# ATA/100 IDE RAID
# Online Manual

**DOC. NO.: RAID-OL-E0102B**

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## *What's in this manual*

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## *Before You Start*

This Online Manual will introduce to the user how this product is installed. All useful information will be described in later chapters. Please keep this manual carefully for future upgrades or system configuration changes. This Online Manual is saved in <u>PDF format</u>, we recommend using Adobe Acrobat Reader 4.0 for online viewing, it is included in <u>Bonus CD disc</u> or you can get free download from <u>Adobe web site</u>.

Although this Online Manual is optimized for screen viewing, it is still capable for hardcopy printing, you can print it by A4 paper size and set 2 pages per A4 sheet on your printer. To do so, choose **File > Page Setup** and follow the instruction of your printer driver.

Thanks for the help of saving our earth.

## *Overview*

**T**hank you for your recent purchase. The motherboard which you bought already contains a Promise Technology® FastTrak100 Lite RAID controller onboard. The FastTrak100 Lite provide a cost-effective, high performance RAID controller that add performance and/or reliability to system using Ultra ATA/100/66/33 or EIDE drives. FastTrak100 Lite supports stripping (RAID 0) and mirroring (RAID 1) solution. With stripping, identical drives can read and write data in parallel to increase performance. Mirroring increase read performance through load balancing and elevator seek while creating a complete backup of your files. A FastTral100 Lite striped array can double the sustained data transfer rate of Ultra ATA/100 drives. FastTrak100 Lite fully supports Ultra ATA/100 specification of up to 100MB/s per drive, depending on individual drive specifications. FastTrak100 Lite also offers fault tolerant, data redundancy for entry-level network file server or simply for desktop PC users wanting to continually protect valuable data on the system. FastTrak100 Lite offers RAID 1 mirroring (for two drives) to protect data. Should a drive (which contains identical data) to assume all data handling. When a new replacement drive is later installed, FastTrak100 Lite rebuilds data to the new drive from the mirrored drive to restore fault tolerance. FastTrak100 Lite's bootable BIOS supports individual drives larger than 8.4GB. With FAT32 and NTFS partitioning, the array cam be addressed as one large single volume.
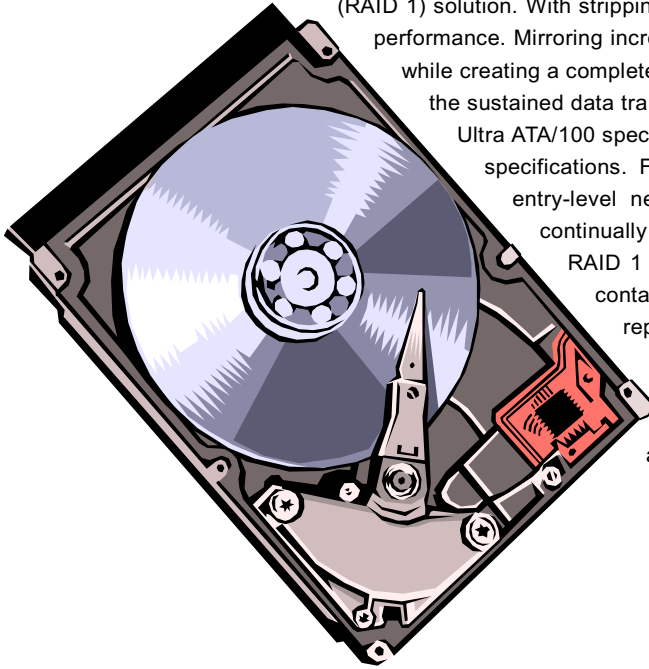
# *Feature Highlight*

## Supports data stripping (RAID 0) and mirroring (RAID 1)

Provides dramatic increase in drive performance and/or fault tolerant options and offers performance customization and data rebuilds from the BIOS menu

## Supports Ultra ATA/100/66/33

Burst data transfer rate up to 100MB/s from Ultra ATA/100 drives to boost overall system performance.

## PCI Plug-and –Play, PCI Interrupt sharing and coexist with motherboard IDE controllers

Easy to install; supports four ATA drives on the FastTrak100 Lite while still supporting 4 devices on the motherboard ATA controller.

## Supports concurrent dual IDE controller operation

Drive workload is distributed in parallel between members of the array.

## Supports IDE Bus Master operation

Allows multitasking during disk transfers that increase CPU efficiency. The CPU is free to process task during IDE data transfers through the PCI bus to/from system memory.

## Utilizes FastBuild™ automenu from the FastTrak100 Lite onboard BIOS

Offers pre-set application specific settings that can be optimized for Desktop, Server or A/V editing. Has "**Auto Setup**" option for quick and easy array builds

## Displays status and error checking message during bootup

Notifies user of possible errors and allows for recovery of mirrored drive arrays directly from FastBuild™.

## Employs the latest Promise PCI Ultra ATA/100 ASIC technology

Fully supports Ultra ATA/100 specifications with 100MB/s timing and CRC error-checking at high speeds.

## Mirroring supports automatic background rebuilds

Fault to tolerance can be restored automatically without rebooting.

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# Hardware Installation

This chapter is designed to get you started for installation of onboard FastTrak100 Lite RAID controller.

> *Note: Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.*
>
> 1.  *Do not remove a component from its protective packaging until you are ready to install it.*
>
> 2.  *Wear a wrist ground strap and attach it to a metal part of the system unit before handling a component. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.*

## Install the Hard Disk Drives

Hard disk drives must be Ultra ATA/100/66/33, EIDE and/or Fast ATA-2 compatible to operate with the FastTrak100 Lite RAID controller. For optimal performance, install all identical drives of the same model and capacity. The drives' matched performance allows the array to function better as a single drive.

1. We recommends using identical drives as part of a FastTrak100 Lite array. If stripping for performance, use up to two new drives. If mirroring for protection, you can use two new drives or use an existing drive and a new drive (the new drive must be the same size or larger than the existing drive).

2. Configure the jumpers of the hard disk drive you're prepare to connect to the FastTrak100 Lite using the correct "Master" or "Cable-Select" setting in the positions described in the table below

*Note: Sometimes the Master drive with no slave attached is called "Single". The master slave setting differentiates two drives chained on the same connector.*

| Jumper Setting | | |
|---|---|---|
| # of Drives | IDE Channel 1 | IDE Channel 2 |
| 1 | Master | - |
| 2 | Master | Master |
| 3 | Master/Slave | Master |
| 4 | Master/Slave | Master/Slave |

*Tips: When you build up a disk array, we recommend you to use one hard disk drive on each IDE RAID channel for get higher data transfer performance*

3. Install the hard disk drives into the hard disk drive bay of system, including the power cables.

4. Attaching one Ultra ATA cable (80-wire) to each hard disk drive. Then attach one cable to each of the IDE connectors on the

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onboard IDE RAID connector. The colored edge of the cable(s) indicates pin 1, and the blue cable connector must be attached to the onboard IDE RAID connector.

> *Warning:  if you wish to include your current bootable drive using the Windows NT or Windows 2000 operating system as part of a bootable Mirrored (RAID 1) array on your IDE RAID controller, **DO NOT** connect the hard disk drive to the FastTrak100 Lite controller yet. You **MUST** install the Windows NT 4.0 or Windows 2000 driver software first (see page 39) to this drive while it is still attached to your existing hard disk drive controller.*

> *Note: You must use an 80-wire, 40-pin cable when connecting an Ultra ATA/100/66 hard disk drive to the onboard IDE RAID connector.*
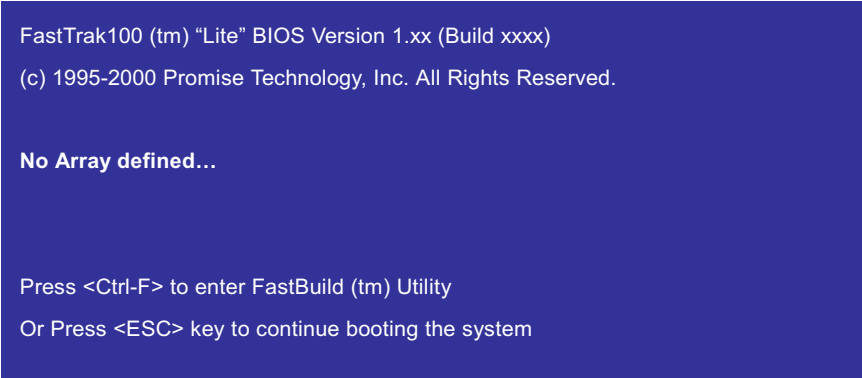
## Create Your Disk Array

You will now use the onboard FastBuild™ BIOS utility to create your disk array using the attached drives. There are three scenarios in create this array. You can create an array for performance; you can create a security array using new hard disk drives (recommended).

> *Warning:   If creating a security array using an existing hard disk drive, backup any necessary data. Failure to follow this accepted PC practice could result in data loss.*

1.  Boot your system, If this is the first time you have booted with onboard IDE RAID controller and drives installed, the onboard IDE RAID BIOS will display the following screen

FastTrak100 (tm) "Lite" BIOS Version 1.xx (Build xxxx)

(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.


**No Array defined…**



Press <Ctrl-F> to enter FastBuild (tm) Utility

Or Press <ESC> key to continue booting the system

2.   Press <Ctrl-F> key to display the FastBuild™ Utility main menu

3.   Press "1" to display the Auto Setup Menu below. This is the fastest and easiest method to creating your first array.

```
        FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                            [Auto Setuo Option Menu]


        Optimized Array for:        Performance
        Typical Application Usage: A/V Editing
                            [Auto Setup Configuration]
        Mode………………………… Stripe
        Drive used in Array………… 2
        Array Disk Capacity…………xxxxxx
                                [Key Available]
        [ ↑ ]Up [ ↓ ]Down [←, →, Space]Change Option [Esc]Exit [Ctrl-Y]Save
```
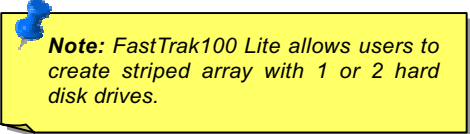
> *Note: If you wish to customize certain setting at a later time, you may to do so by manually creating your array.*

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## *Creating an Array for Performance*

To create an array for best performance, follow these steps:

1.  Using the Spacebar, choose "Performance" under the "**Optimize Array for**" section.

2.  Select how you will use your system most under the "**Typical Application Usage**" section. The choices are **A/V Editing, Server and Desktop (default)**.

3.  Press <Ctrl-Y> keys to save and create array.

4.  Reboot your system.

5.  Once the array has been created, you will need to FDISK and format the array as if it were a new single hard disk drive.

6.  Proceed to installing FastTrak100 Lite RAID controller's drivers section of manual
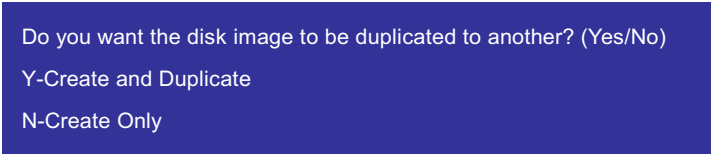
> *Note: FastTrak100 Lite allows users to create striped array with 1 or 2 hard disk drives.*

## *Creating a Security Array with New Drives*
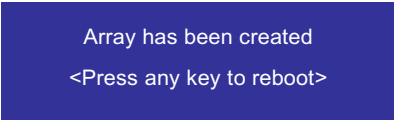
To create any array for data protection using new hard disk drives, follow these steps:

*Note: FastTrak100 Lite permits only two drives to be used for a single striped/mirrored array in **FastBuild™**. If more drives are physically attached to the onboard IDE RAID connectors, they will be a single drive by controller.*

1. Using the Spacebar, choose "**Security**" under the "**Optimize Array for**" section.

2. Press <Ctrl-Y> keys to save your selection.

3. The window below will appear.

4. Press "**N**" for the "**Create only**" option.
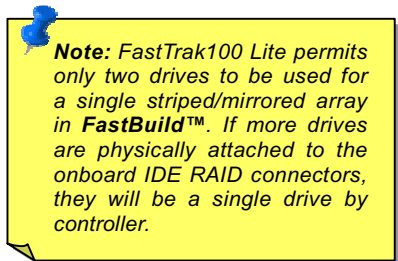
> Do you want the disk image to be duplicated to another? (Yes/No)
>
> Y-Create and Duplicate
>
> N-Create Only

5. A window will appear almost immediately confirming that your security array has been created. Press any key to reboot system.

