



# **RocketRAID 2700 PCI-Express 2.0 x8 HBA series SAS/SATA 6Gb/s RAID Host Adapters**

## **User's Guide**

**Revision: 2.3  
Jul. 23, 2015  
HighPoint Technologies, Inc.**

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# HighPoint RocketRAID 272x/271x – PCI-Express 2.0

## RocketRAID 272x/271x Host Adapters

The RocketRAID 272x/271x host adapters are high-performance SAS RAID solutions, delivering reliability to demanding data-intensive applications such as tiered storage environments, security and surveillance, video editing, and digital content creation.

Support for both 6Gb/s SAS and SATA drives on the same controller maintains configuration optimization for performance based on the characteristics of SAS and SATA drives available today.

HighPoint RAID Management HighPoint RAID Management software offers a user friendly interface to create, manage and maintain your storage solutions. Email notification and remote are some of the advance features that the RAID Management software has to offer.

## 1 Features and Specifications

### Host Adapter Architecture

- PCI-Express x8 (Gen2)
- Support up to 4/8 SAS/SATA drives
- 1 Internal Mini-SAS Connectors (SFF-8087) (RocketRAID 2710)
- 1 External Mini-SAS Connector(SFF-8808) (RocketRAID 2711)
- 2 Internal Mini-SAS Connectors (SFF-8087) (RocketRAID 2720)
- 1 External Mini-SAS Connector (SFF-8088) / 1 Internal Mini-SAS Connector (SFF-8087) (RocketRAID 2721)
- 2 External Mini-SAS Connectors (SFF-8088) (RocketRAID 2722)
- Hot Swap and hot plug
- Low Profile
- RoHS complaint

### Advanced RAID Features

- Supports RAID 0, 1, 5, 6, 10,50 and JBOD
- NCQ (Native Command Queuing)
- Auto detect of unplug/plug SAS/SATA hard drive for RAID auto rebuild
- Staggered drive spin up
- HDD bad sector repair and remapping
- Support Disk Scrubbing
- BIOS Booting (INT13) to RAID array for better redundancy
- 64bit LBA for RAID arrays greater than 2TB single partition
- S.M.A.R.T array monitoring for hard drive status and reliability

### Array Monitors, Alerts and Indicators

- Hard Drive LED Indicators (Activity and Failed) (except RocketRAID 2711/2722)
- SMTP email notification for events and error reporting
- Alarm/Buzzer alerts for drive/array failure
- SAF-TE (I2C) and SGPIO enclosure management

### RAID Management

- Online Capacity Expansion (OCE) and Online RAID Level Migration (ORLM) for Windows/Linux/FreeBSD
- Quick and Background initialization for instant RAID access
- API library for customization
- CLI (Command Line Interface) for Linux and FreeBSD

- Web GUI RAID management (local and remote monitoring)
- Online array roaming
- SHI (Drive analysis driven from S.M.A.R.T)

#### **HighPoint RAID Management (HRM)**

- Hot key (ctrl-h) boot-up RAID manager via BIOS
- Web browser-based RAID management software (Web GUI)
- Command Line Interface (CLI)

#### **Operating System Support**

- Windows 7, 8, 8.1, 10 / Windows Server 2008, 2012
- Linux (Fedora Core, Red Hat Enterprise / CentOS, SuSE, Debian, Ubuntu)
- FreeBSD
- OS X (for RocketRAID 2711, 2721 and 2722 only)

## **2 Physical Specifications**

#### **Dimensions:**

Size: 96.3mm X 65.0mm (RocketRAID 2710/2720)

Size: 120.0mm X 68.0mm (RocketRAID 2711/2721/2722)

