started.
— 👲 Warning	Information	2003.09.20 at 19:26:30	SATARaid Configuration tool started.
—😣 Error	Information	2003.09.20 at 19:12:12	SATARaid Configuration tool started.
	र। र		

SATARaid Toolbar and Menu Commands

The Toolbar buttons from Left to Right are:

- A RAID Management
- B-System View
- C Configure SATARaid
- D Send Configuration
- E Save Configuration
- F Copy Configuration
- G-SATARaid Help



All options available via the Command Menu are replicated on the toolbar except Exit and About SATARaid. The Menu commands are shown below

<u>F</u> ile	<u>A</u> dvanced	<u>H</u> elp
Save Configuration	RAID <u>M</u> anagement	SATARaid <u>H</u> elp
Copy Configuration	System <u>V</u> iew	A <u>b</u> out SATARaid
<u>E</u> xit	Configure SATARaid	
	Send Configuration	

The commands are documented on the pages that follow.

RAID Management

This command allows the management of the RAID sets and drives on the SATA host adapter. It is available only under Windows 2000 and XP. See Section 10 - *RAID Set Management Under Windows 2000 & XP* for detailed instructions on using this feature.

System View

This command displays a graphical representation of the host adapter and RAID sets. Clicking on each of the components and then clicking the Details button will open a new window showing more information on the selected device.



Configure SATARaid

This command allows the configuration of the SATARaid program to be viewed and changed. SATARaid configuration is documented in detail in the next section of this manual.

Send Configuration

This command allows the SATARaid configuration file to be emailed to the address selected during configuration. This function is used most frequently when contacting the system administrator for technical support.

Save Configuration

This command allows the SATARaid configuration to be saved.

Copy Configuration

This command allows the creation of a copy of the SATARaid configuration file.

SATARaid Help

This command opens an interactive help dialog using the standard Windows help interface.

Exit

This command is displayed only on the command menu. Choosing this command exits the SATARaid program.



About SATARaid

This command is displayed only on the command menu. Choosing this command displays a dialog box with more information about the SATARaid program, including the revision level.

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual
9 SATARaid Configuration

SATARaid configuration options include customization of the settings for Event Notification, E-mail Notification, Log File, Audio, and Popup. The first tab displayed when SATARaid configuration is opened is for Event Table configuration. This setting determines which events are displayed in the Event Table.

The messages logged for the various settings are as follows:

- Error Level The following messages are logged:
 - Errors
- Warning Level The following messages are logged:
 - Warnings
 - Errors
- Information Level The following messages are logged:
 - Informational
 - Warnings
 - Errors
- Disable All No events will be logged.

찯 Configuration	
Notification Event Level	Log File Audio Popup ime SMTP E-mail
Event Level Information The event level sets which level	of event will shows in event table.
Event Level Configuration	1
-Error Level	Move the slider to set event level for event table.
-Warning Level	
Information Level	
Disable All	
	OK Cancel

SATARaid User's Manual

The next tab is used to set the interval time in seconds for the program to poll the status of the host adapter and devices. Lower settings may have an impact on system performance. If the RAID sets are subject to heavy activity, the Event Time interval should be increased.



The SMTP tab allows the server name to be set for all SATARaid email-related functions. These include sending of configuration files and automatic notification. This entry must include the full name and of server and the top-level domain, for example mail.mycompany.com or smtp.mymailserver.com. Contact the System Administrator if the name of the SMTP server is not known.

Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

찯 Configuration				_ 🗆 X
Notification	Event Level	Log File	Audio	Popup E-mail
-SMTP Informatio A SMTP server i Contact your ne this server. Be s Exar	s the server tha twork administr sure to include t	ator to find ou	t the name domain.	of
-SMTP Configura	ation	npanyname.c	om	
		ок	C;	ancel

Silicon Image

Copyright © 2003 Silicon Image Inc.

The current SATARaid configuration may be sent via e-mail. This feature is most often used when contacting the system administrator for technical support. Select the e-mail tab in the SATARaid Configuration Menu and enter the default e-mail address and subject line for the party receiving the configuration data. The default address and subject can be overridden prior sending the email.

