



VIA Storage Controller Family

Feature and Driver Support Datasheet

For VT8237A PATA/SATA integrated Storage controllers

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REVISION 0.8



Revision History

Document Release	Date	Revision	Initials
0.8	4/7/06	Initial Internal Release	JY



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1 Introduction

This document is intended for users of VIA PATA/SATA host controllers of VT8237A south bridge. This document focuses on features and driver supporting of storage controllers that are integrated in VT8237A. The scope of this document covers below storage controllers :

1. VIA Bus Master IDE Controller, Device ID 0x0571.
2. VIA SATA Controller, Device ID 0x0591.

1.1 Overview

The PCI-SIG defines various types of PCI mass storage controllers. Each type is classified into class and sub-class.. Chip vendors, such as VIA Technologies Inc., who design PCI storage controllers, can specify the type of controller in controller's PCI header registers. Upon reading the device's PCI header registers, the operating system will receive the type of controller and search for corresponding drivers. Table 1 lists the base class and sub-class code of all PCI mass storage controllers.

Base Class Code	Sub-Class Code	Meaning
01h	00h	SCSI bus controller
	01h	IDE controller
	02h	Floppy disk controller
	03h	IPI bus controller
	04h	RAID controller
	05h	ATA controller with single/chained DMA
	06h	Serial ATA Direct Port Access
	80h	Other mass storage controller

Table 1: Base class and Sub-Class code of all PCI mass storage controllers

There are two host storage controllers integrated in VT8237A south bridge, list as below:

Item	Name	Device ID	Configurable Class
1	VIA Bus Master IDE Controller	0x0571	1. Base class = 01, sub-class= 01, IDE Controller
2	VIA SATA Controller – xxxx	Depend on Sub-Class Code	Base class = 01, sub-class= 01, IDE controller Base class = 01, sub-class= 04, RAID controller

Table 2: Two integrated storage controllers in VT8237A

The term "Configurable Class" refers to the possible base class and sub-class that the controller can be configured to.. User can configure class and sub-class of controller in BIOS setting. From table 2, the "VIA Bus Master IDE Controller" (VT8237A PATA Controller, note 1) is not configurable because it only supports IDE controller. The "VIA SATA controller-**xxxx**" (VT8237A SATA controller) can be dynamically configured as either one of IDE or RAID controller. Sometime "IDE controller" implicitly implies to the controller that is configuring to "IDE mode"; and "RAID controller" implies to the controller is configuring to "RAID mode".

Note 1: Throughout this document, the term "VT8237A PATA Controller" refers to "VIA Bus Master IDE controller" that Device ID equal to 0x0571.



1.1.1 Features of VT8237A PATA Controller

The VT8237A PATA controller is a standard dual-channel IDE controller and it can only be configured as “IDE controller”. Microsoft Windows and Linux has provided default driver for standard IDE driver. To enhance the supporting of ATA/ATAPI Ultra-DMA mode, VIA also provide mini-IDE drivers for VT8237A PATA controller. See section 2.2.1.

VT8237A PATA controller	
Class	Interface Type
IDE Controller	2 master/slave-mode Parallel ATA channels Support up to 4 ATA/ATAPI devices.

Table 3: Channel type of VT8237A PATA controller

- Standard Dual Channel Bus master IDE controller.
- Transfer mode supports up to ATA 133(Ultra DMA mode 6).
- AT Attachment with Packet Interface - 6 (ATA/ATAPI-6).

1.1.2 Feature of VT8237A SATA Controller

The VT8237A SATA controller is an advanced host controller that consists of functionalities of Serial ATA (SATA) . Figure1 shows the function block of SATA module in VT8237A SATA controller. The default for SATA module is active.

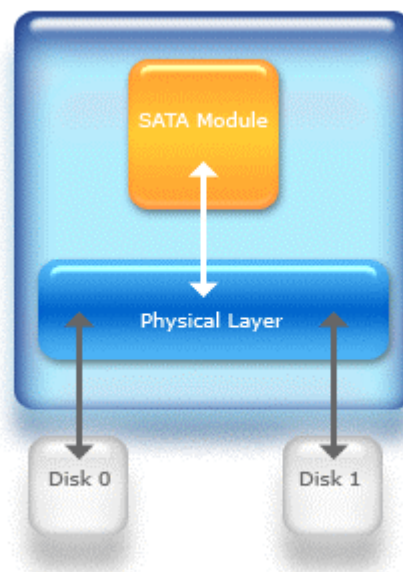


Figure 1: Module block of VT8237A SATA controller

When SATA module of VT8237A SATA controller is active, it can emulate as parallel ATA controller and is compatible to standard dual channel IDE controller. Therefore, default IDE driver can be loaded.

0x0591 controller	
Class	Interface Type
IDE Controller	Master/Master-mode SATA channels (ports) (Note: Slave ports are not provided by this chip.)
RAID Controller	Master only SATA ports. For detailed driver support, see section 2)

Table 4: Channel type of VT8237A SATA controller



2 Driver Support

2.1 Driver supporting for Microsoft Windows

Table 5 list out the current driver support status for VT8237A's storage controllers.

<Update Date: February 2006 >

Class	Device ID	Module	Microsoft Windows		
			NT4	Win 9X/ME	2k/XP/Serv2003
IDE	0x0571		1. Microsoft - Default.	1. Microsoft - Default.	1. Microsoft - Default. 2. VIA - VIAMiniIDE after V1.30 (included).
	0x5337	SATA	1. Microsoft - N/A 2. VIA – N/A (Note 1)	1. Microsoft - N/A 2. VIA – N/A (Note 1)	1. Microsoft – Default 2. VIA - VIAMiniIDE after V1.30 (included).
RAID	0x0591	SATA	VIA: V-RAID after V5.20C (included)	VIA: V-RAID after V5.20C (included)	VIA: V-RAID after V5.20C (included)

Class	Device ID	Module	Microsoft Windows
			Vista
IDE	0x0571		1. Microsoft - Default.
	0x5337	SATA	1. Microsoft – Default or In-Box VIA Bus/Master driver. 2. VIA: VIA MiniIDE after V1.40 (included) Note 3)
RAID	0x0591	SATA	1. Microsoft - In-Box VIA Stor-Miniport RAID driver. 2. VIA: VIA V-RAID after V5.30 (included) (Note 3)

Table 5: Windows storage driver supporting of VT8251

Note 2: Microsoft NT4, Windows 98 and Window ME do not support SATA Native IDE. They only support legacy PATA IDE controller. Therefore, if end-user wants to use it for these OSES, please configure this controller into RAID mode through BIOS setup menu in order to enable VIA V-RAID driver.

Note 3: VIA has checked-in new RAID driver and new IDE Bus/Master driver into Microsoft Vista to become in-box default driver.

2.1.1 Windows Driver supporting of VT8237A PATA Controller

Microsoft Windows has provided default driver for VT8237A PATA controller, however users are able to install VIA's mini-IDE driver from released driver package "VIAMiniIDE". For further details on mini-IDE driver please refer to section 2.1.3



2.1.2 Windows Driver supporting of VT8237A SATA Controller

The driver support for VT8237A SATA controller is based on the configuration modes. When it is set to IDE mode, user may use default IDE driver or optionally install VIA mini-IDE driver.

When VT8237A SATA controller is set to IDE class, the controller is fully compatible to standard dual channel IDE controller, therefore, Microsoft Windows load default IDE driver to VT8237A SATA controller. User can optionally install VIA's mini-IDE driver for better usage of VT8237A SATA controller. There are two major benefits to install VIA's mini-IDE driver:

1. It enables auto hot-plug detection of SATA.
 - Auto detects plug-in/out of SATA hard disks.
2. It enables safe-remove feature of SATA hard disk.
 - Add safe-remove icon and dialog in windows. See Figure 4.

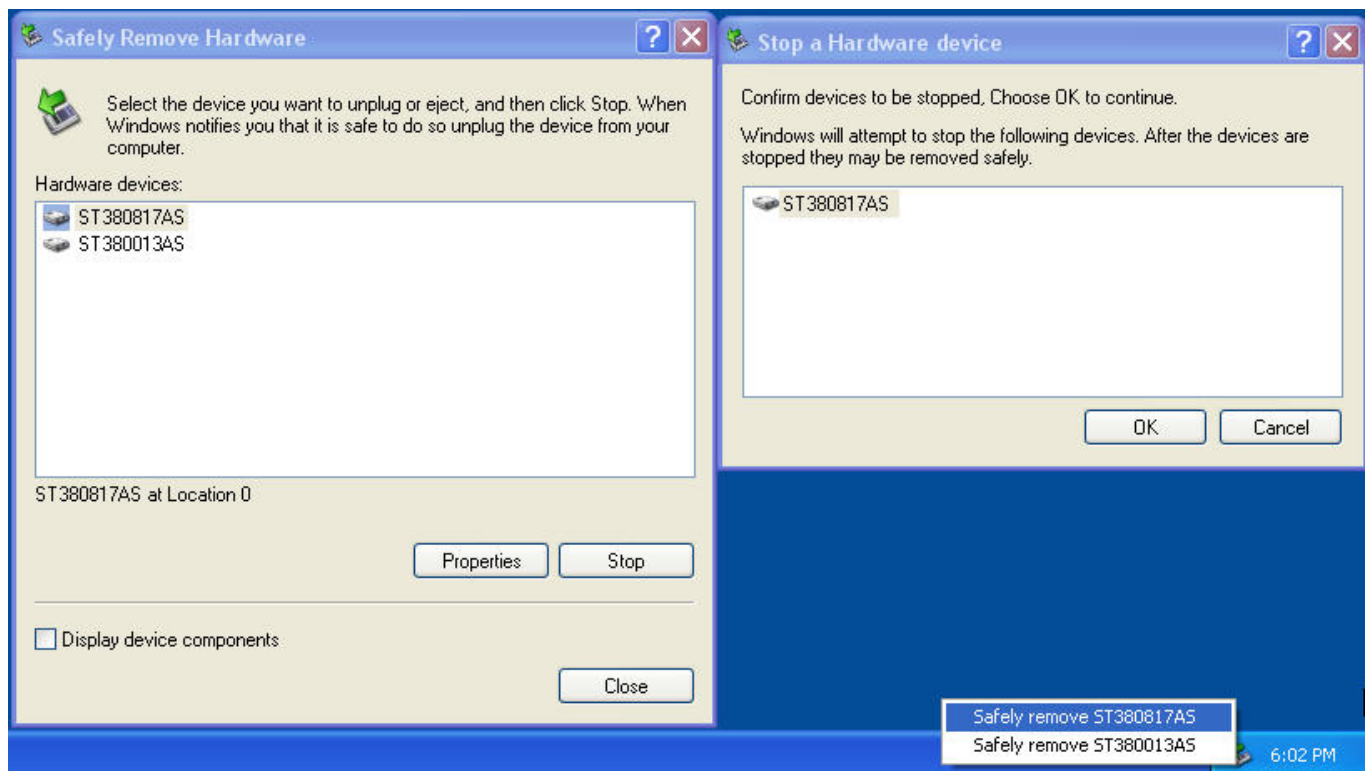


Figure 2: Safe-remove icon and safe remove hardware dialog of SATA hard disk.

When VT8237A SATA controller is setting to RAID class, Microsoft Windows does not load any default driver for it (Figure 5 and Figure 3), users must install VIA V-RAID driver. For further details regarding to installation process, please refer to section 3.

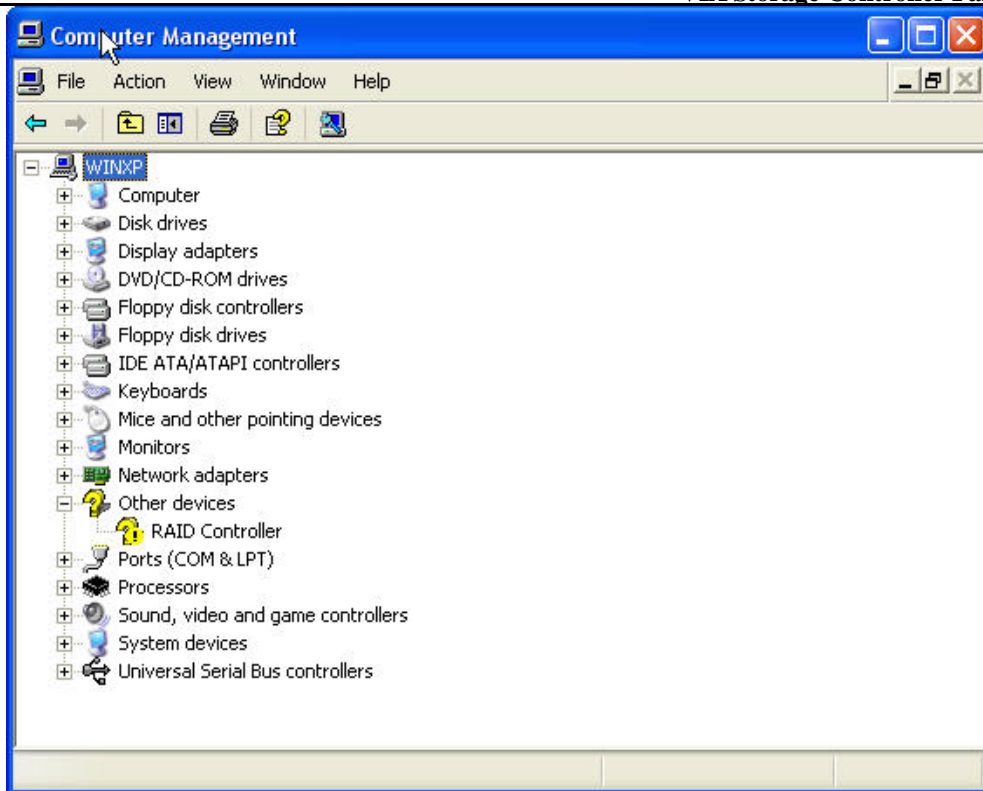


Figure 3: Device Manager View - Unknown RAID controller before install VIA V-RAID driver.

The driver will enable software RAID function according to current base and sub class settings in BIOS. When it is set to RAID mode, driver enables software RAID function.

RAID	Controller Mode	RAID Controller
	Driver RAID function	Enable

Table 6: Software RAID enable/disable condition.

2.1.3 Introduction to Mini-IDE driver package

The mini-IDE driver is vendor provides drivers that report capabilities of IDE controller to Microsoft Windows. Mini-IDE driver exports interface functions for Windows, to query and set the transfer mode of host controller. Windows can then proceed following items from mini-IDE driver:

1. The channel's (port's) disabled/enabled status.
2. The transfer modes supported by IDE controllers.
3. Set current transfer mode to specific mode.

Microsoft Windows knows how to control VIA's old IDE controller after Windows XP service pack 2. But for new VT8237A integrated PATA and SATA IDE controller, Windows considers it as an unknown VIA IDE controller and assume it support transfer mode up to Ultra-DMA 6. Microsoft Windows works fine because both integrated controllers are backward compatible and support transfer mode up to Ultra-DMA 6. For better devices compatibility for this new VIA VT8237A PATA/SATA IDE controller, it is recommended to install VIA's mini-IDE driver.