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	4W max	1W max

## **3 Kit Contents**

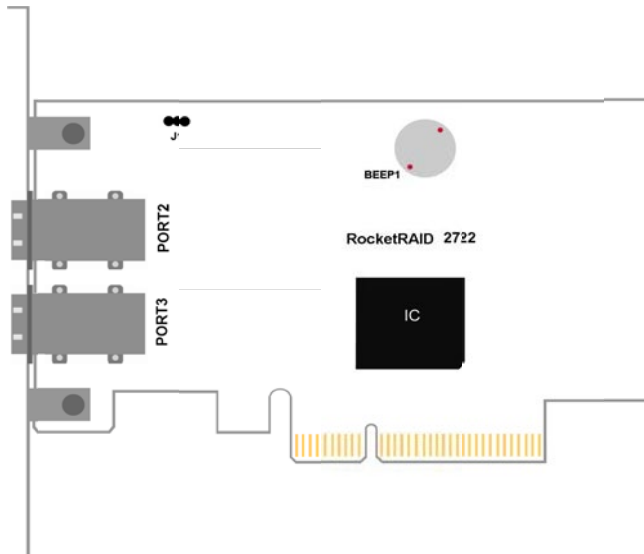
- RocketRAID Host Adapter
- Quick Installation Guide
- HighPoint Software CD
- Low-profile bracket

## 4 Hardware Description and Installation

### 4.1 RocketRAID 272x/271x Host Adapter board layout



## RocketRAID 2722



### 4.2 Connector and Jumper description

Connector / Jumper description	RocketR ID 2710	RocketRAID 711	RocketRAID 2720	RocketRAID 2721	RocketRAID 2722
J1	I2C connector				
A1 or A2	Active LED PIN	N/A	Active LED PIN	Active LED PIN	N/A
F1 or F2	Fail LED PIN	N/A	Fail LED PIN	Fail LED PIN	N/A
BEEP1	Alarm buzzer				
PORT1~ PORT3 (Mini-SAS Port)	SFF-8087	SFF-8088	SFF-8087	SFF-8087 & SFF-8088	SFF-8088

#### Active/FAIL LED PIN connector:

This connector is one-pin connection from HBA to LED on chassis. For detail LED connection requirement and display information, please refer to:

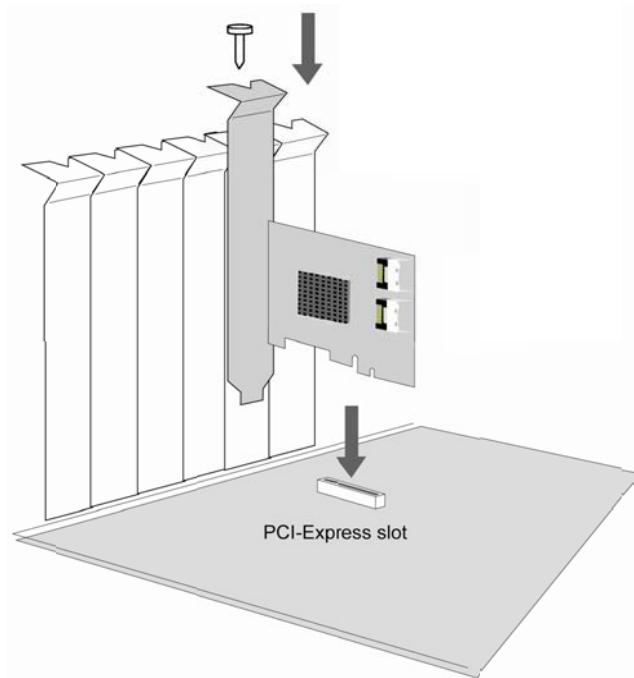
[https://filedn.com/IG3WBCwKGHT7yNuTsFCwXy0/HighPoint-Download/Document/Guide/RocketRAID/General%20Guide/LED\\_connection.pdf](https://filedn.com/IG3WBCwKGHT7yNuTsFCwXy0/HighPoint-Download/Document/Guide/RocketRAID/General%20Guide/LED_connection.pdf)

### 4.3 Installing the RocketRAID Host Adapter

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

The RocketRAID 272x/271x includes both standard and low-profile brackets. It may be necessary to attach the low-profile bracket in place of the standard bracket, depending upon the chassis design.

