VIA RAID Installation Guide

If you insert two HDDs to VIA SATA connectors and plan to configure RAID functions, please refer to VIA RAID installation guide part, including VIA BIOS RAID installation guide and VIA Windows RAID installation guide.

1. VIA BIOS RAID Installation Guide

You are allowed to configure RAID functions under BIOS environment.

1.1 Introduction of RAID

VIA VT8237 south bridge chipset integrates RAID controller supporting RAID 0, RAID 1, and JBOD functions with two independent SATA channels. This section will introduce the basic knowledge of RAID.

RAID

The term "RAID" stands for "Redundant Array of Independent Disks", which is a method combining two or more hard disk drives into one logical unit. For optimal performance, please install identical drives of the same model and capacity when creating a RAID set.

RAID 0 (Data Striping)

RAID 0 is called data striping that optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. It will improve data access and storage since it will double the data transfer rate of a single disk alone while the two hard disks perform the same work as a single drive but at a sustained data transfer rate.

WARNING!

Although RAID 0 function can improve the access performance, it does not provide any fault tolerance. Hot-Plug any HDDs of the RAID 0 Disk will cause data damage or data loss.

RAID 1 (Data Mirroring)

RAID 1 is called data mirroring that copies and maintains an identical image of data from one drive to a second drive. It provides data protection and increases fault tolerance to the entire system since the disk array management software will direct all applications to the surviving drive as it contains a complete copy of the data in the other drive if one drive fails.

JBOD (Spanning)

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

1.2   RAID Configurations Precautions

Please use two new drives if you are creating a RAID 0 (striping) array for performance. It is recommended to use two SATA drives of the same size. If you use two drives of different sizes, the smaller capacity hard disk will be the base storage size for each drive. For example, if one hard disk has an 80GB storage capacity and the other hard disk has 60GB, the maximum storage capacity for the 80GB-drive becomes 60GB, and the total storage capacity for this RAID 0 set is 120GB.

1.   You may use two new drives, or use an existing drive and a new drive to
   create a RAID 1 (mirroring) array for data protection (the new drive must be of the same size or larger than the existing drive). If you use two drives of different sizes, the smaller capacity hard disk will be the base storage size. For example, if one hard disk has an 80GB storage capacity and the other hard disk has 60GB, the maximum storage capacity for the RAID 1 set is 60GB.
2.   Please verify the status of your hard disks before you set up your new RAID array.

1.3   BIOS Configuration Utility

1.3.1 Enter BIOS Configuration Utility

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

The main interface of BIOS configuration utility is as below:


1.3.2   Create Disk Array

1.   Within the main interface, use the up and down arrow key to highlight the Create Array command and press <Enter> to call out the list of creation steps.
2.   Highlight the Array Mode and press <Enter>, then a list of array modes will appear. Just highlight the target array mode that you want to

create, and press <Enter> to confirm the selection.

3.   There are two methods to create a disk array. One method is "Auto Setup", and another is "Select Disk Drives". Select "Auto Setup" to

        allow BIOS to select the disk drives and create array automatically. Select "Select Disk Drives" to let user select the array drives

        manually. When using Select Disk Drives method, the channel column will be activated. Just highlight the target drives that you want to

        use and press <Enter> to select them respectively. When all drives have been selected, press <Esc> to go back to the creation steps

        menu.
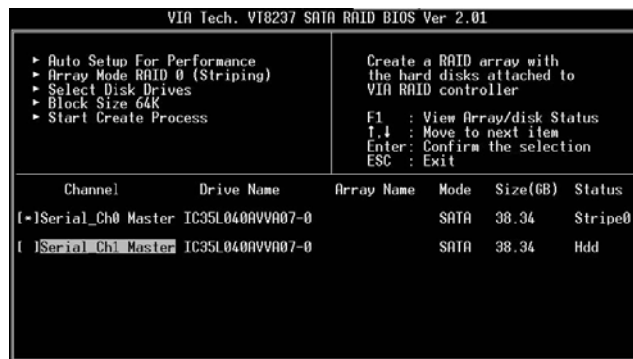
Create RAID 0

If RAID 0 array is selected in step 2, user can also select a block size for the array. Use the arrow key to highlight the "Block Size" and press

<Enter>. Then the list of available block size will popup. The block size can be selected from 4K to 64K Bytes.