The Driver package of VIA Mini-IDE (after V1.30 (included)) can support PATA IDE and SATA IDE controllers.



2.1.4 Introduction to VIA V-RAID Software package

The driver inside VIA V-RAID software package is SCSI-miniport driver that performs software RAID on VIA storage controller families through the RAID tool inside this package. The driver supports following features on VT8237A SATA:

1. Supports four SATA ports at 3.0Gb/s (300MB/sec).
2. Supports hard disk drive larger than 137 GB (48-bits LBA).
3. Supports SATA I, SATA II, Ultra DMA mode 6/5/4/3/2/1/0, DMA mode 2/1/0, and PIO mode 4/3/2/1/0.
4. Supports RAID 0, 1 and JBOD.
5. Bootable disk or disk array support. (Note: The VIA V-RAID OPRM should be existed.)
6. Windows-based RAID configure and management software tool. (Compatible with BIOS)
7. Real-time monitoring of device status and error alarm with popup message box and beeping.
8. Supports hot-swap failed disk drive in RAID 1 array.
9. Mirroring automatic background rebuild support.
10. SATA and ATA S.M.A.R.T support.
11. Microsoft Windows 98, Me, NT4.0, 2000, XP and Server 2003 operating system support.
12. Event log for easy troubleshooting.
13. On-line help for easy operation for RAID software.

For further details on RAID operation steps, please refer to section 4.

2.2 Driver supporting for Linux

2.2.1 Linux Driver supporting of VT8237A PATA Controller

Linux Default driver supports all south bridge integrated parallel IDE controllers.

2.2.2 Linux Driver supporting of VT8237A SATA Controller

VIA has provided driver source patches of VT8237A SATA controller to Linux organization. As table 7 shows, the package is named "VIA Linux Driver patch package V1.0". For Linux kernel status, please refer the release note of Linux Kernel published by Linux organization.

Advanced user or customer can also access this patch package by contact to: JosephChan@via.com.tw

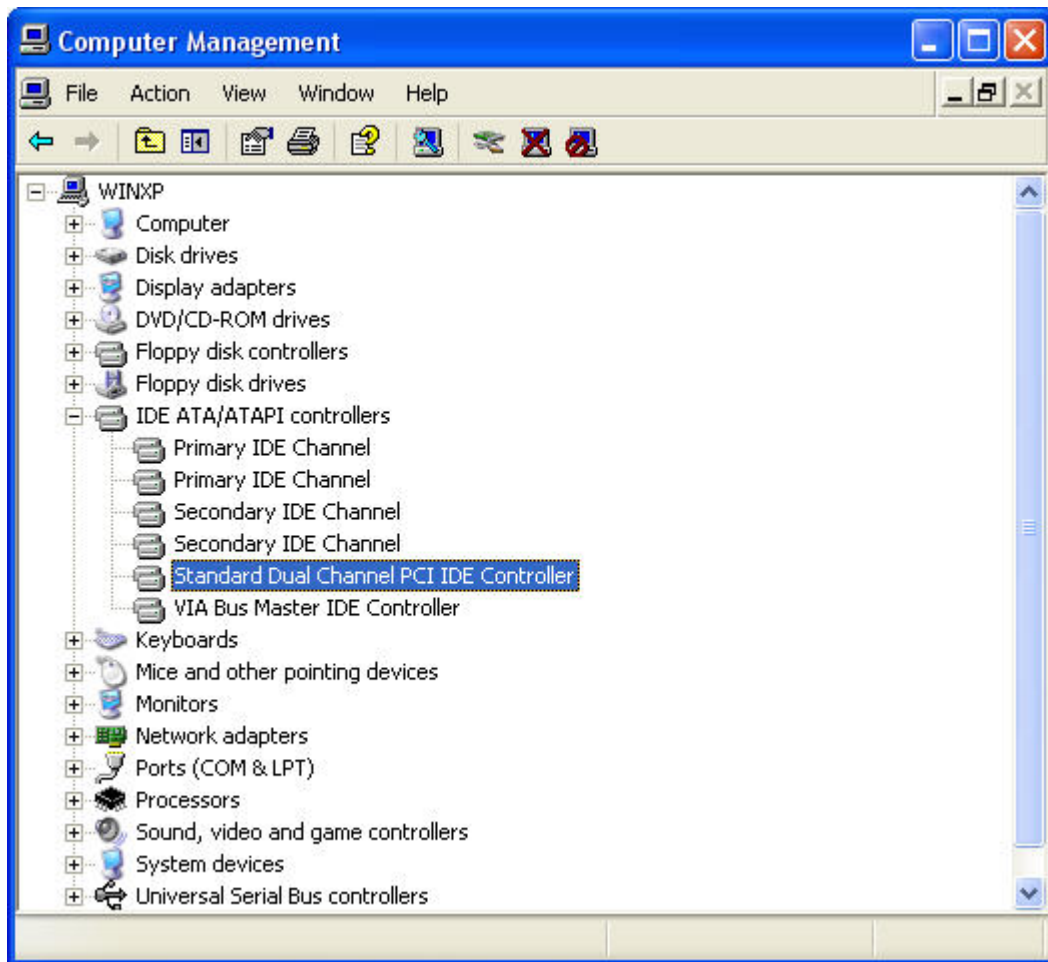
Class	Device ID	Module	Linux	
			Kernel 2.4.X	Kernel 2.6.X
IDE	0x5337	SATA	Note 4	VIA Linux Driver Patch package after V1.0 (included)

Table 7: Linux storage driver support for VT8237A SATA Controller

Note 4: VIA recommends Linux users to upgrade their kernel to version 2.6.X. VIA will not provide VT8237A patches for kernel 2.4.X to end-user. If there are any special requests from thirty party hardware vendors, please also contact to JosephChan@via.com.tw.

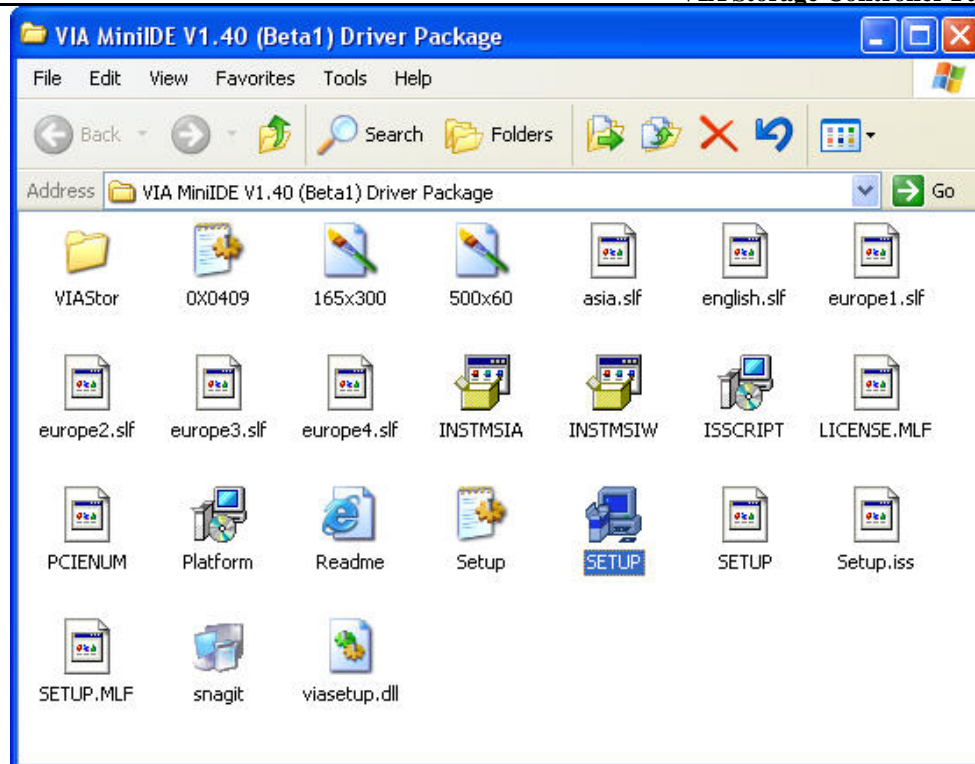
3 Driver Installation Guide

3.1 Install mini-IDE driver for VT8237A PATA/SATA IDE Controller



Step 1: Before start to install mini-IDE

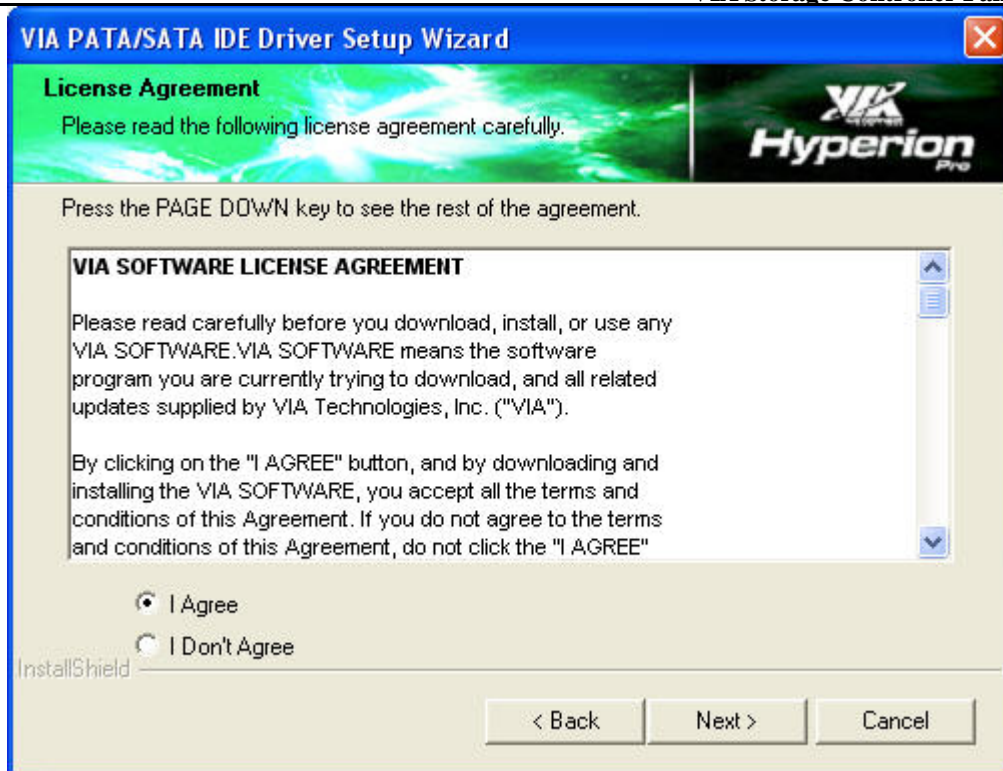
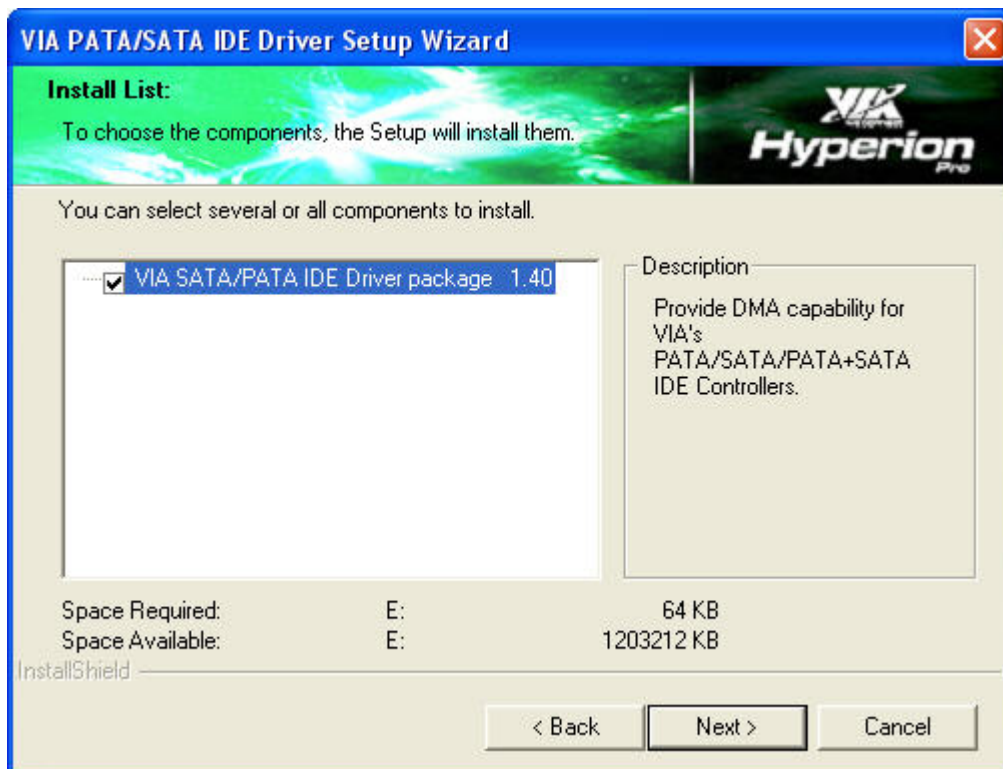
1. Prior to installation of VIA mini-IDE driver, please first uninstall existing non-default driver for VT8237A PATA and SATA controllers.
2. The VT8237A SATA controller should be set to IDE mode through BIOS setup menu.
3. In Step 1 Figure, "VIA Bus Master IDE Controller" is the default name of VT8237A PATA controller. "Standard Dual Channel PCI IDE Controller" is the default name of VT8237A SATA controller.

