

# **HighPoint ATA RAID Management Software User's Manual**

Version 1.0

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## 1 Overview

HighPoint ATA RAID Management Software provides you a friendly graphical interface to manage RAID arrays and monitor device information and event logs. With this software, you can add, delete or configure RAID arrays on your system.

This software implements the following functions:

- Create a RAID array (RAID 0, RAID 1, RAID 0/1 and JBOD).
- Delete a specified RAID array.
- View the information of RAID arrays.
- View the information of physical disks.
- View the information of controllers and channels.
- Rebuild and synchronize a critical array.
- Add a spare disk to enhance data security.
- View event log.

After the installation of HighPoint ATA RAID Management Software, you can type the command "hptraid" to launch the program or click the corresponding menu in X-Window system. The main window pops up (see below).



The main window controls all functions of HighPoint ATA RAID Management Software. Here we will walk through all of the menu items and explain their usage.

## **Main Menu**

The main menu has three items: **Configuration**, **View** and **Help**.

**Configuration Menu** Including functions such as creating a RAID array, deleting a RAID array, editing a spare disk, synchronizing an array, renaming an array and rescanning the devices.

**View Menu** Setting the visibility of the toolbar and status bar, viewing the event log.

**Help Menu** Help topics for this software.

## **Toolbar**

The toolbar provides a quick way to access the functions of the software.

## **Array Tab and Controller Tab**

The Array tab in the left pane displays the logical devices on your system, while the Controller tab displays the physical drives on your system. Right-clicking on one of the items will bring out a pop-up menu through which you can perform various operations on that item.

## **Information Pane**

The right pane in the main window shows the detailed information for the selected item in the left pane.

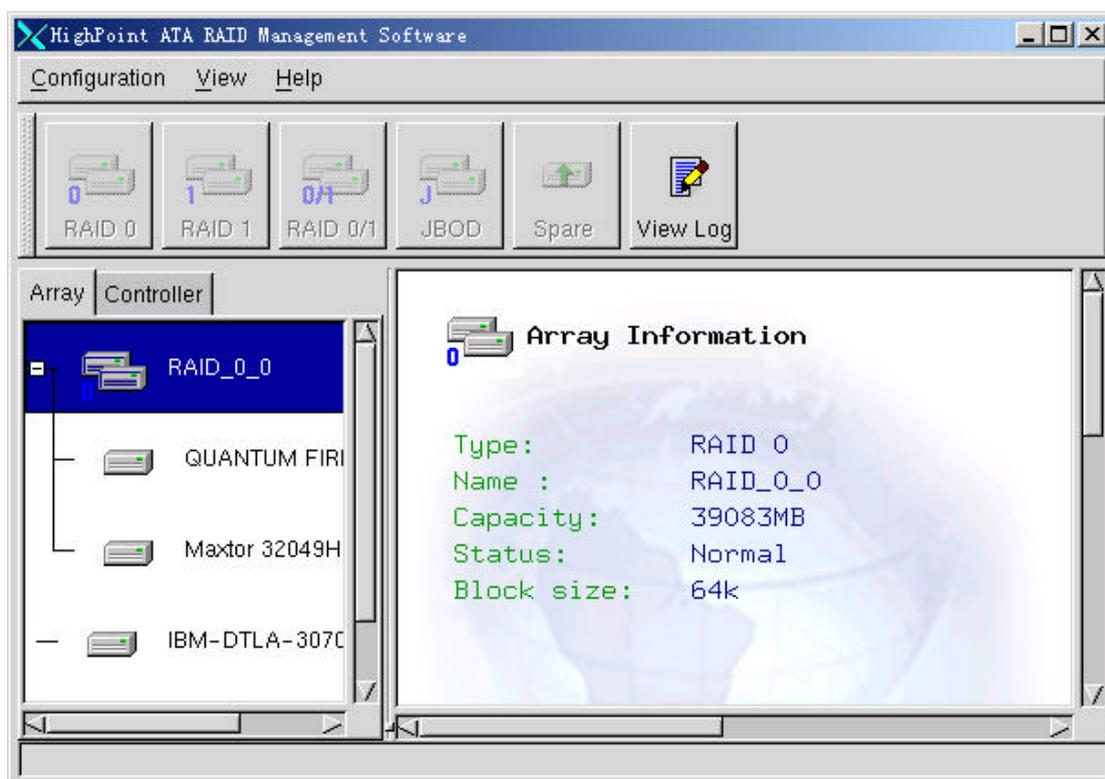
## 2 Using HighPoint ATA RAID Management Software

The following chapters describe how to use HighPoint ATA RAID Management Software step by step.

### Viewing Device Information

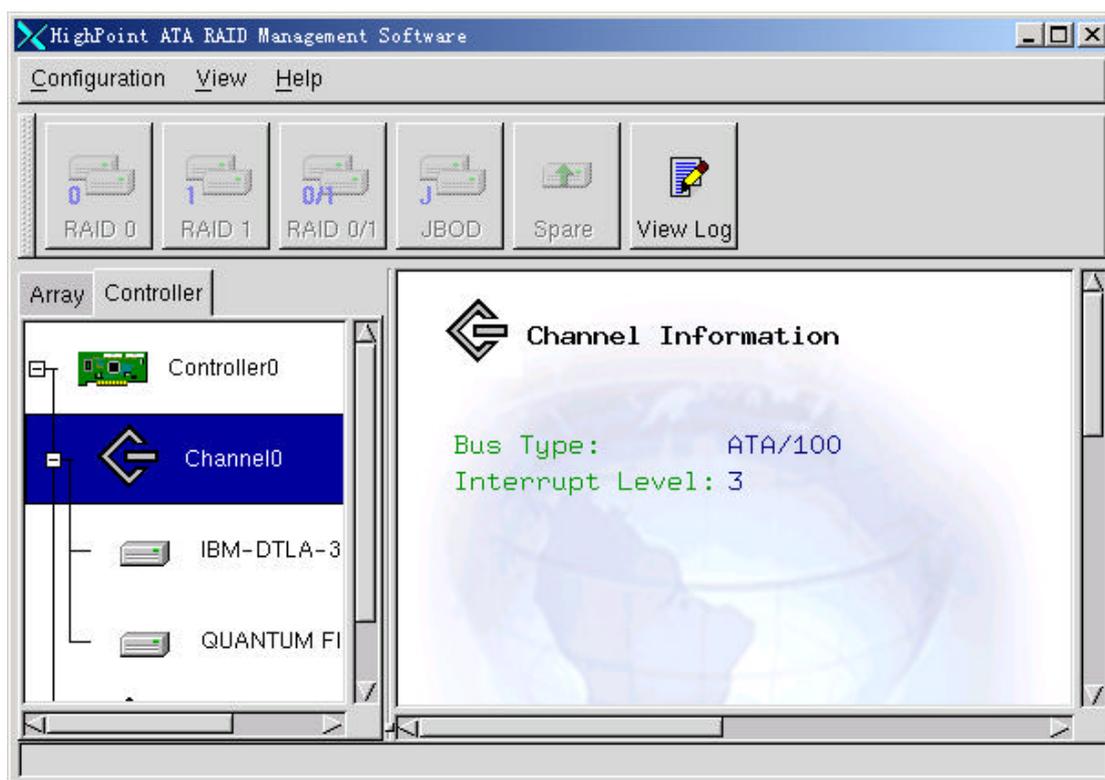
#### Viewing Array Information

The **Array** tab in the main window shows a list of logical devices on your system in a tree type format. Clicking on any of the arrays in this pane will activate the **Array Information** on the right pane (see below).



#### Viewing Controller/Channel Information

The **Controller** tab in the main window shows a list of physical devices attached to HPT370 controller. Clicking on one of the items will activate the right pane, showing the corresponding information about the selected controller, channel or hard drive (see below).



## Creating a RAID Array

There are three ways to create a RAID array.

1. Right-click one of the devices on the array tree will pop up a menu. Select the array type you want to create.
2. Click **Create** on the **Configuration** menu. Choose a type of the array you want to create on the pop-up submenu.
3. Click the corresponding tool buttons on the toolbar.