> Array has been created
>
> <Press any key to reboot>

6. Proceed with normal FDISK and format procedures as if you had just installed a new hard disk drive.

7. Once the arrayed drives have been formatted, proceed to the **Installing Driver** chapter to install your operating system and/or FastTrak100 Lite driver.

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# Creating a Security Array with an Existing Data Drive

You would use this method if you wish to use a drive that already contains data and/or is the bootable system drive in your system. You will need another drive of identical or larger storage capacity. Please follow the steps below to create a array with an existing data drive:

1.  Using the Spacebar, choose "**Security**" under the "**Optimize Array for**" section.

2.  Press <Ctrl-Y> keys to save your selection. The window below will appear.

> Do you want the disk image to be duplicated to another? (Yes/No)
>
> Y-Create and Duplica
>
> N-Creat Only
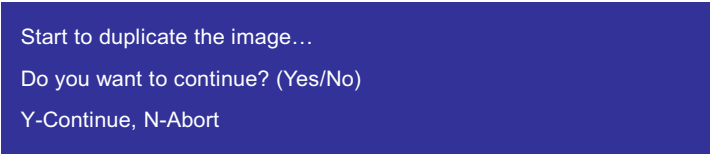
3.  Press "**Y**" for the "**Create and Duplicate option**". The window below will appear asking you to select the source drive to use. FastBuild™ will copy all data from the source drive to the target drive.

*Warning: Backup any necessary data before proceeding. Failure to follow this accepted PC practice could result in data loss.*

| Source Disk | | |
|---|---|---|
| Channel:ID | Drive Model | Capacity (MB) |
| Target Disk | | |
| Channel:ID | Drive Model | Capacity (MB) |
| [Please Select A Source Disk] | | |
| Channel:ID | Drive Model | Capacity (MB) |
| 1 :Master | QUANTIUMCR8.4A | 8063 |
| 2 :Master | QUANTIUMCR8.4A | 8063 |
| [ ↑ ]Up [ ↓ ]Down [←, →, Space]Change Option [Esc]Exit | | |

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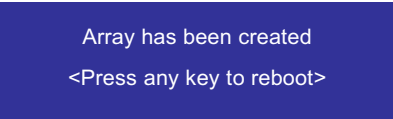
4.  Use the arrow keys to choose which drive contains the existing data to be copies.

5.  Press <Ctrl-Y> keys to save your selection and start duplication. The following progress screen will appear.

> Start to duplicate the image…
>
> Do you want to continue? (Yes/No)
>
> Y-Continue, N-Abort

6.  Select "**Y**" to continue. If you choose "**N**", you will be returned to step 1.

7.  Once complete, the following screen will appear confirming that your security array ahs been created. Press any key to reboot the system.

> Array has been created
>
> <Press any key to reboot>

8.  Proceed to the **Installing Driver** chapter to install the FastTrak100 Lite driver and/or operating system.

*Warning: If you wish to include your current bootable drive using the Windows NT 4.0 or Windows 2000 operating system as part of a bootable Mirrored (RAID 1) array on the motherboard, **DO NOT** connect the hard drive to the IDE RAID connectors yet. You **MUST** install the Windows NT 4.0 or 2000 driver software first to this drive while it is still attached to your existing hard drive controller*

*Note: If your operating system is Windows[®] 95/98, Based on FDISK limitation, it only can create a maximum **64GB** hard disk space even you use a RAID 0 stripping "Vitural Disk" or have a hard disk drive that more than 64GB.*

# Using FastBuild™ Configuration Utility

The FastBuild™ Configuration Utility offers several menu choices to create and manage the drive array on the AOpen motherboard. For purposes of this manual, it is assumed you have already created an array in the previous chapter and now wish to make a change to the array or view other options.

## Viewing FastTrak100 Lite BIOS Screen

When you boot your system with onboard IDE RAID controller and drives installed, the IDE RAID onboard BIOS will detect the drives attached and show the following screen.

FastTrak100 (tm) "Lite" BIOS Version 1.xx (Build xxxx)

(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

Scanning IDE devices………

If any array exists already, the BIOS will display the following screen showing the controller's BIOS version and status of the array.

```
FastTrak100 (tm) "Lite" BIOS Version 1.xx (Build xxxx)

(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

ID      MODE        SIZE        TRACK-MAPPING       STATUS

1*      2+0 Stripe  16126M      611/128/32          Functional






Press <Ctrl-F> to enter FastBuild (tm) Utility……
```

The array status consists of three possible conditions: *Functional, Critical, Offline*.

**Functional**-The array is operational.

**Critical**-A mirrored array contains a drive that had failed or disconnected. The remaining drive member in the array is functional. However, the array has temporarily lost its ability to provide fault tolerance. The user should identify the failed drive through the FastBuild™ Setup Utility, and then replace the problem drive.

**Offline**-A mirrored array has 2 drives that have failed/disconnected or a striped array has 1 drive that has failed or been disconnected. When the array condition is "Offline", the user must replace the failed drive, and then restore data from a backup source.

# Navigating the FastBuild™ Setup Menu

When using the menus, these are some of the basic navigation tips: [Arrow] key highlights through choices; [Space] bar allows to cycle through options; [Enter] key selects an option; [Esc] key is used to abort or exit the current menu.

## How to Using the Main Menu

This is the first option screen when entering the FastBuild™ setup program.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

                         [Main Menu]

Auto Setup……………………………………………………………[1]

View Drive Assignment……………………………………………..[2]

Define Array…………………………………………………………[3]

Delete Array………………………………………………………[4]

Rebuild Array………………………………………………………[5]

Controller Configuration………………………………………[6]


                       [Keys Available]

Press 1…6 to Select Option                              [Esc] Exit
```
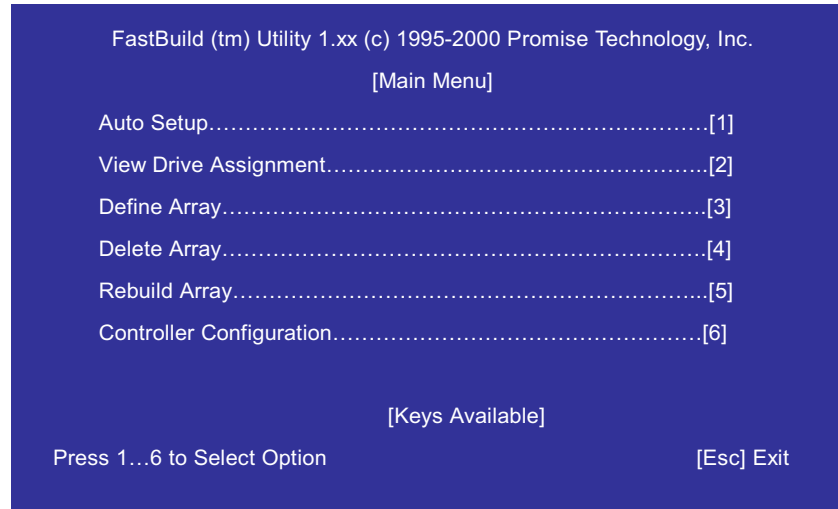
To create a new array automatically, follow the steps under "Creating Arrays Automatically" on page 25. We recommend you this option for most users.
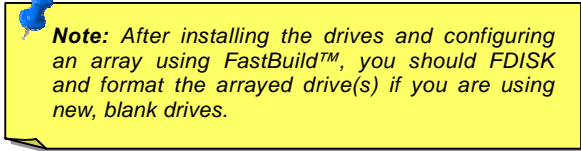
To view created arrays or define an array as bootable, follow the steps under "Viewing Created Arrays" on page 28..

To view drives assigned to arrays, see "Viewing Drive Assignments" on page 27.

To delete an array (but not delete the data contained on the array), select "Deleting An Array" on page 31.

To rebuild a mirrored array, see "Rebuild an Array" on page 33.

To view controller settings, see "Viewing Controller Configuration" on page 36.

> **Note:** *After installing the drives and configuring an array using FastBuild™, you should FDISK and format the arrayed drive(s) if you are using new, blank drives.*

## Creating Array Automatically

The **Auto Setup** selection from the main menu can intuitively help create your disk array. It will assign all available drives appropriate for the disk array you are creating. After making all selection, use <Ctrl-Y> keys to save selection. FastBuild™ will automatically build the array.

```
        FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

                          [Auto Setup Option Menu]

    Optimize Array for:              Performance

    Typical Application Usage:       A/V Editing


    Mode……………………………………………………………Stripe

    Spare Drive Count……………………………….……………………1

    Drives used in Array…………………………………….………2

    Array Disk Capacity…………………………………………16126



                            [Keys Available]

    Press 1…6 to Select Option                        [Esc] Exit
```
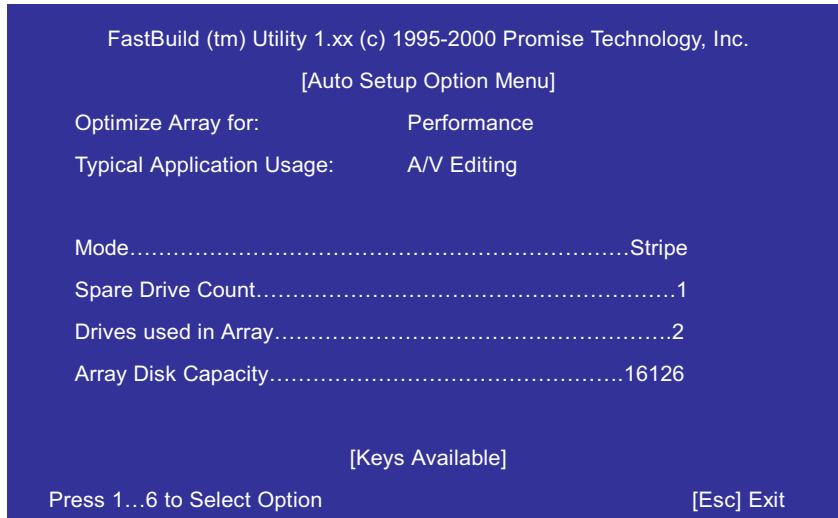
## Optimize Array for

Select whether you want **Performance** (RAID 0) or **Security** (RAID 1) under the "**Optimize Array for**" setting.

### Performance (RAID 0 Striping)

Supports the maximum performance. The storage capacity equals the number of drives times the capacity of the smallest srive in the disk array.

> *Note: FastTrak100 Lite permits striped arrays using 1 or 2 drives attached in **Auto Setup** mode.*

### Security (RAID 1 Mirroring)

Creates a mirrored array for data security.

> *Note: Under the **Performance/Security** setting, FastTrak100 Lite permits two drives to be used for a single striped/mirrored array and others drives to be used for individual striped arrays in Auto Setup.*

## Defining Typical Application Usage

Allows the user to choose the type of PC usage that will be performed in order to optimize how FastTrak100 Lite handles data blocks to enhance performance. Your choice will determine the block size used. You may choose from: **A/V Editing** (for audio/video applications, or any similar application that requires large file transfers), **Server** (for numerous small file transfers), or **Desktop** (a combination of large and small size file sizes).

## *Viewing Drive Assignments*

The "**View Drive Assignment**" option in the main menu displays whether drives are assigned to a disk arrays or are unassigned.

Under the "Assignment" column, drives are labeled with their assigned disk array or shown as "Free" if unassigned. Such "Free" drives can be used for a future array or used as a individual striped array. Unassigned drives are not accessible by the operating system. The menu also displays the data transfer mode that relates to speed used by each drive (U5 refers to 100MB/s transfers, U4 refers to 66MB/s transfers, etc…).

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

[View Drive Assignment]

| Channel:ID | Drive Model | Capacity (MB) | Assignment | Mode |
|------------|-------------|---------------|------------|------|
| 1: Master | QUANTIUMCR8.4A | 8063 | Array 1 | U5 |
| 2: Slave | QUANTIUMCR8.4A | 8063 | Free | U5 |
| 3: Master | QUANTIUMCR8.4A | 8063 | Array 1 | U5 |

[Keys Available]

Press 1…6 to Select Option                                      [Esc] Exit

## Viewing Created Array

The "**View Array**" option from the main menu provides users to check the drive elements and RAID levels for one or multiple disk arrays attached to FastTrak100 Lite.

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

[View Array Menu]

| Array No | RAID Mode | Total Drv | Capacity (MB) | Status |
|----------|-----------|-----------|---------------|--------|
| *Array 1 | Stripe | 2 | 16126 | Functional |
| Array 2 | -------------- | ----------- | ------------------ | ------------- |
| Array 3 | -------------- | ----------- | ------------------ | ------------- |
| Array 4 | -------------- | ----------- | ------------------ | ------------- |

[Keys Available]

Note: * — Bootable Array

[↑]Up [↓]Down [←, →, Space]Change Option                    [Esc]Exit [Ctrl-Y]Save

> **Note:** For most installation, we recommend the <1> **Auto Setup** for easy disk array creation.

## Making a FastTrak100 Lite Disk Array Bootable

1. Once you have come into the "View Array" menu window (below), you will see the array(s) you have created. You now may use the menu to select that previously defined array will be used as the bootable array.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

                         [View Array Menu]
   Array No      RAID Mode     Total Drv    Capacity (MB)      Status
   *Array 1        Stripe          2           16126         Functional
   Array 2      --------------  ----------  ------------------  -------------
   Array 3      --------------  ----------  ------------------  -------------
   Array 4      --------------  ----------  ------------------  -------------


                         [Keys Available]
   Note: *  —  Bootable Array
   [↑]Up [↓]Down [←, →, Space]Change Option [Esc]Exit [Ctrl-Y]Save
```