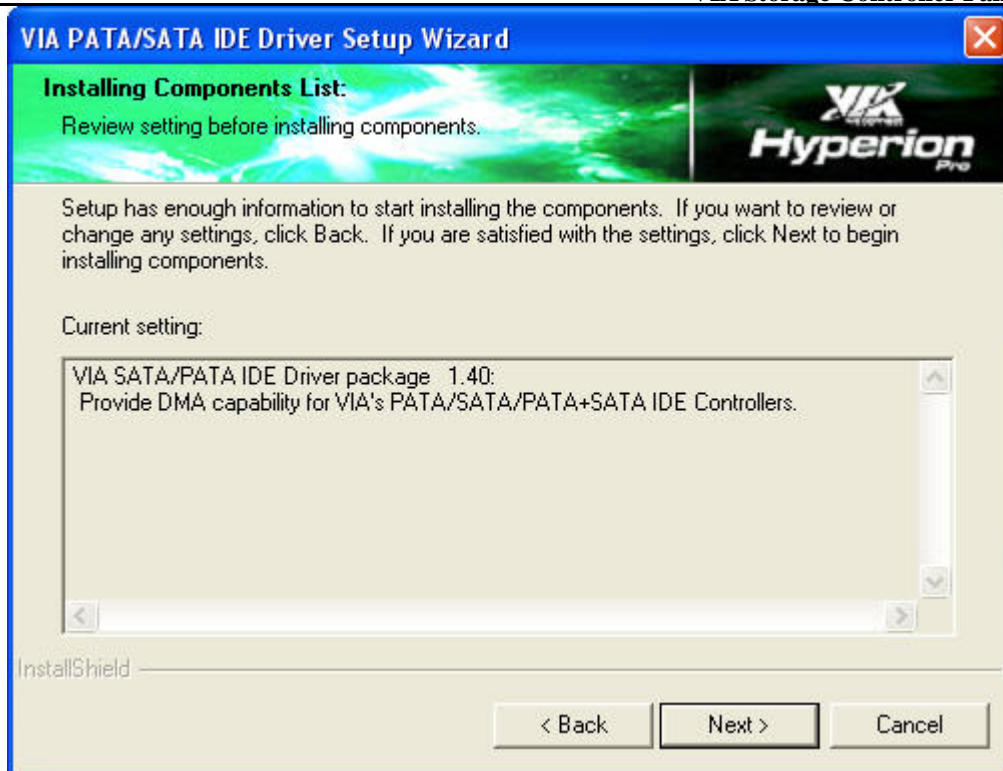
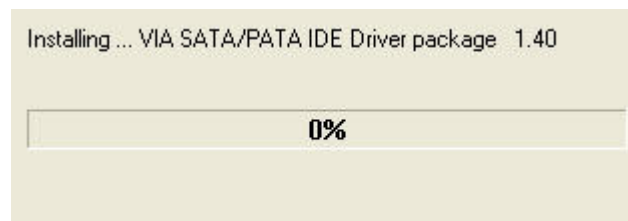


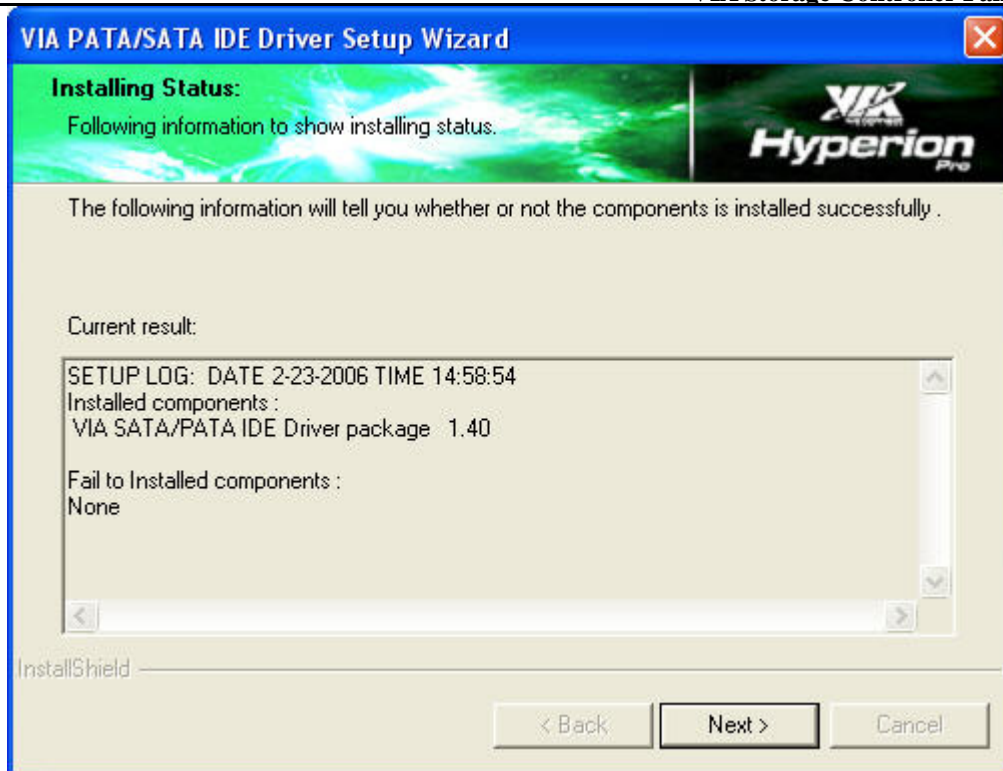
Step 2: Execute setup.exe from driver package



Step 3: Welcome and press “Next”

**Step 4: Read License agreement and then press "Next"****Step 5: Choose component to install**

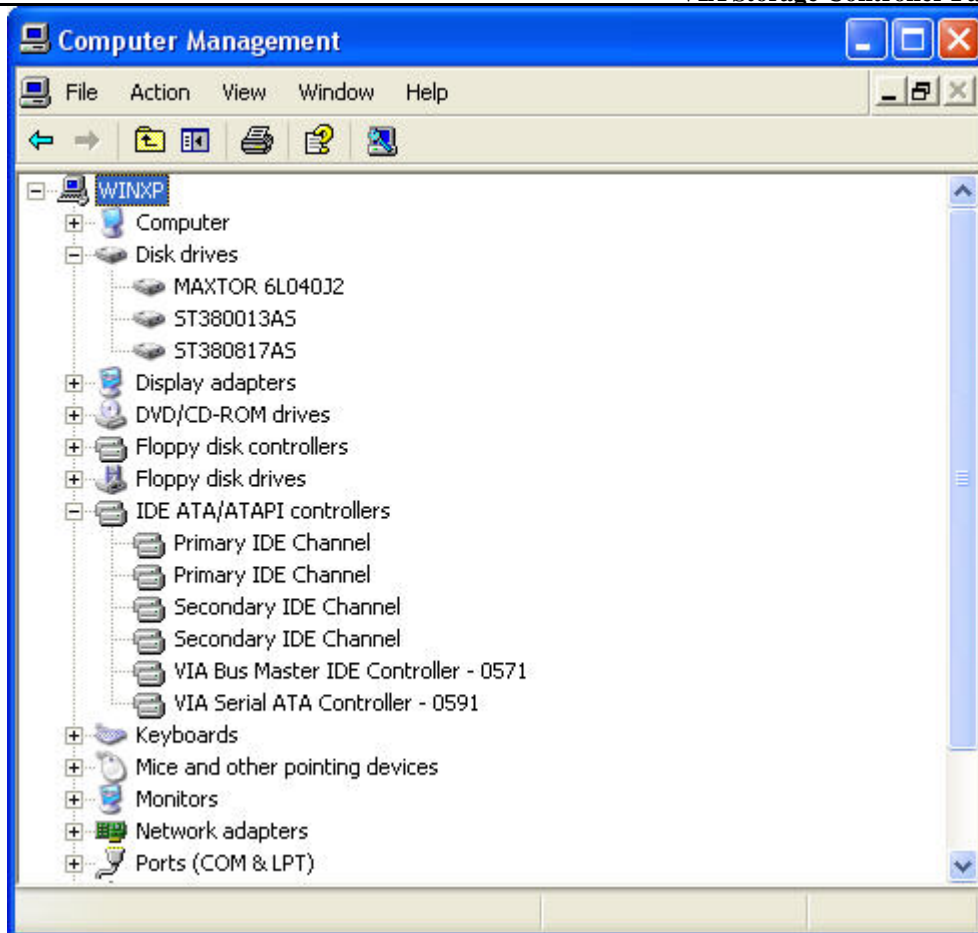
**Step 6: Confirm installation****Step 7: Installing VIA mini-IDE driver**



Step 8: Install Finished



Step 9: Ask for reboot

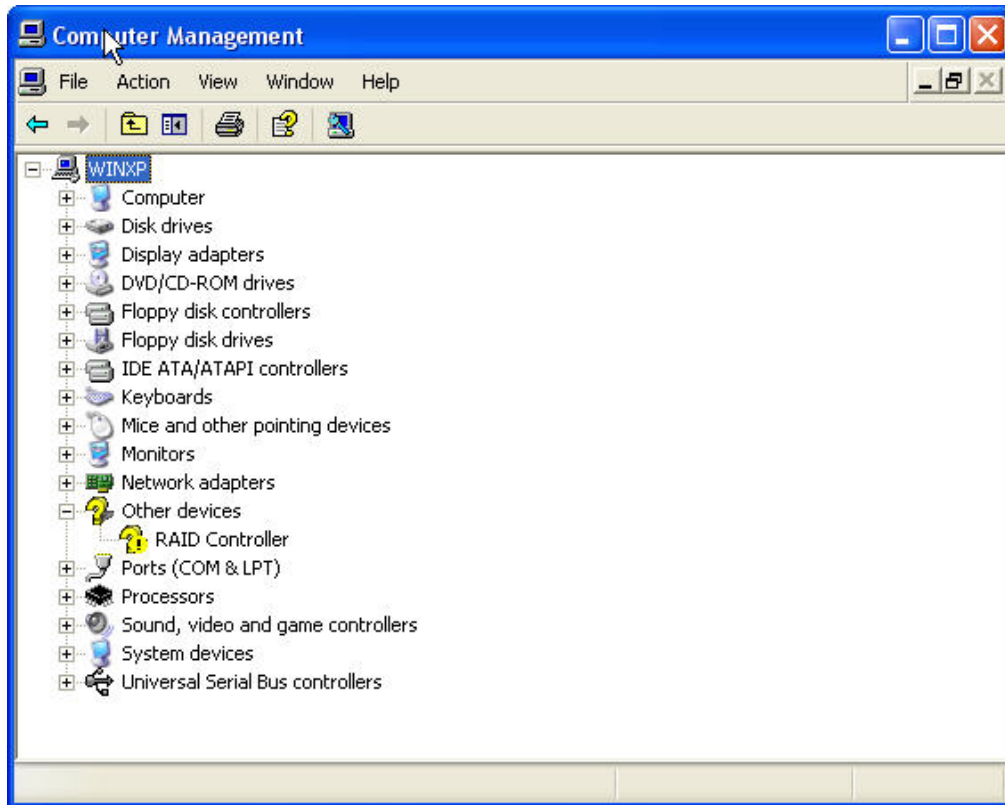


Step 10: Reboot and check driver

After driver is successfully installed for VT8237A PATA and SATA IDE controller, user can check the devices in device manager. The name of VT8237A PATA controller should be changed to "VIA Bus Master IDE Controller - **0571**". The name of VT8237A SATA controller should be changed to "VIA Serial ATA Controller - **5337**"

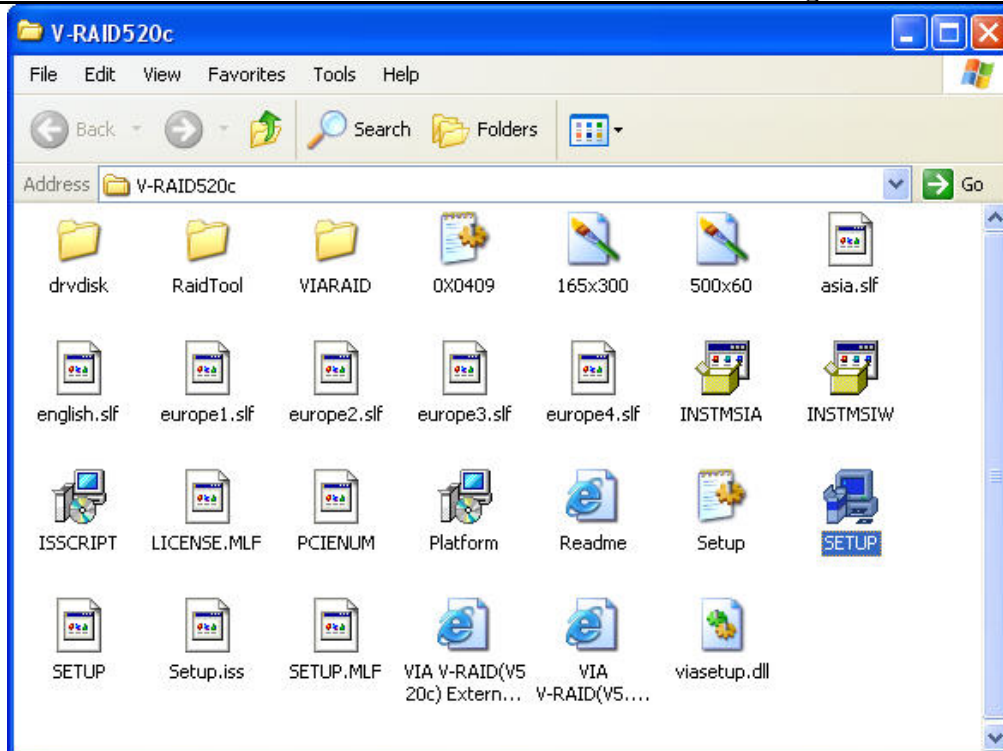


3.2 Install VIA V-RAID Driver for VT8237A SATA RAID Controller



Step 1: Before start to install VIA V-RAID driver

1. If user has installed other driver on VT8237A SATA controller before, it is recommended to remove previous installed driver first.
2. The VT8237A SATA controller must set to RAID mode in BIOS setting.