1. Open the system chassis and locate an unused PCI-E x8(or PCI-E x16) slot.
2. Remove the PCI slot/bracket cover.
3. Gently insert the RocketRAID card into the PCI-Express slot, and secure the bracket to the system chassis (*illustration shows RocketRAID 2720*).



4. After installing the adapter, attach hard drives to the host adapter.

**Note:** Many server-level chassis include hard-drive hot-swap bays. For these system chassis, cables are attached to the chassis backplane, rather than directly to each individual hard drive. Consult the chassis manual for proper installation procedures.

5. Close and secure the system chassis.

#### 4.4 Verifying Installation

Once the host adapter and hard drives 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" key combination to access the RocketRAID adapter's BIOS Utility.



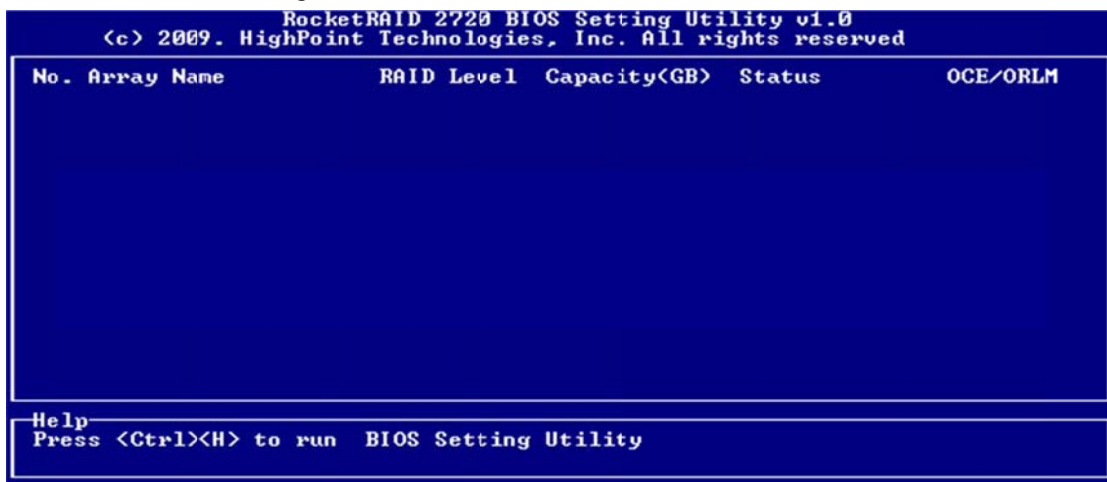
## 5 RocketRAID BIOS Utility

The RocketRAID 272x/271x controller will display its BIOS screen during the system's boot process. 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 power and cable connections.

Press "Ctrl"+"H" key combination to access the RocketRAID adapter's BIOS Utility.

### 5.1 BIOS Settings Overview

The RocketRAID 272x/271x controller BIOS utility is an interface that provides management commands and controller related settings.



### 5.2 Using the BIOS Utility

The following keys utilized by the RocketRAID 2700 BIOS utility:

**Alt** – press Alt to highlight the tool bar.

**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, or exit the BIOS Utility

### 5.3 BIOS Commands



**Create** - this command is used to open the RAID Creation menu.

**Delete** - this command will delete the selected RAID array.

**Add/Remove Spare** - this command is used to assign hard disks to function as spare disks. The controller is capable of using spare disks to automatically rebuild broken or faulted RAID arrays.

