RocketRAID 3530/3540 SATAII Host Adapter User's Guide

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Congratulations

You have purchased one of the highest performing and SATA hardware RAID controllers available. The RocketRAID 3500 series offers the performance and data protection features for homogeneous storage environments. The RocketRAID 3500 series meets the bandwidth requirements for high performance applications like video capture and editing, CAD/CAM and digital graphics.

Remember to visit the HighPoint websites at http://www.highpoint-tech.com and http://www.hptmac.com. There you can find information on all of HighPoint's products with FAQ's, online manuals, BIOS and driver updates.

1 - Features and Specifications

Host Adapter Architecture

- TerabyteStream™ for Blazing Performance
- TerabyteSaver™ and TerabyteGuard™ for Data Protection and Reliability
- Intel IOP 81341 (800MHz)
- PCI -Express x8 (compatible with x16 slot)
- 256 MB of DDR II memory with ECC protection
- RocketRAID 3530/3540 support up to 12/16 SATAII drives
- Multi adapter support up to 4 adapters
- Intel RAID 6 (P+Q) for large capacity RAID arrays
- NVRAM for write journaling
- Battery Backup Unit (BBU) Optional
- RoHS compliant

Advanced RAID Features

- Support RAID 0, 1, 3, 5, 6,10, 50 and JBOD
- Multiple RAID support
- Multiple logical drive support

- BIOS booting support
- BIOS PnP and BBS (BIOS boot specification)support
- Write through and write back cache
- Online array roaming
- Online capacity expansion (OCE) and Online RAID level migration (ORLM)
- Quick and Background initialization for instant RAID configuration
- Automatic RAID rebuild
- 64bit LBA support greater than 2TB per volume
- S.M.A.R.T monitoring hard drive status for reliability
- Staggered Drive Spinup
- (MAID) spin down drives in array when idle
- ATA pass-through mode support
- Firmware update while running the Operating System

Array Monitors, Alerts and Indicators

- SMTP for email notification
- Alarm / Buzzer alerts for drive failure
- SAF-TE (I2C) and SGPIO enclosure management
- SNMP for remote management
  - Ethernet port for (OBM) Out of Band Management
  - NTP (Network Time Protocol)
  - Intelli-VRM. (Intelligent Virtual RAID Management)
- SHI – Storage Health Inspector (S.M.A.R.T. and disk maintenance)

HighPoint RAID Management (HRM)

- Hot key (ctrl-h) boot-up RAID manager via BIOS
- Web browser-base RAID management software
- Command Line Interface (CLI)
- API library for customizing AP

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Operating System Support

- Windows XP, 2003, Vista, 2008 (32 and 64-bit versions)
- Linux (Fedora Core, Red Hat Enterprise / CentOS, SuSE)
- Mac OS X 10.4.x and above
- FreeBSD

Physical Specifications

Size: (202.0mm x 96.0mm) 7.95" L x 3.77" W

EMI: FCC Part 15 Class B and CE

Thermal and Atmospheric Characteristics:

Work Temperature Range: +5 C ~+ 55 C

Relative Humidity Range: 5% ~ 60% non condensing

Storage Temperature: ~20 ~ 80 C

MTBF: 920,585 Hours

Electrical Characteristics:

PCI-e	3.3V	12V
Power	2W max	14W max

2 - Kit Contents

Host Adapter

Mini-SAS to SATA cables
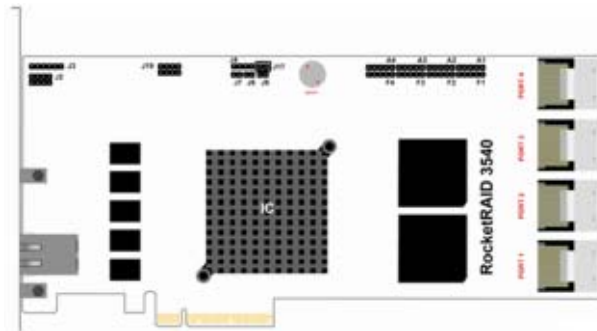
User Guide

HighPoint Products Software CD

Hardware - Description and Installation

1 – RocketRAID 3540/3530 Host Adapter layout

RocketRAID 3540

RocketRAID 3530

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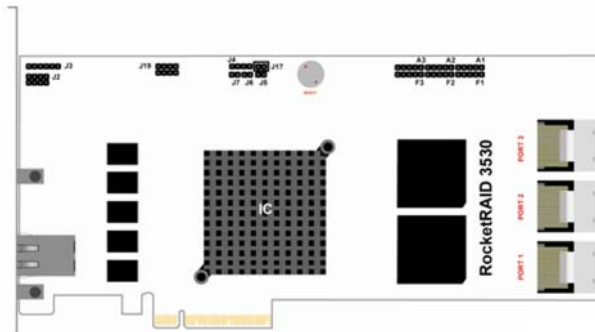
Port1-4 - These represent the RocketRAID 3530/3540's Internal Mini-SAS ports. Each port can support up to 4 SATA hard disks. The RR3530 is 3 ports, and can support up to 12 disks. The RR3540 is 4 ports, and can support up to 16 hard disks.

BEEP1 – (alarm/speaker): the speaker emits and audible alarm in the case of disk/array failure.

A1-A4/F1-F4 – LED connections. "A" refers to the disk activity connectors, and those marked "F" function as disk failure connectors

Note: The RocketRAID 3530 supports 12 disks, and only provides 3 LED connectors for each function (A1-A3 ,F1-F3).

J17 - This jumper can be used to enable or disable the card's alarm (BEEP1). The alarm is enabled by default (the jumper is attached). To disable the alarm, remove the jumper

J4 - This jumper supports SAF-TE interface (I2C).

J18 (BBU connector) - Connector for battery backup unit (optional part).

Ethernet Port - Ethernet port (U32) for Out of Band Management, support Net Time Protocol.

2 – LED Connections

LED connectors (Drive-activity/Drive-failure):. The RocketRAID 3530/3540 host adapters have multiple LED connectors that are used to indicate the activity and failure status of hard drives to the card's SATA channels.

Active and Failure LED

Connectors A1-A4 provides LED support for Drive Activity, while connectors F1-F4 indicate Drive Failure.

ACT LED and Fail LED have 5 pins while we just explain 4 pin's function.

A1/ A2/A3 /A4
F1/F2/F3/F4

5   4   3   2   1

Pin Number Connection	Pin1	Pin2	Pin3	Pin4	Pin5
A1	Drive1	Drive2	Drive3	Drive4	NC
A2	Drive5	Drive6	Drive7	Drive8	NC
A3	Drive9	Drive10	Drive11	Drive12	NC
A4	Drive13	Drive14	Drive15	Drive16	NC
F1	Drive1	Drive2	Drive3	Drive4	NC
F2	Drive5	Drive6	Drive7	Drive8	NC
F3	Drive9	Drive10	Drive11	Drive12	NC
F4	Drive13	Drive14	Drive15	Drive16	NC

J4 – This jumper is the SAF-TE interface port (for disk enclosures/chassis) SAF-TE jumper has 4 pins while we just explain 3 pin's function.