2. Highlight the array which you want to boot from using the [↑]up or [↓]down keys.

3. Press [Space] bar key.

4. An * asterisk will appear next to the array number indicating it as bootable.

5. The system will then use this bootable array as the (fixed) boot C: drive.

**Note: The bootable arrays must contain your configured operating system.**

## How FastTrak100 Lite Orders Arrays

During startup, the disk arrays on the FastTrak 100 Lite are recognized in this order:

1.    The array set to bootable in the FastBuild™ setup program.

2.    The array number, i.e. Array 0, Array 1…

This would be involved in determining which drive letters will be assigned to each disk array.

## How FastTrak100 Lite Saves Array Information

All disk array data is saved into the reserved sector on each array member. We suggest that users record their disk array information for future reference.

Another feature of the FastTrak100 Lite disk array system is to recognize drive members even if drives are moved between different FastTrak100 Lite IDE RAID connectors of M/B. Since each drive's array data identifies itself to the array, it is possible to move or swap drives without modifying the array setup. This is valuable when adding drives, or during a rebuild.

## Deleting An Array

The "**Delete Array**" menu option allows for deletion of disk array assignments. This is not the same as deleting data from the drives themselves. If you delete an array by accident (and before it has been used again), the array can normally be recovered by defining the array identically as the deleted array.

```
         FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

                              [Delete Array Menu]

      Array No      RAID Mode      Total Drv     Capacity (MB)      Status

      Array 1         Stripe           2             16126         Functional

      Array 2         Mirror           2              8063         -------------

      Array 3      --------------    -----------   ------------------   -------------

      Array 4      --------------    -----------   ------------------   -------------




                               [Keys Available]


      [ ↑ ]Up [ ↓ ]Down                            [Esc]Exit [Ctrl-Y]Save
```

*Warning: Deleting an existing disk array could result in its data loss. Make sure to record all array information including the array type; the disk members, and stripe block size in case you wish to undo a deletion.*

1.  To delete an array, highlight the array you wish to delete and press the [Del] key.

2.  The **View Array Definition** menu will appear (as below) showing which drives are assigned to this array.

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

[Define Array Menu]

| Array No | RAID Mode | Total Drv | Capacity (MB) | Status |
|---|---|---|---|---|
| Array 1 | Stripe | 2 | 16126 | Functional |

Stripe Block: 64KB

[Drive Assignment]

| Channel: ID | Drive Model | Capacity (MB) | Assignment |
|---|---|---|---|
| 1: Master | QuantumCR8.4A | 8063 | Y |
| 2: Master | QuantiumCR8.4A | 8063 | Y |

3.  Confirm yes to the following warning message with the <Ctrl-Y> key to continue array deletion.

Are you sure you want to delete this array?

Press Ctrl-Y to Delete, others to Abort

4.  After deleting the array, you should create a new array using **Auto Setup** or **Define Array** menu from the FastBuild™ main menu.

# *Rebuilding A Mirrored Array*

The "**Rebuild Array**" menu option is necessary to recover from an error in a mirrored disk array. You will receive an error message when booting you system from the FastTrak100 Lite BIOS.

Follow these steps **BEFORE** using the **Rebuild Array** menu option:

1. On boot-up, the FastTrak100 Lite startup BIOS will display an error message identifying which drive has failed.

2. Press <Ctrl-F> keys to enter FastBuild™ menu.

3. Select submenu "Define Array"

4. Select the failed array and identify the channel and ID of the failed drive.

5. Power off and physically remove the failed drive.

6. Replace the drive with an identical model.

7. Reboot the system and enter the FastBuild™ main menu.

8. Select the "**Rebuild Array**" option. The following screen will appear.

> *Note: Drives **MUST** be replaced if they contain any physical errors.*

| FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc. | | | | |
|---|---|---|---|---|
| [Rebuild Array Menu] | | | | |
| Array No | RAID Mode | Total Drv | Capacity (MB) | Status |
| Array 1 | Stripe | 2 | 16126 | Functional |
| Array 2 | Mirror | 2 | 8063 | Critical |
| Array 3 | -------------- | ----------- | ------------------- | ------------- |
| Array 4 | -------------- | ----------- | ------------------- | ------------- |

9.   Highlight the array whose status is "Critical".

10.   Press <Enter> key. The following screen will then appear.

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

[Rebuild Array Menu]

| Array No | RAID Mode | Total Drv | Status |
|---|---|---|---|
| Array 2 | Mirror | 2 | Critical |

Stripe Block: Not Available

[Select Drive for Rebuild]

| Channel: ID | Drive Model | Capacity (MB) |
|---|---|---|
| 1: Slave | QUANTIUMCR8.4A | 8063 |

[Key Available]

[↑]Up [↓]Down [←, →, Space]Change Option [Esc]Exit [Ctrl-Y]Save

11.  Under **[Select Drive for Rebuild]**, highlight the replacement drive.

12.  Press <Enter> key and confirm that the data will be copied on to the selected drive. All data on the replacement drive will be written over with mirrored information from the array drive; a progress bar will appear as below.

Please Wait While Duplicating The Image
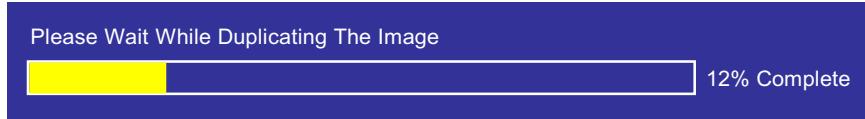
12% Complete

13.  Once the rebuild process is complete, the user will be asked to reboot the system.

## *Viewing controller Setting*

The "**Controller Configuration**" menu option selection allows you to enable or disable the FastTrak100 Lite BIOS from halting (the default) if it detects an error on boot-up. You may also view the system resources (Interrupt and I/O port address) of FastTrak100 Lite's data channels.

```
        FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.

                        [Controller Configuration Menu]

    Halt On Error:        Enable


                        [System Resource Configuration]

    Channel 1 (IDE 1)              Interrupt: A              I/O Port: FFF0
    Channel 2 (IDE 2)              Interrupt: B              I/O Port: FFA8




                                [Key Available]



      [←,  →, Space]Change Option                    [Esc]Exit [Ctrl-Y]Save
```

## Halting FastTrak BIOS On Boot-up Errors

The **[Controller Configuration – Options]** section allows you to enable or disable FastTrak100 Lite to halt operation at the BIOS startup screen should an error be detected. This is the only option that can be changed on this screen.

## Viewing FastTrak System Resource

The **[System Resources Configuration]** section of this submenu displays the PCI interrupt and port address used by the FastTrak 100 Lite. The resources used are determined by the motherboard PCI PnP BIOS for the PCI interface devices in which the FastTrak resides.

(This page left intentionally blank for notes)
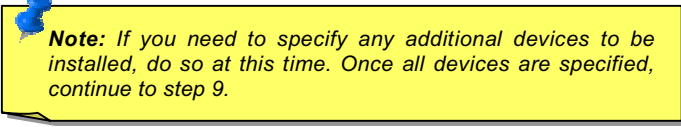
## *Installing Drivers*

This section details the FastTrak100 Lite drive installation when used with various operating systems. The software includes the driver necessary to identify FastTrak100 Lite to the operating system.

- For Windows 2000, please see page 40.
- For Windows ME, please see page 43.
- For Windows 9x, please see page 45.
- For Windows NT, please see page 51.
- For Windows 3.1/DOS, see page 50.

## Windows 2000

### Installing Driver During New Windows 2000 Installation

1.  Floppy install: Boot the computer with the Windows 2000 installation diskette.

2.  Floppy-less Install: Boot from floppy and type "WINNT". After files have been copied, the system will reboot. On the reboot, press <F6> key after the message "Setup is inspecting your computer's hardware configuration…" appears

3.  CD-ROM Install: Boot from the CD-ROM. Press <F6> key after the message "Press F6 if you need to install third party SCSI or RAID driver" appears.

4.  When the "Windows 2000 Setup" window is generated, press <S> key to specify an additional device(s)

5.  Press <O> key select "Other" and press <Enter> key.

6.  Insert the Promise Technology® driver diskette into Drive A (3.5", 1.44MB) and press "Enter" key.

7.  Choose "Win2000 Promise FastTrak100 Lite (tm) Controller" from the list that appears on screen, then press "Enter" key.

8.  The Windows 2000 Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Win2000 Promise FastTrak100 Lite (tm) controller".

> *Note: If you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, continue to step 9.*

9.  From the Windows 2000 Setup screen, press the <Enter> key. Setup will now load all device files and then continue the Windows 2000 installation.

## Installing Drive in Existing Windows 2000 System

After installing the motherboard that has FastTrak100 Lite controller onboard and boot-up your system, Windows 2000 setup will show a "New hardware found" dialog box. Under Windows 2000, the "PCI RAID controller" will be displayed.

> *Warning: If you will be moving the boot drive containing the existing Windows 2000 operating system to a mirrored RAID 1 array on the FastTrak100 Lite, the FastTrak100 Lite driver **MUST** be loaded to the hard disk drive while it is still attached to your existing hard disk drive controller. Do not attach this drive or any other hard drive to the onboard IDE RAID connectors before completing this step.*

1.  In the dialog box, choose "Driver from disk provided by hardware manufacturer" button.

2.  In the Drive A, insert the FastTral100 Lite driver diskette.

3.  Type "A:\WIN2000" in the text box, then press <Enter> key.

4.  Choose "WIN2000 Promise FastTrak100 Lite (tm) Controller" from the list that appears on screen, the press <Enter> key.

5.  The Windows 2000 Setup screen will appear again saying "Setup will load support for the following mass storage device – Win2000 Promise FastTrak100 Lite (tm) controller". The FastTrak 100 Lite driver will now be copied on to the system and entered into the Windows 2000 driver database.

6.  When the "System Setting Change" dialog box appears, remove the floppy diskette and click on "Yes" to restart the system. Windows 2000 will then restart for the driver installation to take effect.

7.  Power off your system, and then attach your hard disk drives to the onboard IDE RAID connectors.

## Confirming Windows 2000 Installation

To confirmed that the drivers has been properly loaded in Windows 2000, perform the following steps:

1.   From Windows 2000, open the Control Panel from "My Computer" followed by the system icon.

2.   Choose the "Hardware" tab, and then click the "Device Manager" tab.

3.   Click the "+" in front of "SCSI & RAID Controller hardware type". The driver "Win2000 Promise FastTrak100 Lite (tm) Controller" should appear.