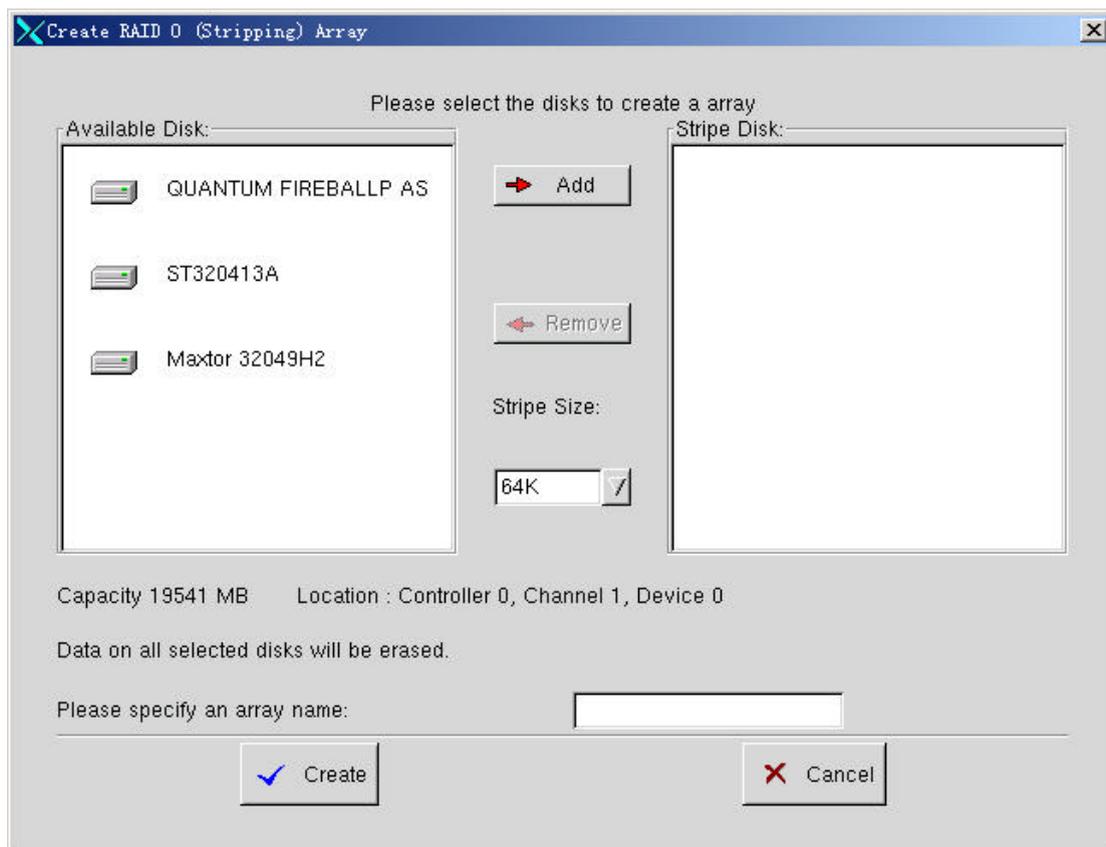
The hard disks used to create an array must meet the following requirements:

1. For RAID 0, RAID 0/1 and JBOD array, the disk must have no active partition on it (a non-bootable disk). For RAID 1 array, the mirror disk must be a non-bootable disk.
2. The disk is not mounted by Linux OS. If it is mounted you must dismount it first.

### 1. Creating a RAID 0 Array

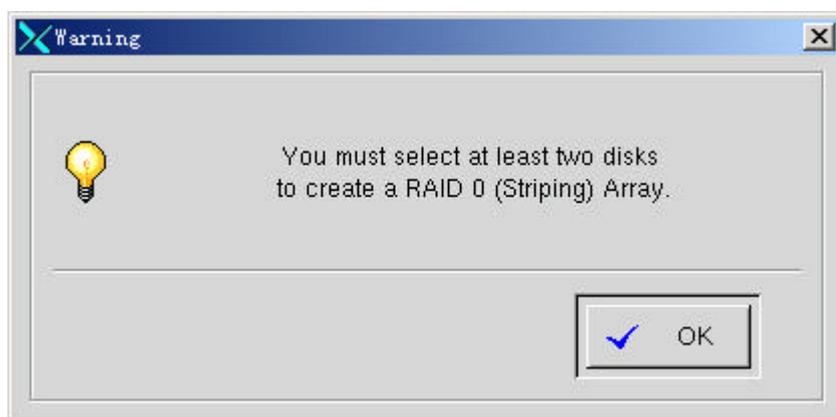
You can follow these steps to create a RAID 0 array.

1. Click on the **RAID 0** button on the toolbar, the **Create Raid 0 (Striping) Array** Window appears (see below).



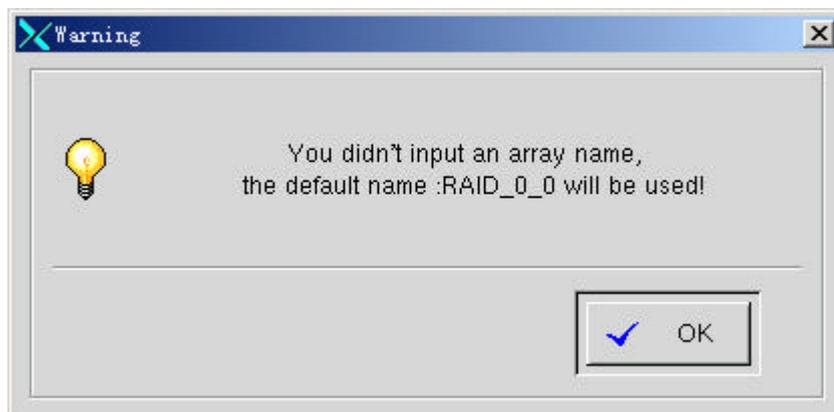
2. Select the disks to create the array. You can add each disk to the **Stripe Disk** list box by selecting a physical disk from the “Available Disk” list box and clicking the **Add** button. If you want to unselect a disk, just click the **Remove** button to return the selected disk from the **Stripe Disk** list box back to the **Available Disk** list box.

When you create a RAID 0 (Striping) array, you must select at least two physical disks. Otherwise, a warning window will appear, reminding you to add more disks. Click **OK** and return to the Create RAID 0 (Striping) Array window.

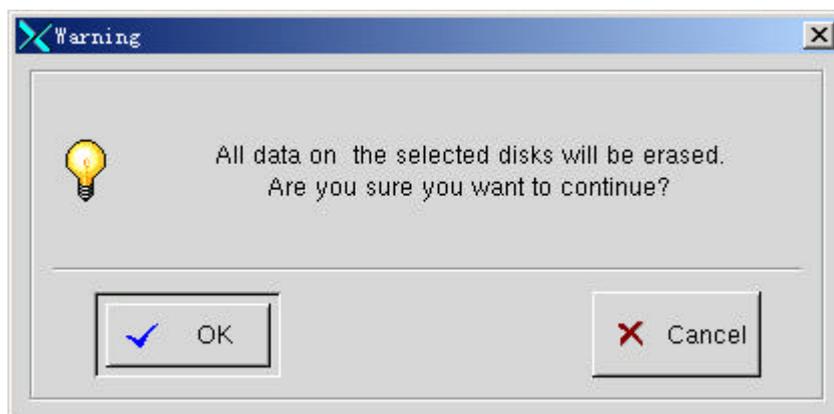


3. Select the stripe size for the RAID 0 array. Click the drop-down arrow to choose the size by 16K, 32K or 64K. Generally, the larger the size is, the more performance the system gets.

- Specify a name for the selected array. You can type in up to 8 characters. If you don't specify an array name, the system will specify a default name automatically for the array (see below).

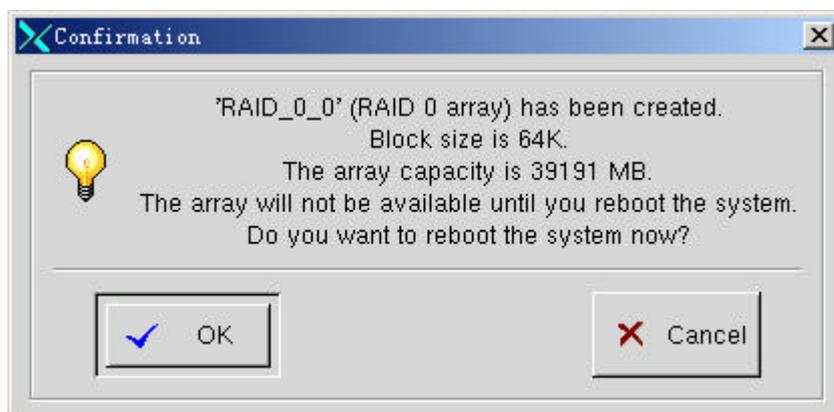


- Click the **Create** button. The following warning window will pop up, warning you that all data on the selected disks will be erased.