J4

1   2   3   4

Pin Number	Pin description
Pin 1	SCL
Pin 2	GND
Pin 3	SDA
Pin 4	NC

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3 – Hardware Installation

Note: Make sure the system is powered-off before installing the RocketRAID host adapter.

1. Open the system chassis and locate an unused PCI-Express x8.

2. Remove the PCI slot cover.

3. Gently insert the RocketRAID card into the PCI-Express slot, and secure the bracket to the system chassis.(*illustration shows* RocketRAID *3540)*

4. After installing the adapter, attach the Mini-SAS connectors to the RocketRAID Card's Mini-SAS port, and to chassis backplane. Each Mini-SAS cable supports up to 4 hard drives. Consult the chassis manual for proper installation procedures.

5. Close and secure the system chassis.

PCI-Express slot
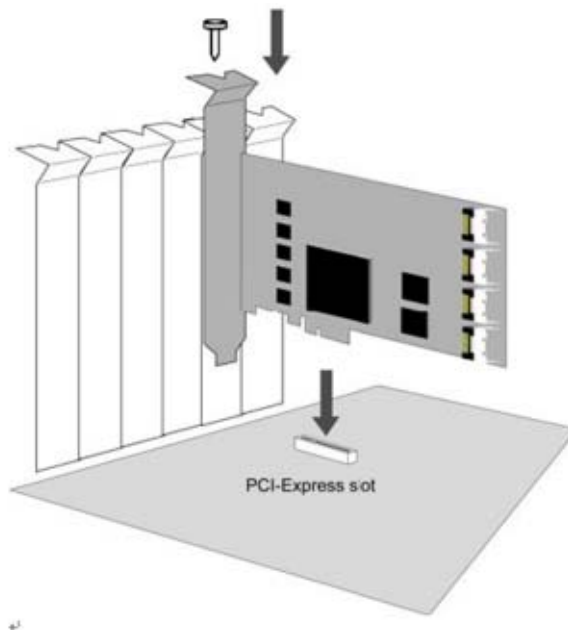
4 - Verifying Installation

Once the host adapter and hard disks have been installed into the chassis, boot-up the system to verify that the hardware is properly recognized.

1. Power on the system. If the system detects the presence of the adapter, the RocketRAID BIOS Utility will be displayed during boot up.

2. Press Ctrl+H to access the RocketRAID BIOS Utility. The BIOS Utility will display information about hard drives attached to the adapter. Make sure all attached drives are detected by this utility. If any of the hard drives are not detected, power down the system and check the cable connections to both the card and enclosure.

5 - Battery Backup

A battery backup option will be available as an optional add-on component. The battery provides additional data security in case of a critical system failure. Data normally lost during a major system fault, such as a power outage or CPU failure which was in transit at the time of the failure (stored in the card's onboard cache), will remain viable for up to 72 hours. The battery unit can be attached to the card using the BBU CONN. Attach the BBU into J18 of RocketRAID 3530/3540 using the cable included with the BBU unit: (illustration shows RocketRAID 3540)

PCI-Express slot

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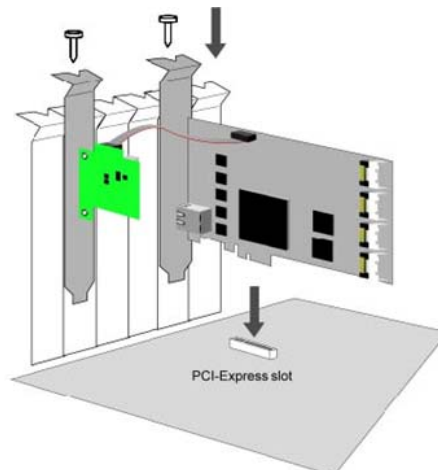
RocketRAID BIOS Utility

The RocketRAID 3530/3540 card will display it's BIOS screen during the system's boot process.

Press Control + H when prompted, to access the BIOS settings Menu.

1 - BIOS Settings Overview

The RocketRAID 3530/3540 BIOS utility is an interface that provides management commands and controller related settings.

Using the BIOS Utility

The following keys are utilized by the RocketRAID 3530/3540 BIOS utility:

F10 – press F10 to highlight the tool bar Menu.

Arrow keys – use these to move between different menu items

Enter – Open the selected toolbar command/execute the selected command.

Esc – move back to the previous menu, cancel the selected operation.

Tab – Switch between Disk and Array menus, move to next Menu item.

Space Bar – select an item (when selecting Block Size for a RAID configuration, for example).

BIOS Menu Shortcuts

The BIOS interface can also be navigated using key stroke combinations (Alt +" X").

When viewing the interface, letters highlighted in "red" represent the "X" values:

"S" – System
"D" – Disk
"A" – Array
"C" – Controller
"W" – Window
"H" – Help
"X" - Exit

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Logging In

The BIOS Utility has two interface modes: **User** and **Supervisor**

The User mode can only view information about the RocketRAID card, disks and arrays.

The Supervisor mode is used to create/delete arrays, and configure RocketRAID related settings. Supervisor mode requires a password – this is the same password that you will need in order to use the Web Management interface.

Press **F10** – this should bring you to the "**System**" toolbar command. Press Enter.

To log on as a User, use the arrow keys to highlight "**User mode**", and press Enter.

To log on as Supervisor, select "**Supervisor Mode"**:, and press Enter.
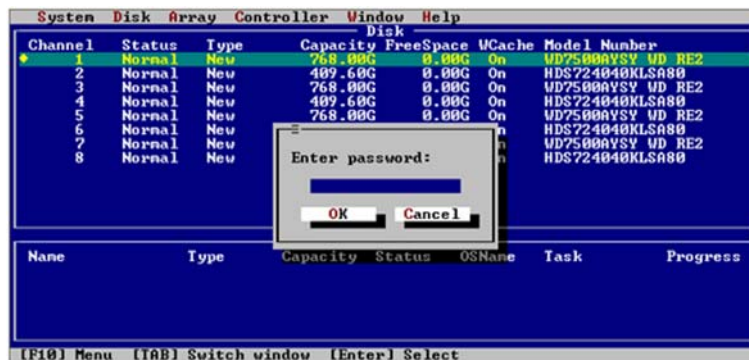
You will be asked to enter the Supervisor password.
The default password is "**hpt**".

BIOS Commands

```
 System  Disk  Array  Controller  Window  Help
                    Disk
 Channel   Status   Type        Capacity FreeSpace WCache Model Number
```

System

User/Supervisor modes – interface modes

Change password - for Supervisor mode

Exit the utility – quit and exit the RocketRAID BIOS utility

Disk

Information – displays information about the select hard disks

Initialize – initialize the selected disks (required in order to use new hard disks for creating RAID arrays, disk replacement, or configuring spare disks.