## *Windows Millennium Edition*

### *Installing Drivers During Windows ME Installation*

The following details the installation of the FastTrak100 Lite drivers while installing Microsoft's Windows ME. If you're installing the FastTrak100 Lite drivers on a system with Windows ME already installed, please see "Installing Drivers with Existing Windows ME System".

1.  Install Windows ME fully.

2.  After installation, go the "Start" menu and choose "Setting".

3.  From the "Setting" menu", choose "Control Panel".

4.  In the "Control Panel" window, double-click on the "System" icon.

5.  In the "System" window, choose the "Device Manager" tab.

6.  In the hierarchical display under "Other Devices" is a listing for "PCI RAID Controller". Choose it and then press the "Properties" button.

7.  Choose the "Driver" tab in the "Properties" window, choose "Update Driver", and then press "Next".

8.  Choose "Search for a better driver than the one your device id using now (recommended)", and then press "Next".

9.  Choose "Specify Location", and then type "A:\WINME" in the text box.

10. Insert the "FastTrak100 Lite Driver" diskette into the Drive A.

11. Press the "Next" button. A message informing you that Windows ME has found "Windows Millennium Promise FasTrak100 Lite Controller" should appear.

12. Press the "Next", and then "Finish", and then "Yes" when asked if you want to restart your computer. Be sure to remove the diskette from Drive A.

### Installing Drivers with Existing Windows ME System

The following section details the installation if FastTrak100 Lite drivers on a system that has Windows ME already installed and running. If you're installing the FastTrak100 Lite drivers on a system during an installation of Windows ME, please see "Installing Drivers During Windows ME Installation"

1.  After installing the motherboard that has FastTrak100 Lite controller onboard and configuring the hard disk drives, please power up the system and boot.

2.  The "Add New Hardware Wizard" will appear, informing you that it ahs found a "PCI RAID Controller".

3.  Click on "Next", and from the generated list box, choose "Search for a better driver than the one your device is using now".

4.  Click on "Next", and from the generated list box, choose "Specify a location".

5.  Insert the "FastTrak100 Lite Driver" diskette into Drive A.

6.  Type "A:\WINME" in the text box that appears.

7.  Click on "Next", and then on "Finish".

8.  Choose "Yes" when asked if you want to restart your computer. Be sure to eject the diskette from Drive A.

### Confirming Drivers Installation in Windows ME

To confirm that the driver has been properly loaded in Windows ME, perform the following steps:

1.  Choose "Settings" from the "Start" menu.

2.  Choose "Control Panel", and then double-click on the "System" icon.

3.  Choose the "Device Manager" tab, and then click the "+" in front of "SCIS &RAID controllers". "Windows Millennium Promise FastTrak100 Lite Controller" should appear.

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## Windows 95/98

### Installing Drivers During Windows 95/98 Installation

The following details the installation of the FastTrak100 Lite drivers while installing Microsoft's Windows 95/98. If you're installing the FastTrak100 Lite drivers on a system with Windows 95/98 already installed, please see "Installing Drivers with Existing Windows 95/98 System".

### Windows 98

1. After installing the motherboard that has FastTrak100 Lite controller onboard, and configuring the hard disk drive(s), partition and format your hard disk drive(s), if necessary.

2. Install Windows 98 normally.

3. After installation, go to the "Start" menu and choose "Settings".

4. From the "Settings" menu, choose "Control Panel".

5. In the "Control Panel" window, double-click on the "System" icon.

6. In the "System" window, choose the "Device Manager" tab.

7. In the hierarchical display under "Other Devices" is a listing for "PCI RAID Controller". Choose it and then press the "Properties" button.

8. Choose "Driver" tab in the "Properties" window, choose "Update Driver", and then press "Next".

9. Choose "search for a better driver than the one your device is using now (Recommended)", and then press "Next".

10. Choose "Specify Location", and then type "A:\WIN95-98" in the text box.

11. Insert the "FastTrak100 Lite Driver" diskette into the Drive A.

12. Press the "Next" button. A message informing you that Windows 98 has found "Win95-98 Promise FastTrak100 Lite (tm) Controller" should appear.

13. Press "Next", then "Finish" and then "Yes" when asked if you want to restart your computer, Be sure to remove the diskette from Drive A.


### Windows 95

1. After installing the motherboard that has FastTrak100 Lite controller onboard, and configuring the hard disk drive(s), partition and format your hard disk drive(s), if necessary.

2. Install Windows 95 normally.

3. After installation, go to the "Start" menu and choose "Settings".

4. From the "Settings" menu, choose "Control Panel".

5. In the "Control Panel" window, double-click on the "System" icon.

6. In the "System" window, choose the "Device Manager" tab.

7. In the hierarchical display under "Other Devices" is a listing for "PCI Mass Storage Controller". Choose it and then press the "Properties" button.

8. Choose "Driver" tab in the "Properties" window, choose "Update Driver", and then press "Next".

9. When asked if you want to Windows to search for the new driver, choose "Yes (recommended)".

10. Insert the "FastTrak100 Lite Driver" diskette into the Drive A.

11. When Windows informs you that it was unable to find the drivers, press "Other Locations".

12. In the "Select Other Location: dialog box, type "A:\WIN95-98".

13. Press "Next", a message informing you that Windows 95 has found "Win95-98 Promise FastTrak100 Lite (tm) Controller:

should appear.

14.   Press "Finish". (If Windows can't find the "FastTrak100.MPD" file, type "A:\WIN95-98" in the "Copy files from:" text box.

15.   Choose "Yes" when asked if you want to restart the system, and remove the diskette from Drive A.

## Installing Drivers with Existing Windows 95/98

The following section details the installation if FastTrak100 Lite drivers on a system that has Windows 95/98 already installed and running. If you're installing the FastTrak100 Lite drivers on a system during an installation of Windows 95/98, please see "Installing Drivers During Windows 95/98 Installation"

### Windows 98

1.  After installing the motherboard that has FastTrak100 Lite controller onboard and configuring the hard disk drives, please power up the system and boot.

2.  The "Add New Hardware Wizard" will appear, informing you that it ahs found a "PCI RAID Controller".

3.  Click on "Next", and from the generated list box, choose "Search for a better driver than the one your device is using now".

4.  Click on "Next", and from the generated list box, choose "Specify a location".

5.  Insert the "FastTrak100 Lite Driver" diskette into Drive A.

6.  Type "A:\WIN95-98" in the text box that appears.

7.  Click on "Next", and then on "Finish".

8.  Choose "Yes" when asked if you want to restart your computer. Be sure to eject the diskette from Drive A.

### Windows 95

1.  After installing the motherboard that has FastTrak100 Lite controller onboard and configuring the hard disk drives, please power up the system and boot.

2.  The "Update Device Driver Wizard" will appear, informing you that it ahs found a "PCI Mass Storage Controller".

3.  Insert the "FastTrak100 Lite Driver" diskette into Drive A.

4.  Type "A:\WIN95-98" in the text box, and then click on "Next". Windows will inform you that it has found the "Win95-98 Promise FastTrak100 Lite (tm) controller".

5.  Click on "Finish", and when prompted to insert the "FastTrak100 Lite Driver" diskette, press "Ok".

6.  If a message informing you that the file "FASTTRAK100.MPD" cannot be found, please go to the "Copy files from:" text box and type "A:\WIN95-98".

7.  Choose "Yes" when asked if you want to restart your computer. Be sure to eject the diskette from Drive A.

## *Confirm Drivers Installation in Windows 95/98*

To confirm that the driver has been properly loaded in Windows 95/98, perform the following steps:

1.  Choose "Settings" from "Start" menu.

2.  Choose "Control Panel", and then double-click on the "System" icon.

3.  Choose the "Device Manager" tab, and then click the "+" in front of "SCSI & RAID controllers". "Win95-98 Promise FastTrak100 Lite (tm) controller" should appear.

## *DOS/Windows 3.1*

The FastTrak 100 Lite BIOS supports both DOS and Windows 3.1x without software drivers. Hence, you do not need to install any drivers.

## Windows NT 4.0

### Installing Driver During Windows NT 4.0 Installation

1.  Start the system installation by booting from the Windows NT disk:

    a.  Floppy install: boot the system with the Windows NT installation diskettes.

    b.  Floppy-less install: boot from floppy and type "WINNT /B". After files have been copied, the system will reboot. On the reboot, press the <F6> key when the message "Setup is inspecting your computer's hardware configuration…" appears.

    c.  CD-ROM disk install: boot from the CD-ROM disk and press the <F6> key when the message "Setup is inspecting your computer's hardware configuration…" appears.

2.  When the "Windows NT Setup" window is generated. Press <S> key to specify an additional device(s).

3.  Press <O> key to select "Other" and press <Enter> key.

4.  Insert the Promise Technology® FastTrak100 Lite river diskette into Drive A and press <Enter> key.

5.  Choose "WinNT Promise FastTrak100 Lite (tm) Controller" from the list that appears on screen, and then press the <Enter> key.

6.  The Windows NT setup screen will appear again saying "Setup will load support for the following mass storage devices". The list will include "WinNT Promise FastTrak100 Lite (tm) Controller".

> **Note:** If you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, continue to step 7.

7.   From the Windows NT setup screen, press the <Enter> key. Setup will now load all device files and then continue the Windows NY installation.

8.   After a successful installation, the "SCSI Adapter Setup" box will show that the "WinNT Promise FastTrak100 Lite (tm) Controller" driver has been installed.

## Installing Driver with Existing Windows NT 4.0

After, you have been installed the motherboard successfully, please following steps as below to complete FasTrak100 Lite controller driver installation:

1. Choose "Setting" from the "Start" menu.

2. Choose "Control Panel" from the "Setting" menu.

3. Double-click on the "SCSI Adapters" icon, which generates the "SCSI Adapters" dialog box.

4. Choose "Drivers", and then press "Add".

5. In the "Install From Disk" dialog box, press "Have Disk…"

6. When the "Install From Disk" appears, insert the "FastTrak100 Lite Driver" diskette into Drive A.

7. Type "A:\WINNT" in the text box window, the press "OK".

8. When the "Install Driver" dialog box appears, select "WinNT Promise FastTrak100 Lite (tm) Controller" and then press "OK".

9. Power off your system.

10. If moving the boot drive to the onboard IDE RAID connector, now attach the hard disk drives (see the page 12, otherwise reboot).

## Removing the Driver from Windows NT 4.0

1.    In "Start" button, choose "Control Panel" in "Setup" group.

2.    In "Control Panel", select "SCSI Adapter", next choose "Drivers" label".

3.    Choose "Remove" button.

4.    After successful removing, the "SCSI Adapter Setup" box will show that "WinNT FastTrak100 Lite (tm) RAID Controller" has been removed.

# FastCheck™ Monitoring Utility

You can monitor the operating status of all arrays and drives configured on the onboard IDE RAID controller using the supplied FastCheck™monitoring utility for Windows-based operating systems. FastCheck™ generates visual and audible messages alerting you of possible problems with the disk array or controller.

FastCheck™ visually identifies the physical location of attached drives on the onboard IDE RAID controller by IDE channel (1 or 2) and setting (Master/Slave). It also displays which drives are included as part of individual arrays. Administrators can customize FastCheck™ to maintain operating logs and event notification, set password access to the utility, and schedule maintenance on Mirrored (RAID 1) array.

# Installing FastCheck™ Monitoring Utility

Please following the steps to complete FastCheck™ installation:

1. Insert AOpen Bonus Pack CD-ROM into your CD-ROM drive, and then the window as below will appear.

2. In the window, select the "Motherboard Drivers" and then scroll the item list to highlight "Promise FastCheck™ Utility", and then press "OK".