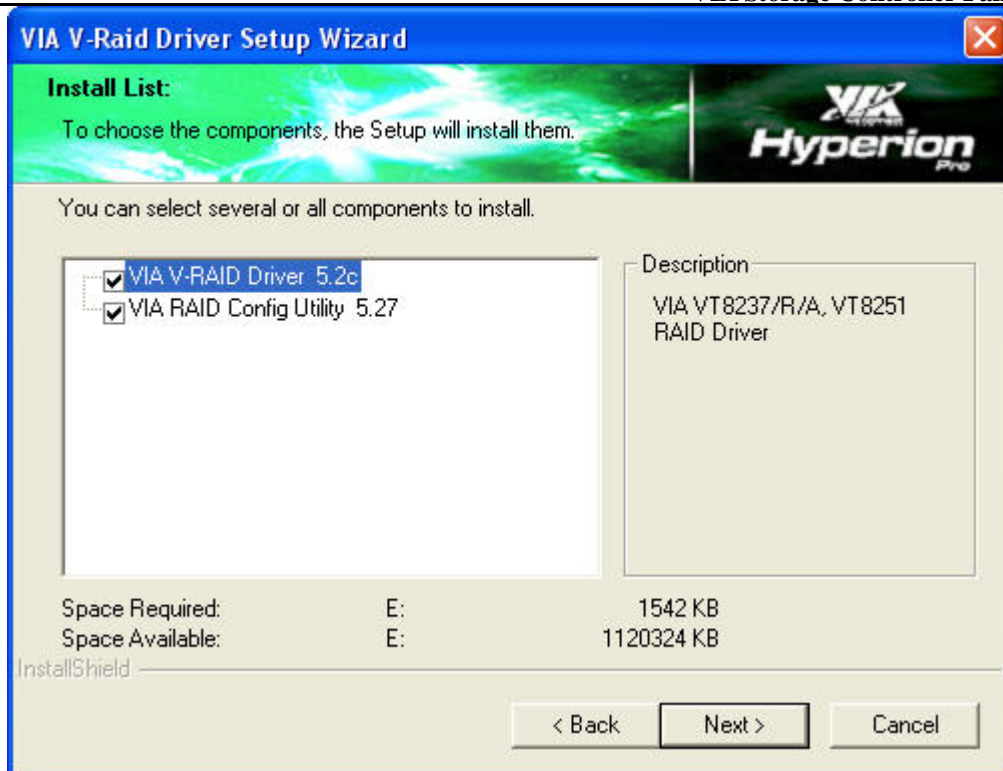
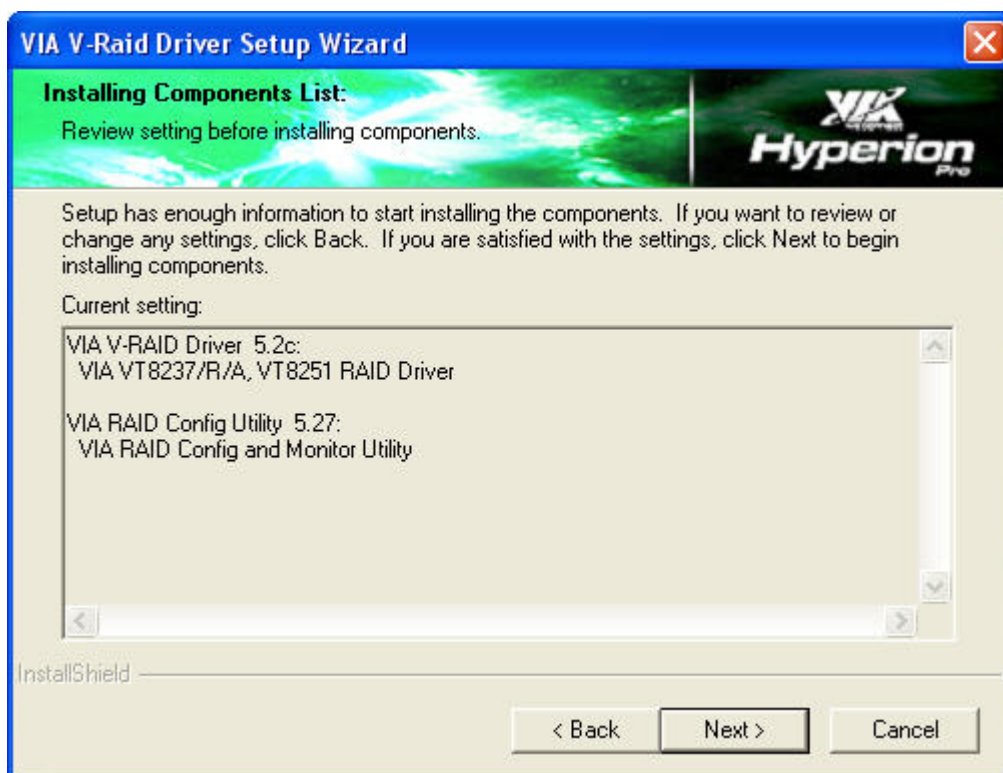


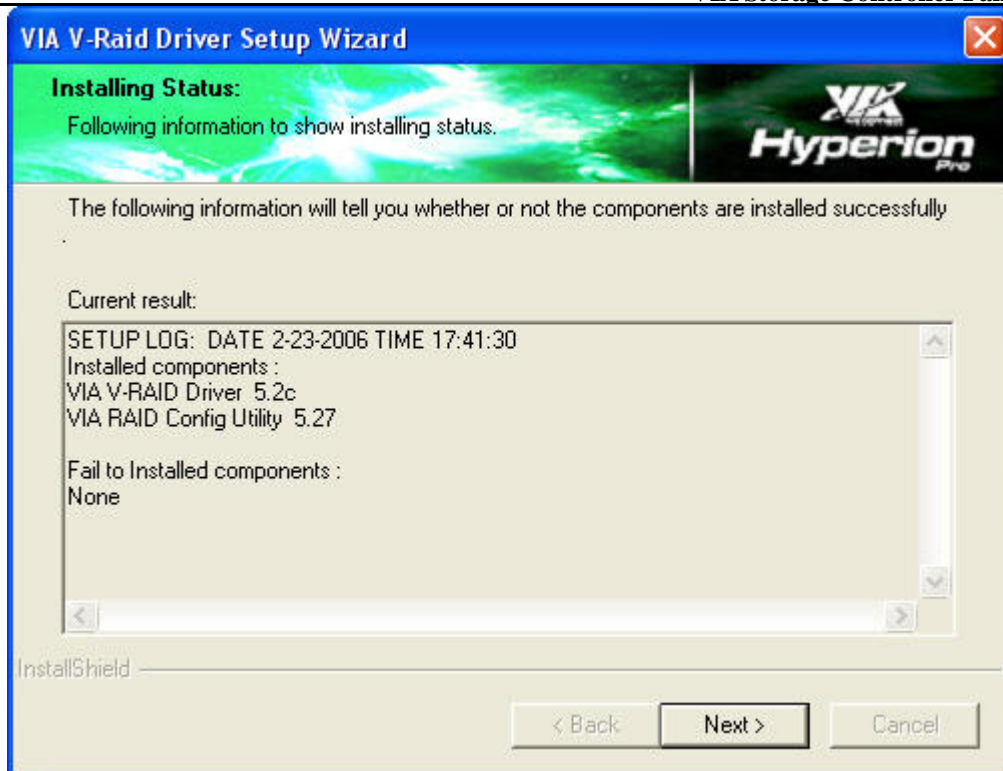
Step 2: Execute setup.exe from driver package



Step 3: Select Install/Update or Remove

1. To install driver, select "Install/Update"
2. To remove previous installed VIA V-RAID driver, select "Remove"

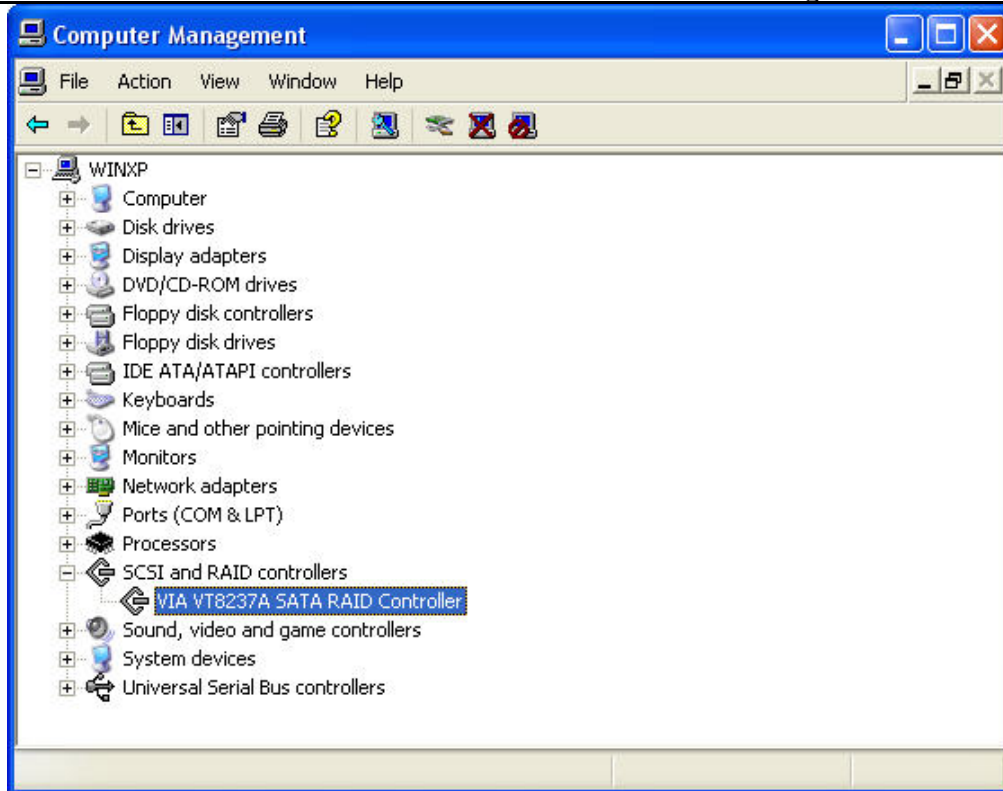
**Step 4: Choose component to install****Step 5: Confirm Installation**



Step 6: Install Finished



Step 7: Ask for reboot



Step 8: Reboot and check driver

After driver successfully install VIA V-RAID driver on VT8237A SATA controller, user can check the devices in device manager. The name should be changed to "VIA VT8237A SATA RAID Controller".



4 VIA V-RAID Operation Guide

This section gives a brief introduction to the RAID-related background knowledge and a brief introduction to the VIA V-RAID Host Controller.

4.1 RAID Basics

RAID (Redundant Array of Independent Disks) is a method of combining two or more hard disk drives into one logical unit. The advantage of an Array is to provide better performance or data fault tolerance. Fault tolerance is achieved through data redundant operation, where if one disk drive fails, a mirrored copy of the data can be found on another drive. This can prevent data loss if one hard disk failed. The individual disk drives in an array are called “members”. The configuration information of each member is recorded in the “reserved sector” that identifies the drive as a member. All disk members in a formed disk array are recognized as a single physical drive to the operating system.

Hard disk drives can be combined together through a few different methods. The different methods are referred to as different RAID levels. Different RAID levels represent different performance levels, security levels and implementation costs. The RAID levels are RAID 0, 1 and JBOD. The table below briefly introduced these RAID levels.

RAID Level	No. of Drives	Capacity	Benefits
RAID 0 (Striping)	2 to 4	Number drives * Smallest size	Highest performance without data protection
RAID 1 (Mirroring)	2	Smallest size	Data protection
JBOD (Spanning)	2 to 4	Sum of All drives	No data protection and performance improving, but disk capacity fully used.

4.1.1 RAID 0 (Striping)

RAID 0 reads and writes sectors of data interleaved between multiple drives. If any disk member fails, it affects the entire array. The disk array data capacity is equal to the number of drive members times the capacity of the smallest member. The striping block size can be set from 4KB to 64KB. RAID 0 does not support fault tolerance.

4.1.2 RAID 1 (Mirroring)

RAID 1 writes duplicate data onto a pair of drives and reads both sets of data in parallel. If one of the mirrored drives suffers a mechanical failure or does not respond, the remaining drive will continue to function. Due to redundancy, the drive capacity of the array is the capacity of the smallest drive. Under a RAID 1 setup, an extra drive called the “spare drive” can be attached. Such a drive will be activated to replace a failed drive that is part of a mirrored array. Due to the fault tolerance, if any RAID 1 drive fails, data access will not be affected as long as there are other working drives in the array.

4.1.3 JBOD (Spanning)

A spanning disk array is equal to the sum of the all drives in the array. Spanning stores data on to a drive until it is full then proceeds to store files onto the next drive in the array. When any disk member fails, the failure affects the entire array. JBOD is not really a RAID and does not support fault tolerance.



4.2 BIOS Configuration Utility

4.2.1 Enter BIOS Configuration Utility

When the system powers on, the following information will appear on screen. Press the 'Tab' key to enter BIOS configuration utility.

```
VIA Technologies, Inc.VIA VT8237A SATA RAID CDROM BOOT BIOS V1.00
Copyright (C) VIA Technologies, Inc. All Right reserved.
237AR100.ROM - FOR RAID

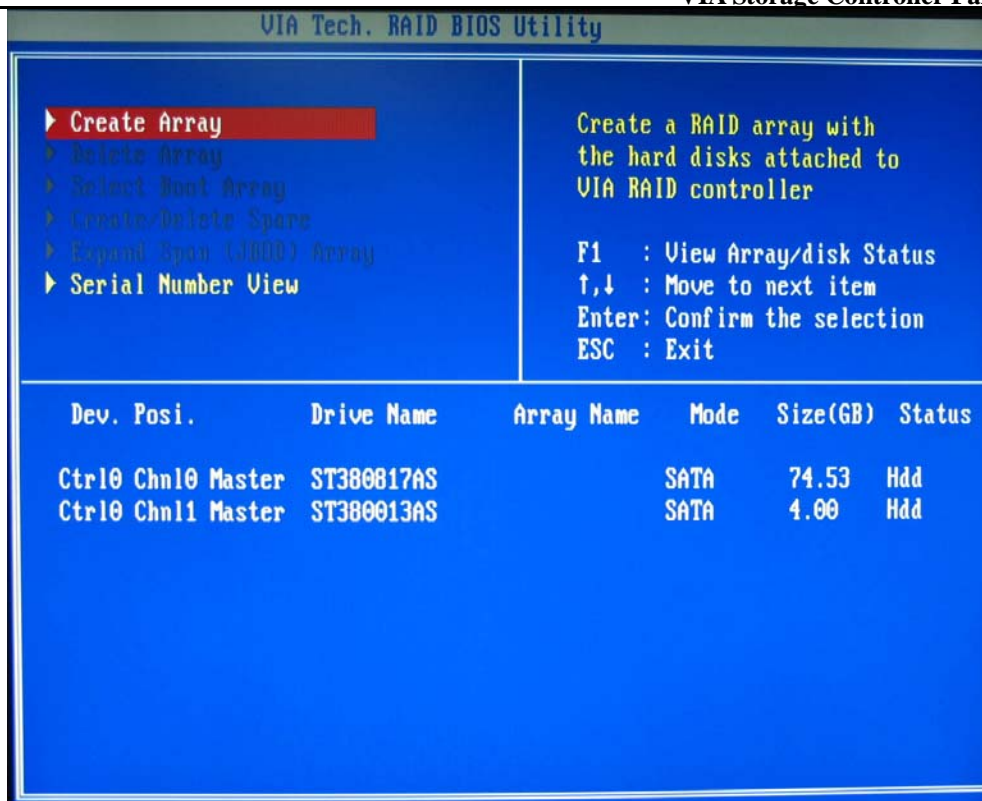
Scan Devices,Please wait...
No Raid

Ctrl0 Chnl0 Master    ST380817AS           - SATA mode
Ctrl0 Chnl1 Master    ST380817AS           - SATA mode

Press <Tab> Key into User Window!

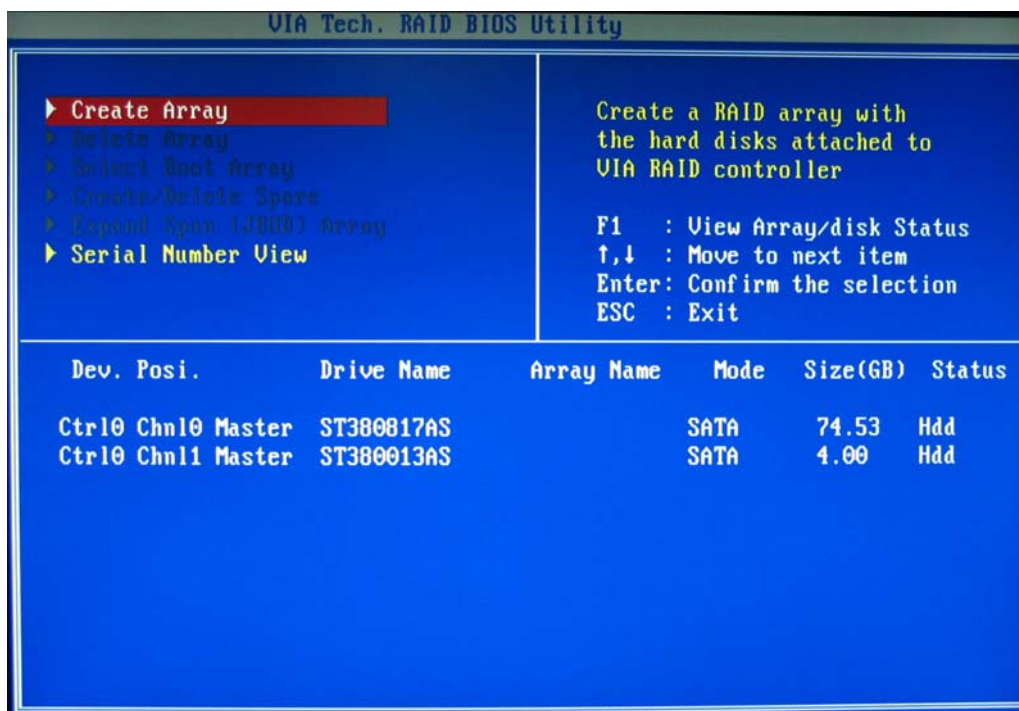
If you want to install Linux Default partition RAID driver, please do not use
OPROM creation operation!
```