Toggle Spare – configure spare disks.

Unplug – remove the selected disks (hot-swap)

Turn on write cache – enable write cache for the selected disks

Turn off write cache – disable write cache for the selected disks

Rescan – prompts the RocketRAID card to scan for new hard disks.

Array

Information – displays information about the selected RAID array

Create – Create a RAID array using the selected disks

Delete – Delete the selected RAID array

Unplug – Remove the selected RAID array (safe removal of disk members of the target array - hot-swap)

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Verify – Verify the selected array (checks for parity errors)

Start Task –

End Task – Stop/Pause current task

Controller

Information – View information about the RocketRAID host adapter

Eventlog – View event log entries

Setting – View and configure host adapter settings

Network – View and configure host adapter network configuration

Window

Maximize – enlarge the selected Window

Restore – restore Windows sizes to default setting

1.Disk – toggle/select the Disk Window

2.Array – toggle/select the Array Window

Refresh – updates on screen information

Help

About – BIOS utility/Company information

2 - Creating RAID Arrays

Initializing Disks:

Before creating a RAID array, the disks must be initialized. Disk initialization writes necessary RAID configuration information to the hard disks.

1. From the Disk window, highlight the target disks using the arrow keys, then select using Enter. A numeral will be displayed before each selected disk.

2. Once all target disks have been selected, select **Disk** from the tool bar, then highlight Initialize and press Enter.

The utility will display a warning, and ask you to press Y (yes) to initialize, or N (no) to cancel. Once initialized, these disks can be used to create RAID arrays.

Warning: Initialization will destroy all pre- existing data on the selected hard disks. Only initialize disks that do not contain critical data. Disks only need to be initialized once.

Disks do not have to be re-initialized after an array is deleted, or before creating a new array.

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Creating Arrays:

From the Disk window, highlight the target disks using the arrow keys, then select using Enter. A numeral will be displayed before each selected disk. To de-select a disk, highlight the target disk, and press Enter once more.

Once all target disks have been selected, select **Array** from the tool bar, then highlight **Create** and press Enter.

This will open the RAID creation Menu.
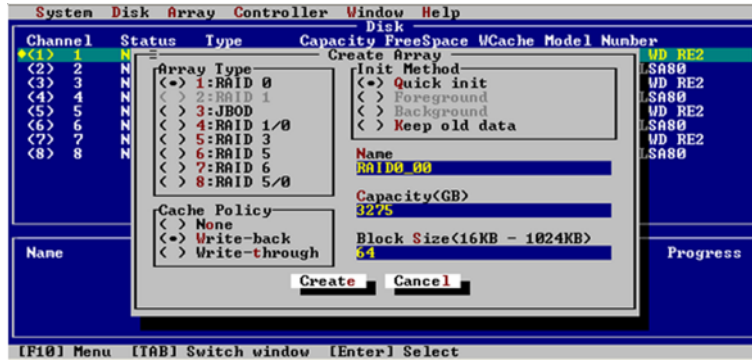
1. **Array Type:** First, use the Tab or arrow keys to highlight the desired RAID level, and press the Spacebar to select the Array Type. The RocketRAID 3530/3540 host adapters support RAID 0, 1, 3, 5, 6, 10, 50 and JBOD.

2. **Cache Policy:** Specify the Cache Policy of the array.

    a. **None:** No cache policy set
    b. **Write-**back – utilizes disk cache. Default setting, optimal for performance.
    c   **Write-**through – data is written directly to disk. More secure than Write-back, but will perform slower.

3. **Init Method –** For redundant arrays (RAID 1, 3, 5, 6, 10 and 50) specify the RAID Initialization method.

    a. **Quick init –** use this option if you want to quickly create an array for testing purposes. This will clear all previous data, and will not build parity. Do not use this method if data integrity is priority.
    b. **Foreground –** this will instruct the host adapter BIOS utility to start the initialization process immediately after creating the array. This option is recommended for data security.
    c. **Background –** this will instruct the host adapter to initialize the array in the background, after the operating system has booted. Consider this option if you need to install an operating system to the array – this allows the array to be used immediately.

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    d.   **Keep old data –** this will only write RAID configuration data to the disks. Use this option when attempting to recover lost arrays.
Note: Make sure the array is re-created using the same settings (disk order, RAID level, Block size, Capacity, Sector Size). If the settings differ from the original configuration, the array will not be accessible, and data may be lost.

4.   **Name:** Use the Tab or arrow keys and highlight **Name**. This feature allows you to name an array for reference. This is an optional setting. Press **Enter** to use the default name, or type in the desired name, and press **Enter**.

5.   **Capacity (GB):** The adapter will display the full available capacity by default. If you want to specify the size of the array, type in the desired capacity (in Gigabytes), and press **Enter**. Specifying the capacity allows you to create multiple arrays using the same set of disks. Any free disk space can be used to

    create additional arrays, or used as a **Spare** disk (if the available capacity meets the requirement – see **5 - Maintaining Arrays – Spare Disks**, for more information).

6.   **Block Size –** This option allows you to specify the block size (also known as "stripe size") for specific array types (RAID 0, 3, 5, 6, 10 and 50). You can specify block sizes ranging from 16(KB) to 1024(KB). This allows you to tailor the array for specific applications. A balanced block size of 64 (in KB) is recommended for most applications.

7. **Create / Cancel –** Use Tab or arrow keys to highlight the **Create** or **Cancel** options, and press **Enter**. Selecting **Cancel** will stop the creation process. Selecting **Create** will create an array based on your selections, and open the **Sector Size** window.

8. **Sector Size –** Also known as VSS (Variable Sector Size), this option allows you to specify the sector size of the array, for use With Windows operating systems. Older, 32-bit versions of Windows do not support volumes over 2TB in size, unless the sector size is altered. This option is not needed for Windows XP 64, Win2003 (SP1), Windows 2008, or Windows Vista. These operating systems support larger volumes, and introduce a partitioning method known as GPT (GUID Partition table). Use GPT when creating arrays over 2TB in size. For Windows 2000, or 32-bit versions of XP, refer to the following chart:

512B – Default sector size (supports up to **2TB**). Use this setting for Windows OS that support GPT.
1K – Supports arrays up to **4TB**
2K – Supports arrays up to **8TB**
4K – Supports arrays up to **16TB**
Highlight the appropriate Sector Size, and press Enter to create the array