Use the arrow key to highlight the Start Create Process and press <Enter>, then a warning message will appear. Press Y to finish the creation, or press N to cancel the creation. Please note that the content of the hard drive will be destroyed after array creation.

Create RAID 1

The data on disk drives will be destroyed if user uses "Auto Setup" to create RAID 1. But you can reserve the data on source drive if you use "Select Disk Drives" to select the source and the mirror drive.

Press "y" to copy data of source to mirror drive. There is a limitation when using this feature. The capacity of mirror drive must be greater or equal to the source drive; otherwise the RAID 1 can't be created and a error message will appear: "Error: mirror's size is smaller than source!!! Press ESC return". If user does not want to duplicate data, the data on the source and the mirror drive will be destroyed.

Create JBOD

The data on disk drives will be destroyed if user uses "Auto Setup" to create a JBOD. However, you can reserve the data on the first disk drive of a JBOD array if you use "Select Disk Drives" to select disk drives

The data on the first disk drive will be reserved and the other disk drives in JBOD will be expanded behind the first disk drive and become free space. Expand Span (JBOD) Array function is not available if VT8237A only supports 2 SATA ports.

1.3.3 Delete Disk Array

User can delete a specific RAID that has been created. Following are the steps to delete a created disk array.

1. Use arrow key to highlight Delete Array item in main menu interface, and

    press <Enter>. The channel column will be activated.

2. Use arrow key to highlight the target disk drive and press <Enter>. A

    warning message will appear. Press Y to delete a specific array or press N to cancel.

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

1.3.4 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 may not be selected if user does not boot the Operating System from the disk array. Use the arrow key to highlight the "Select Boot Disk" item then press <Enter>. The channel column will be activated. Just use arrow key to highlight the target disk array then press <Enter>. If you select a disk array that has a boot mark and press <Enter>, then its boot setting will be canceled.

2. VIA Windows RAID Installation Guide

You are allowed to configure RAID functions under Windows environment. The "RAID Software" is a Windows-based software utility with graphical user interface and provides user an easy-operation tool to configure and manage disk drives or disk arrays connected to VT8237 SATA controller.

After GUI software is installed, it will automatically start every time when your Windows OS is started. An icon will appear in the system tray of the tool bar to indicate that GUI software is currently running.
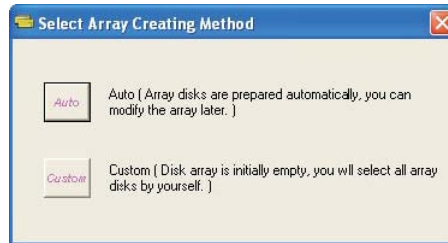

Just double click on the small icon to call out the main interface of the software.
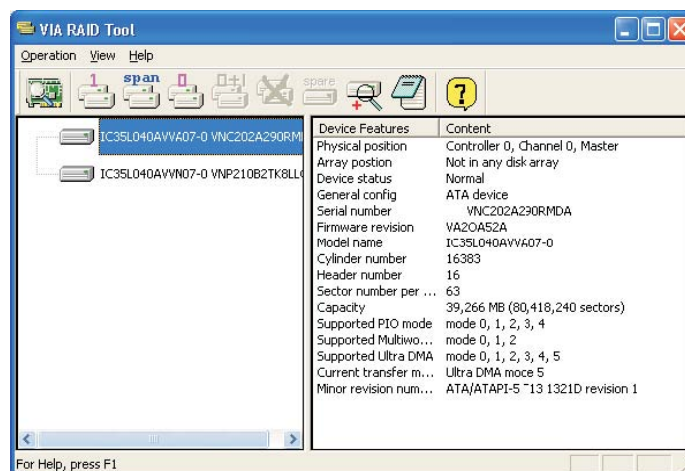
2.1   Create Disk Array

1.   You may click on one of the three buttons to create different types of disk array– RAID 1, Span, and RAID 0. Then a "Select Array Creating Method" will be prompted.


Auto:

The software will configure the available hard disk drives to be a disk array. User can modify the hard disk drives later. It is strongly recommended to use this method.

Custom:

Disk array is arranged by user.