- Click **OK** to create the RAID 0 array. A confirmation dialog box will appear, reminding you that the RAID 0 (Striping) array has been created and it will not be available until you reboot the system.

**WARNING:** You must reboot the system to use the newly created array.

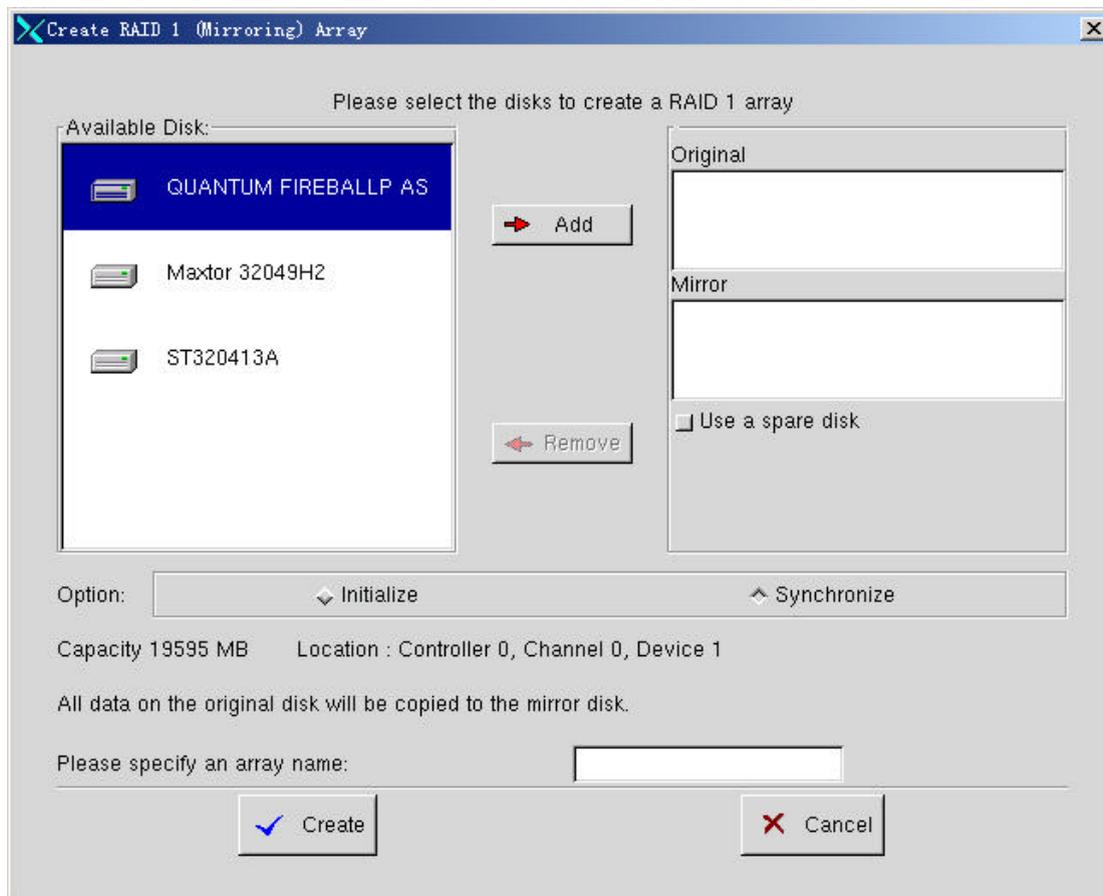


- Click **OK** to reboot the system. After you reboot the system, the new RAID 0 array will appear in the main window.

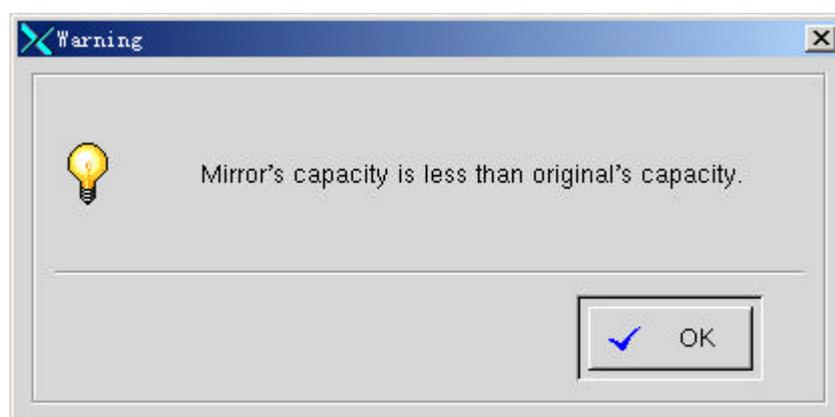
## 2. Creating a RAID 1 Array

You can follow these steps to create a RAID 1 array.

1. Click the **RAID 1** button on the toolbar, the "Create RAID 1 (Mirroring) Array" window appears (see below).



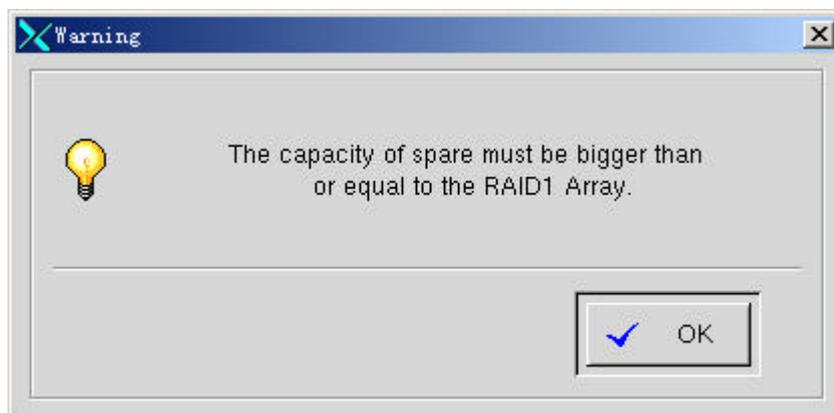
2. All the available disks on your system are listed in the **Available Disk** list box. You can specify the source disk and the mirror disk by selecting the disk and clicking **Add** button to add it the **Original** box and **Mirror** box. Note the capacity of the original disk must be smaller than that of the mirror disk. Otherwise you will see the following message box. You have to reselect another disk.



3. If you want to add a Spare Disk, click the **Use a spare disk** option and select

a spare disk. You can also add a spare disk after you have created the RAID 1 array (please see chapter **Adding or Removing a Spare disk**).

The capacity of spare disk must not be less than that of the mirror disk, otherwise you will get this message box and must reselect a disk:

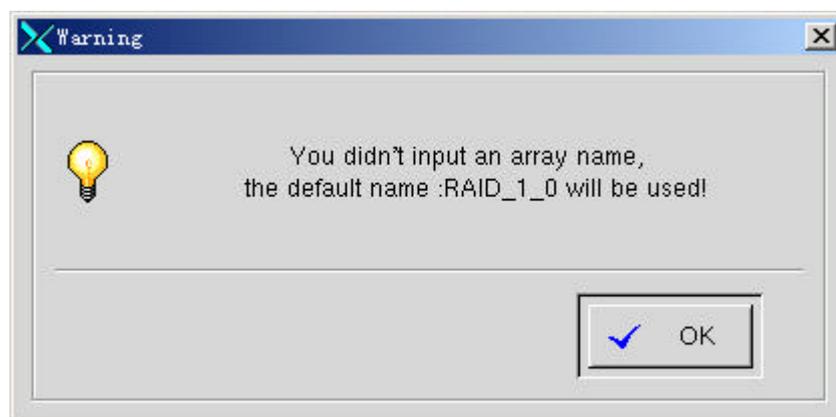


4. Select one of the options "**Initialize**" or "**Synchronize**". "**Synchronize**" is the default.

**Initialize:** Create a RAID 1 array and clear all data on the disks.

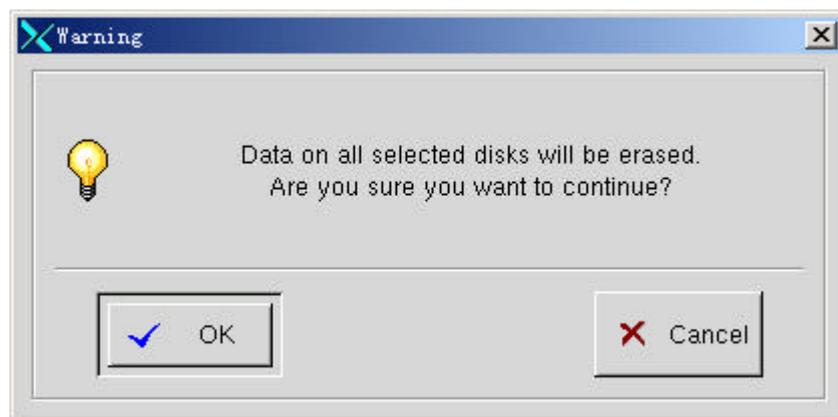
**Synchronize:** Create a RAID 1 array and duplicate all data from the original disk to the mirror disk.