**Settings** - this command opens the settings menu (selecting the boot disk/array, staggered drive spinup)

**View** – this command is used to select between two views: Devices (HARD DISKS), and Arrays (configured

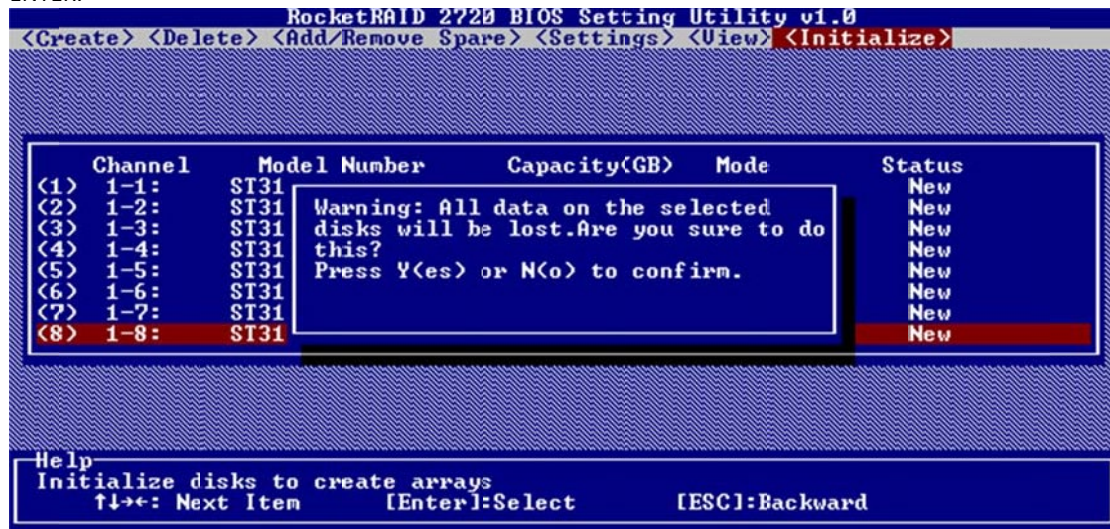
RAID arrays).

**Initialize** - this command is used to prepare disks for use with RAID arrays. Disks must be initialized before they can be used to create arrays.

## 5.4 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. Select the Initialize command from the toolbar, and press ENTER.



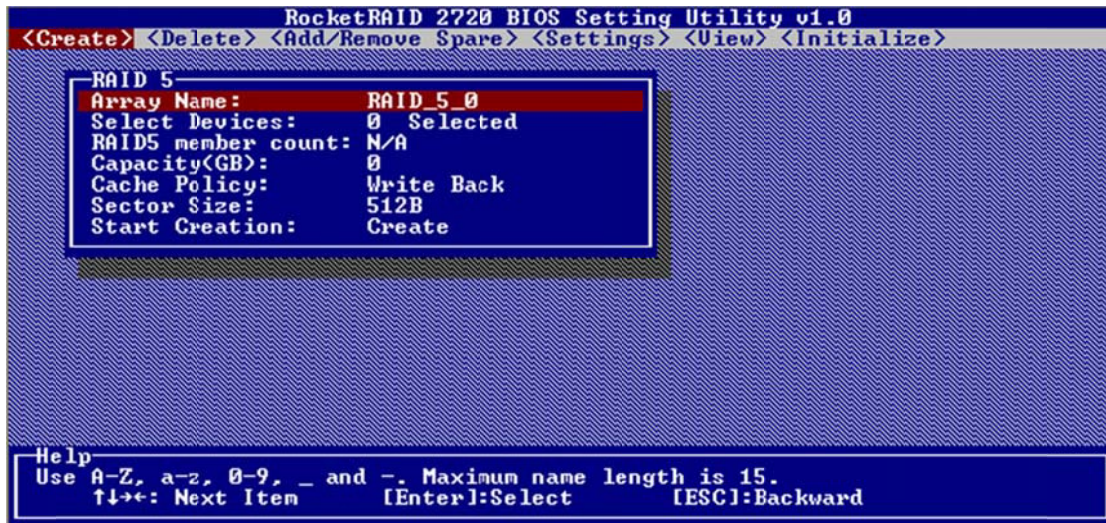
Highlight the target disks using the arrow keys, then select using Enter. A numeral will be displayed before each selected disk. Once all target disks have been selected, press ESC. The utility will display a warning, and ask you to press Y (yes) to initialize, or N (no) to cancel. Once initialized, 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.