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3 - Deleting Arrays

From the Array window, highlight the target array and press **Enter**. Highlight **Array** from the toolbar.
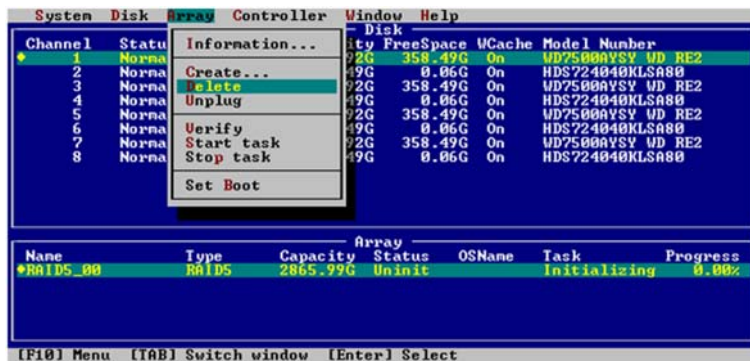
Select Delete and press **Enter**. The utility will display a warning message. Press **Y** (yes) to delete the array, or select **N** (no) to cancel.
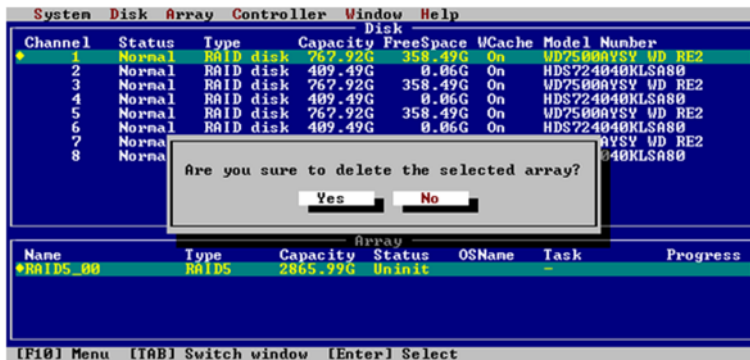
Warning: all data stored on the array will be lost – do not delete if the array contains critical data.

4 - Monitoring the Host Adapter, Arrays and Devices

The BIOS Settings Utility allows the Administrator to check the status of the RocketRAID host adapter, and any devices (hard disks), and arrays hosted by the adapter.

Disk/Array Status

To check the status of any disk or array, use Tab to select the Disk or Array Windows, highlight the target disk/array and press enter.

Array Information – this will display the array's Name, RAID type, Block size, Sector size, member hard disks, and status.

Disk Information – this will display the disk Model Number, serial number, firmware revision, capacity, and various disk related settings (NCQ, TCQ, Read Ahead, Write Cache, and Staggered Drive spinup mode).

Alternately, highlight the target disk/array, then highlight either Disk or Array from the tool bar, select Information, and press Enter.

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Controller Information

Highlight **Controller** from the toolbar, select **Information**, and press **Enter**.

This option will display information about the host adapter's model (Product ID), PCI-E bus location, IO Processor model, memory, firmware revision, serial number, and the status of the BBU (battery backup unit).

Event Log

The RocketRAID host adapter automatically generates Event Log entries during the case of routine administration (creating arrays), or in the case of a critical error (disk or array failure).

Highlight **Controller** from the toolbar, select **Event Log**, and press **Enter**.

Use this option to view Event Log information, including **Errors** (disk or array failure), **Warnings** (problems such as disk sector or Smart issues) and **Information** (such as the creation or deletion of arrays).

This option will display information about the host adapter's model (Product ID), PCI-E bus location, IO Processor model, memory, firmware revision, serial number, and the status of the BBU (battery backup unit).

You can filter displayed events by using Tab to highlight the **Information**, **Warning**, and **Error** options towards the top of the window. Enable or disable these filter options using the **Spacebar**.

Use the Clear option to delete all **Event** Log entries. Use the **Prev** and **Next** option to scroll through log entries. Select **Cancel** (or press Esc) to exit the window.

5 - Maintaining Arrays

The BIOS Settings Utility provides several RAID and device related maintenance functions, including device and controller settings, Network Configuration settings (for managing the host adapter, remotely), and rebuilding broken/degraded RAID arrays.

Network Settings

This option allows the Administrator to configure Network Settings for use with the RocketRAID host adapter's Out-of-Band (OOB), and In-Band (IB) Management functions.

Highlight Controller from the toolbar, select **Network**, and press **Enter**.
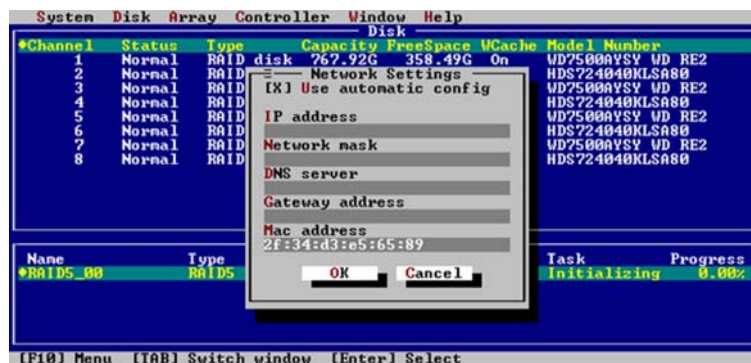
This option will display information about the host adapter's network settings. By default, these settings are configured automatically, based on information provided by the local network. To manually configure these settings, use the Tab or arrow keys and highlight **Use automatic config**, and press the **Spacebar**. Type in the appropriate network settings, highlight **OK**, and press **Enter**.

Controller Settings

Highlight Controller from the toolbar, select Settings and press Enter.
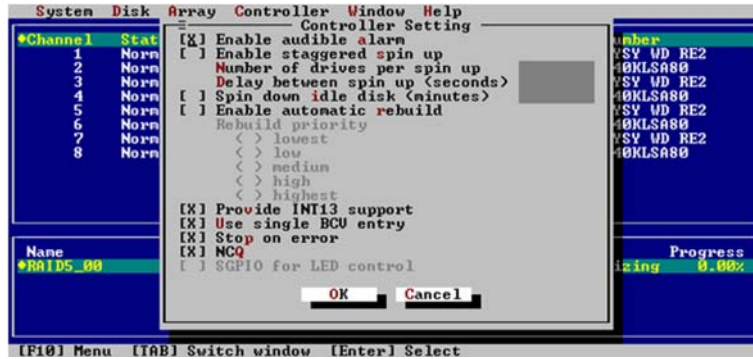
Use the tab and arrow keys to select each item, and the Spacebar to enable/disable the target option.

- **Enable Audible Alarm** – enables/disables card's alarm (beeper)

- **Enable Staggered drive spinup** – enable/disable staggered drive spin-up Disabled by default. If enabled, the host adapter will spin disks in sequence (one disk, every "x#" of seconds – enter the desired value). Some hard disks do not support this setting – consult the hard disk's documentation for more information.

- **Spin down idle disk** – If enabled, the host adapter will power down idle (inactive) disks/arrays based on the allotted time. Specify the value (in minutes)

- **Rebuild Priority** – This option is provided for redundant arrays. This setting determines the priority of rebuilding arrays in regards to other system tasks.

- **Provide INT13 support** – enable or disable INT13 (the host adapter's boot function). Disabling this setting may resolve motherboard BIOS related issues in cases where the card cannot be loaded into memory properly (option ROM/out of memory errors).