5. Specify a name for the array. You can type in up to 8 characters. If you don't specify an array name, the system will use a default name for it.

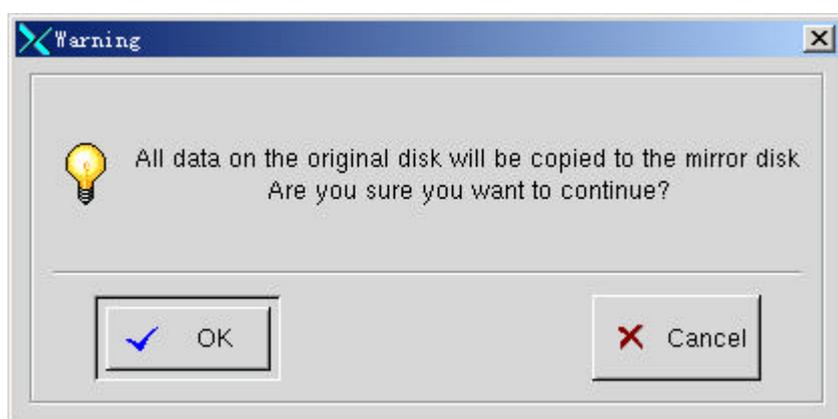


6. Click the **Create** button to create the RAID 1 array.

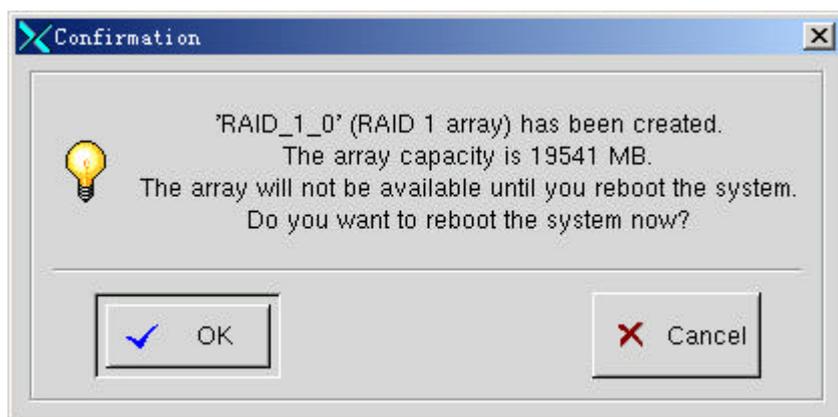
If you have selected "initialize" option, the following warning window will pop up, warning you that all data on the selected disks will be erased.



If you have selected the **Synchronize** option, you will be warned that all data on the source disk will be copied to the mirror disk.



7. Click **OK**. A confirmation dialog box appears, reminding you that the array will not be available until you reboot the system.



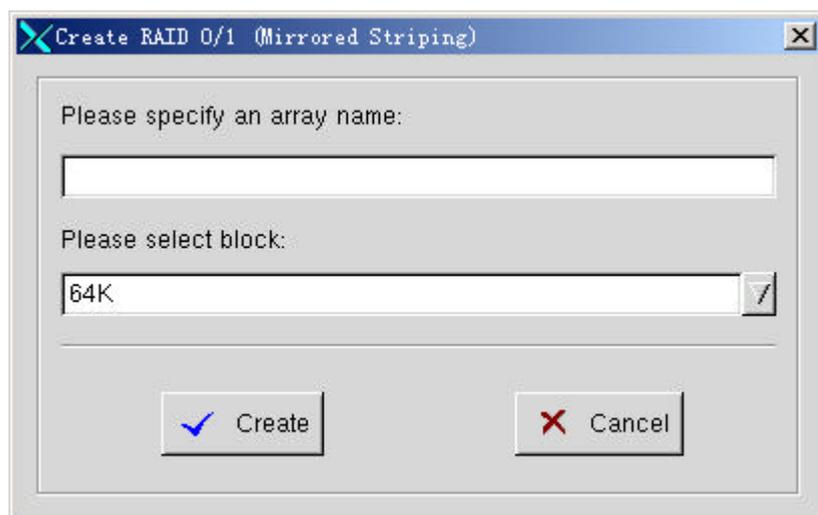
8. Click **OK** to reboot the system. After you reboot the system, the new RAID 1 array will appear in the main window.

### 3. Creating a RAID 0/1 Array

You can follow these steps to create a RAID 0/1 array.

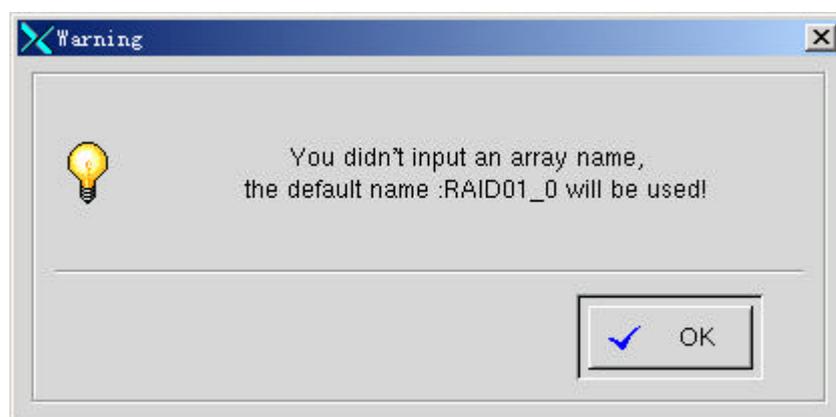
1. Click the **RAID 0/1** button on the toolbar, the **Create RAID 0/1 (Mirrored**

**Striping) Array** Window appears (see below).

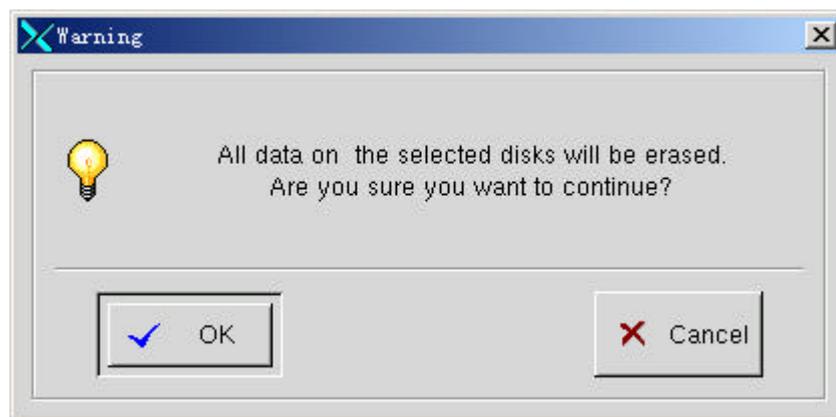


**Note:** You must attach four hard disks to HPT370 controller to create a RAID 0/1 array.

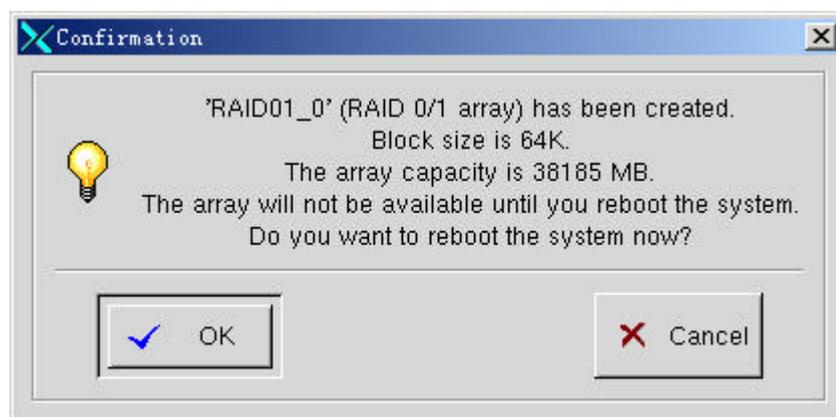
2. Select the stripe size (16k, 32k and 64k) from the drop-down list. Generally, the larger the size is, the more performance the system will get.
3. Specify a name for the selected array. You can type in up to 8 characters. If you don't specify an array name, the system will assign a default name for the array.