찯 Configuration				×
Notification	Event Level	Log File	Audio Popus	
Event Table	Event Tim	ne St	MTP E-mail	
-E-mail Informa E-mail Subjec configuration i	t can be overridden	at the point v	when the	
-E-mail Config E-mail Addre	uration ss: Administrator@	gyourcomany	yname.com	
E-mail Subje	ct: SATARaid Rep	ort		
		OK	Cancel	

When different types of events occur, SATARaid can send notices to assigned individual e-mail addresses. Select the Notification tab and enter the e-mail addresses of all parties to whom the notices will be sent.

Copyright © 2003 Silicon Image Inc.

Silicon Image

찯 Configuration			_ 🗆 X
Event Table	Event Time vent Level Log	SMTP File Audio	E-mail Popup
E-mail Notification Inf E-mail notification is to list for each event rect configuration.	used to send an e-i		
Subject:	eport		
Address List			
			Add
			Remove
		ок	Cancel

Silicon Image

Copyright © 2003 Silicon Image Inc.

The Event Levels tab is used to select which events trigger a message to be sent to those in the Notification email list. (see Notification on previous page)

- Error Level The following events will be sent:
 - Errors
- Warning Level- The following events will be sent:
 - Warnings
 - Errors
- Information Level The following events will be sent:
 - Informational
 - Warnings
 - Errors
- Disable All No event logs will be sent.

Configuration Event Table Event Table Event Level Event Level Event Level Information The event level sets which leve	I of event logs are sent by e-mail.
Event Level Configuration	
-Error Level -Warning Level -Information Level -Disable All	Move the slider to set event level for notification.
	OK Cancel

Copyright © 2003 Silicon Image Inc.

The log file is used to store event information received from all Silicon Image RAID drivers. The log file is a text file and can be viewed with any text viewer (such as Notepad) or with the Event Property page of SATARaid. Use the Log File tab to set location and the desired filename for the log file.

찯 Configuration			_ 🗆 X
Event Table Notification	Event Time		E-mail Popup
Image IDE RAID	tion ed to store event received drivers. The logfile can be nt property page of the GUI	viewed with any f	19 C 202
Log File Configu O Disable Log O Enable Log F	File		
PathC:\		Br	rowse
File sataraideve	nts.log	F	Purge
		OK Car	ncel

The Audio tab is used to select audio alerts in response to events. Each event can use a different audio alert, and each can be individually disabled.

찯 Configuration						
Event Table Notification	Event Tin		E-mail udio Popup			
Audio Notification Information Audio notification is use to alert the system administrator or user that event occured. Audio Notification Configuration Select the sound to play by clicking the browse button or click the disable button for no sound notification.						
Informational Eve Disabled	ent:	Browse	Disable			
Warning Event: Disabled		Browse	Disable			
Error Event: Disabled		Browse	Disable			
		ОК	Cancel			

Silicon Image

SATARaid can be configured to notify the user of events using messages in popup windows. These alerts can occur separately or in conjunction with audio alerts and email notification. Use the slider control to set the event level for popups to occur:

- Error Level The following events will trigger a popup window:
 - Errors
- Warning Level- The following events will trigger a popup window:
 - Warnings
 - Errors
- Information Level The following events will trigger a popup window:
 - Informational
 - Warnings
 - Errors
- Disable All No events will trigger a popup window.

Configuration							
Event Table Event T Notification Event Level	me SMTP E-mail Log File Audio Popup						
Popup Window Information The popup window is a visual notification that an event occured. This popup windows can be disabled or set to popup for only certain event levels.							
-Popup Window Event Level Config	juration Move the slider to set event level						
-Warning Level	for notification.						
-Information Level							
–Disable All							
	OK Cancel						

Copyright © 2003 Silicon Image Inc.

10 RAID Set Management Under Windows 2000 & XP

Selecting the RAID Management command or toolbar button causes a RAID Configuration Wizard to open. Click Next to go the Main Operation Menu screen.

NOTE: Modifying RAID Sets may result in the existing data on the affected drives being permanently lost. Make sure all data is backed up prior to executing any operation described in this section.

RAID Wizard				×
Main Operatio	n Menu			(The
Create RAID Set Delete RAID Set Modify RAID Set Create Spare Drive Delete Spare Drive				
	Back	Next	Cancel	Help

Menu selections that are available depend on the number of drives available and whether any RAID sets currently exist. The commands available from within the Wizard are:

Create RAID Set is used to create a new RAID 0, 1, or 10 Set.