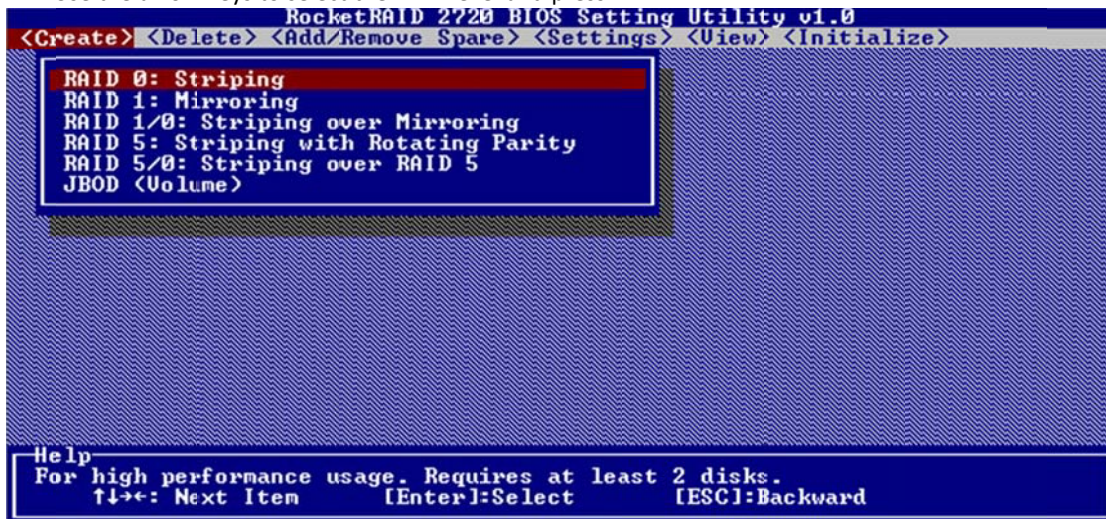
### Creating Arrays:

Select Create from the toolbar and press Enter.





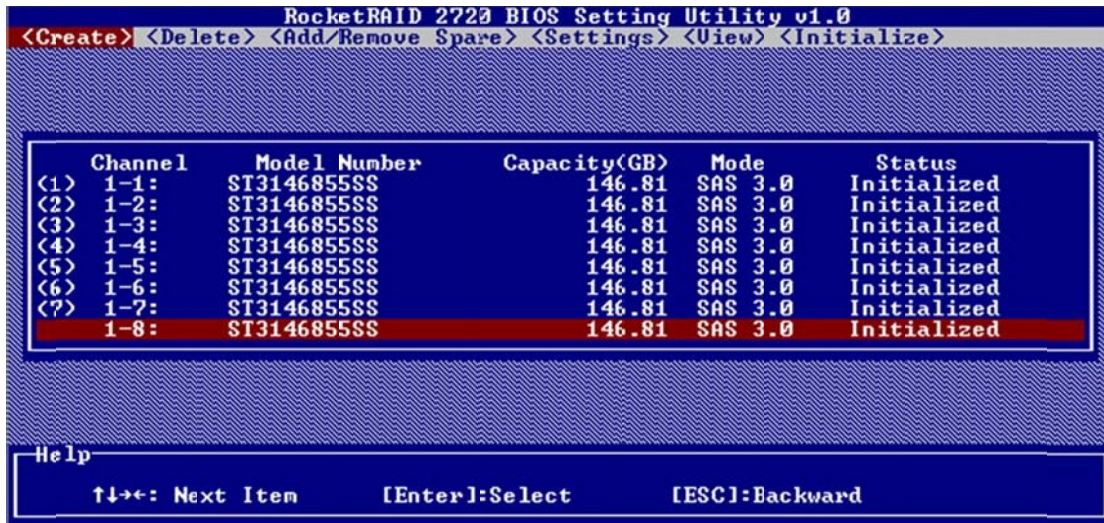
1. Use the arrow keys to select the RAID level and press ENTER.