4. Click **Create** to create a RAID 0/1 array. The following warning window pops up warning you that all data on the 4 disks will be erased.



5. Click **OK**. A confirmation dialog box appears, reminding you that the RAID 0/1 (Mirrored Striping) Array you specified has been created successfully and the array will not be available until you reboot the system.

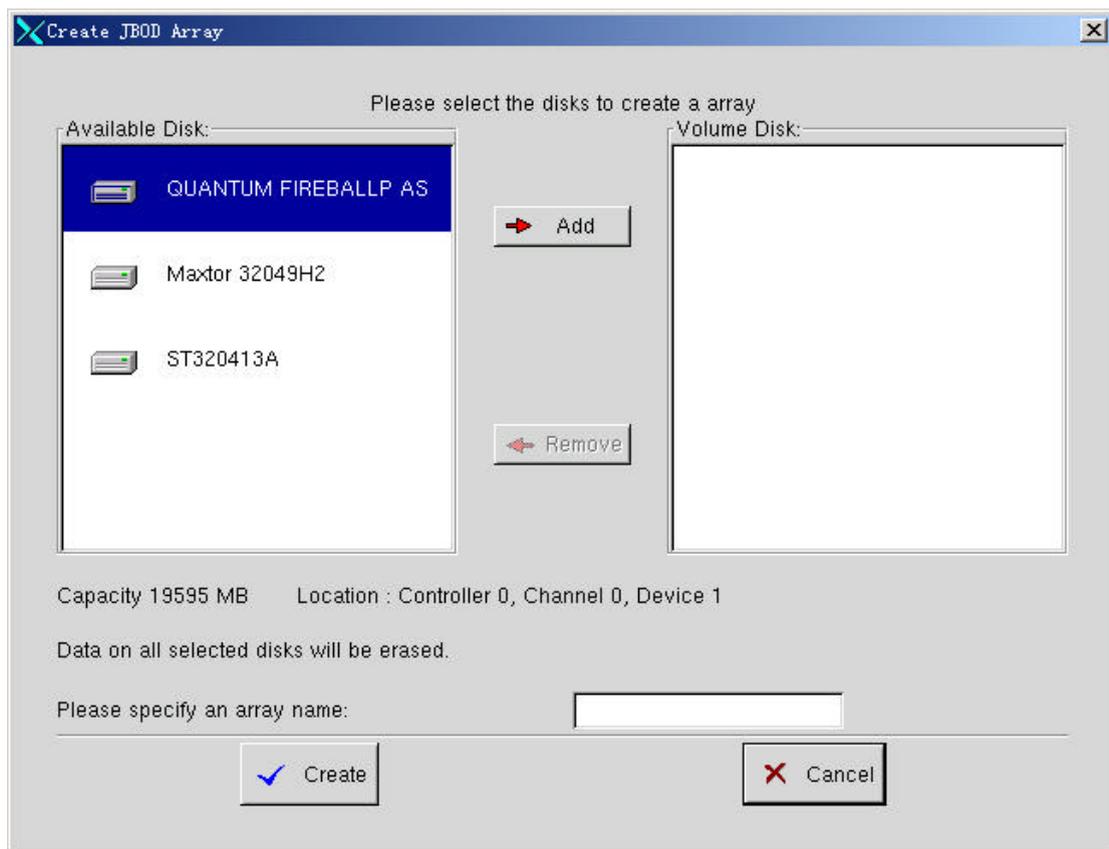


6. Click **OK** to reboot the system. After you reboot the system, the new RAID 0/1 array will appear in the main window.

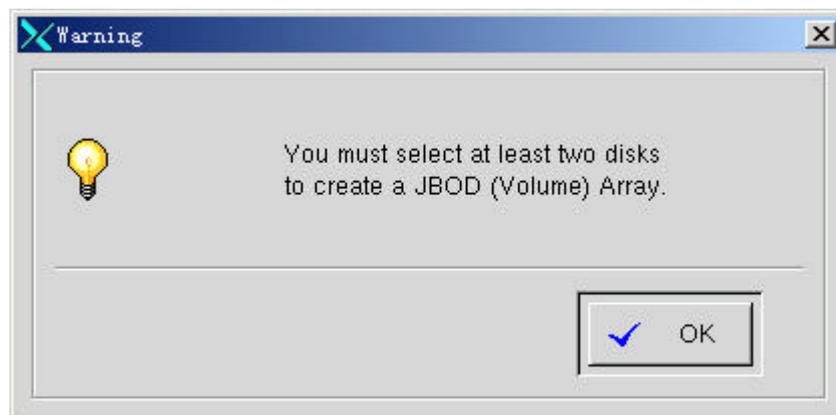
#### 4. Creating a JBOD Array

You can follow these steps to create a JBOD array.

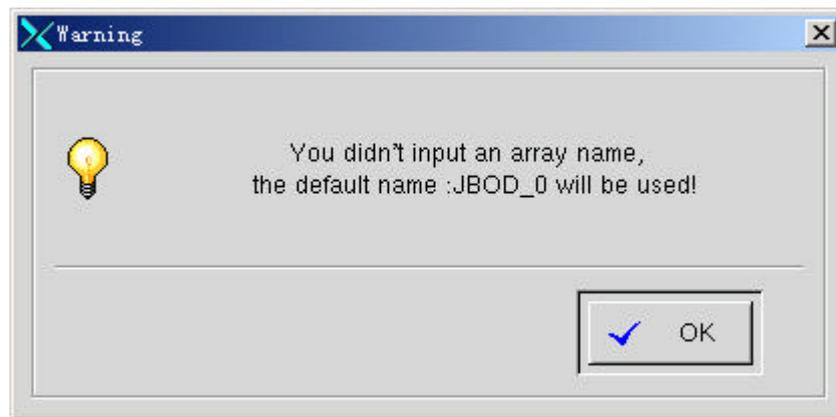
1. Click the **JBOD** button on the toolbar, the **Create JBOD Array** window appears (see below).



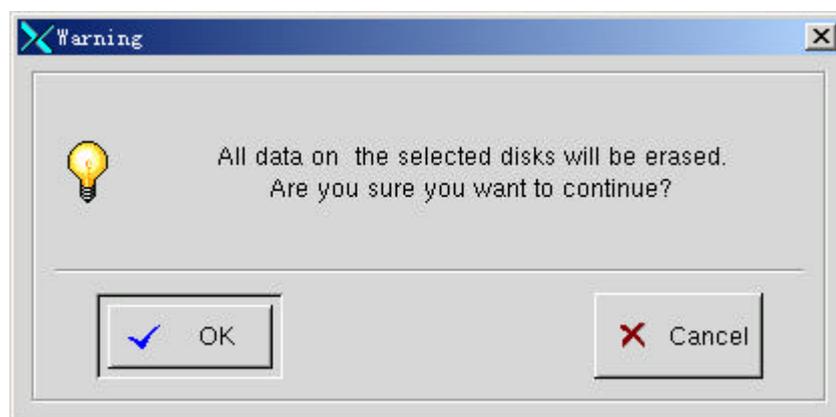
Select the disks you want to create the JBOD array. You must select at least two physical disks. Otherwise, a warning window appears, reminding you to add more disks. Click **OK** and return to the **Create JBOD Array** window.



2. Specify a name for the selected array. You can type in up to 8 characters. If you don't specify an array name, a default name will be assigned.