3. Follow the directions from the setup program.

4. During installation, click "Yes" when prompted to run the utility on every startup. If "No" selected, FastCheck™ will not initialize during startup. You may manually execute the utility via the Start Button.
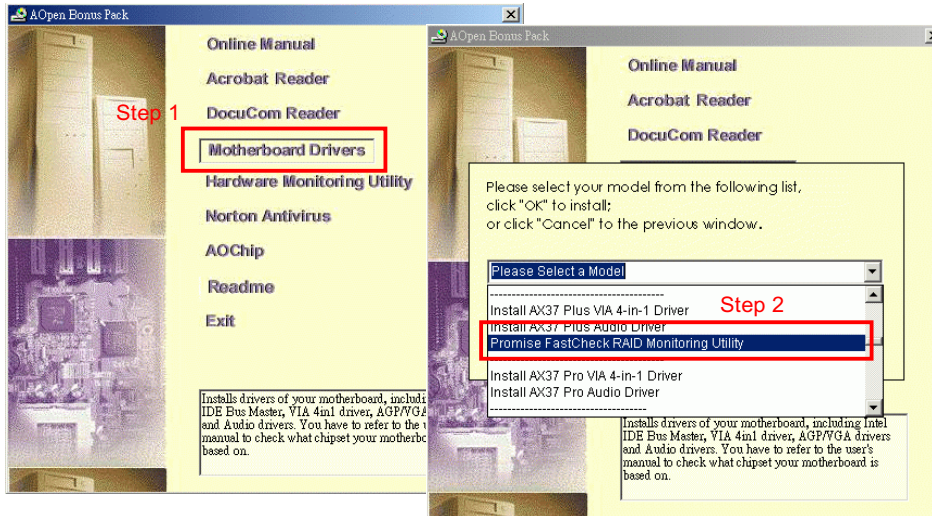
*Note: We recommend you to have FastCheck™ load during startup. This insures you that it will be ready to post alerts on error.*

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## *Running FastCheck™ Monitoring Utility*

As Described in the installation section, the default option for FastCheck™ is to load during startup of Windows 95/98/ME/NT/2000. It appears minimized on the taskbar under Windows 95/98/ME/NT/2000 (see below).
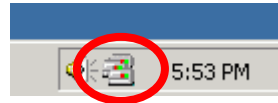


To start FastCheck™, double-click on the FastCheck™ icon on the taskbar (see above) or you may also use the taskbar: "Start" → "Promise" → "FastTrak" → "FastCheck" menus shown below
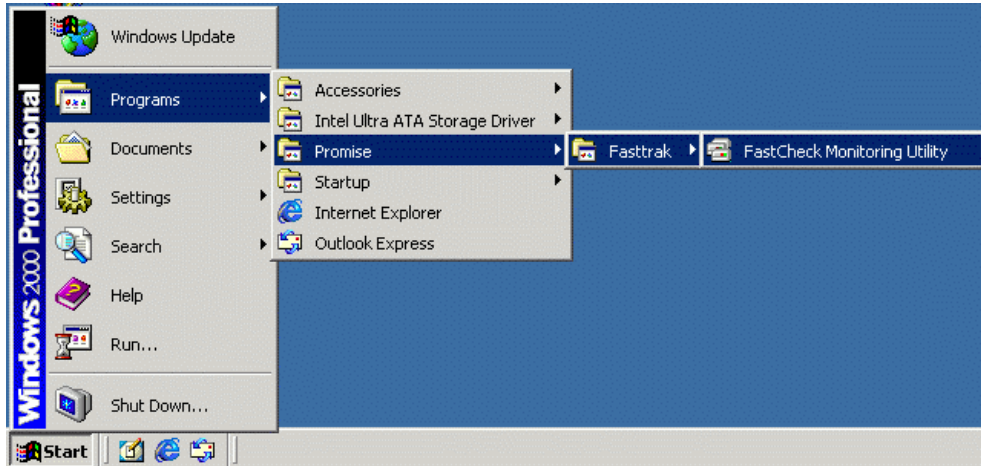
## *Closing FastCheck™ Monitoring Utility*

Once FastCheck™ is opened (either automatically on startup or manually), the monitoring utility remains running in the background even if the user "closes" the FastCheck™ window.

To completely shit down FastCheck™, perform the following steps:

1. Right-click the FastCheck™ icon on the taskbar.

2. Select "Exit" from the pop-up window.

3. FastCheck™ will on longer be running and will no longer be monitoring the array.

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## Using FastCheck™ Monitoring Utility

Once FastCheck™ is selected, the FastCheck™ monitoring utility window will appear. The main pane has three information window tabs: **Array**, **Controller**, and **Options**. You can switch screens by clicking on the tab. The "Array" window is the active screen by default as shown below:
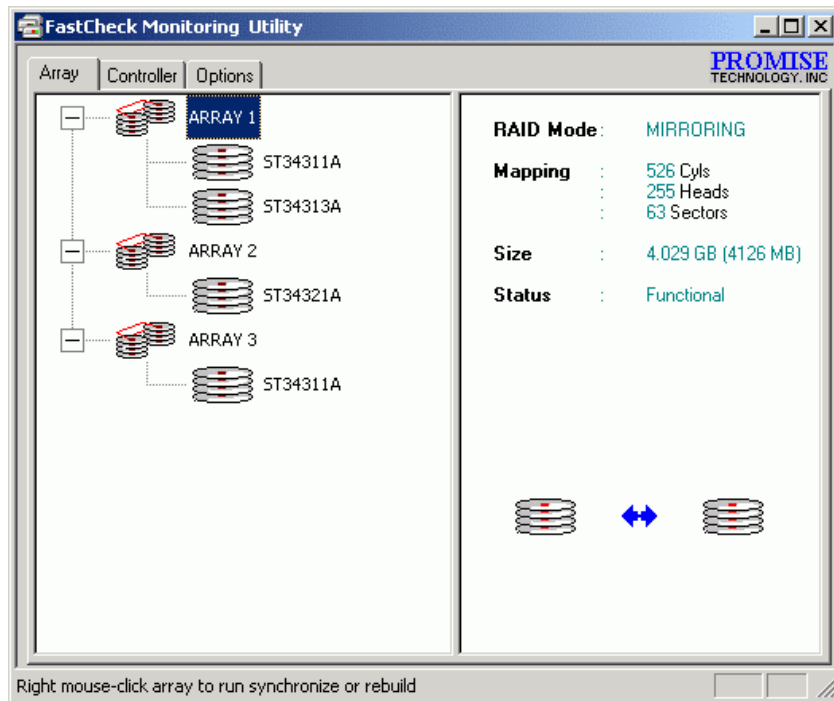
The "Array" window displays information about the arrays configured on your onboard IDE RAID controller through the FastBuild™ BIOS. From this window, you can also perform data synchronization of mirrored array.

While the "Array" window does not allow you to change the array configurations directly, it clearly identifies which drives are associated with each array shown in the left pane.

## *Viewing Array Information*

By left-clicking on the "Array #", the right pane shows the following information categories for that array:

1. **RAID mode:** Striping or Mirroring

2. **Mapping:** Describing # of cylinders, heads, and sectors of the array's "virtual" drive as seen by the system (similar to physical drive specifications)

3. **Size:** Storage capacity of the array.

4. **Status:** Functional, Critical or Offline.

   a. **Functional:** Means the array is providing full functionally.

   b. **Critical:** Used only in reference to a Mirroring array (RAID 1). A problem has been detected in one of the drive of the array and the drive has been taken "Offline". However, a "Critical" array will continue to save and retrieve data from the remaining working drive. We recommend replacing the failed drive as soon as possible since a "Critical" array offers no data redundancy.

   c. **Offline:** This would appear most commonly within a RAID 0 array. The "Offline" results from a drive having failed which has taken the entire array "Offline". In this case, you have likely lost data. Fix/replace the drive that has failed, then restore data from a backup source.

## *Viewing Arrayed Drive Information*

By left-clicking on a drive member of an array in the left pane, the right pane shows the following information categories for that drive:

1.  **Status** (Also shown under the "Controller" window)**:** It can be **Functional**, **Critical**, or **Offline**. The meanings are shown below:

    a.  **Functional:** Means the drive is working normally.

    b.  **Critical:** A problem has been detected in the drive and the drive taken offline as part of a mirroring array. Mirrored array will continue to function without the drive, Fix/replace the drive that has failed, then restore data from a backup source.

    c.  **Offline:** Drives that are **NOT** identified as "bad" may be taken offline if part of a Striping array containing a "bad" drive. These drives do **NOT** need to be replaced, however.

2.  **S.M.A.R.T. Status:** Indicates whether attached hard disk drive implements **S**elf-**M**onitoring **A**nalysis & **R**eporting **T**echnology to predict drive failure.

3.  **Size:** Indicates capacity of individual drive.

4.  **Location:** Shows physical location of drive. Indicates on which IDE channel (1 or 2), and whether drive is Master or Slave on cable. This allows you to identify drives for removal/replacement.

5.  **Mapping:** Indicates physical parameters of drive (cylinders, heads, sectors).

6.  **Timing:** Shows selection of drive timing (directly related to burst speed) based on type of drive and cable used.

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## *Using Array Pull-Down Menu*

At the bottom of the "Array" window, it indicates to right-click on an Array to perform synchronization or rebuild operations. Right-clicking displays the following pull-down menu:
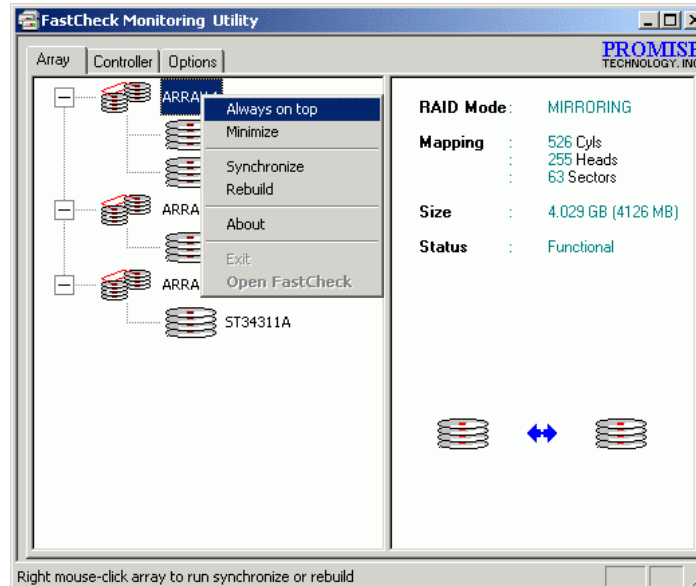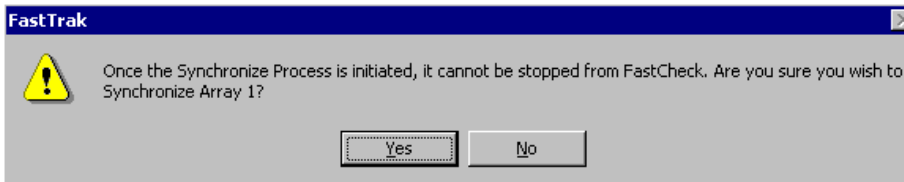


From this menu, users may choose to have the window "always appears on top" of applications, "minimize", "synchronize" mirrored drives, "rebuild" a mirrored array, use "about" to check FastCheck™ version, or "exit" the onscreen window.