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- **Use Single BCV Entry** – also related to motherboard BIOS settings (troubleshooting)

- **Stop on Error** – Enabled by default. If disabled, the host adapter BIOS menu will bypass array or device errors when booting the system.

- **NCQ** – enable/disable NCQ (native command queuing)

Device Settings

These options allow the administrator to enable or disable hard disk cache related settings.

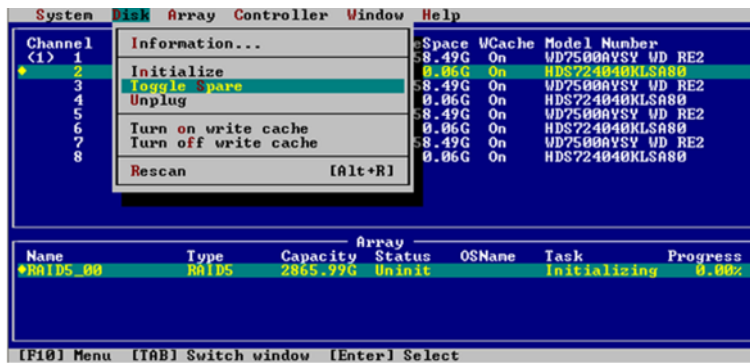From the Disk Window, highlight the target disk and press Enter. Highlight Disk from the toolbar:

Turn on Write cache – enables the use of the hard disk cache. This is the recommended setting

Turn off write cache – disable the use of the hard disk cache. Use this setting for troubleshooting hard disks, or for testing purposes. Disabling disk cache will lower performance

Spare Disks

Spare Disks are used to automatically rebuild Redundant RAID arrays in the case of disk failure. As with creating RAID arrays, disks must be initialized before they can be used as spares. To set a hard disk to act as a Spare Disk, switch to the Disk window, use the arrow keys to select the target disk from the list of initialized disks, and press **Enter**.

Highlight **Disk** from the toolbar, then select **Toggle Spare**, and press **Enter**.

To remove a spare, follow the same procedure. From the Disk window, select the target Spare disk and press Enter. Highlight **Disk** from the toolbar, select **Toggle Spare** and press **Enter**.
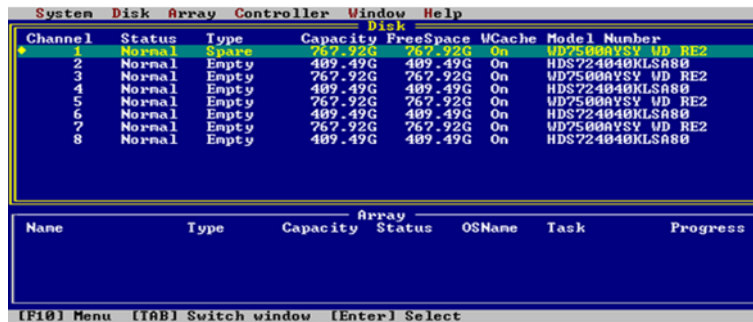
Generally, single disks are designated to act as spares (disks that are not configured into RAID arrays).

However, in some instances, disks that are members of RAID arrays may also be assigned to act as a spare disk. If the disks in question are part of a RAID array that did not utilize the full available capacity at the time of creation, these disks may be

used as spares. For example: a RAID 0 array was created between two 200GB hard disks, but only 200GB of space (out of a grand total of 400GB), was assigned to that array. In this example, 200GB of disk space remains unallocated. This unallocated space allows these disks to be set as spares for a separate redundant array that meets the capacity requirement (200GB or less).

Verifying Arrays

Routine RAID verification is essential for maintaining the integrity of data stored on redundant RAID arrays. The RocketRAID BIOS utility allows you to manually verify RAID arrays.

From the Array window, highlight the target array and press **Enter**. Highlight **Array** from the toolbar, select **Verify**, and press **Enter**.

Progress will be displayed towards the lower right-hand corner of the screen (percent complete).
To stop or pause the verification process, select **Stop Task** from the same menu. To continue the verification process, select **Start Task**.

6 – Additional Functions and Settings

Set Boot

Highlight the target array from the Array window and press Enter. Highlight Array from the toolbar:
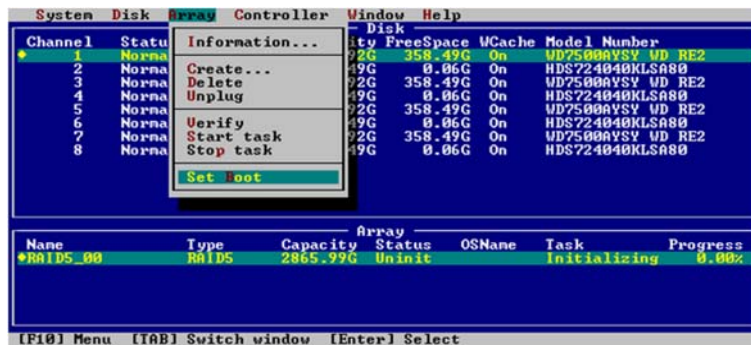
Note: Use this option to set an array to act as the boot device. The selected array will act as the boot "disk", if the motherboard's BIOS instructs the card to act as the system's boot device.

Hot-Swap

The BIOS utility provides several options that allow the administrator to add or remove disks and arrays, without powering down the system.

Adding/removing Disks

To prepare a disk for removal, first highlight the target disk using the Disk window and press **Enter**. Highlight Disk from the toolbar, select **Unplug,** and press **Enter**.

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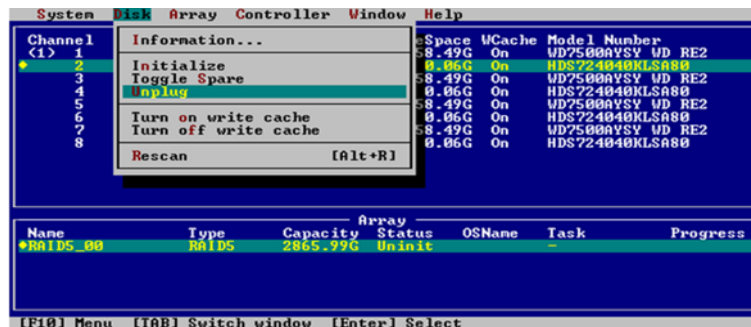
To add a disk, install the hard disk, then highlight **Disk** from the toolbar, select **Rescan**, and press **Enter**.

Note: After installing the disk into the hot-swap capable drive bay, wait several seconds to allow the disk to fully power on, before using the Rescan command.