Delete RAID Set is used to delete a RAID Set or to deallocate a spare RAID 1 drive.

Modify RAID Set allows certain parameters of the RAID Set, such as rebuild rate for RAID 1, to be modified.

Create Spare Drive For RAID 1 is used for allocating a spare drive to a RAID 1 set.

Delete Spare Drive removes the allocated spare drive from a RAID 1 set.

These operations are detailed in the pages that follow.

Silicon Image

Creating RAID Sets

As previously discussed, the Silicon Image SATA host adapter supports RAID 0, 1, and 10 configurations. The selection of the RAID level to be used should be based upon factors including performance, data security, and number of drives available. It is best to carefully consider the long-term role of the system and plan the data storage strategy appropriately.

Creating a RAID 1 Set

The following example shows the creation of a RAID 1 Set with Duplication.

1. Start the RAID Wizard. Select "Create RAID Set" and click Next.



2. Choose the type of RAID set to be created and click Next.



Silicon Image

3. The following message may be displayed. Click OK to acknowledge.



4. Select the Source and Target disks for the Set and click Next.

RAID Wizard				×
Create RAID) 1 Set With Du	plication		A.
RAID 1 Set con	ifiguration to be cre	ated		442
Disk Model: S Disk Location: Disk Capacity:	Data to be kept): ST330013AS Channel 1 Device 28629 MB ata to be replaced wit	h the Source Disk Data):		
	Maxtor 4D060H3			
Disk Location:	Channel 3 Device	-		
Disk Capacity:	, 58627 MB			
The Raid 1 Set S Click the Next to	iize will be 28628M Create Raid 1 Set	В		
	Back	Next	Cancel	Help

Copyright © 2003 Silicon Image Inc.

5. A window will be displayed noting configuration success. Click Finish.



6. An acknowledgement window will appear. Click Finish. A moving bar will appear in the window while the operation is in progress. Once the window closes, the operation is complete. When the window closes, the new RAID Set will appear in the SATARaid window under RAID Sets. After allocating any other RAID sets, you will need to create and format the new partitions. See Section 7 - *Allocating Partitions* for instructions.



Creating a RAID 0 Set

- 1. Referring to the example above for creating a RAID 1 Set, start the RAID Wizard. Select "Create RAID Set" and click
- 2. Hold down the Ctrl key on the keyboard while clicking devices to add them to the RAID Set. A RAID 0 set must contain at least two members. Add as many members as desired. Click Next.

ID Wizard				
eate RAID 0 Se	t			4
ID 0 Set configurat	on to be created	k		C.
		ng members. P	lease select(ctrl+click)	
east 2 memebers from	the list.			
Location	D	isk Model	Capacity	
hannel 0 Device	Maxtor 4R	080L3	78167 MB	
Channel 1 Device	ST330013	AS	28629 MB	
aid 0 Stripe Size: 64	(•		
id 0 Set Size:				
<u>•</u>	ate the Raid 0 set. ber disks will be e			
	Back	Next	Cancel	Help

3. An acknowledgement window will appear. Click Finish. A moving bar will appear in the window while the operation is in progress. Once the window closes, the operation is complete. When the window closes, the new RAID Set will appear in the SATARaid window under RAID Sets. After allocating any other RAID sets, you will need to create and format the new partitions. See Section 7 - *Allocating Partitions* for instructions.

Copyright © 2003 Silicon Image Inc.

Silicon Image



Silicon Image

Creating a RAID 10 Set

- 1. Referring to the example above for creating a RAID 1 Set, start the RAID Wizard. Select "Create RAID Set" and click Next. Select 'Create RAID 10 Set' and click Next.
- 2. Highlight the device to add in the lower section of the Create RAID 10 Set window. Click the up arrow under the First mirror members section to add the first device to the RAID Set. Repeat for the second device. Click the up arrow under the Second mirror members section to add the third device to the RAID Set. Repeat for the fourth device. A RAID 10 set must contain at least four members. When done adding members, click Next.