2. Use the arrow keys to highlight the **Array Name** option and press Enter. The array name dialogue box will appear. Use the keyboard to input a new Array Name, and press the Enter key.

**Note:** the Array Name command is optional – it is not necessary to name the array. The array can be named at a later time, and the name of the array can be changed at any time.

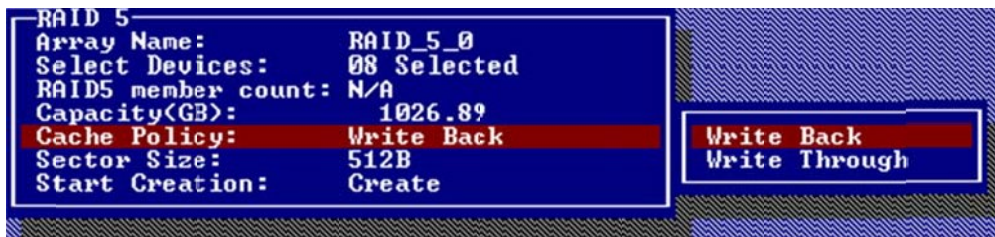
3. On the Create menu, use the arrow keys to highlight the **Select Devices** item and press Enter. A device list will appear, and display all available hard disk drives.



- Highlight the target disks that you want to use, and press Enter to select them. A numeral will be displayed before each selected disk. This number designates disk order. After all of the disks have been selected and press the ESC key to return to the Create Menu.
- Next, Use the ↓ arrow key to highlight the **Capacity (GB)** option and press Enter. The total available capacity will be displayed. Press ENTER if you wish to use all available space. If you wish to reserve disk space for additional arrays/single disks, use the keyboard to input the amount of space (in GB) you wish to set aside for this particular array, and press Enter.

**Note:** Multiple arrays can be created using the same set of hard disk drives. The Capacity option allows you to set aside disk space that be used to create another array, set as a spare disk, or partitioned to act as a single disk (by the operating system).

- For redundant RAID arrays (RAID 1, 5, 10), select the **Cache Policy**:



**Write Back** – utilizes disk cache (higher performing)

**Write Through** – writes directly to the disks (may reduce the risk of data loss during a critical failure, but at the cost of lower performance).

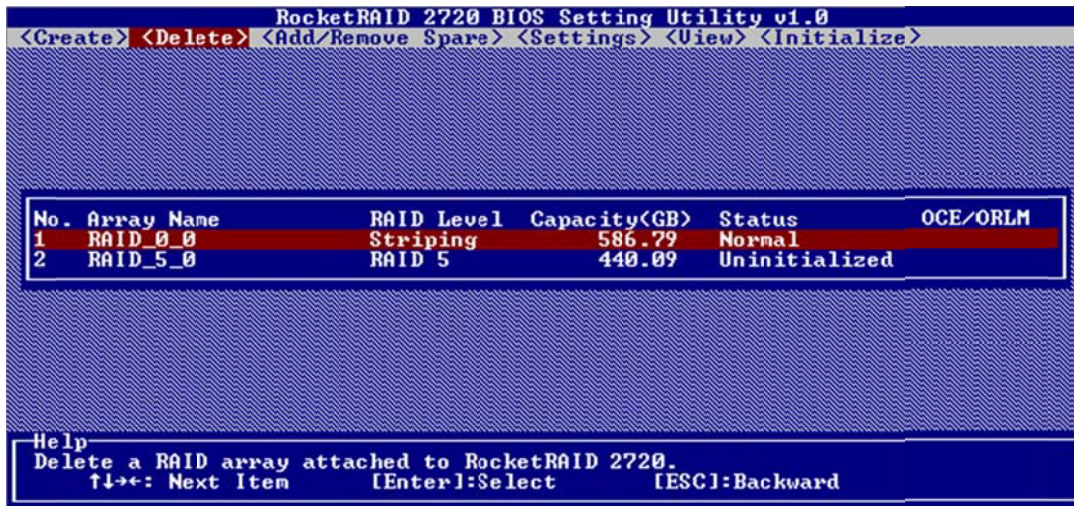
- Sector Size** – Also known as “Variable Sector Size”. Use this option if you are using an older 32-bit Windows operating system. This allows older operating systems to support volumes over 2TB in size. Do not use if the operating system already supports large volumes (such as GPT).
- To complete the creation procedure, use the arrow key to highlight the **Start Creation** item and press Enter. Press the **Y** (yes) key to create the array, or **N** (no) key to cancel the creation process.