The main interface of BIOS configuration utility is as below:



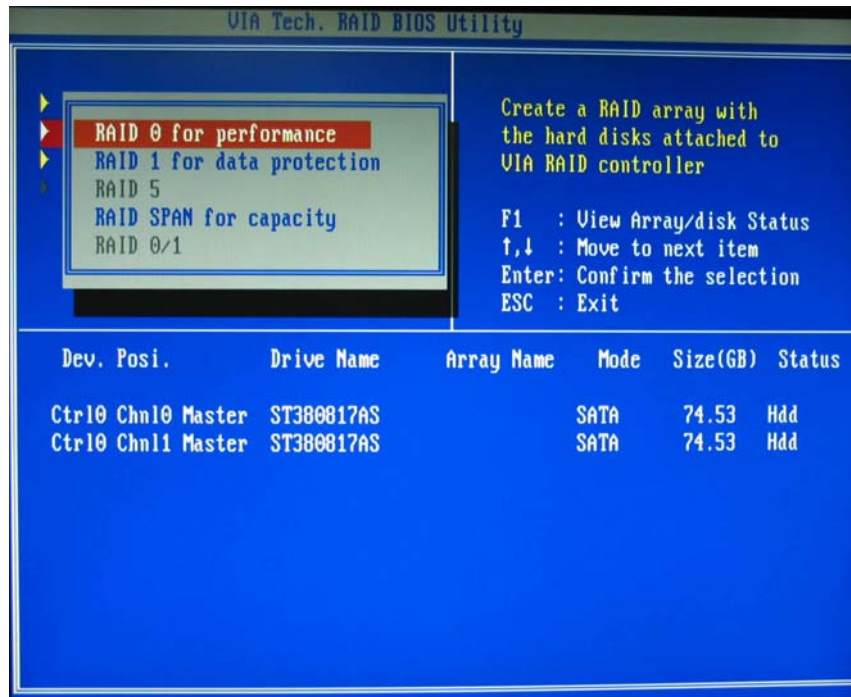
4.2.2 Create Disk Array

1. Use the arrow keys to navigate the menu. Select **Create Array** and press <Enter> to call out the list of creation steps.

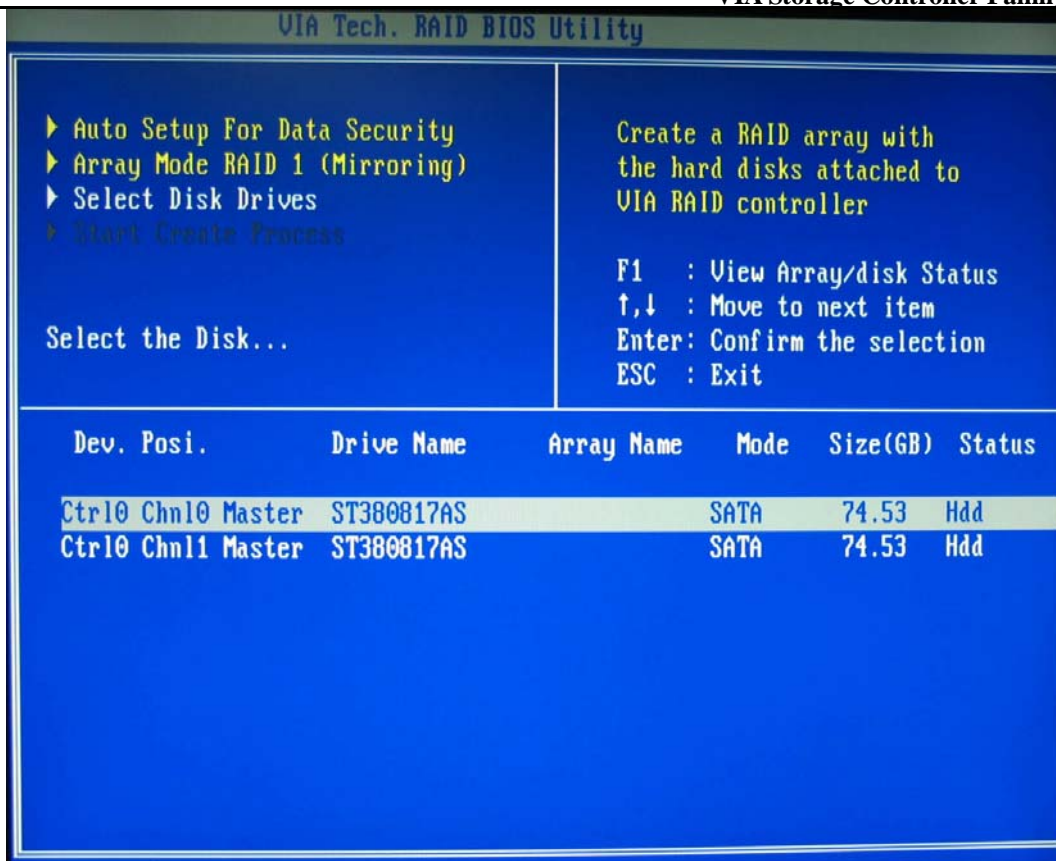




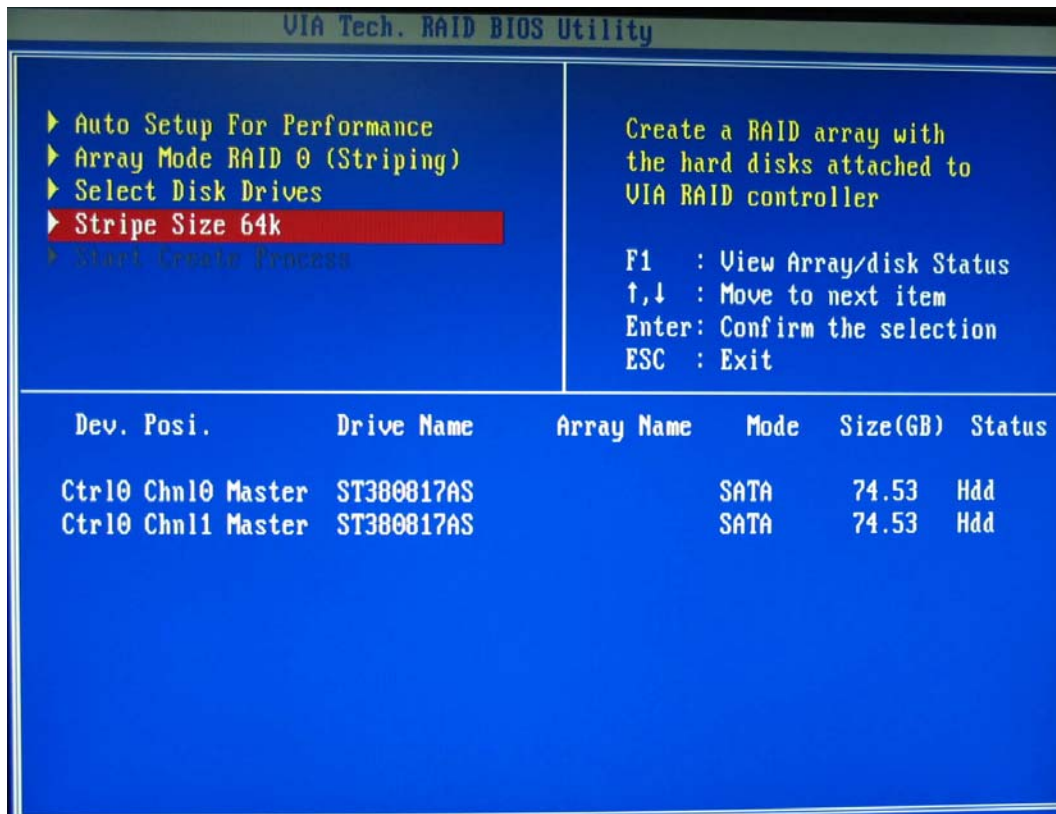
2. Select **Array Mode** and press <Enter>. A list of array modes will appear. Highlight the target array mode that you want to create, and press <Enter> to confirm the selection. If RAID 1 or RAID 0/1 is selected, an option list will pop up and enable the users to select **Create only** or **Create and duplicate**. **Create only** will allow BIOS to only create an array. The data on the mirroring drive may be different from the source drive. **Create and duplicate** allows BIOS to copy the data from the source to the mirroring drive.



3. After array mode is selected, there are two methods to create a disk array. One method is "**Auto Setup**" and the other one is "**Select Disk Drives**". **Auto Setup** allows BIOS to select the disk drives and create arrays automatically but it does not duplicate the mirroring drives even if the user selected **Create and duplicate** for RAID 1 . It is recommended all disk drives are new ones when wanting to create an array. **Select Disk Drives** lets the user select the array drives by their requirements. When using **Select Disk Drives**, the channel column will be activated. Highlight the drives that you want to use and press <Enter> to select them. After all drives have been selected, press <Esc> to go back to the creation steps menu.



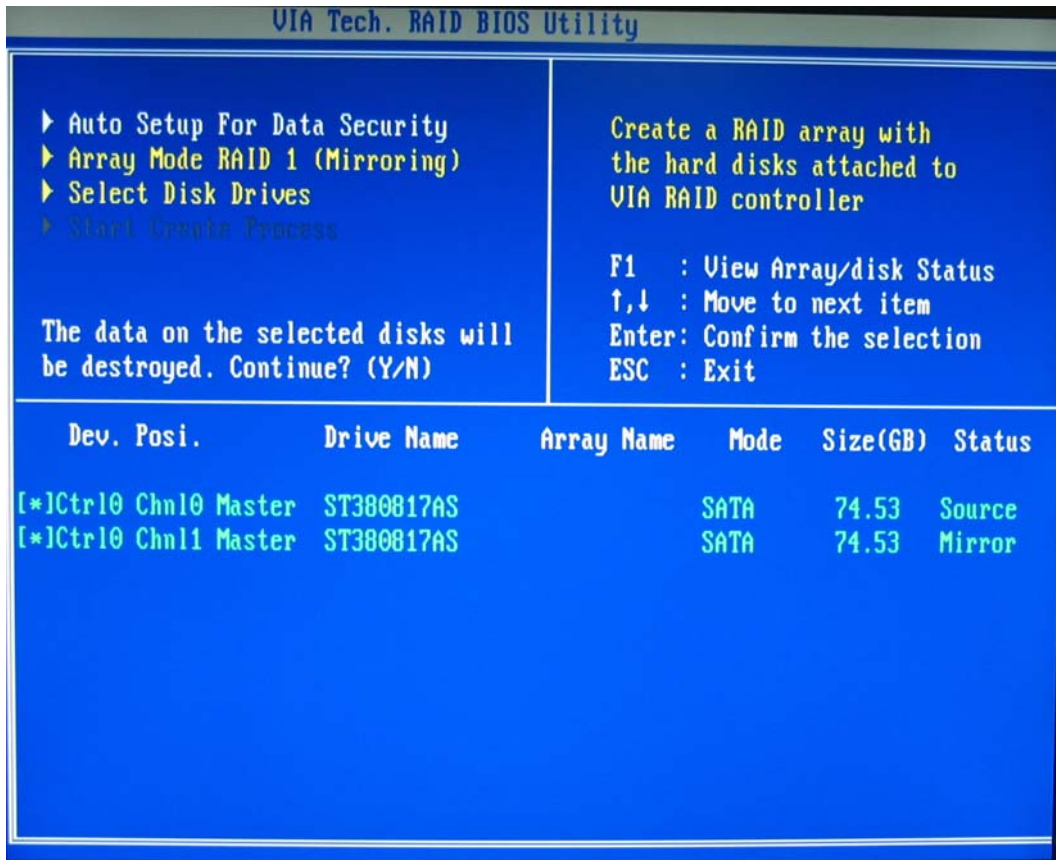
4. If RAID 0 was selected in step 2, the block size of the array can also be selected. Use the arrow key to highlight **Block Size** and press <Enter>. Then select a block size from the popup menu. The block size can be 4KB to 64KB.





VIA Storage Controller Family – VT8237A

5. Use the arrow key to highlight **Start Create Process** and press <Enter>. A confirmation message will appear. Press **Y** to finish the creation, or press **N** to cancel the creation.