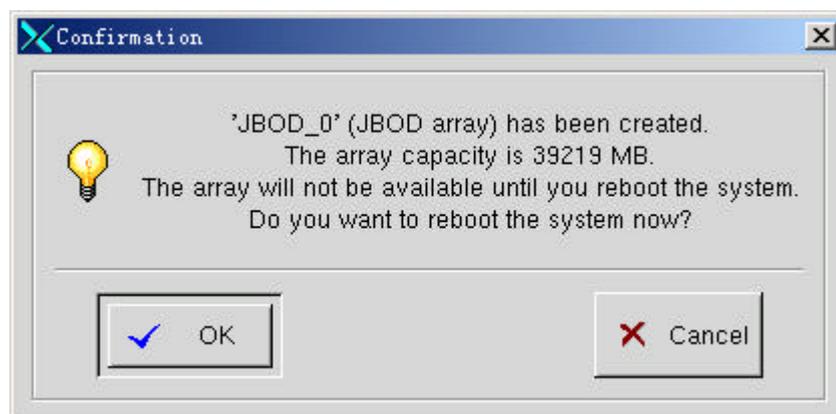
3. Click **Create**. The following warning dialog box pops up, warning you that all data on the selected disks will be erased.



4. Click **OK** to create the JBOD array.

5. Then a confirmation dialog box appears reminding you that the array will not be available until you reboot the system.

**WARNING:** You must reboot the system to use the newly created array.



6. Click **OK** to reboot the system. After you reboot the system, the new JBOD array will appear in the main window.

## Deleting a RAID Array

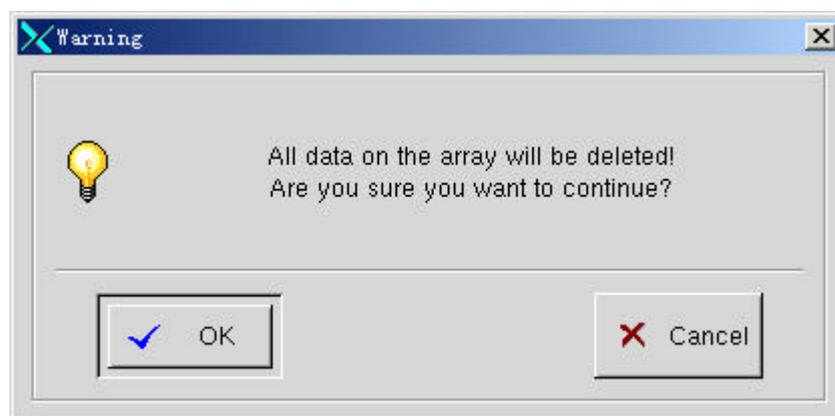
Deleting an array will break the array into single disks.

**WARNING:** To delete a bootable RAID array (which has an active partition on it), you must use HPT370 BIOS Setting Utility.

There are two ways to delete a RAID array.

1. Right-click one of the devices on the array tree will pop up a menu. Then click **Delete** on the menu.
2. Select the array in the **Array** view of the main window, click the **configuration** menu. Click **Delete** on the pop-up menu.

A warning dialog box shows the following information: All data on the array will be deleted! Are you sure you want to continue?

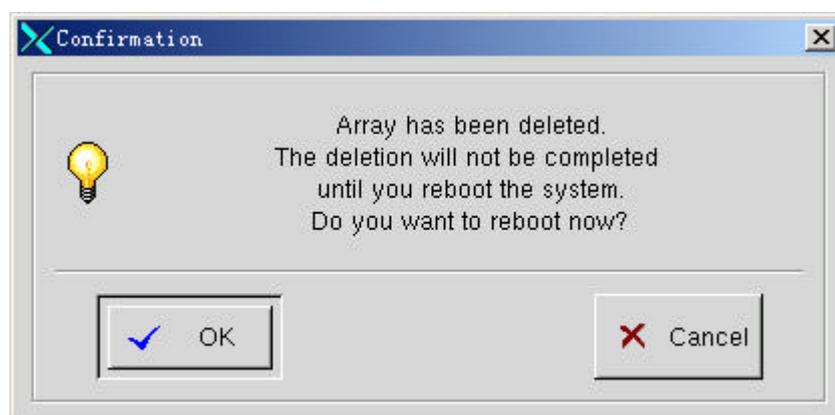


Click **OK** to delete the array, or **Cancel** to cancel deleting.

**Note:** Deleting an array will result in all its data loss. Make sure to backup all data on the array in case you wish to undo a deletion.

Then a confirmation dialog box appears reminding you to reboot the system.

**WARNING:** The disks of the deleted array will not be accessible by OS before you reboot the system.



Click **OK** to reboot.

## Rebuilding and Synchronizing

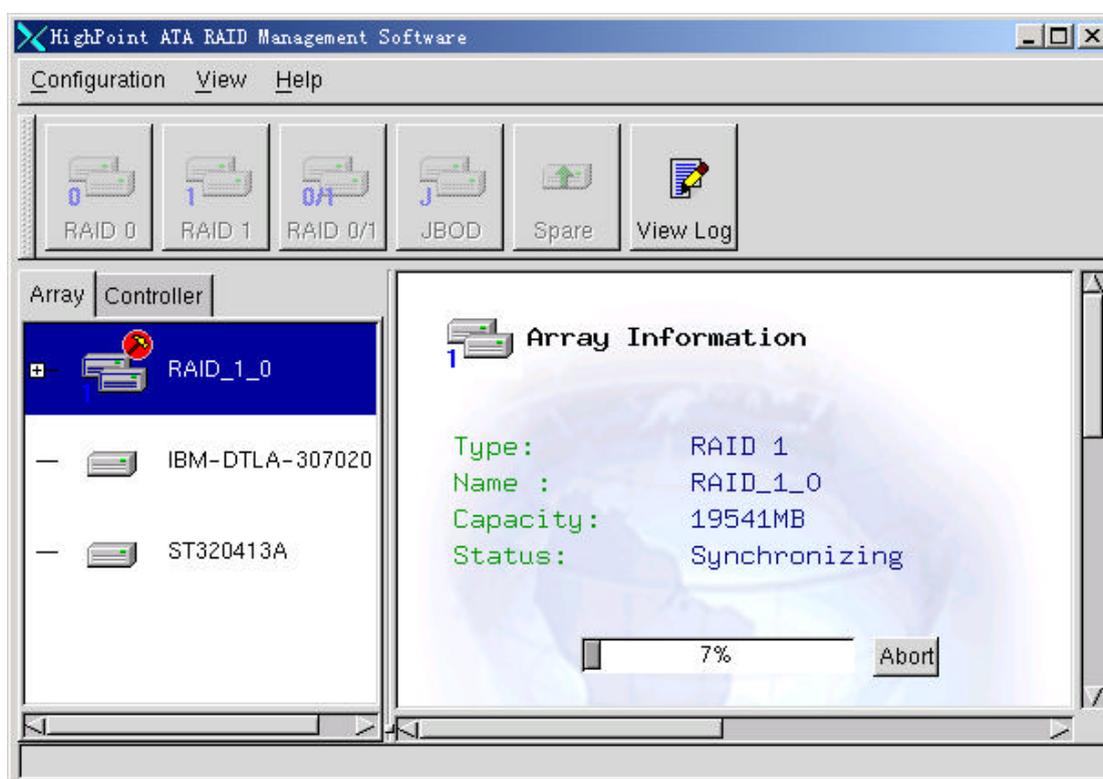
**Synchronizing** will copy data from the source disk to the target disk to ensure data consistency on the mirroring array. This operation will be performed when a failed array member is replaced.

Only RAID 1 array and RAID 0/1 array can be synchronized.

There are two ways to synchronize an array:

1. Right-click a RAID 1 or RAID 0/1 array on the array view will pop up a menu. Click **Synchronize** on the menu (see below).
2. Click the menu "Configuration->Monitoring->Synchronize".

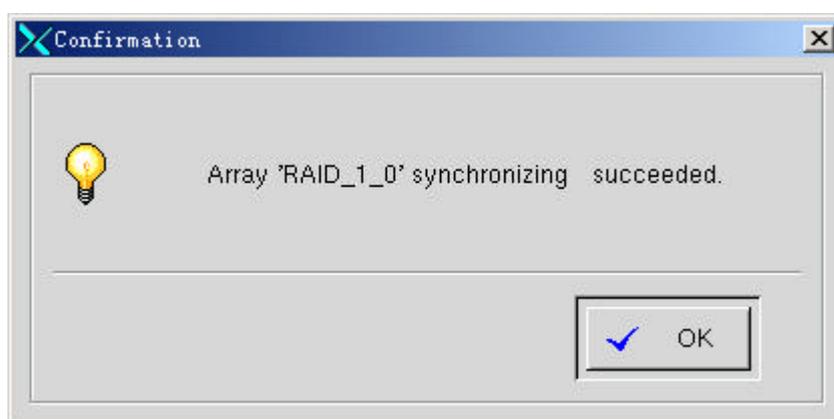
If you choose the **Synchronize** option, a progress bar will appear in the "Array Information" window showing synchronizing in progress.