Adding/removing Arrays

To prepare a RAID array for removal, highlight the target array using the Array window and press **Enter**. Highlight **Array** from the toolbar, select **Unplug**, and press **Enter**.
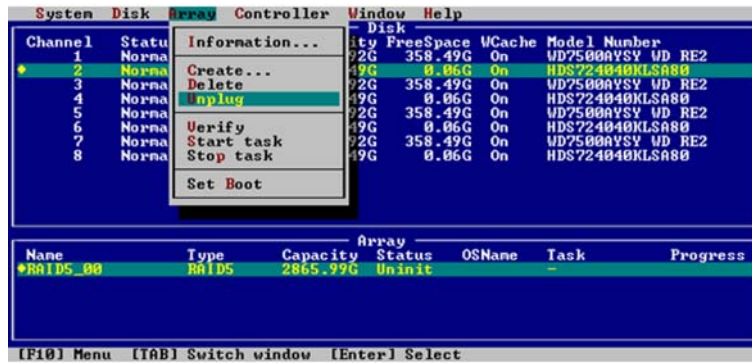
The interface will notify you when the disk can be removed.

To add an array, install all of the RAID hard disks, then highlight **Window** from the toolbar. Select **Refresh**, and press **Enter**.

Note: After installing the hard disks into the hot-swap capable drive bays, wait several seconds to allow the disks to fully power on, before using the Rescan command.

Window Menu

The Window menu provides several view options.

- **Maximize** – enlarge viewing area of the selected window (Disk or Array)
- **Minimize** – reduce the viewing area of the selected window)
- **Disk** – selects the Disk window
- **Array** – selects the Array window
- **Refresh** – scans for any hardware changes (used when adding arrays or disks to the card)

Device Driver CD and HighPoint RAID Management

Each retail box includes a copy of the HighPoint Products Software CD.

This CD can be used to generate driver diskettes, and install the HighPoint RAID Management Utility Suite for a variety of operating systems.

1 - Creating a Driver Diskette

Windows 2000, 2003 and several distributions of Linux and FreeBSD require driver diskettes when installing the operating system directly to a disk or array hosted by the Rocket RAID host adapter.

To create a driver floppy diskette:

1. Insert the CD into the system's CD/DVD drive. The program should start automatically.
2. Insert a blank floppy diskette into the system's floppy drive.
3. Click on "Create Driver Diskette".
4. Click on the "Please Select a Product" drop-down button, and select the appropriate host adapter model from the list.
5. Click on the "Please Select the Diskette you want to create" drop-down button, and select the desired operating system from the list.
6. Click on the "OK" button to create the driver diskette.
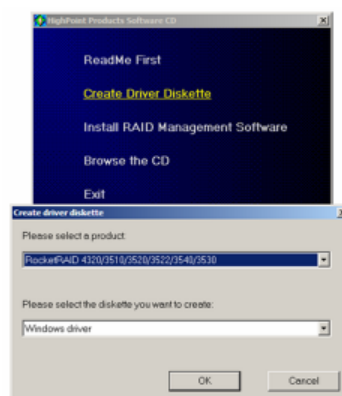
2 - Device Driver Installation

We recommend visiting the RocketRAID download pages for the latest Windows Device Driver updates:

RocketRAID 3540

http://highpoint-tech.com/USA/bios_rr3540.htm

RocketRAID 3530

http://highpoint-tech.com/USA/bios_rr3530.htm
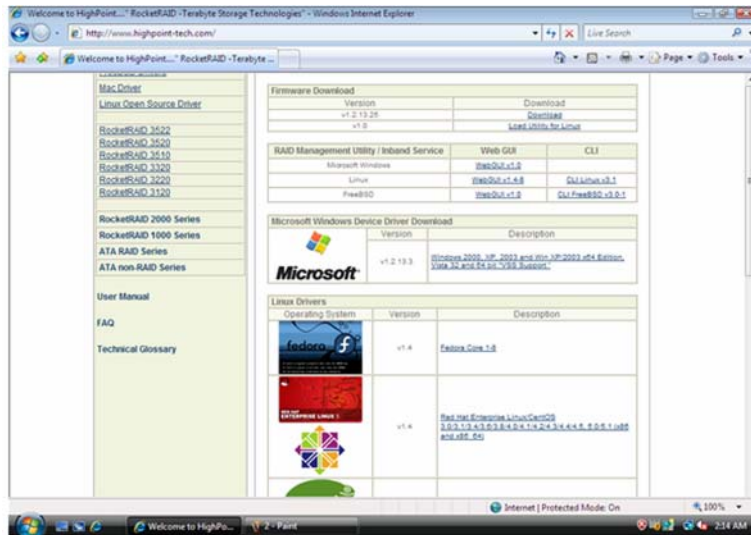
Drivers are posted in .zip archive format. Most Windows operating systems will recognize this archive format, natively. Double click the driver download to view and extract their contents. Drivers can be extracted and/or copied to various media.

Windows Driver Installation (Win2000, XP, Win 2003)

Before installing the RocketRAID 3530/3540 host adapter's device driver, make sure the host adapter and all required hard disks have been installed into the system's chassis/disk enclosure. If you are working with a supplied driver, or driver download, you will want to extract the contents directly to a directory of your choice (or device). You will need to browse to this location, in order to load the driver (see step 2, below).

Installing the RocketRAID 3530/3540 driver for an existing Windows system.

After the operating system has booted, Windows will automatically detect the RocketRAID 3530/3540 host adapter, and request that a device driver be installed. To install the device driver, follow the steps outlined below:

1. When the "Found **New Hardware Wizard**" window appears, select "**Install from a list or specific location (Advanced)**", and click Next to continue.

2. Click on the "**Include this location in the search**" option, and select the system's floppy drive (generally Disk A). Next, insert the Driver Installation diskette into the system's floppy drive, or select Browse, and browse to the location of the driver. *If you are using the RocketRAID 3530/3540 software CD, the drivers are located in RR3xxx_4xxx – Windows –Driver– Windows (then select the appropriate folder).*

3. Windows may display a warning message that states the driver has "**not been signed**". Select "**Continue Anyway**", then click Finish when prompted. When windows asks to reboot the system, choose No.

4. Remove the Driver Installation diskette from the floppy drive, then Shut down and restart the computer.

Installation Verification

After the driver has been installed, and the system has been restarted:

1.   Click the Start button, then right-click the "My Computer" icon. Select the
     Properties item from the pop up menu.

2.   In the popup window, click the "Hardware" tab then click Device Manager
     button.

3.   Double click the "**SCSI and RAID controllers**" entry. If the RocketRAID 3530/
     3540 device entry is not displayed, or there are "?" or "!" marks displayed near
     the RocketRAID 3530/3540 entry, the driver has not been installed properly.
     Delete the entries and reinstall the driver.

Installing the RocketRAID driver during a fresh Windows installation

1.   After booting from the Windows CD or DVD-ROM, when the Windows Setup
     blue screen appears, look towards the bottom of the screen. Windows will prompt
     you to press the **F6** key if you want to install a third party SCSI or RAID driver.
     Press the **F6** key at this time.

2.   The setup procedure will continue, and will later instruct you to press the "**S**"
     key to specify additional adapters. Press the "**S**" key as instructed.

3.   Next, the setup program will prompt for the insertion of the driver diskette. Please
     insert the driver diskette, and then press ENTER to continue.