RAID Wizard					
Create RAID 10 S	iet				(A)
RAID 10 Set configur	ation to be creat	ed			44
First mirror members	i=	Sec	ond mirror mer	nbers:	
Location D	isk Model Ci	apacity l	ocation	Disk Model	Capacity
Channel 0 De Max Channel 1 De ST3					
Stripe size: 64K	Ŀ	•	Raid ²	10 Set Size:	
Location		Disk Model		Сара	acity
Channel 2 Device		or 4R080L3		167 MB	
Channel 3 Device	Maxt mber disks will be	or 4D060H3 erased.	58	627 MB	
	Back	Next	Can	cel	Help

3. An acknowledgement window will appear. Click Finish. A moving bar will appear in the window while the operation is in progress. Once the window closes, the operation is complete. When the window closes, the new RAID Set will appear in the SATARaid window under RAID Sets. After allocating any other RAID sets, you will need to create and format the new partitions. See Section 7 - *Allocating Partitions* for instructions.



Deleting RAID Sets

For various reasons it may be necessary or desired to delete an existing RAID Set. The following example shows the deletion of an existing RAID 0 Set.

1. Start the RAID Wizard. Select "Delete RAID Set" and click Next.

Main Operatio	n Menu			
				140
Create RAID Set Delete RAID Set Modify RAID Set Create Spare Drive Delete Spare Drive				
	Back	Next	Cancel	Help

2. Select the type of set to be deleted and click Next.



Copyright © 2003 Silicon Image Inc.

SATARaid User's Manual

3. Select the set to be deleted and click Next.

			×
Delete RAID Set 0			A C
Select RAID Set 0 to D	elete		445
		<i>1</i> /2	
Select the Raid	Set 0 you would like to Delet	e:	
Raid Type	Disk Model	Capacity	
Striped Set	Sil RAID 0 Set	175878MB	
Raid Memb	ers in the Selected Raid Set	0 [.]	
Raid Memb Location	ers in the Selected Raid Set Disk Model	0: Capacity	
	1		
Location	Disk Model	Capacity	
Location Channel 0 Device	Disk Model Maxtor 4R080L3	Capacity 78167 MB	
Location Channel 0 Device Channel 2 Device Channel 3 Device	Disk Model Maxtor 4R080L3 Maxtor 4R080L3	Capacity 78167 MB 78167 MB 58627 MB	

4. An acknowledgement window will appear. Click Finish. A moving bar will appear in the window while the operation is in progress. Once the window closes, the operation is complete.



Modifying RAID Sets

This feature allows the configuration of various settings related to a RAID Set to be adjusted. The following example shows the modification of the rebuild rate of a RAID 1 Set.

1. Start the RAID Wizard. Select "Modify RAID Set" and click Next.

RAID Wizard				×
Main Operation M	lenu			(Free
Create RAID Set				
Delete RAID Set				
Modify RAID Set	an an an an an a			
Create Spare Drive For	RAID 1			
Delete Spare Drive				
	Back	Next	<u>C</u> ancel	Help

2. Select the operation to be performed and click Next. Only operations that are valid for the selected set will be displayed.



Copyright © 2003 Silicon Image Inc.

Silicon Image

SATARaid User's Manual

3. Select the set on which the operation is to be applied and click Next.

RAID Wizard				×
Select RAID Set 1	//10			(Fe
Select the Raid Set you	would like to set r	ebuild rate:		
Raid Type		Disk Model		Capacity
Mirrored Set	Sil R/	AID 1 Set	28628MB	
Raid Members in the Sel	ected Raid Set:	Disk Model		Capacity
Channel 1 Device	ST33	0013AS	28629 MB	
Channel 3 Device	Maxte	Maxtor 4D060H3		
a second second state and the second second second		01 40000113	58627 MB	
			50027 MB	

4. Change the setting as desired. Click Next.



SATARaid User's Manual

Silicon Image

5. An acknowledgement window will appear. Click Finish. A moving bar will appear in the window while the operation is in progress. Once the window closes, the operation is complete.



Silicon Image

The following example shows modification of a RAID 1 Set by adding a member.