During synchronizing, you can abort this process by clicking the **Abort** button. Or you can right-click the array and choose **Abort** on the pop-up menu. Click **OK** to abort synchronizing the array.



After the synchronizing process completes, the following message box will pop up (see below). Click **OK**.



## Adding/Removing a Spare Disk

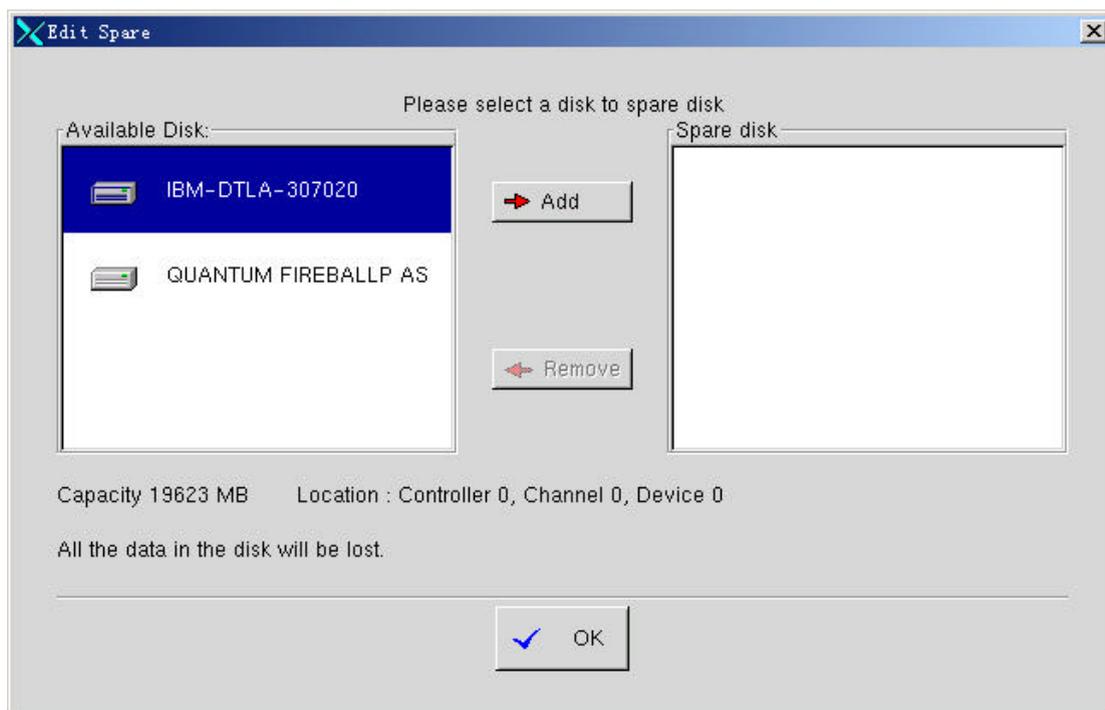
With a spare disk, you can enhance the security of RAID 1 (Mirroring) array. If one of the disks in the array fails, the spare disk will automatically take over.

You can open the **Edit Spare** window to add or remove a Spare Disk.

There are three ways to open the Edit Spare window.

1. Right-click the RAID 1 array on the array tree will pop up a menu. Select **Edit Spare** on the menu.
2. Click the menu **Configuration->Edit Spare**.
3. Click the **Spare** button on the tool bar.

Open the **Edit Spare** window, select a physical disk from the **Available Disk** list box and click the **Add** button to add the selected disk to the **Spare Disk** list box.



Click **OK** to add or remove the disk you selected. If you add a spare disk successfully, you can see the new spare disk appearing on the array tree.

## Renaming an Array

You can modify the name of an array after you created it. There are two ways to rename an array.

1. Right-click an array on the array tree will pop up a menu. Select **Rename** on the menu.
2. Click the menu **Configuration->Monitoring->Rename**.

Then the **Rename** dialog box appears (see below).



In the above dialog box, you can input a new name for the selected array. Then click **OK**.

## Rescanning Devices

You can rescan all the devices attached to HPT370 controller and refresh their status.

There are two ways to rescan the devices.

1. Right-click an array on the array tree will pop up a menu. Select **Rescan** on the menu.
2. Click the menu **Configuration->Monitoring->Rescan**.

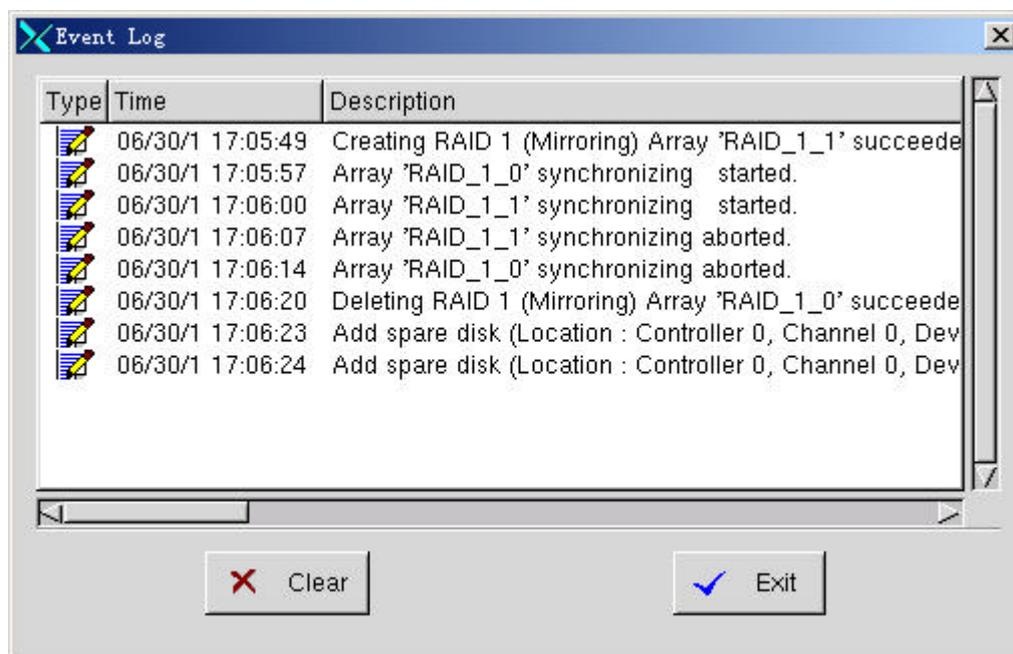
Then the status of the selected device will be refreshed.

## Event Log

All important events are logged. You can view the events to monitor the array status.

Click the **View Log** button on the toolbar or choose the menu **View->Event Log** to open the **Event Log** dialog box. The type, occurring time and description of the events will be displayed.

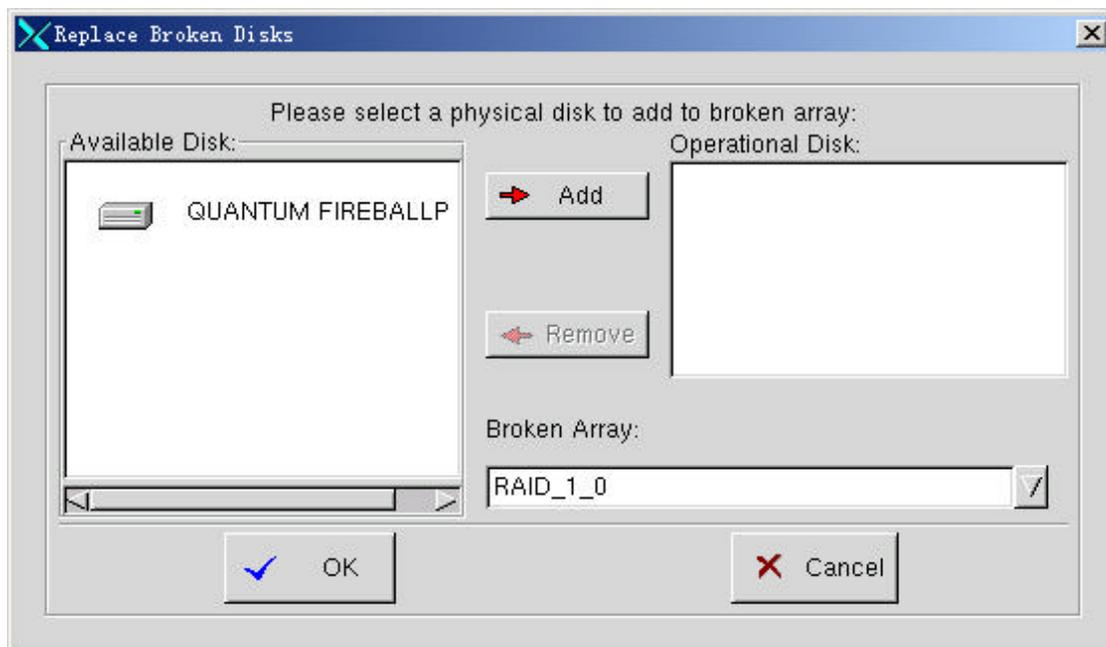
The **Event Log** dialog box shows as follows:



## Adding Physical Disk into a Broken Array

When the management software starts up, it will detect if there are any critical

arrays, such as a RAID 1 array only with a source disk, a RAID 0/1 array having one broken RAID 0 array, etc. If a critical array is detected and there are some physical disks available, users will be prompted to select a physical disk to rebuild the critical array.