## Synchronizing An Array

Synchronization is a periodic maintenance procedure for Mirroring (RAID 1) array to maintain data consistency on all mirrored drives. In operation, array synchronization compares data on the mirrored drives for any differences. If there are differences detected, data from the primary drive is automatically copied to the secondary drive. This assures that all mirrored drives will contain the exact information.
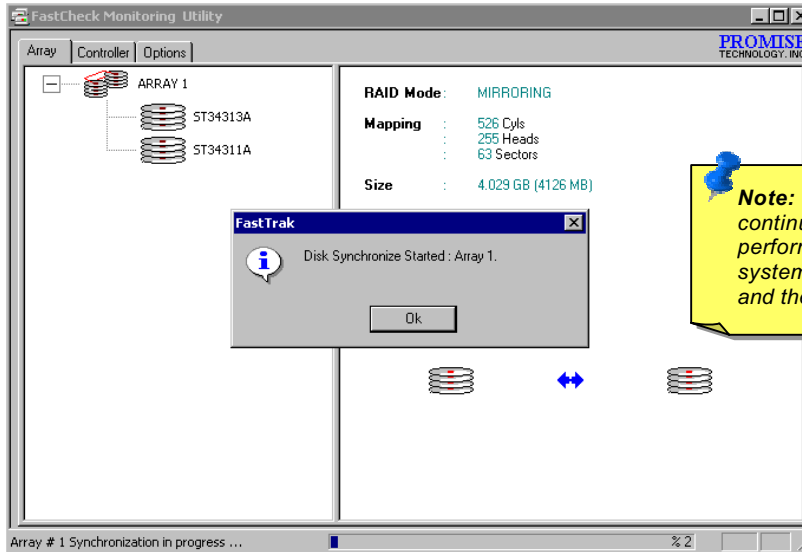
> *Note: You may instead choose to schedule array synchronization automatically under the "Options" tab view versus manually initiating synchronization.*

1.  To synchronize, choose the "Array" tab view.

2.  Right-click on the array you wish to synchronize and choose "Synchronize" from the context menu.

3.  Click "Yes" to initiate synchronization (see below) when the confirmation window appears. To cancel this option, click the "No" button.

| FastTrak | ✕ |
|---|---|
| ⚠ Once the Synchronize Process is initiated, it cannot be stopped from FastCheck. Are you sure you wish to Synchronize Array 1? | |
| [ Yes ]   No | |

> *Warning: Once initiated, synchronization **CANNOT** be halted in order to prevent data errors.*

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4. Once synchronization is confirmed, the following information screen appears. Click "OK" button or close the window to proceed.



**Note:** *During array synchronization, you may continue to access the working array and perform normal PC functions. However, system performance will be slightly degraded and the process will take longer.*

5. A progress bar will appear at the bottom of the FastCheck™ monitoring window showing synchronization in progress and the percentage that has been completed.

# Rebuilding An Array

This command effectively copies or overwrites data from an existing data drive in the array on to a blank drive. The operation will be typically used when a failed drive has been replaced with a new drive as part of a mirrored array.

1.  To perform a rebuild, choose the "Array" tab view.

2.  Right-click on the array number and choose "Rebuild" from the context menu.

3.  Once "Rebuild" is selected, you will be asked to "Initialize Rebuild process on Array #" by clicking "OK".

## Using Rebuild Wizard

1.  Initiating rebuild array will open the Rebuild Wizard Step 1 screen (see next page).

2.  Select the target drive which will receive data. Make sure you select the blank new or replacement drive. The unselected drive will contain "good" data. It will be the remaining working drive of an array, or a system drive containing existing data that you wish to mirror.

> *Warning:   Make absolutely sure and double-click which drive is which. If data exists on the target drive, it will be overwritten.*
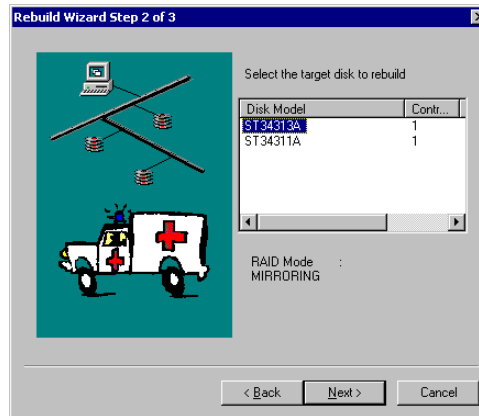
3.  Click the "Next" button to proceed to Rebuild Wizard Step 2 or "Cancel" button to stop.

4. Rebuild Wizard Step 2 confirms the target or "rebuild" disk by Array # and drive ID.

5. Click "Finish" button to initiate physical rebuild; "Back" button to review Step 2, or "Cancel" button to stop. A final confirmation window appears as below:
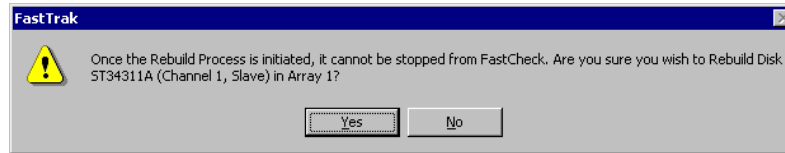


6. Click "Yes" to initiate rebuild. To cancel this option, click the "No" button.

> *Note: During array rebuild, you may continue to access the array and perform normal PC functions. However, the array will **NOT** provide data redundancy until rebuild is completed. If you choose to continue using the PC during rebuild, system performance will be slightly degraded and the process will take longer.*

> *Warning:    Once initiated, synchronization **CANNOT** be halted in order to prevent data errors.*

7. Once array rebuild has begun, you are returned to the FastCheck™ monitoring window. A progress bar showing the rebuild progress in percentage will appear at the bottom of the FastCheck™ monitoring window.

# Using Controller Window

Clicking on the "Control" tab will reveal the Control Window. This displays physical information about the location of onboard IDE RAID controller, data channels on the controller, and the attached drives.
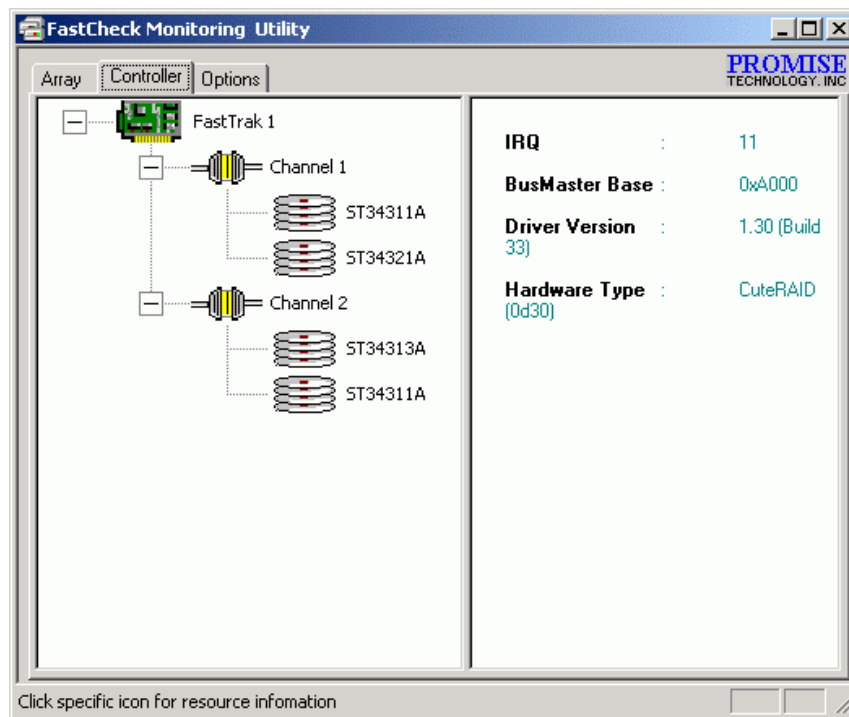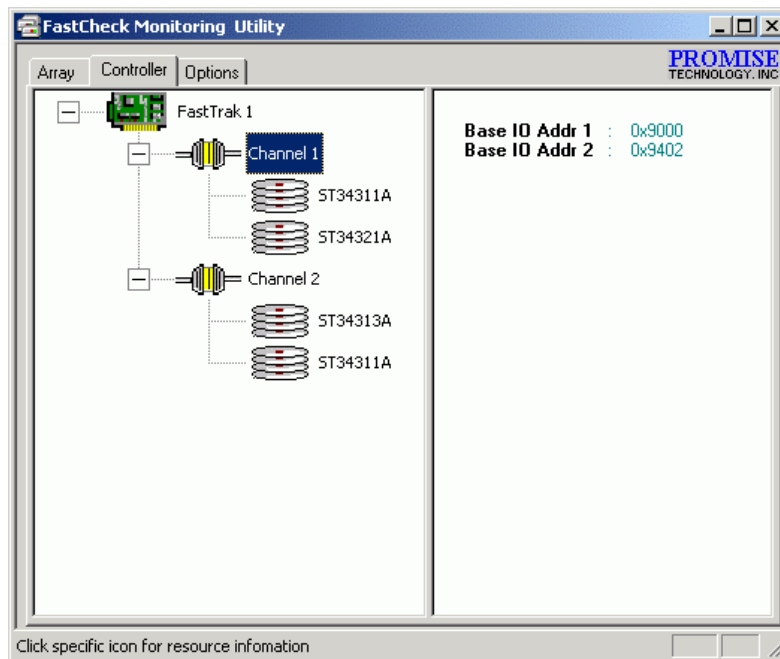
## *Viewing Controller Information*

By left-clicking on the FastTrak controller icon, the right pane shows the following information categories for that array:

1.  **IRQ:** Identifies interrupt request assigned to PCI device.

2.  **Bus Master Base:** Shows base address in hex numbering for board's bus master input/output function.

3.  **ROM Base Address:** Shows base address in hex numbering for FastTrak's Flash ROM chip.

4.  **Driver Version:** Identifies which version of the onboard IDE RAID controller's driver you have installed.

5.  **Hardware Type:** Identifies which FastTrak product is installed.
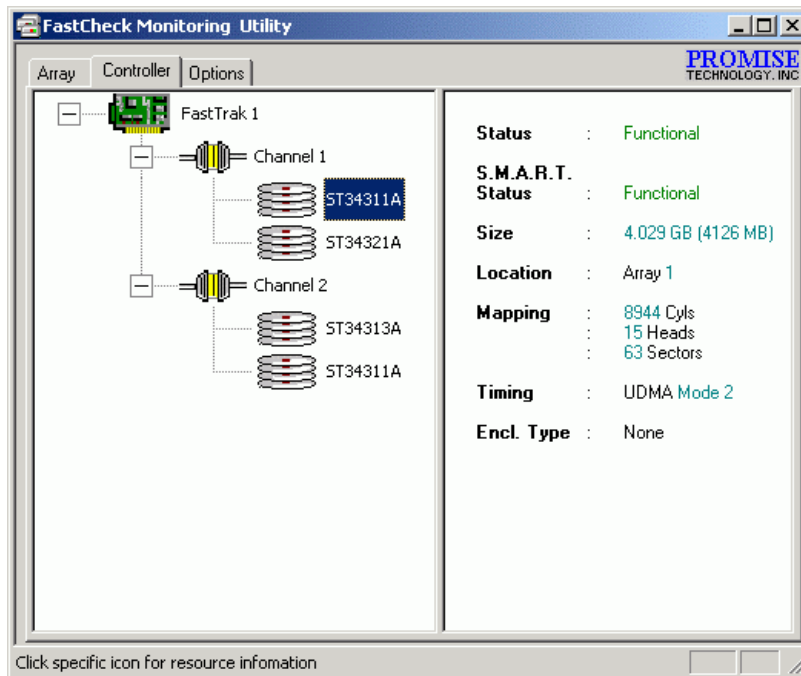
# *Viewing IDE Channel Information*

Left-clicking on a given channel icon or # in the left pane will show the Base I/O addresses of the channel in the right pane (used for troubleshooting).

## *Viewing Drive Information*

Left-clicking a given drive icon or ID in the left pane will show similar information categories as the "Array" window drive information in the right pane.

1. **Status** (Also shown under the "Controller" window)**:** It can be **Functional**, **Critical**, or **Offline**. The meanings are shown below:

    a、 **Functional:** Means the drive is working normally.

    b、 **Critical:** A problem has been detected in the drive and the drive taken offline as part of a mirroring array. Mirrored array will continue to function without the drive, Fix/replace the drive that has failed, then restore data from a backup source.

    c、 **Offline:** Drives that are **NOT** identified as "bad" may be taken offline if part of a Striping array containing a "bad" drive. These drives do **NOT** need to be replaced, however.

2. **S.M.A.R.T. Status:** Indicates whether attached hard disk drive implements **S**elf-**M**onitoring **A**nalysis & **R**eporting **T**echnology to predict drive failure.

3. **Size:** Indicates capacity of individual drive.