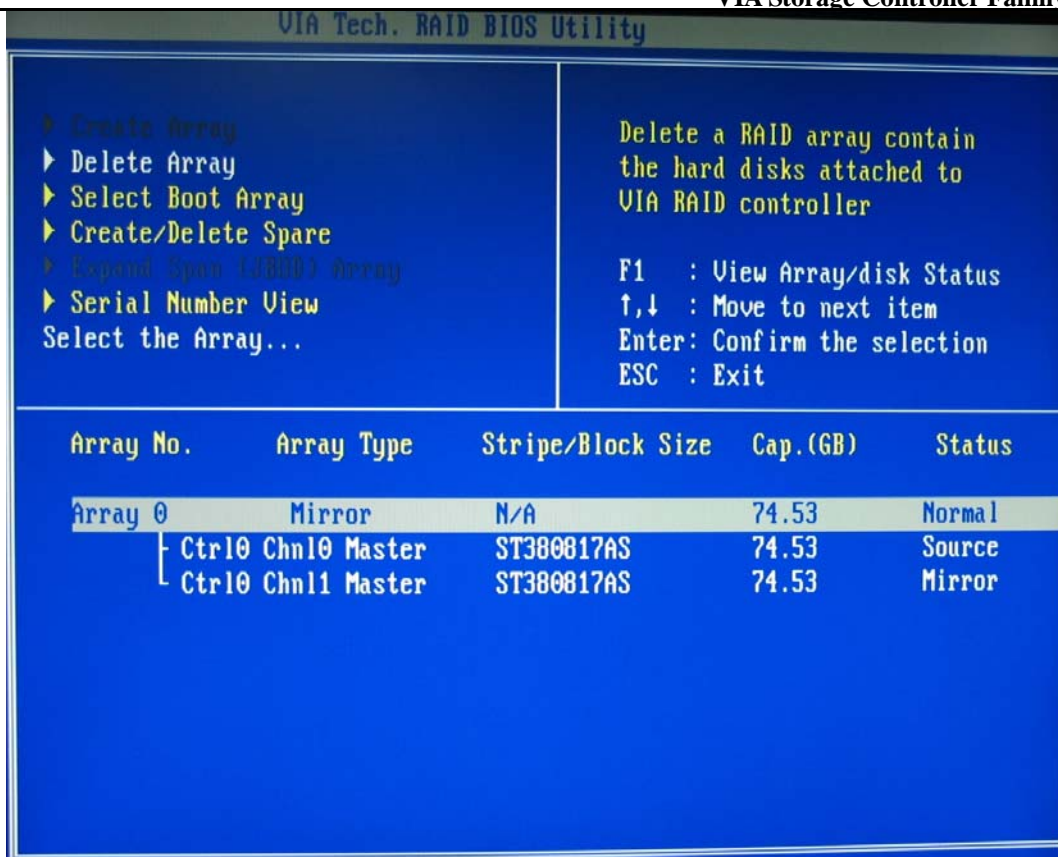


6. Important note: All existing content in the hard drive will be destroyed during array creation.

4.2.3 Delete Disk Array

A RAID can be deleted after it has been created. To delete a RAID, use the following steps:

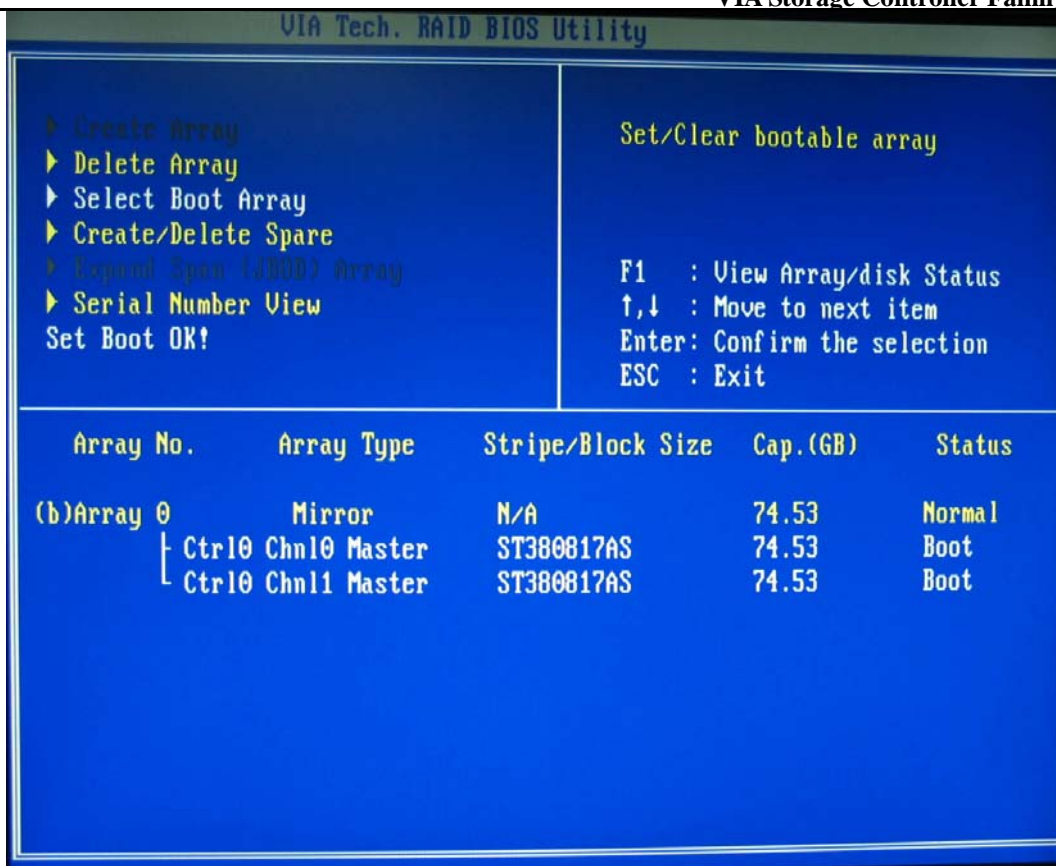
1. Select **Delete Array** and press <Enter>. The channel column will be activated.
2. Select the member of an array that is to be deleted and press <Enter>. A warning message will display. Press **Y** to delete or press **N** to cancel.



Deleting a disk array will destroy all the data on the disk array except RAID 1 arrays. When a RAID is deleted, the data on these two hard disk drives will be reserved and become two normal disk drives.

4.2.4 Select Boot Array

User can select a disk array as boot device if user wants to boot operating system from an array. Boot disk array cannot be selected if the operating system does not boot from the disk array. Highlight the **Select Boot Array** item, then press <Enter> and the channel column will be activated. Then highlight the target disk array and press <Enter>. If user selects a disk array that has a boot mark and press <Enter>, its boot setting will be canceled.

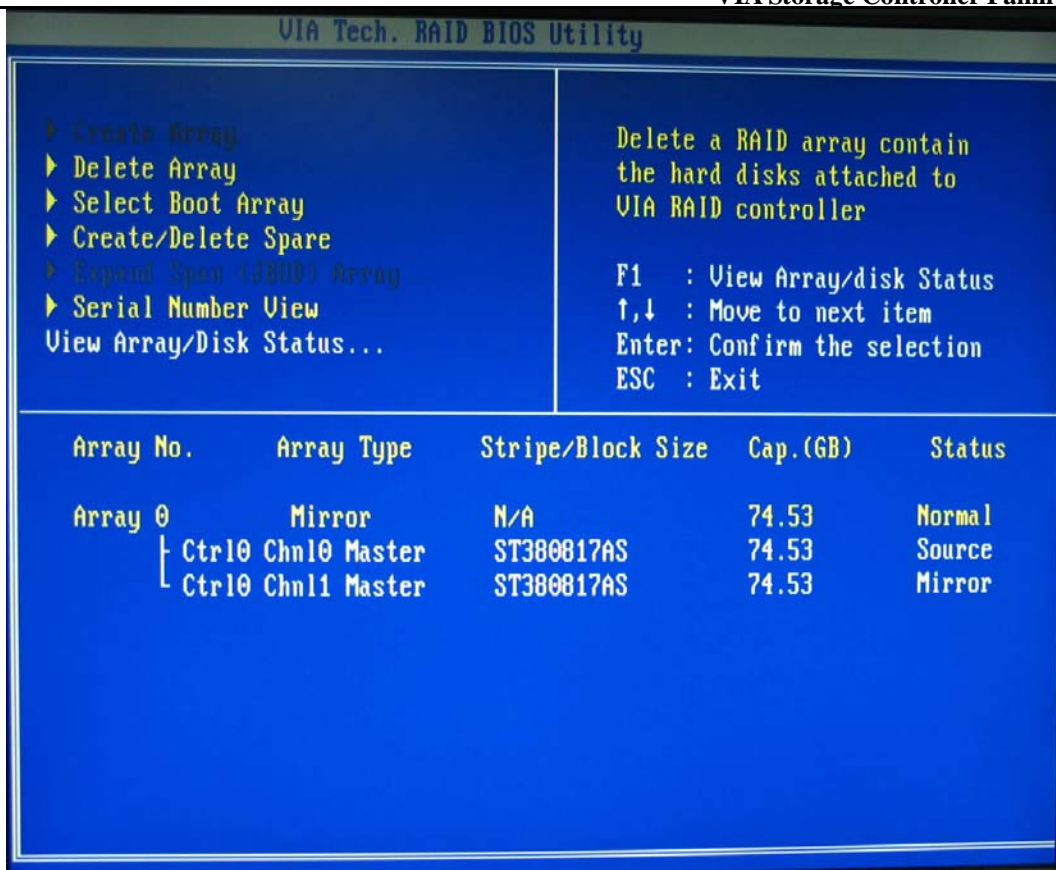


4.2.5 View Serial Number of Hard Drive

Highlight **Serial Number View** and press <Enter>. Use arrow key to select a drive, the selected drive's serial number can be viewed in the last column. The serial number is assigned by the disk drive manufacturer.

4.2.6 View Array Status

Press the **F1** key to show the array status on the screen. If there are no disk arrays then nothing will be displayed on the screen.



4.2.7 Duplicate Critical RAID 1 Array

When booting up the system, BIOS will detect if the RAID 1 array has any inconsistencies between user data and backup data. If BIOS detects any inconsistencies, it prompts the user pressing Ctrl+C to enter the critical process window. The status of the disk array will be marked as critical and BIOS will prompt the user to duplicate the RAID 1 to make the backup data consistent with the user data.



VIA Technologies, Inc. VIA VT8237A SATA RAID CDROM BOOT BIOS V1.00
Copyright (C) VIA Technologies, Inc. All Right reserved.
237AR100.ROM - FOR RAID

Scan Devices, Please wait...

Raid

Array 0	Mirror	N/A	74.53	Duplicating
{	Ctrl0 Chnl0 Master	ST380817AS	74.53	Source
	Ctrl0 Chnl1 Master	ST380817AS	74.53	Mirror

Press <Ctrl+C> into Critical Window!

Press <Tab> Key into User Window!

If you want to install Linux Default partition RAID driver, please do not use
OPROM creation operation!

VIA Tech. RAID BIOS Utility


<p>▶ Duplicating Now</p> <p>▶ Continue to boot</p>	<p>A disk member of a mirroring array has failed or is not responding. The array is still functional, including fault tolerance.</p> <p>F1 : View Array/disk Status</p> <p>↑,↓ : Move to next item</p> <p>Enter: Confirm the selection</p> <p>ESC : Exit</p>																			
<table><thead><tr><th>Array No.</th><th>Array Type</th><th>Stripe/Block Size</th><th>Cap.(GB)</th><th>Status</th></tr></thead><tbody><tr><td>(b)Array 0</td><td>Mirror</td><td>N/A</td><td>74.53</td><td>Duplicating</td></tr><tr><td rowspan="2">{</td><td>Ctrl0 Chnl0 Master</td><td>ST380817AS</td><td>74.53</td><td>Boot</td></tr><tr><td>Ctrl0 Chnl1 Master</td><td>ST380817AS</td><td>74.53</td><td>Boot</td></tr></tbody></table>		Array No.	Array Type	Stripe/Block Size	Cap.(GB)	Status	(b)Array 0	Mirror	N/A	74.53	Duplicating	{	Ctrl0 Chnl0 Master	ST380817AS	74.53	Boot	Ctrl0 Chnl1 Master	ST380817AS	74.53	Boot
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{	Ctrl0 Chnl0 Master	ST380817AS	74.53	Boot																
	Ctrl0 Chnl1 Master	ST380817AS	74.53	Boot																

Continue to boot will enable duplicating the array after booting into OS.



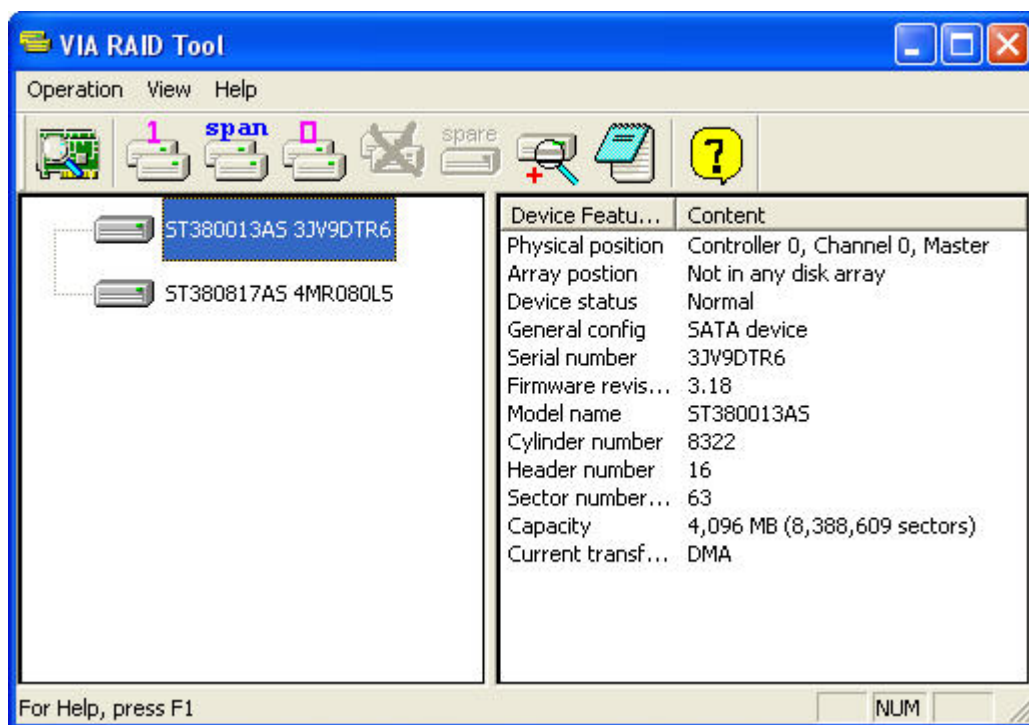
4.3 RAID Software

4.3.1 Getting Start

After installing the GUI software, it will be automatically initiate every time Windows is started. An icon  will appear in the system tray of the tool bar to indicate that GUI software is currently running.



Double click on the system tray icon to launch the main interface of the utility.



The main interface is divided into two windows and the toolbar above contain the main functions. Click on these toolbar buttons to execute specific functions. The left windowpane displays the controller and disk drives and the right windowpane displays the details of the controller or disk drives.