2.   Click "Auto" button. The "Creating Array" window will pop up. If you select "Custom", the "Available Disks" window will list the available disk drives for array-creating. Select a disk drive and click right arrow button to add the specific disk drive to array. After adding a disk drive, user can also remove the selected disk drive from array. Click the disk drive in "Array Disks" windows, then click left arrow button to remove the selected disk drive.
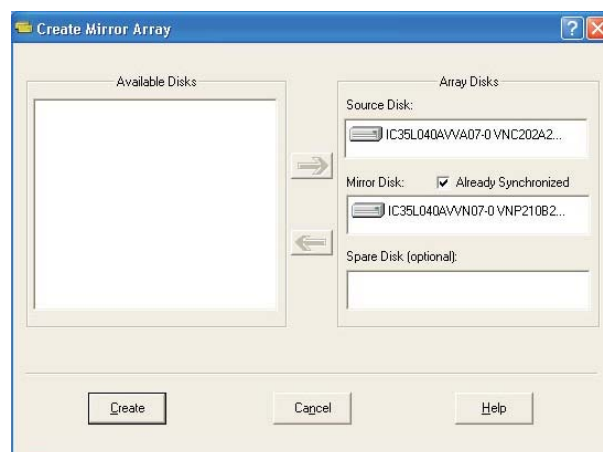

Press "Create" button to create or "Cancel" button to cancel it.

After you pressed the "Create" button, a warning message will pop up. Click "Yes" to finish the creation of disk array, or "No" to cancel.

3. A message box will pop up to prompt user that the disk array has been created successfully and ask user whether to restart the computer.

    Click "Yes" to restart the computer or click "No" to skip restarting. New disk array setting will take effect only after restarting.
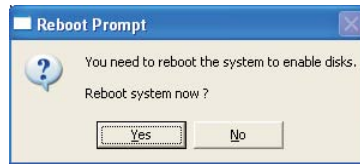
Create RAID 1

You can reserve the data on the source drive after clicking "Create" button when you create a RAID 1 array.
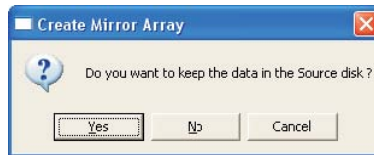

There is a limitation if user wants to keep the data on the source drive the capacity of the mirror drive must be greater or equal to the source drive,

otherwise the RAID 1 can't be created.

If user wants to keep data in the source drive, RAID tool will ask user to synchronize the mirror drive after the system's rebooting.

Create JBOD

The data in the first disk drive of JBOD array can be reserved when a JBOD array is created.
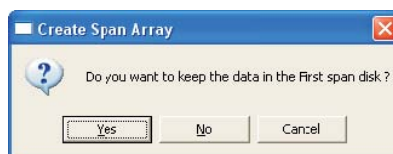
The data on the first disk drive will be reserved and the other disk drives in JBOD will be expanded behind the first disk drive and become free

space.

2.2   Delete Disk Array

1.   Select the disk array that you want to delete from the left ![icon] window. Click "Remove Array" button , then a warning message will pop up.
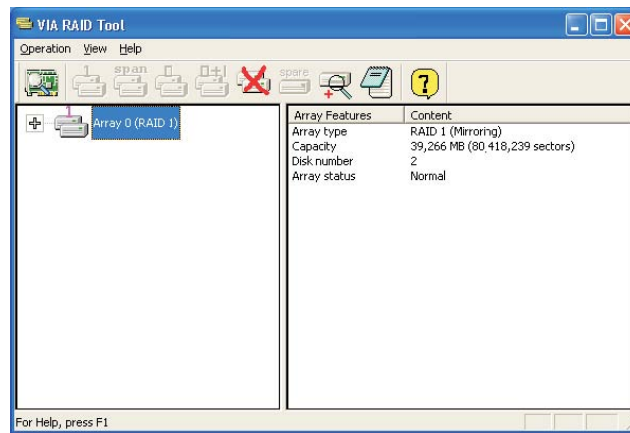
2. Click "Yes" to delete the specific disk array or click "No" to cancel.
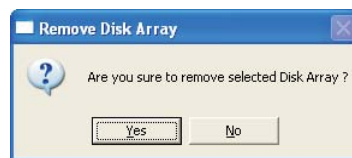
3.   A message box will pop up to prompt user that the disk array has been deleted successfully and ask user whether to restart the computer.

Click "Yes" to restart the computer or click "No" to skip the restarting. New setting will take effect only after restarting.
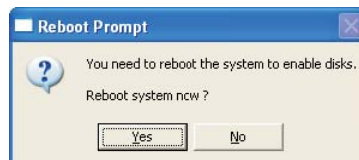

Warning:

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

reserved.