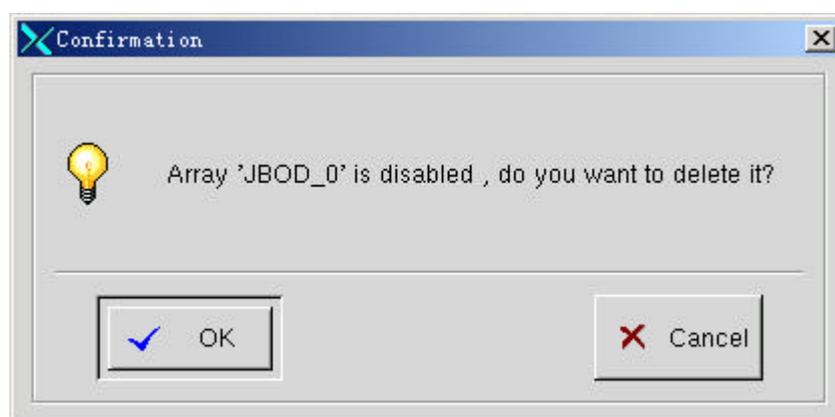
Select a physical disk from the **Available Disk** list box and click the **Add** button to add the selected disk to the **Operational Disk** list box and click **OK**.

**Note:**

1. A bootable disk cannot be added to an array.
2. You can only add a disk to a broken RAID 1 or RAID 0/1 array. A RAID 0 and JBOD array cannot be rebuilt.

## Deleting Unavailable Arrays

When the management software starts up, if it detects a disabled RAID array, it will ask users to delete it.



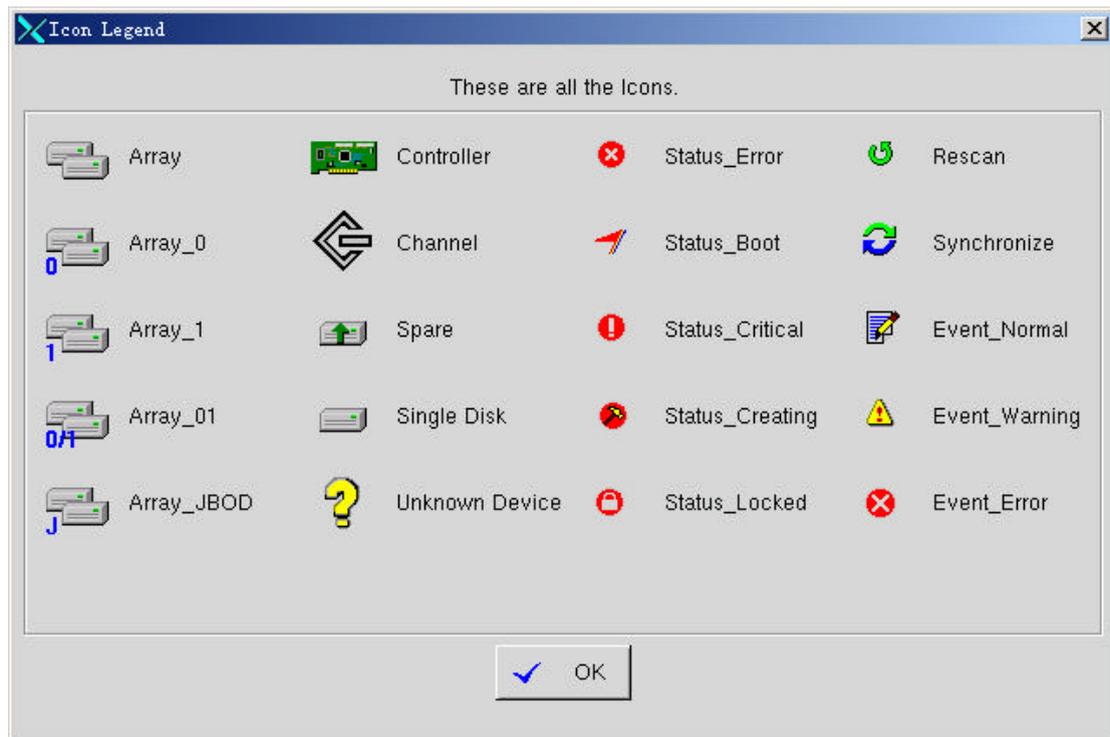
Click **OK** to delete or **Cancel** to abort.

**Note:**

1. A bootable array cannot be deleted.
2. Only disabled RAID 0 and JBOD array can be deleted.

## Icon Legend

All the icons appear on the screen have their own meaning. Click on the menu **Help->Icon Legend** to open the **Icon Legend** window (see below):



### 3 Glossary

**Controller:** A system may include the RAID controllers. They provide RAID 0, RAID 1, RAID 0/1, JBOD, Spare and Hot-Swap functions. There are two channels on each controller. One is channel 0 (Primary Channel) and the other is channel 1 (Secondary Channel).

**Channel:** The channel provides connections between controller and device (Array or physical disk). Each channel can attach a master device and a slave device.

**Array:** As used in RAID, an array consists of one or more hard disks, which are logically combined to form a single storage disk. Arrays are categorized by the method in which they are accessed to logically organize data on them for purposes of performance enhancement, capacity augmentation, and /or data redundancy protection. The different types of array include RAID 0 (Striping), RAID 1 (Mirroring), RAID 0/1 (Mirrored Striping), RAID 5, etc.

**RAID 0 (Striping):** RAID 0 is typically defined as a group of striped disks without parity or data redundancy. RAID 0 arrays can be configured with large stripes for multi-user environments or small stripes for single-user systems that access long sequential records. RAID 0 arrays deliver the best data storage efficiency and performance of any array type. The disadvantage is that if one drive in a RAID 0 array fails, the entire array fails.

RAID 0 provides much speed because the data are scattered in all the disks. When reading or writing, all disks work at the same time. If there is more than one single physical disk (not member of an array and not an ATAPI device or a removable disk), you can create a RAID 0 array.

**RAID 1 (Mirroring):** RAID 1, also known as disk mirroring, is simply a pair of disk drives that store duplicate data but appear to the computer as a single drive. Although striping is not used within a single mirrored drive pair, multiple RAID 1 arrays can be striped together to create a single large array consisting of pairs of mirrored drives. All writes must go to both drives of a mirrored pair so that the information on the drives is kept identical. However, each individual drive can perform simultaneous, independent read operations. Mirroring thus doubles the read performance of a single non-mirrored drive and while the write performance is unchanged. RAID 1 delivers the best performance of any redundant array type. In addition, there is less performance degradation during drive failure than in RAID 5 arrays. RAID 1 array can provide much security because the mirror disk can replace the original disk when original disk is fault. If there are 2 physical disks (not member of an array and not an ATAPI device or a removable disk), you can create RAID 1 array. From the "selected disks" list box, system will regard the first disk as "Original Disk" and the second disk as "Mirror Disk" automatically.

**JBOD (Volume):** JBOD is an acronym for Just a Bunch of Disks. It is used to refer to hard disks that aren't configured according to RAID -- a subsystem of disk drives that improves performance and fault tolerance. JBOD provides much more capacity (the sum of all the disks). If there is more than one single physical disk (not member of an array and not an ATAPI device or a removable disk), you can create a JBOD array.

**RAID 0/1 (Mirrored Striping):** RAID 0/1 can provide much speed and security. Only when four single physical disks are available, you can create a RAID 0/1 array.