4. **Location:** Shows physical location of drive. Indicates on which IDE channel (1 or 2), and whether drive is Master or Slave on cable. This allows you to identify drives for removal/replacement.

5. **Mapping:** Indicates physical parameters of drive (cylinders, heads, sectors).

6. **Timing:** Shows selection of drive timing (directly related to burst speed) based on type of drive and cable used.

# *Using Options Window*

Clicking on the "Options" tab reveal the Options Window. Array administrators can customize the FastCheck™ monitoring utility in four major area: **Notification**, **Array Synchronization Scheduling**, **Setting Password**, **Desktop Appearance**. Most options relate to monitoring arrays (RAID 1).
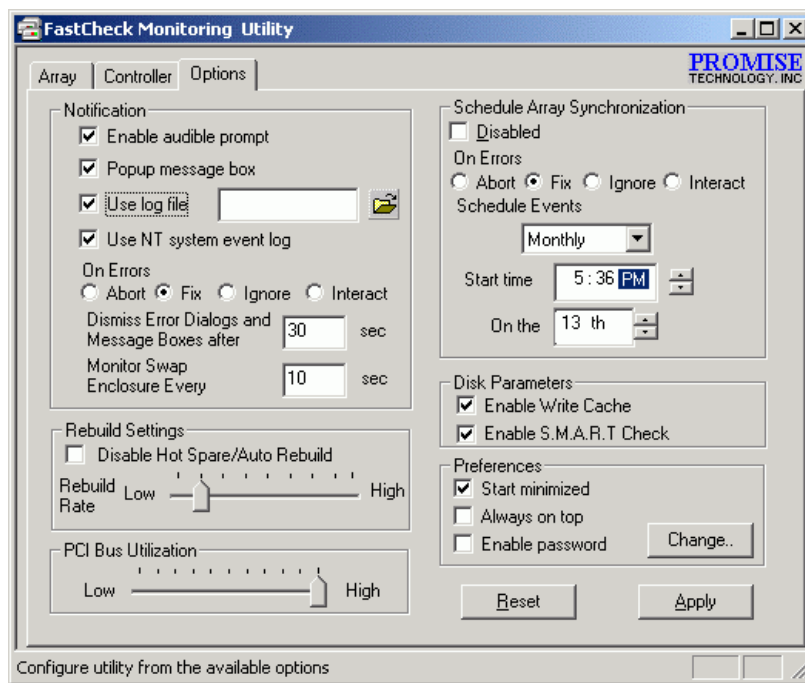
## *Selecting Notification Options*

This section of the Options windows allows you to select how you're notified of a system event. A system event includes driver-initiated rebuilds, user-initiated manual rebuilds or manual synchronization, and error-handling reporting for these processes.
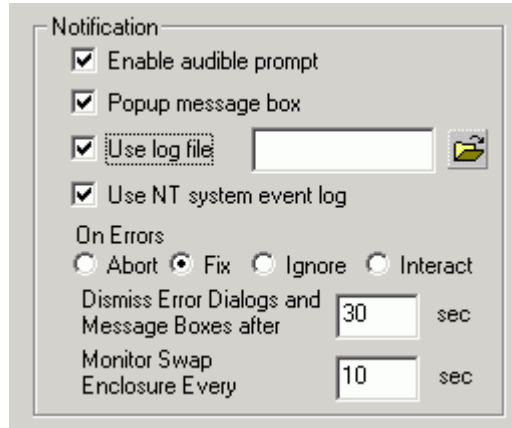
1. **Enable audible prompt** checkbox turns on/off an audible alarm of an event (typically a drive failure, or completion of rebuild or synchronization).

2. **Pop-up message box** checkbox turns on/off the appearance of an event message box that would typically indicate a drive failure, or completion of rebuild or synchronization.

3. **Use log file** checkbox allows writing operating event logs of the array activity (alerts and status reports) to a given file name and directory. If a file name id used but the path left blank, the default directory is the same as the FastCheck™ utility (typically is: C:\Program Files\Promise\FastTral100)

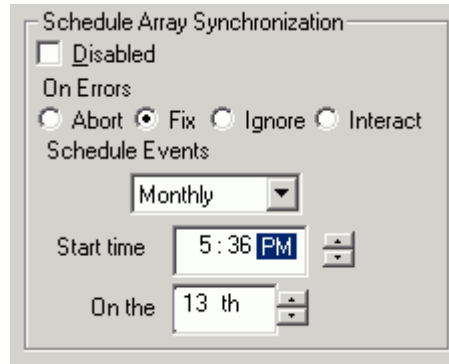4. **Use NT system event log** checkbox is grayed out under Windows 95/98/ME/2000 automatically. Under Windows NT 4.0 and Windows 2000, it permits user to write array logging to NT's own event log.

   a. To view FastCheck™ events under Windows NT, go to "Start" → "Programs" → "Administrative Tools" → "Event Viewer".

   b. In the Event Viewer, choose "Log" from the menu bar, and then check "System". Any events generated by FastCheck™ will appear under the source column as "FastCheck™".

5. **On Errors** section offers four radio button choice for the user to select what procedure they would like to perform if an error is detected during automatic/manual rebuilds or manual synchronization. There are three types of errors that onboard IDE RAID controller detects -- a data mismatch between the primary and secondary drive, a physical media error on source or target drive, or a total disk failure. The options for handling errors are as follows:

   a. Abort: Stops any synchronization or rebuild process if an error is encountered.

   b. Fix: In most cases, onboard IDE RAID controller automatically can correct errors. The method of correction varies depending on the type of error.

   c. Ignore: Onboard IDE RAID controller will log the event error and continue the rebuild or synchronization process. Use this setting if you want to detect the presence of errors, but do not want to fix these errors at the same time. You may then decide what to do about the error(s) detected.

   d. Interactive: Bt checking this option, a selection window will appear each time an error is detected asking you whether you want to **Abort**, **Fix**, or **Ignore** the error.

> *Warning:    This may result in mismatched drives under RAID 1.*

6. **Dismiss Error Dialogs** designates the length of time (in seconds) that a message box or error dialog box appears on screen.

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## *Scheduling Array Synchronization*

This section of the "Option" window allows you to schedule when and how often onboard IDE RAID controller will perform synchronization maintenance of a mirrored array.

```
┌─ Schedule Array Synchronization ──────┐
│  ☐ Disabled                            │
│  On Errors                             │
│  ○ Abort  ⊙ Fix  ○ Ignore  ○ Interact  │
│  Schedule Events                       │
│       ┌─────────────┬───┐              │
│       │ Monthly     │ ▼ │              │
│       └─────────────┴───┘              │
│                ┌───────────┐  ┌─┐      │
│  Start time    │ 5 : 36 PM │  │▲│      │
│                └───────────┘  │▼│      │
│                ┌───────────┐  ┌─┐      │
│  On the        │ 13  th    │  │▲│      │
│                └───────────┘  │▼│      │
└────────────────────────────────────────┘
```

1. **Disable** checkbox is checked (the default) to turn off automated scheduling of synchronization. When unchecked, the "Scheduling" section will be highlighted (see above).

2. **On Errors** section offers four radio button choice for the user to select what procedure they would like to perform if an error is detected during automatic/manual rebuilds or manual synchronization. There are three types of errors that onboard IDE RAID controller detects -- a data mismatch between the primary and secondary drive, a physical media error on source or target drive, or a total disk failure. The options for handling errors are as follows:

   a. Abort: Stops any synchronization or rebuild process if an error is encountered.

   b. Fix: In most cases, onboard IDE RAID controller automatically can correct errors. The method of correction varies

depending on the type of error.

   c. Ignore: Onboard IDE RAID controller will log the event error and continue the rebuild or synchronization process. Use this setting if you want to detect the presence of errors, but do not want to fix these errors at the same time. You may then decide what to do about the error(s) detected.

   d. Interactive: Bt checking this option, a selection window will appear each time an error is detected asking you whether you want to **Abort**, **Fix**, or **Ignore** the error.

3. **Schedule event** drop down box allows scheduling synchronization by minute, by hour, by day, by week, or by month. If enabled, the default is "By Month". This allows synchronization to take place during an off-hour when the system is either not in use or not at peak demand.

4. **Start Time** designates hr/min am/pm.

5. **On the** designates days of week or by ordinal ($1^{st}$, $2^{nd}$, $3^{rd}$ …) selection.

## *Setting Rebuild Options*
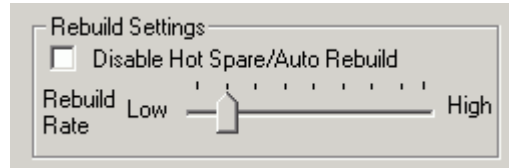


1.  **Disable Hot Spare/Auto Rebuild** checkbox turns off the automatic rebuilding of a mirrored array. The default id unchecked (or enable Host Spare/Auto Rebuild).

2.  **Rebuild Rate** assigns the amount of importance the onboard IDE RAID controller gives to mirroring data from one drive to another in the background. A "high" setting assigns most of onboard IDE RAID controller's resources to the rebuild process at the expense of responding to ongoing read/write data requests by the operating system. A "Low" setting gives priority to ongoing read/write data requests by the operating system at the expense of the rebuild process and will typically result in longer rebuild times. The setting shown above in the default.

## Setting PCI Bus Utilization Option

This Section of the "Option" window allows you to change how much time the onboard IDE RAID controller holds on to the PCI bus to transfer data.

```
┌─ PCI Bus Utilization ──────────────────┐
│            ' ' ' ' ' ' ' ' ' '         │
│   Low  ═══════════════════╡      High   │
└─────────────────────────────────────────┘
```
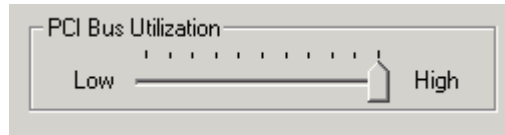
The default setting of "High" on the slider bar means onboard IDE RAID controller holds on to the PCI bus longer for data transfers to occur. A setting of "Less" reduces the time which controller occupies on the PCI bus and for use by other PCI devices.

Once a bus setting has been selected, click the "Apply" button on the "Option" window to implement changes immediately.

> *Note: In most cases, you do not need to change this setting since onboard IDE RAID controller's data handling rarely conflicts with another PCI device. However, certain brands of video capture cards can produce a "glitch" on play back A/V files that may require adjusting the default setting devices.*

## *Setting Disk Parameters Option*

```
Disk Parameters
☑ Enable Write Cache
☑ Enable S.M.A.R.T Check
```
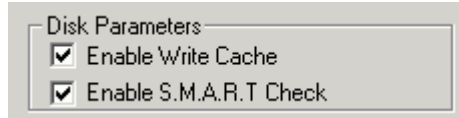
1. **Enable Write Cache** checkbox allows you to enable/disable write caching for hard disk drives that include this performance feature. FastCheck™ automatically recognizes such drives and enables the feature as the default setting. For drives that do not use write caching, this option is automatically grayed out.

2. **Enable S.M.A.R.T. Check** checkbox tells FastCheck™ to regularly monitor each drive to assure that drive failure prediction is functioning. The default is unchecked, meaning FastCheck™ will not monitor this function.

## *Setting Screen Preferences*

This section controls how the FastCheck™ utility screen is displayed and sets the security password to protect the administrative setting.

```
Preferences
☑ Start minimized
☐ Always on top
☐ Enable password      Change..
```
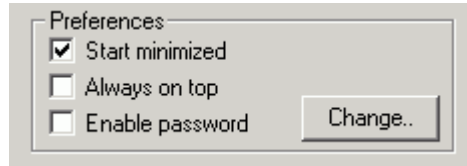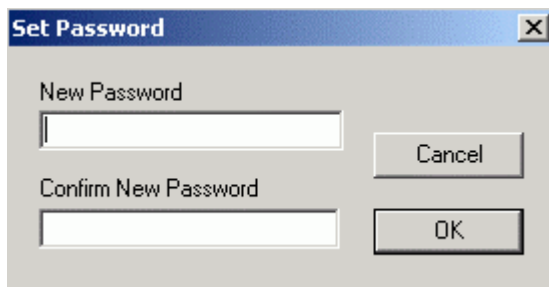
1. **Start Minimized** checkbox allows you to have FastCheck™ appear on the toolbar only on startup. Click on the icon to see the FastCheck™ utility screen.