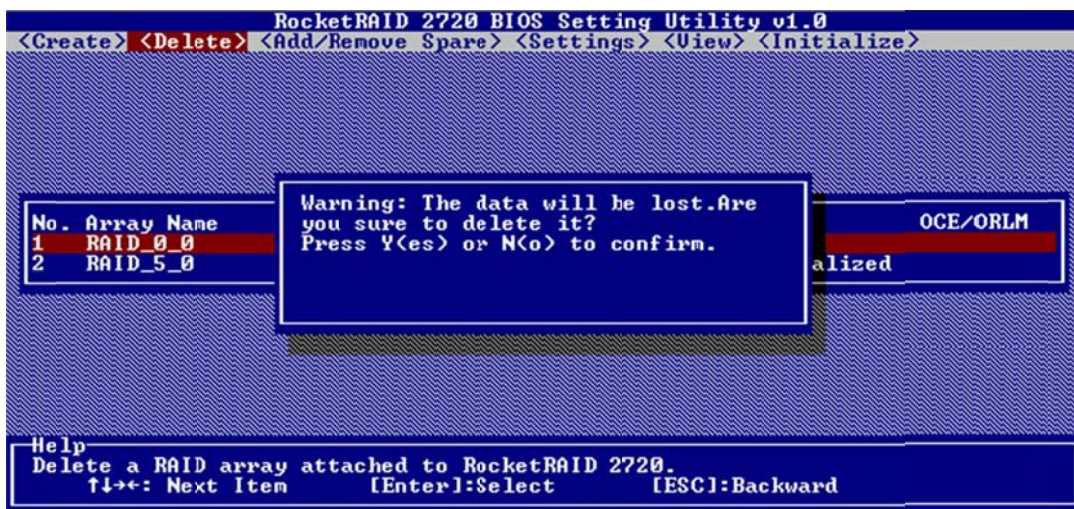
## 5.5 Deleting Arrays

Highlight the Delete command from the toolbar, and press Enter.

The BIOS utility will display a list of available RAID arrays. Select the array you wish to 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.

## 5.6 Adding/Remove Spare Disks

This Add/Remove Spare command is used to assign a hard disk to act as a Spare Disk. Spare Disks are used to automatically rebuild Redundant RAID arrays (RAID 1, 5, 10) 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, use the arrow keys to select the target disk from the list of initialized disks, and press Enter. To remove the Spare Disk setting from a hard disk, highlight the spare disk, 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 designated to act as a spare. 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 would allow these disks to be set as spares for a separate redundant array that falls into the same capacity range (200GB).

## 5.7 Settings

To access the Settings menu, highlight the Settings command from the toolbar, and press Enter.



**Select Boot Device** – select which disk or array will act as the boot disk, if the motherboard BIOS instructs the card to act as the boot device.

**Staggered Drive Spinup** – This option is disabled by default. Enabling this setting will instruct the card to power up the hard disks, sequentially (one disk approximately every 2 seconds). Not all disk support this setting – consult the disk documentation for more information.