1. Start the RAID Wizard. Select "Modify RAID Set" and click Next.

RAID Wizard			×
Main Operation Menu			(Te
Create RAID Set			
Delete RAID Set			
Modify RAID Set			
Create Spare Drive For RAID 1			
Delete Spare Drive			
Back	Next	<u>C</u> ancel	Help

2. Select the operation to be performed and click Next. Only operations that are valid for the selected set will be displayed.



3. Select the set on which the operation is to be applied. Select the device to be added. Click Next.

RAID Wizard				×
Add new member 1	to RAID Set			
Select RAID Set for new		440		
Select the RAID set you we disk that you would like to .		member to. And selec	t one member	
Raid Type		Disk Model		Capacity
Mirrored Set	Sil RAI	D 1 Set	58626MB	
Availabe disks:				
Location		Disk Model		Capacity
Channel 0 Device	Maxtor	r 4R080L3	78167 MB	
Channel 1 Device			28629 MB	
channel i Device				
Channel 2 Device	Maxtor	r 4R080L3	78167 MB	
	Maxtor		78167 MB	
	Maxto		78167 MB	

4. An acknowledgement window will appear. Click Finish. A moving bar will appear in the window while the operation is in progress. Once the window closes, the operation is complete.



Copyright © 2003 Silicon Image Inc.

Silicon Image

5. Return to the SATARaid Main Window. In the Devices window, select the RAID Set to which you have added the device. Select the Members tab for the RAID Set in the Information window. From here, the progress of the RAID Set rebuild can be monitored.



Creating a Spare RAID 1 Drive

Creating a spare RAID 1 drive allows the spare to be quickly added to an existing RAD 1 set in the event of a catastrophic failure. The following example shows the creation of a RAID 1 spare drive.

1. Start the RAID Wizard. Select "Create Spare Drive For RAID 1" and click Next.

RAID Wizard				×
Main Operatio	on Menu			(Te
Create RAID Set				
Delete RAID Set				
Modify RAID Set				
Create Spare Driv				
Delete Spare Drive	8			
	Back	Next	<u>C</u> ancel	Help

2. Select the disk to be used to create the spare. Click Select. The drive will be displayed in the Spare Disks window. Click Next.

Copyright © 2003 Silicon Image Inc.

Silicon Image

RAID Wizard			×
Select RAID 1 Spa	re Disks		de la
Select Spare Disk(s) fo	or Raid 1 Set(s)		442
Select the disks to cr Avaiable Disks:	eate the spare drive		
Location	Disk Model	l Capacity	
Channel 2 Device	Maxtor 4R080L3	78167 MB	
Spare Disks:			
Location	Disk Model	l Capacity	
Channel 0 Device	Maxtor 4R080L3	78167 MB	
Channel O Device	Maxtor 4R080L3	78167 MB	

3. An acknowledgement window will appear. Click Finish. A moving bar will appear in the window while the operation is in progress. Once the window closes, the operation is complete.

RAID Wizard				×
You have finished with Raid Configuration Wizard				
		Raid Configurati		
	Back	Finjish	Cancel	Help

Silicon Image

Deleting a Spare RAID 1 Drive

For various reasons it may be desired or necessary to deallocate a RAID 1 spare drive. The following example shows the deletion of a spare RAID 1 drive.

1. Start the RAID Wizard. Select "Delete Spare Drive" and click Next.



2. Select the drive to be deallocated and click Deselect, then click Next.

				x
Select RAID 1 S	pare Disks			A.
Select Spare Disk(s) for Raid 1 Set(s)			440
Deselect the disks Avaiable Disks:	to remove the spare d	rive		
Location	Disk M	lodel	Capacity	
Channel 2 Device	Maxtor 4R080L	3 7	8167 MB	
Ourses Distant				
Spare Disks:	Si-			
Spare Disks: Location	Disk M	lodel	Capacity	
	Disk M Maxtor 4R080L		Capacity 8167 MB	
Location				Deselect

3. An acknowledgement window will appear. Click Finish. A moving bar will appear in the window while the operation is in progress. Once the window closes, the operation is complete.

RAID Wizard	×			
You have finished with Raid Configuration Wizard				
	You have finished setting Raid configuration with the Raid Configuration Wizard. Click "Finish" button to apply configuration, it may take some time to finish, please wait till this window disappear!			
<u> </u>	k Finish Cancel Help			

Silicon Image