2. **Always on Top** checkbox tells the utility to appears above all programs until closed or minimized manually.

3. **Enable Password** checkbox in the "Preferences" section turns on/off use if a password every time the FastCheck™ monitoring utility icon is selected or the program is run from the "Start" menu. Disabling use of a current password requires password entry.

## *Creating Password*

1. To create a password, check the "**Enable Password**" checkbox in the "Preferences" section. The "Set Password" window will appear.

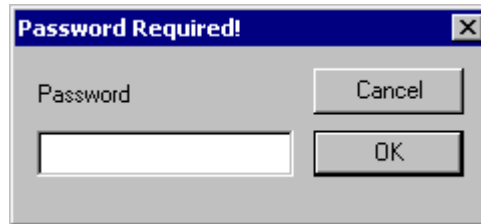| Set Password | ✕ |
|---|---|
| New Password | |
| [                          ] | Cancel |
| Confirm New Password | |
| [                          ] | OK |

2. Type the password you want to use. Press the <Tab> key or click to re-type the same password in the "Confirm New Password" section. Click the "OK" button.

> *Note: Remember to record the password you use in a secure place in case you forget it.*

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3. A confirmation screen will appear saying, "Password Checking is Enabled". Click the "OK" button.

4. Once the password feature is enabled, the following menu will appear before the FastCheck™ window can be opened, If this function enabled, the following window will appear on each use of FastCheck™.

## *Changing Password*

1. Input the original password you first created to gain access to FastCheck™.

2. Click on "Option: tab, and then click on the Change button in the "Password" section. The "Set Password" window will appear.

3. Type the password you want to use, Press the <Tab> key or click to re-type the same password in the "Confirm New Password" section.

4. Click "OK" button to finish changing password.


## *Disabling Password*

1. Input the original password you first created to gain access to FastCheck™.

2. Click on "Options" tab.

3. Uncheck the "Enable Password" checkbox. Click "Apply" button on "Options" window.

# Understanding Disk Array Concepts

## Disk Array Term

### Disk Array Description

A "disk array" is formed from a group of 2 or more disk drives that appear to the system as a single drive. The advantage of an array is to provide better throughput performance and/or data fault tolerance. Better performance is accomplished by sharing the workload in parallel among multiple physical drives. Fault tolerance is achieved through data redundant operation where if one (or more) drive fails or has a sector failure, a mirrored copy of the data can be found on another drive(s).

For optimal, results, select identical Ultra ATA/100 drives to install in disk arrays. The drives' ***matched performance*** allows the array to function better as a single drive.

### Disk Array Member

The individual disk drives in an array are called "members". Each member of a specific disk array is coded in their "reserved sector" with configuration information that identifies the drive as a member. All disk members in a formed disk array are recognized as a single physical drive to the system.

## *Disk Array Types*

For most installations, the FastBuild™ setup "Auto Setup" option will configure your system.

There are two disk array types that can be installed on the onboard IDE RAID controller. Striping is in the performance category while Mirroring, Mirroring is in the fault tolerance category.

Disk array within the performance and fault tolerance categories conform to the **R**edundant **A**rray **I**ndependent (or **I**nexpensive) **D**isks technology, or RAID. The RAID levels supported are 0 and 1.

| RAID Level | Performance | Capacity | # of Drives |
|------------|-------------|----------|-------------|
| 0 | High | # Drives x Smallest Size | 2 |
| 1 | Normal | 50% min | 2 |

## *About RAID Levels*

### *Striping (RAID 0)*

Reads and writes sector of data interleaved between multiple drives. When any disk member fails, it affects the entire array. Performance is better than a single drive since the workload is balanced between the array members. This array type is for high performance systems. Identical drives are recommended for performance as well as data storage efficiency. The disk array data capacity is equal to the number of rive members times the smallest member capacity. For example, one 1GB and one 2GB drives will form a 2GB (2x1GB) disk array.

**Stripe Size –** a value can be set from 1KB to 1024KB sector size. The size cam directly affect performance. In the FastBuild™ BIOS, the "Desktop" default is 8KB while "Server" and "A/V Editing " are 64KB.



RAID 0 (Striping)
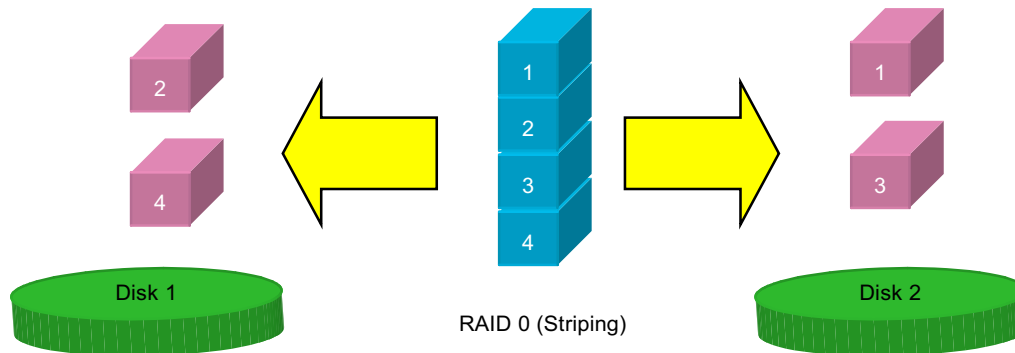
## Mirroring (RAID 1)

Writes duplicate data on to a pair of drives while reads are performed in parallel. ATA RAID 1 is fault tolerance because each drive of a mirrored pair is installed on separate IDE channels. If one of the mirrored drives suffers a mechanical failure (e.g. spindle failure) or does not respond, the remaining drive will continue to function. This is called *Fault Tolerance*. If one drive has a physical sector error, the mirrored drive will continue to function.

On the next reboot, the FastBuild™ utility will display an error in the array and recommend replacing the failed drive. You may choose to continue using your PC, however, we recommend replacing the failed drive as soon as possible.

Due to redundancy, the drive capacity of the array is half the total drive capacity. For example, two 1GB drives that have a combined capacity of 2GB would have 1GB of usable storage. With drives of different capacities, there may be unused capacity on the larger drive.

RAID 1 (Mirroring)
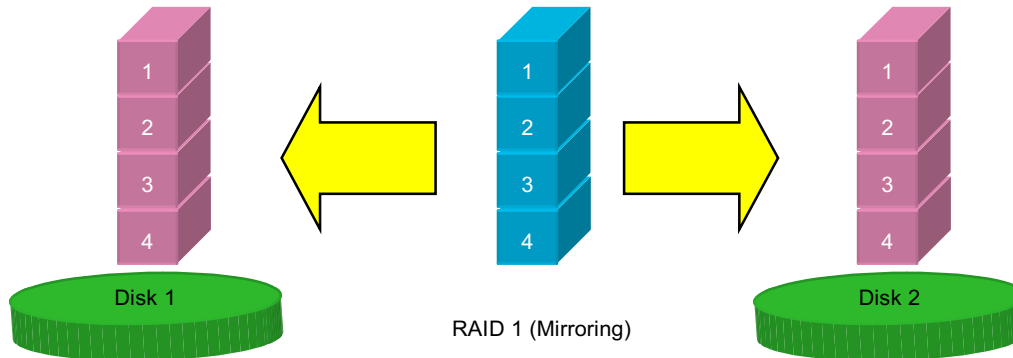
# Technical Support

Dear Customer,

Thanks for choosing AOpen products. To provide the best and fastest service to our customer is our first priority. However, we receive numerous emails and phone-calls worldwide everyday, it is very hard for us to serve everyone on time. We recommend you follow the procedures below and seek help before contact us. With your help, we can then continue to provide the best quality service to more customers.

Thanks very much for your understanding!

AOpen Technical Supporting Team

**1** **Online Manual:** Please check the manual carefully and make sure the jumper settings and installation procedure are correct.
http://www.aopen.com.tw/tech/download/manual/default.htm

**2** **Test Report:** We recommend choosing board/card/device from the compatibility test reports for assembling your PC.
http://www.aopen.com.tw/tech/report/default.htm

**3** **FAQ:** The latest FAQ (Frequently Asked Questions) may contain a solution to your problem.
http://www.aopen.com.tw/tech/faq/default.htm

**4** **Download Software:** Check out this table to get the latest updated BIOS/utility and drivers.
http://www.aopen.com.tw/tech/download/default.htm

**5**

**News Group:** Your problem probably had been answered by our support engineer or professional users on the news group.
http://www.aopen.com.tw/tech/newsgrp/default.htm

**6**

**Contact Distributors/Resellers:** We sell our products through resellers and integrators. They should know your system configuration very well and should be able to solve your problem more efficiently than us. After all, their attitude of service is an important reference for you if next time you want to buy something else from them.

**7**

**Contact Us:** Please prepare detail system configuration and error symptom before contacting us. The **part number**, **serial number** and **BIOS version** are also very helpful.

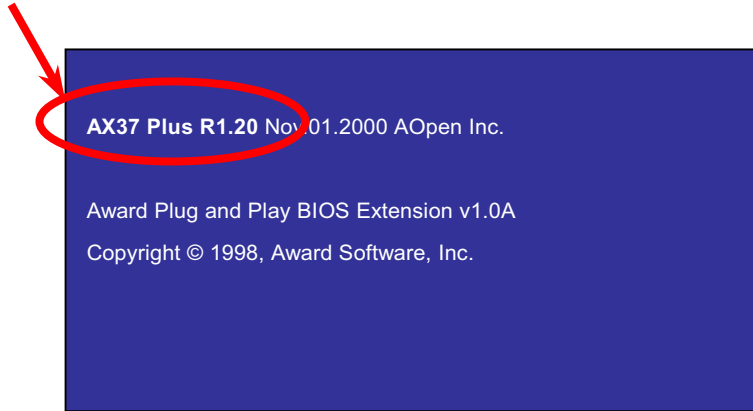## Part Number and Serial Number

The Part Number and Serial number are printed on bar code label. You can find this bar code label on the outside packing, on ISA/CPU slot or on component side of PCB. For example:



Part No.                                                         Serial No.
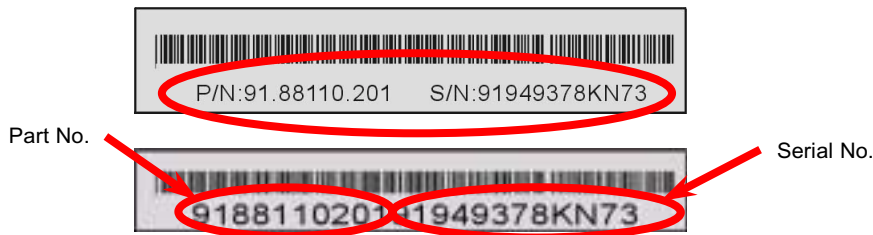
**P/N: 91.88110.201** is part number, **S/N: 91949378KN73** is serial number.

## *Model name and BIOS version*

Model name and BIOS version can be found on upper left corner of first boot screen (POST screen). For example:

**AX37 Plus R1.20** Nov.01.2000 AOpen Inc.

Award Plug and Play BIOS Extension v1.0A

Copyright © 1998, Award Software, Inc.

**AX37 Plus** is model name of motherboard, **R1.20** is BIOS version.

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- Be upgraded to gold membership of Club AOpen program.

- Receive email notification about product safety alerts. Its purpose is to alert consumers quickly and conveniently when products contain technical issues.

- Receive email notification about latest product's announcements.

- Be able to personalize your AOpen web pages.

- Receive e-mail notification about latest BIOS/Driver/Software release information.

- Have opportunities to participate special product promotional programs.

- Enjoy higher service priority to receive technical assistance provided by AOpen specialists worldwide.

- Be able to join the discussions of web-based news groups.

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> *Note: If registering products purchased from different dealers/retails and/or purchased on different dates, please submit a separate form for each product.*

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| **Simplified Chinese** | *http://www.aopen.com.cn/tech/contact/techcn.htm* |