View by Controller

Create Span Array (JBOD)

Remove Array

Check All Disks

Help Topics



Create Mirror Array (RAID 1)

Create Stripe Array (RAID 0)

Add/Remove Spare disk


View Event log

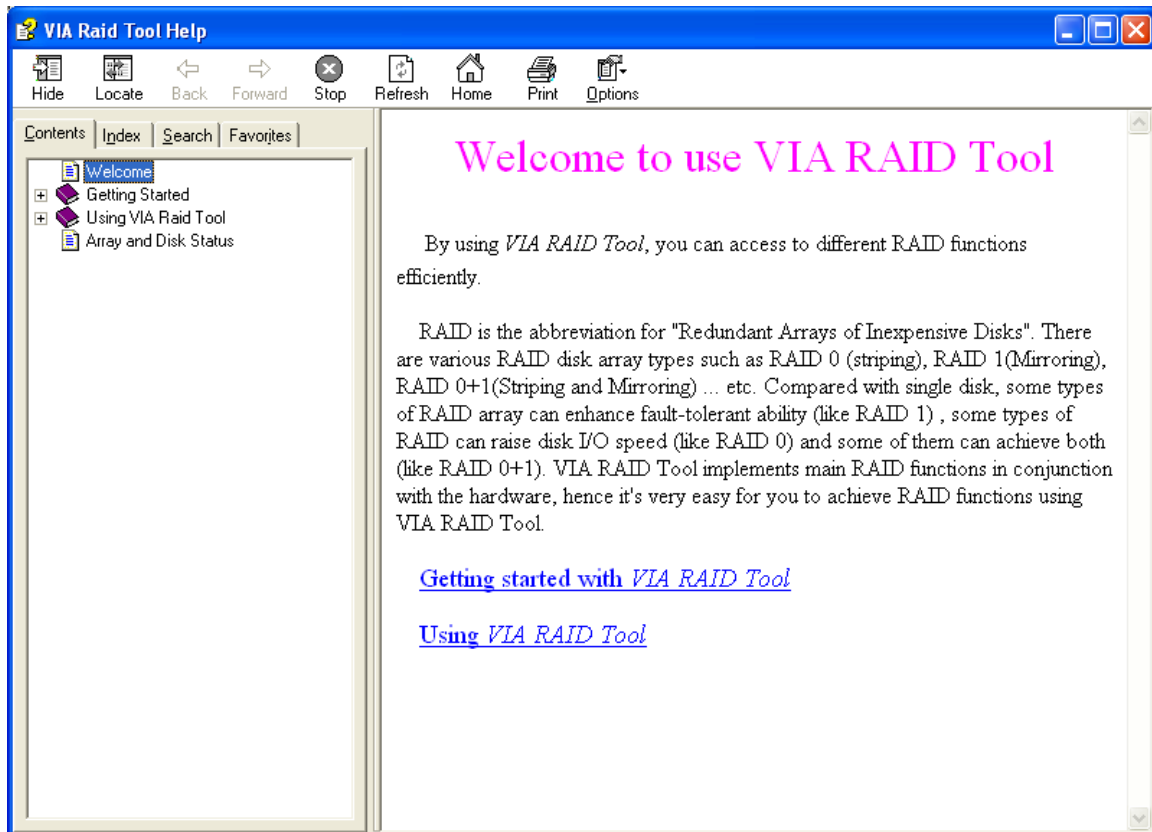
View by Devices



4.3.2 View Online Help





Click on  to launch the Help Topics. It is recommended that you read through the help articles before using RAID utility.

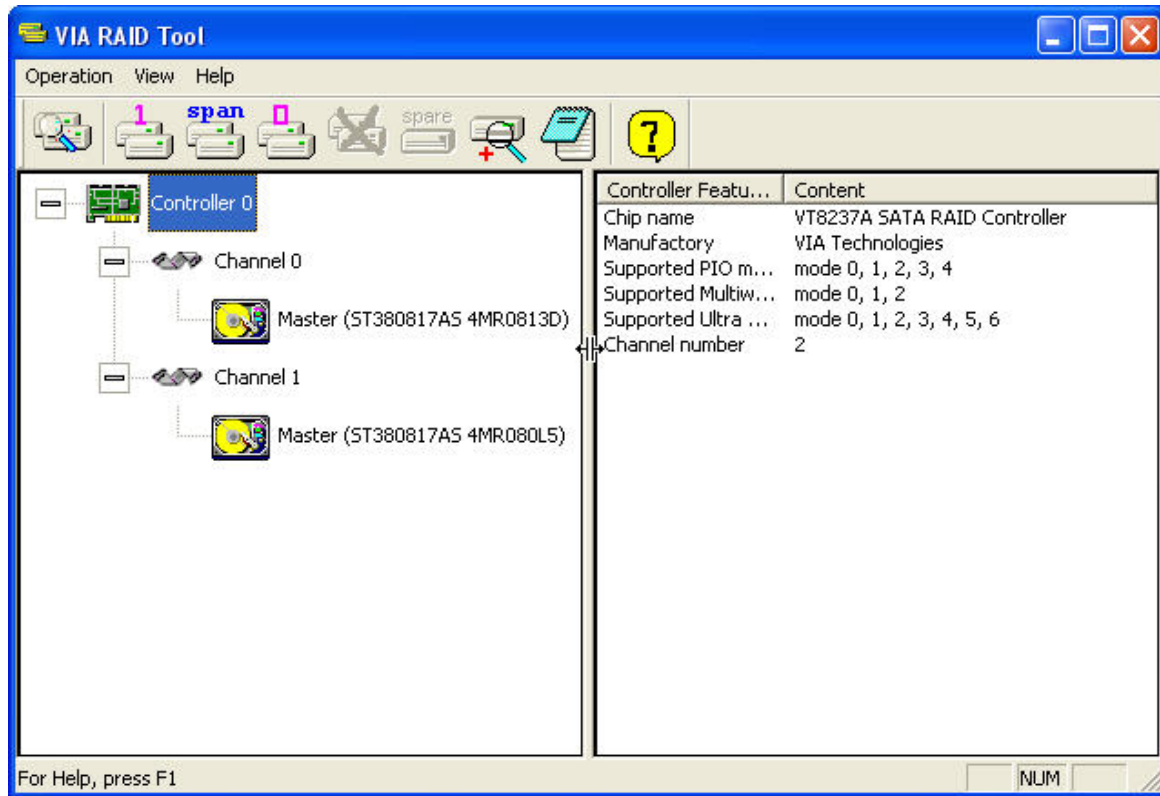




4.3.3 View Controller and Device Status



Click on  or  button to determine the viewing type of left windowpane. There are two viewing types: By controllers and by device. Click on the object in the left windowpane to display the status of the object in the right windowpane.




4.3.4 Create Disk Array

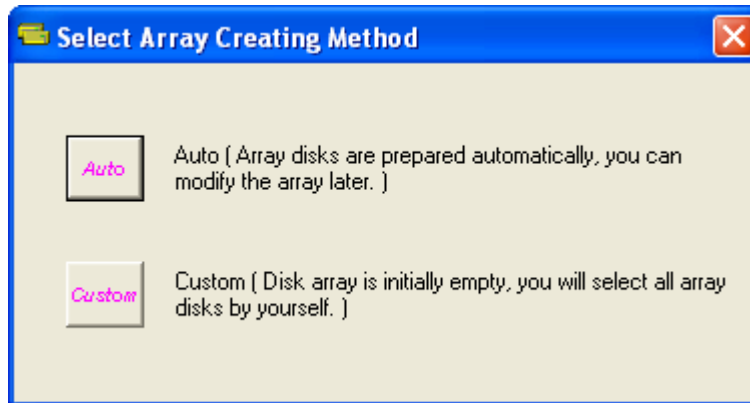
- The following five buttons are used to create a disk array depending on users' preference:



RAID 1,



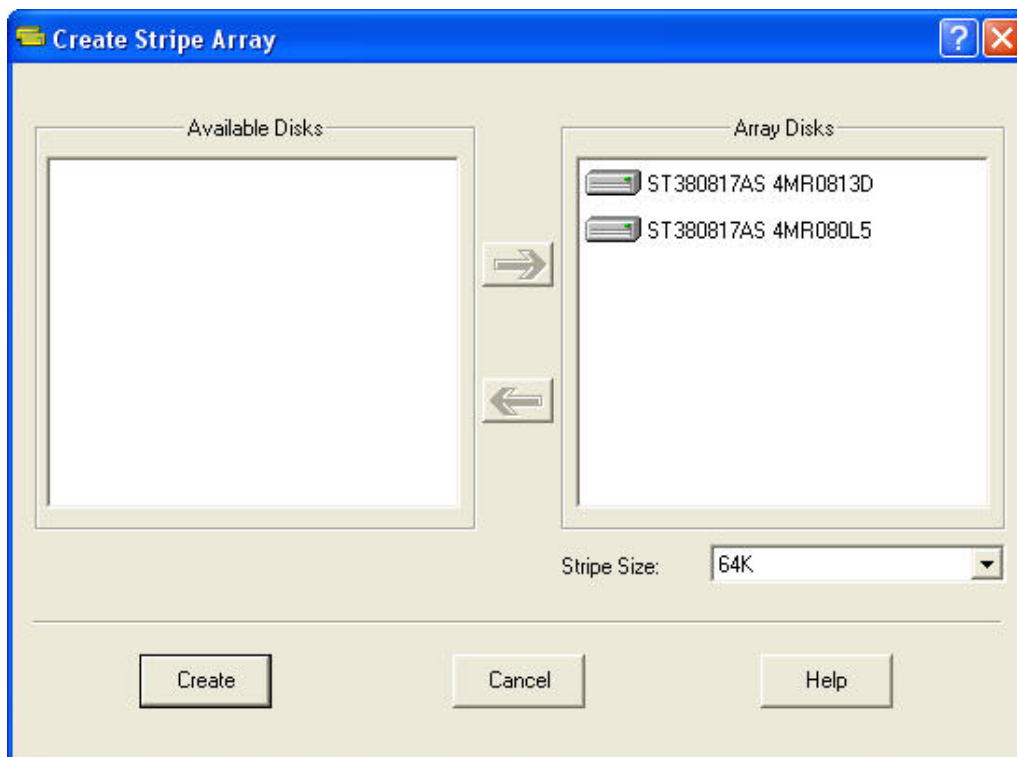
Span,  and RAID 0. Click on the RAID button you want to create, the **Select Array Creating Method** will be displayed.



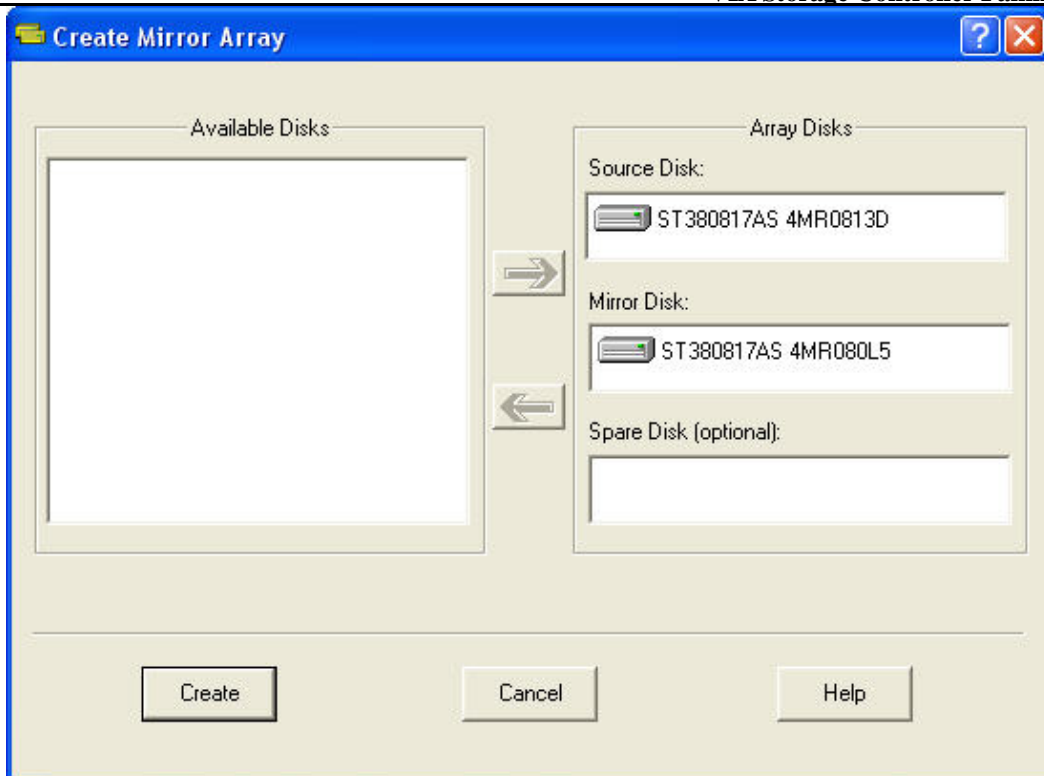
Auto: The utility will arrange the available hard disk drives to be the disk arrays. The hard disk drives can still be modified later. This method is strongly recommended.

Custom: The utility will provide an interface to manually arrange the array.

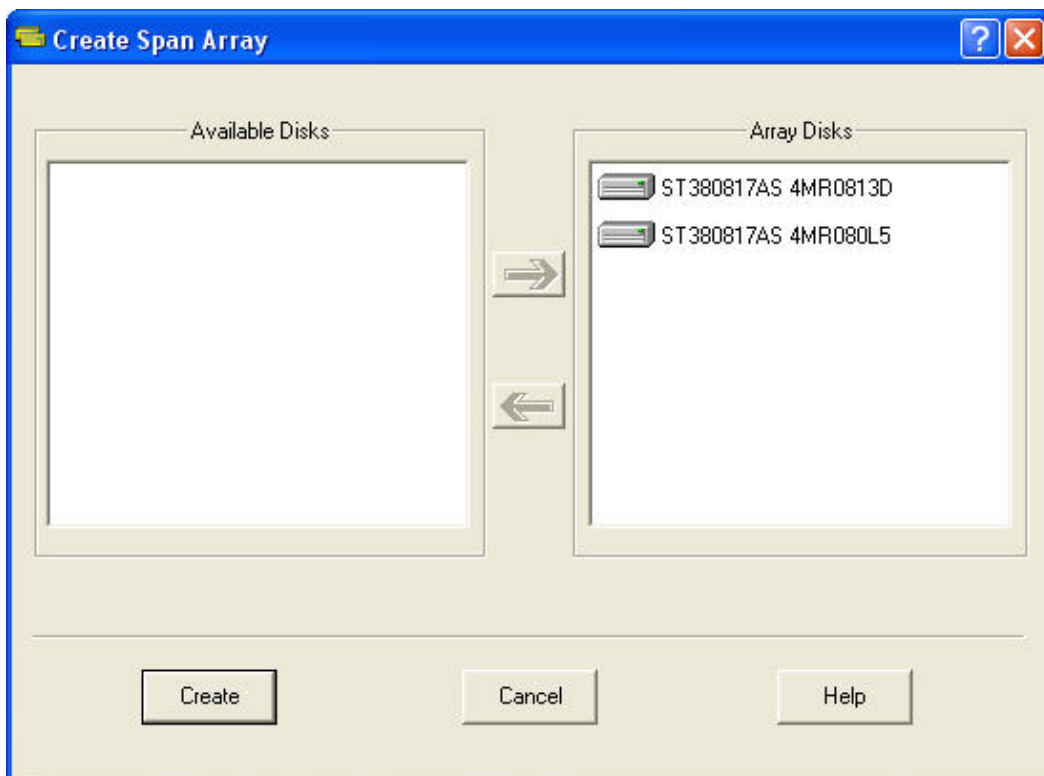
- Click on "**Auto**" to launch the creating array window. If you select **Custom**, the available disks window lists the available disk drives that can be used to create the array. Select a disk drive and click on the right arrow button to add the specified disk drive to the array. Disk drives can be removed from the array by selecting an array disk and clicking on the left arrow button to remove the drive from the array.