2.3   Check All Disks

You can check if all the disk drives work normally by clicking button. After you complete the checking, a dialog window will pop up to show each

disk's current status as following picture.

Your hard disk drive must be compatible with ATA/ATAPI-5 specifications and support SMART commands; otherwise the checking will fail.
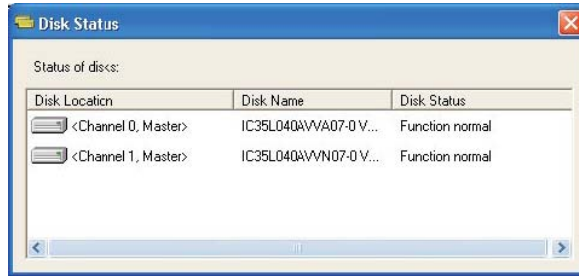
2.4 Verify Mirror Disk

Data on the mirror disk must be the same as its corresponding source disk to provide fault tolerance for RAID 1.

1. Select a RAID 1. Right-click the selected RAID, and then a shortcut menu will appear. Click "Verify Mirror" to verify whether the source and the mirror disks are identical.
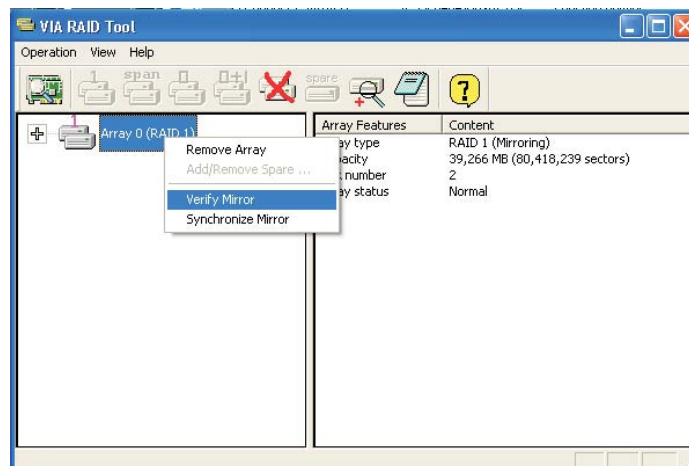
2. After executing "verify mirror" command, a dialog will show the verifying process. You can pause or cancel this process at any time. The process may take a long time if the capacity of RAID is large.


3. When the mirror disk is not identical with the corresponding source disk, the mirror disk will be marked with a "need-sync" icon: . A

"need-sync" mirror disk should be synchronized as soon as possible.

2.5   Synchronize Mirror Disk

For RAID 1, it must be synchronized when 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 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 keep the data on a pair of the source and the mirror disks identical. RAID software always marks the mirror disk with a "need-sync" icon ▓ even though the mirror disk may have the correct data.

1. Select RAID 1. Right-click the selected RAID, then a shortcut menu will appear. Click "Synchronize Mirror" to synchronize the source and the mirror disks.
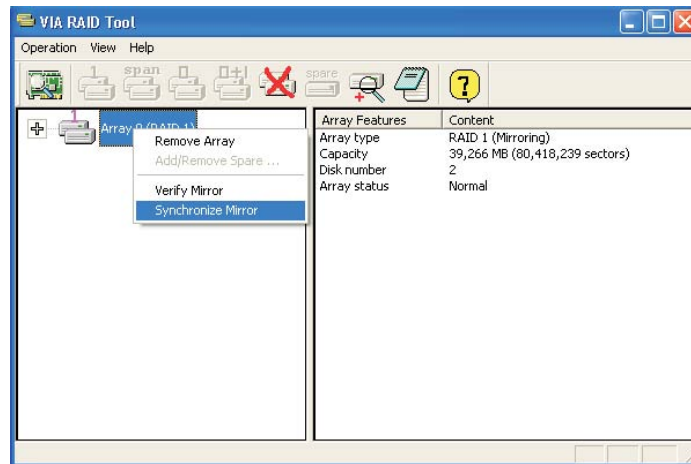
2. When synchronization starts, a dialog will show the process. You can pause or cancel this process at any time.

3. A message will pop up when synchronization is finished.

2.6 Disk Error Detection

RAID will pop up an error message when the failure or absence of a disk drive is detected.