4.   The next window will display several driver options. Please select the driver for
     the corresponding operating system, and press ENTER to continue.

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Windows Vista/2008 Driver Installation

Installing the driver during a fresh Windows Vista/2008 installation

1. Boot from Windows Vista DVD.

2. When the screen "**where do you want to install Windows**" appears, click "**Load driver**" and browse for the driver location. Windows Vista will accept install drivers from various sources: floppy diskette, USB flash disk or CD. *If you are using the RocketRAID 3530/3540 software CD, the drivers are located in RR3xxx_4xxx – Windows-Driver – VistaWin2008 – 32 (or 64, if you are running a 64-bit version of the operating system).*

3. Select the RocketRAID 3530/3540 controller driver, and click "**Next**".

4. The driver is now installed – you can now commence with the standard OS installation procedures.

Installing the driver for an existing Windows Vista/2008 system

1. Install the RocketRAID 3530/3540 host adapter into the PC, then boot up Windows.

2. Windows should automatically detect the card, and display the "Found **New Hardware**" wizard pop-up window. Select "**Locate and install driver software**". When Windows asks: "**Windows needs your permission to continue**", select "continue".

3. Select "I don't have disc, show me other options" and then select "Browse my computer for driver software".

4. Specify the location of the driver and click "Next. *If you are using the RocketRAID 3530/3540 software CD, the drivers are located in RR3xxx_4xxx – Windows-Driver – VistaWin2008 – 32 (or 64, if you are running a 64-bit version of the operating system).*

5. When asked: "Would you like to install this driver software?", select "Install".

6. Reboot the system when prompted. The RocketRAID 3530/3540 will be available for use after Windows reboots.

Installation Verification

After the driver has been installed, and the system has been restarted:

1. Click the Start button, then right-click My Computer icon. Select the Properties item from the popup menu.

2. In the popup window, select Hardware tab and then click Device Manager button.

3. Double click the "**Storage Controllers**" entry. If the RocketRAID 3530/3540 device entry is not displayed, or there are "?" or "!" marks displayed near the RocketRAID 3530/3540 entry, the driver has not been installed properly. Delete the entries and reinstall the driver.

Linux and FreeBSD Device Driver installation

The RocketRAID 3540 and 3530 host adapters are fully GPL compliant, and are natively support by Linux kernel 2.6.25x. Linux distributions that utilize this kernel (and all later releases) will automatically recognize the host adapter, and do not require driver installation.

In addition, binary and source driver updates are routinely posted for a variety of older Linux operating systems including past versions of Red Hat Enterprise, CentOS, OpenSuSE, and Fedora Core.

Drivers are also available for several FreeBSD revisions, and are available from the same support page:

RocketRAID 3530

http://highpoint-tech.com/USA/bios_rr3530.htm

RocketRAID 3540

http://highpoint-tech.com/USA/bios_rr3540.htm
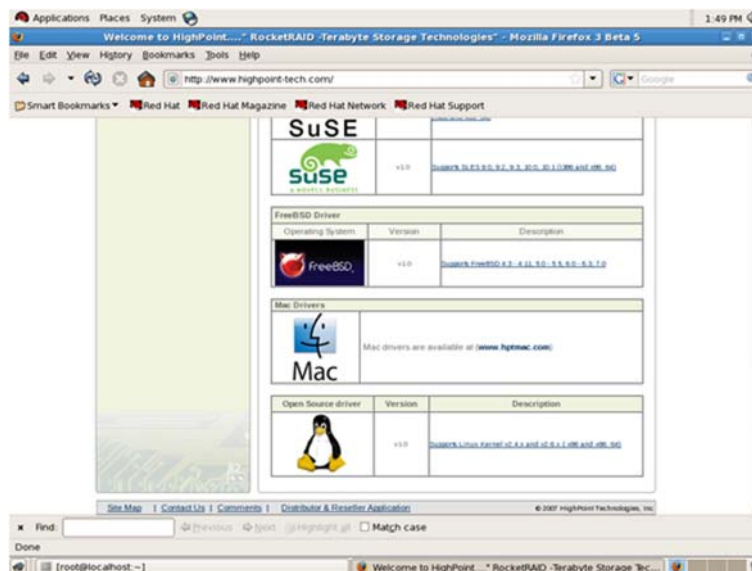
Several driver sets are included with the RocketRAID 3530/3540 Software CD.

Each binary driver and source package includes an installation guide (.pdf format).

Linux Driver sets:

RR3xxx_4xxx/Linuxdirectory.

FreeBSD Driver sets:

RR3xxx_4xxx/FreeBSDdirectory.

3 - HighPoint RAID Management Utilities (HRM)

The HighPoint RAID Management Utility Suite, also known as "HRM", includes several user interface options. The latest version of the Web Management utility user manual, is available from the following link:http://www.highpoint-tech.com/PDF/ RR3530/3540-UM-WebGUI-Linux-Aug232008.pdf

Windows Operating Systems – Installing the Web-based Management Utility

Click on "**Install RAID Management Software**".

Select the desired software from the drop down menu, and click on the "OK" button.

Red Hat Enterprise/CentOS, Fedora Core, Open SuSE – Installing the Web-based Management utility

Linux operating systems that support .rpm packages, allow you to double-click the HighPoint Web RAID Management .rpm file to start the installation process.

1. Copy the Web RAID Management package from the RR3530/3540 Software CD, to the desktop of the Linux operating system. The .rpm file is located in

    HighPoint RAID Management Software – WebGUI – RR3xxx_4xxx_OBM –

    Inband_service – Linux

2. Browse to the appropriate .rpm file (there are 32 and 64-bit options).

3. Double click the .rpm file – this should open the operating systems software installer. Enter the Administrative password when prompted and proceed with installation.

4. The package can also be installed manually, using a terminal. Log on in as "root", open a terminal, and browse to the location of the .rpm file. Run the following command:

5. # rpm -i hptsvr-https-1.4-8.i386.rpm (or hptsvr-https-1.4-8.x86_64.rpm)

Note: The i386 rpm package can also work on 64-bit systems if you have 32-bit runtime libraries installed. If you use the x86_64 rpm package, please make sure the controller driver has 64-bit ioctl support.-

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Debian/Ubuntu Linux Distributions – Installing the Web-based Management Utility

For Debian/Ubuntu Linux distributions, you can use **alien** to convert the rpm packages to a .deb package, then use "**dpkg -i**" command to install each package. Some script files may be lost during the conversion process from rpm to .deb, so you may need to make manual corrections. .

The following files will be installed/configured:

/usr/bin/hptsvr	- service program
/etc/hptcfg	- service config file
/etc/rc.d/init.d/hptdaemon	- service control script
/usr/share/hpt/webguiroot	- data files

If there is no /etc/hptcfg present, you can add it manually using by using the "echo" command on the driver file name to /etc/hptcfg.