Create RAID 0 Disk Array



Create RAID 1 Disk Array



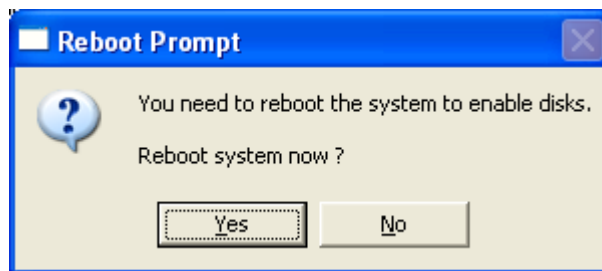
Create JOBD Disk Array

Click on **"Create"** to continue or **"Cancel"** to exit. Click on **"Help"** to launch the Help Topics window.

3. A warning message will pop up after clicking on **Create**. Click **Yes** to finish the creation of disk array, or **No** to cancel.




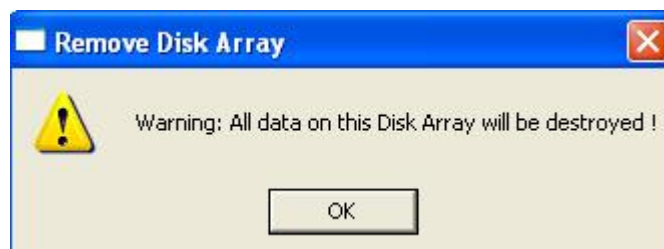
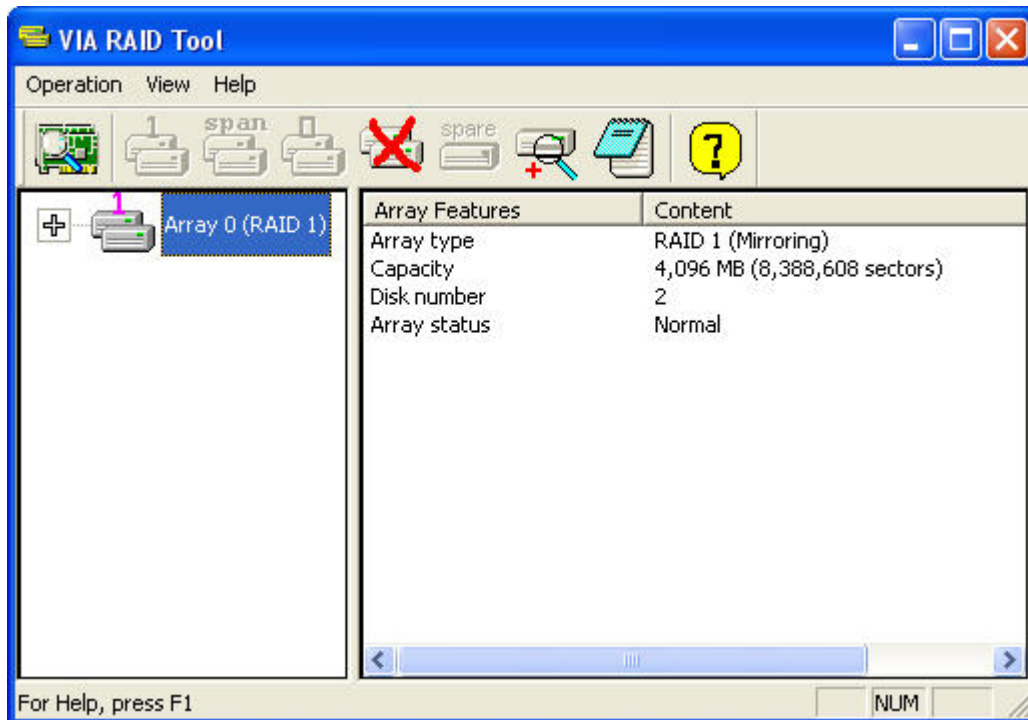
4. A message box will pop up to prompt the user to restart the computer. Click **Yes** to restart the computer or click **No** to skip restarting. The new disk array setting will take effect only after restarting.



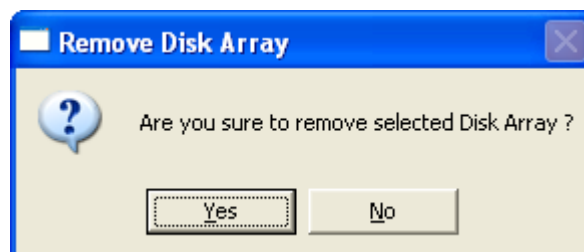
Note: There is no need to reboot for OS 2K and above operating systems.

4.3.5 Delete Disk Array


1. Select the disk array that you want to delete from the left windowpane. Click on **Remove Array** . A warning message will pop up.

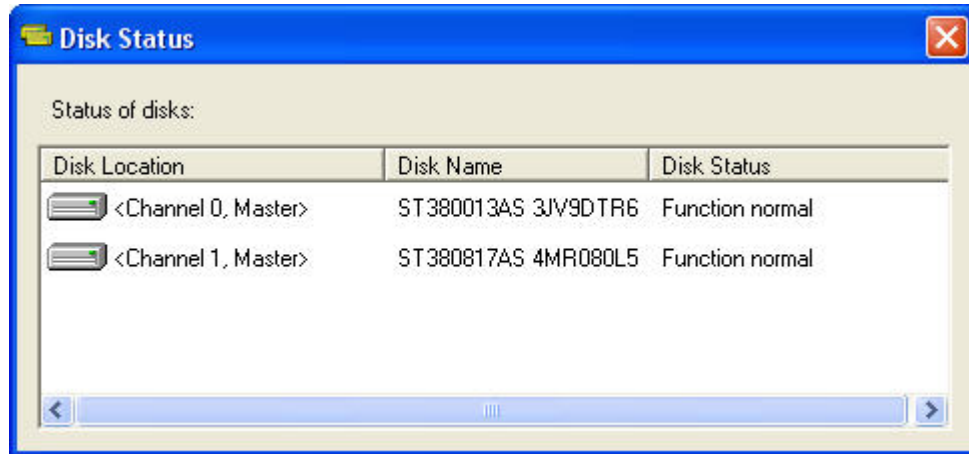


2. Click **Yes** to delete the specified disk array or click **No** to cancel.



4.3.6 Check All Disks





You can check whether the disk drives are working normally at any time by clicking on . After the disk check is completed, a dialog window will pop up to show the status of each disk. See picture below.



Your hard disk drive must be compatible with the ATA/ATAPI-5 specification and support SMART commands or the disk checking will fail.

4.3.7 View Event Log



The RAID software records important events into a log file, such as disk array creation, disk array removal, disk failure, synchronization...etc.

- Click on  to display the event log. There are three types of log items: Information , Warning , and Error .

RAID Event Log		
Operation		
Type	Time	Event
Information	2006-02-24 17:51:45	Array 0(Mirror Array) removed.
Information	2006-02-24 17:50:52	>>>> End Sync:Source = ST380013AS 3JY?
Information	2006-02-24 17:49:36	<<<< Begin Sync:Source = ST380013AS 3JY?
Information	2006-02-24 17:49:34	Mirror Array created. Array disks: Source =
Information	2006-02-24 17:49:20	Array 0(Mirror Array) removed.
Information	2006-02-24 17:46:52	>>>> Sync Aborted:Source = ST380817AS .
Information	2006-02-24 17:46:38	<<<< Begin Sync:Source = ST380817AS 4M
Information	2006-02-24 17:45:55	>>>> Sync Aborted:Source = ST380817AS .
Information	2006-02-24 17:33:58	<<<< Begin Sync:Source = ST380817AS 4M
Information	2006-02-24 17:33:42	Mirror Array created. Array disks: Source =
Information	2006-02-24 17:33:31	Array 0(Mirror Array) removed.
Information	2006-02-24 17:32:58	>>>> Sync Aborted:Source = ST380817AS .
Information	2006-02-24 17:32:56	<<<< Begin Sync:Source = ST380817AS 4M
Information	2006-02-24 17:32:52	>>>> Sync Aborted:Source = ST380817AS .
Information	2006-02-24 17:31:09	<<<< Begin Sync:Source = ST380817AS 4M
Information	2006-02-24 17:28:56	Mirror Array created. Array disks: Source =
Information	2006-02-24 17:15:10	Array 0(Mirror Array) removed.

- To view the details of a log item, you can double click on the log item, select the log item and press <Enter>, or select the log item and click on **Operation->View Detail** in the menu bar. The following dialog will appear.

RAID Event Details	
Type: Information	↑
Time: 2006-02-24 17:46:52	↓
Event Description:	
>>>> Sync Aborted: Source = ST380817AS 4MR0813D Mirror = ST380817AS 4MR080L5 Copy direction: Source to Mirror	
OK	


Click on  or  to browse the next or previous log item.

- To clear all log items, click on **Operation->Clear All** in the menu bar.

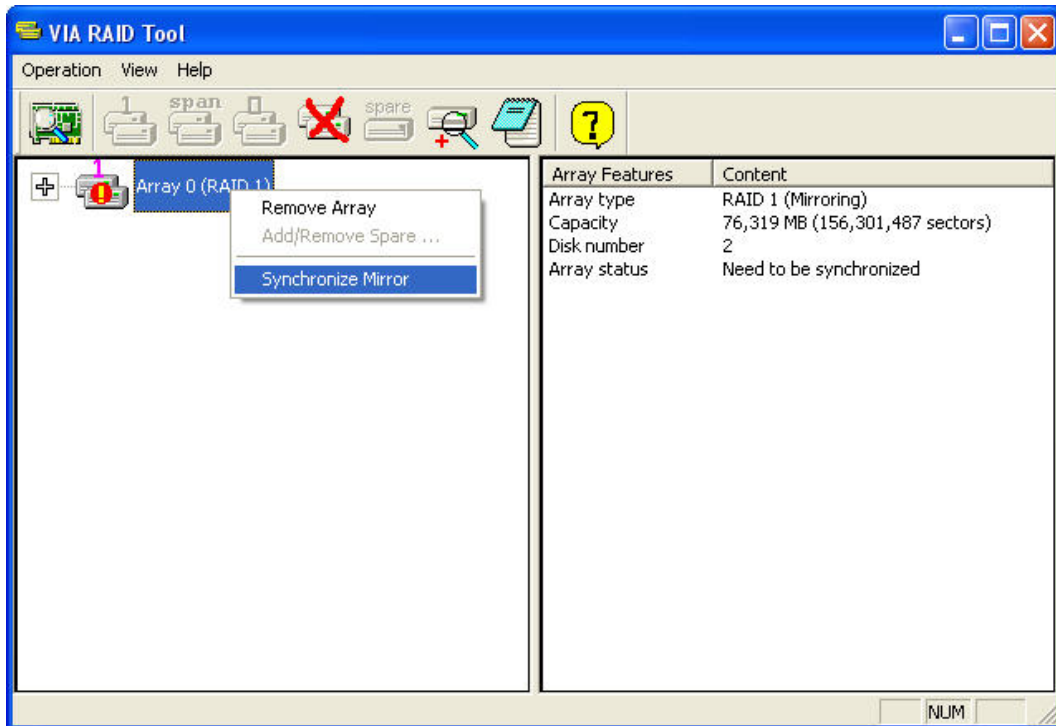
Note: Only the operations in the RAID software can be recorded into the log file. The operations in BIOS will not be recorded.



4.3.8 Synchronize Mirror Disk

RAID 1 arrays must be synchronized when the data on the mirror disk is not identical with its corresponding source disk. Sometimes the data on the mirror disk may be newer than the data on the source disk. For example, the source disk is absent and the mirror disk runs in the tolerance mode. So the exact meaning of “Synchronize Mirror” is to make a pair of source and mirror disks have identical data. The RAID software always marks the mirror disk with a “need-sync” icon  although the mirror disk may have the correct data.

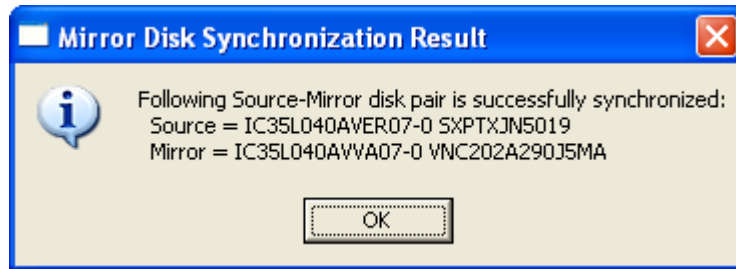
1. Select a RAID 1 array. Right-click the selected RAID, then a shortcut menu will be shown. Click on **Synchronize Mirror** to synchronize the source and mirror disks.



2. After synchronization has started, a dialog box will show the process. You can pause or cancel this process at any time.

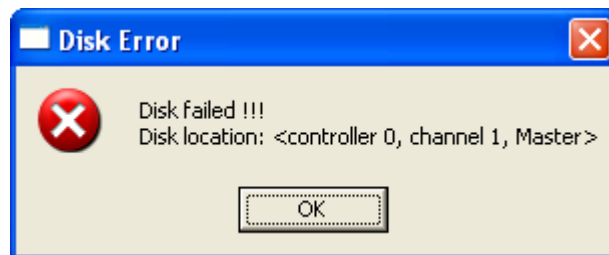


A message will pop up when the synchronization is finished.



4.3.9 Disk Error Detection

The RAID software will pop up an error message if a disk drive fails or is missing.



4.3.10 Duplicate Critical RAID 1 Array

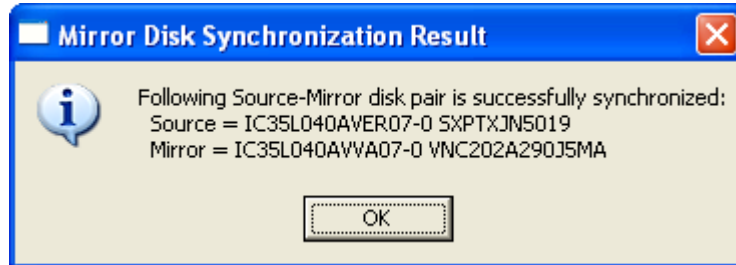
When booting up the system, the RAID utility will detect if there are any inconsistencies between the source and mirror disk drives of the RAID 1 arrays. If the software detects that a RAID 1 array has any inconsistencies, then the status of the disk array will be marked as critical and the software will prompt the user to duplicate the RAID 1 to make the mirror disk consistent with the corresponding source disk.



You can click **Yes** to synchronize now or click **No** to synchronize later.



After synchronization has started, a dialog box will show the process. You can pause or cancel this process at any time. If you cancel the synchronization process, the RAID will be on the “need-sync” condition. You should synchronize again to guarantee that the data between source and mirror disk drives is identical. A message will pop up when the synchronization is finished.



4.3.11 Icon View

All icon types and their meanings are listed below. You can check the meaning of a specific icon here. The real status of an array or a disk drive is described on “Array status” or “Device status” in the right windowpane.



Normal Disk Array



Disk Array with Warning status



Broken Disk Array



Disk Drive with Normal status



Absent Disk Drive in a Array



Disk Drive with Error



Disk Drive with Warning status



The pair of Source and Mirror Disks should be synchronized



Disk Drive which needs system rebooting to enable its function