2.7 Duplicate Critical RAID 1 Array

If, during the system-booting, the software detects the inconsistence between the source and the mirror disks of RAID 1, the disk array will be marked as critical status, and the software will automatically prompt user to duplicate the RAID 1 to make the mirror disk consist with the corresponding source disk again.
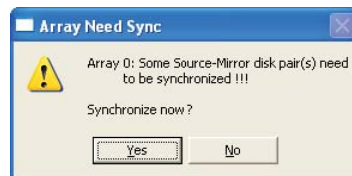
You may click "Yes" to synchronize now or click "No" to synchronize later.

When the synchronization starts, a dialog will show the process. You can pause or cancel this process at any time. If you cancel the synchronization process, the RAID is on "need-sync" condition. You should synchronize again to guarantee the data are identical between the source and the mirror disk drives. A message will pop up when synchronization is finished.


2.8 Rebuild Broken RAID 1 array

If, during the system-booting, the failure or absence of any member disk of RAID is detected, the array will be marked as broken status. If broken

RAID 1 array is detected by the RAID software, it will indicate a serial steps to repair this problem.

1. A dialog box will pop up to indicate the RAID is broken. Click Yes.


2. Then another dialog box will pop up. If the source or the mirror disk drive is unplugged only, click "Cancel" to stop rebuilding step. Shut down the system. Plug the absent disk drive, and then reboot the system. If the original disk drive is broken-down, you may plug a new disk drive then reboot the system. Click "Next" to the next step.
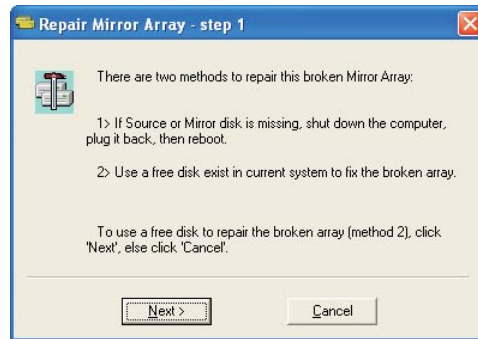
3. Select a disk drive from "Available Disks" and click button to replace the broken-down one, and then click "Next".
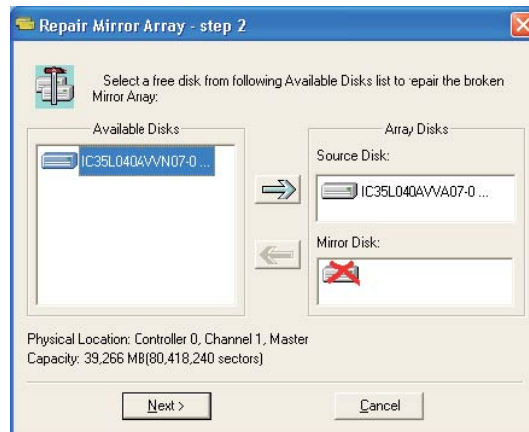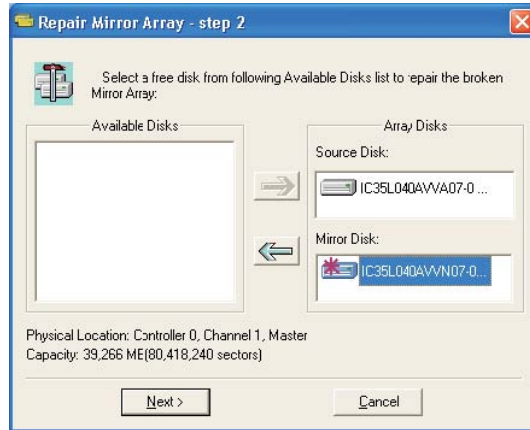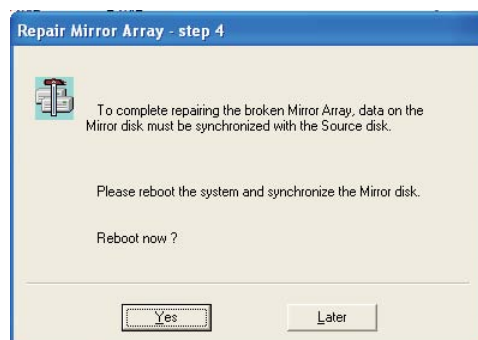
4. A warning message will pop up. If you want to rebuild the RAID by using the disk drive that you selected in the previous step, click "Next".

   Warning: The data on the selected disk drive will be lost.

5. Reboot the system.

6. This RAID is marked as a critical RAID. The RAID software will do the "Duplicating Critical RAID 1" process.