For example:
echo hptiop.ko >/etc/hptcfg

Uninstalling the Utility

Open a terminal, and use the following command:
rpm -e hptsvr-https

Linux Distributions – Command Line Interface (CLI)

Command Line interface versions of the RocketRAID management utilities are available for Linux and FreeBSD operating systems.

These packages are posted on the HighPoint Technologies, Inc. website, under the BIOS & Driver downloads page for the RocketRAID 3530/3540.
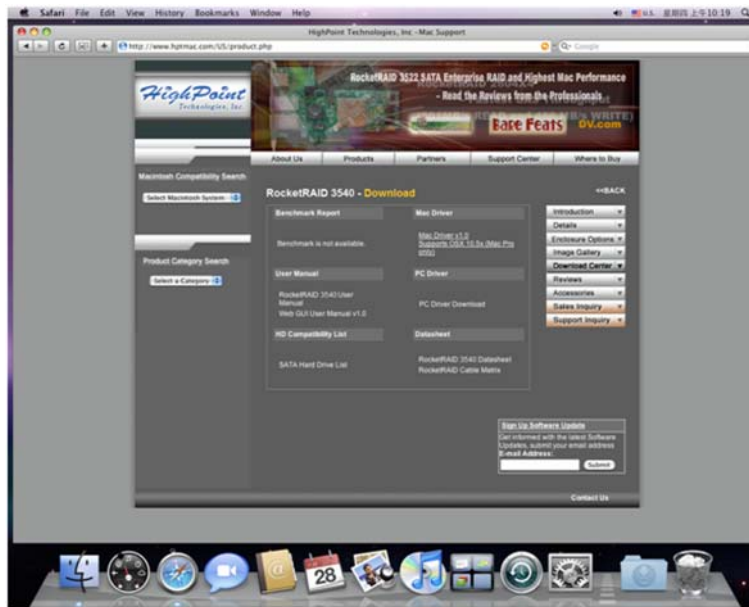
Mac OS X Driver and Web-based RAID Management Utility

The driver and software package for the RocketRAID 3530/3540 includes both the device driver for OS X, and a copy of the Web RAID Management utility.

Please check http://www.hptmac.com for the latest software/driver packages.

Driver updates are posted on the card's product page, under the "Download Center" section.

The latest package is posted towards the right-hand side of the page, under "Mac Driver". On the left-hand side of the page, there is a section devoted to user documentation. The latest versions of the Product, and Web-based RAID Management Manuals are posted here.

**Mac OS X Driver and RAID Management Installation**

The driver and software package for the RocketRAID 3530/3540 includes both the device driver for OS X, and a copy of the Web RAID Management utility. Copy the Mac driver and software package from the Software CD, to the Mac Desktop. Open the .dmg file, and double click "rr3xxx_4xxx" to begin installation.
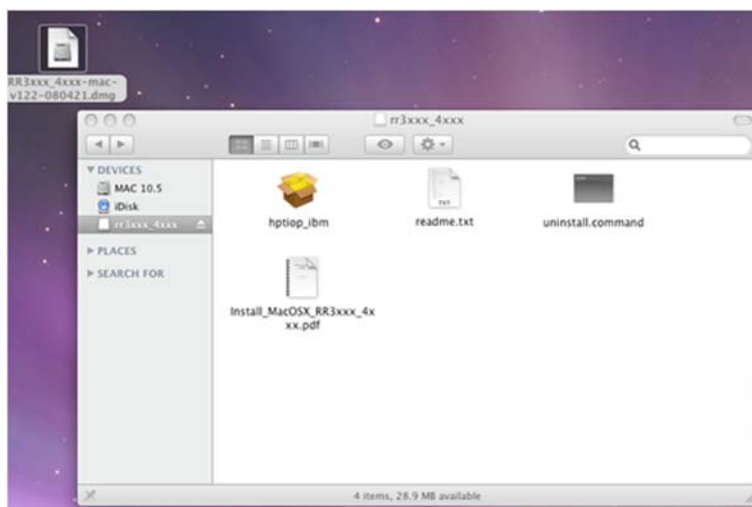
Click "**Continue**" to proceed with installation
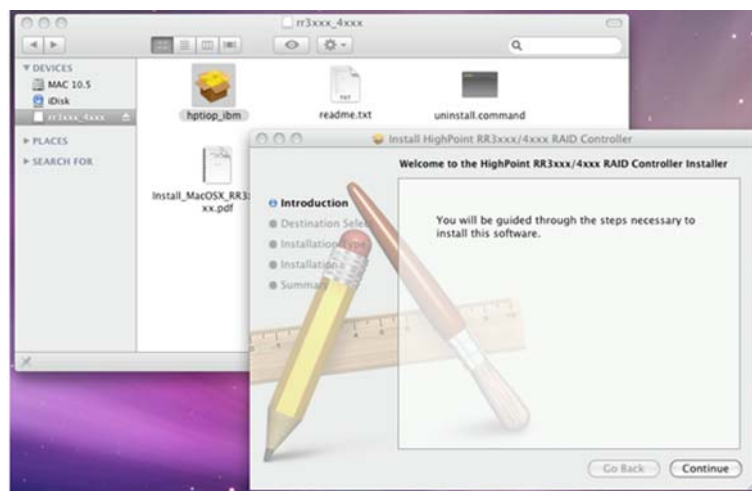
Select the installation destination:

Click "**Continue**"

Click "**Restart**" – after OS X reboots, the card will be recognized by the system. Configure arrays using the Web RAID Management interface. User guides for the Web interface are available from http://www.hptmac.com. Check the product page for the RocketRAID 3530 or 3540, and click on the "Download Center" link.

Customer Support

If you encounter any problems while utilizing the RocketRAID host adapter, or have any questions about this or any other HighPoint Technologies, Inc. product, feel free to contact our Customer Support Department.

Troubleshooting Checklist

Before contacting our Customer Support department:

- Make sure the latest BIOS, driver and HighPoint RAID Management software has been installed for the host adapter. The latest updates are available from our website
- Prepare a list of the computer system's hardware and software (motherboard, CPU, memory, other PCI-E devices/host adapters, operating system, applications)

Contact Information

E-mail address: support@highpoint-tech.com

Phone: 408-240-6119

9:00AM-5:00PM, Pacific Standard Time

Contact Us

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Milpitas, CA, 95035

Website: http://www.highpoint-tech.com

Phone: 1-408-942-5800 (9 am ~ 6 pm PST, M-F) **Fax:** 1-408-942-5801

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Support Phone: 1-408-240-6108 (9 am ~ 5 pm PST, M-F)

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E-mail: sales@microaurora.com.cn

Support: support@microaurora.com.cn

FCC Part 15 Class B Radio Frequency Interference statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union Compliance Statement

This Information Technologies Equipment has been tested and found to comply

with the following European directives:

- European Standard EN55022 (1998) Class B
- European Standard EN55024 (1998)

Thank You

Thank you for purchasing the RocketRAID 3530/3540 SATAII RAID Host adapter. We appreciate your support, and welcome any questions, comments or product suggestions you may have.