Warning: Western Digital hard disks do not support this setting. Enabling this setting is not recommended. If enabled, these disks may not be detected by non-RAID controller.



## 6 HighPoint Software CD

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

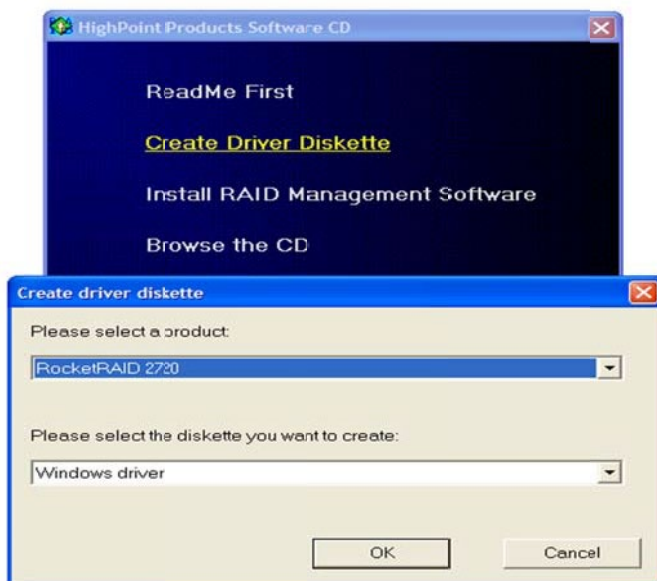
This CD can be used to generate driver diskettes, and install the HighPoint RAID Management Utility Suite for a variety of operating systems.

### Creating a driver diskette

Windows / Windows Server and several distributions of Linux and FreeBSD require driver diskettes when installing the operation system directly to a disk or array hosted by the RocketRAID 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.



## 7 RocketRAID 2700 Driver Installation

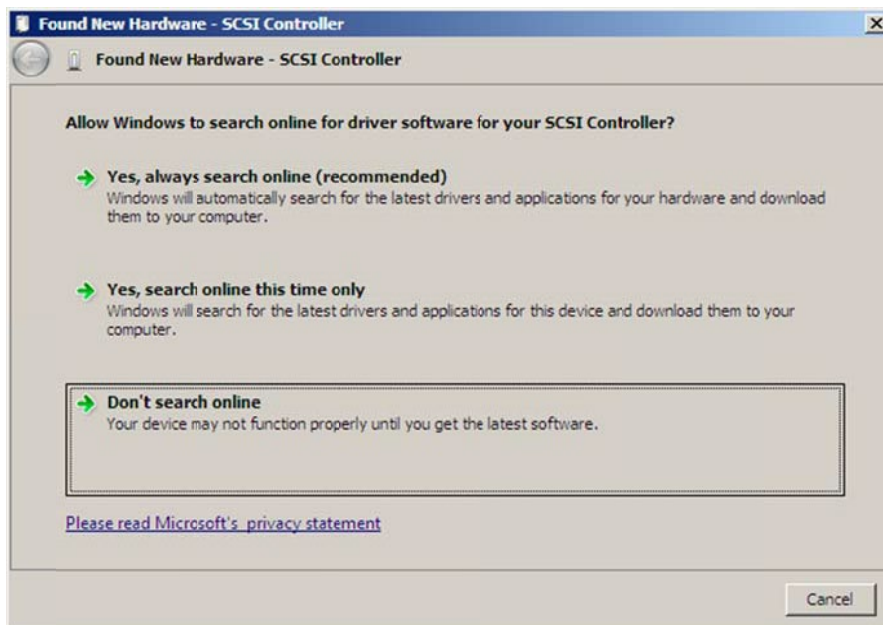
### 7.1 Driver installation -Windows

#### Installing the driver for an existing Windows operating system

1. Install the RocketRAID host adapter into the PC, then boot up Windows Vista.
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”.

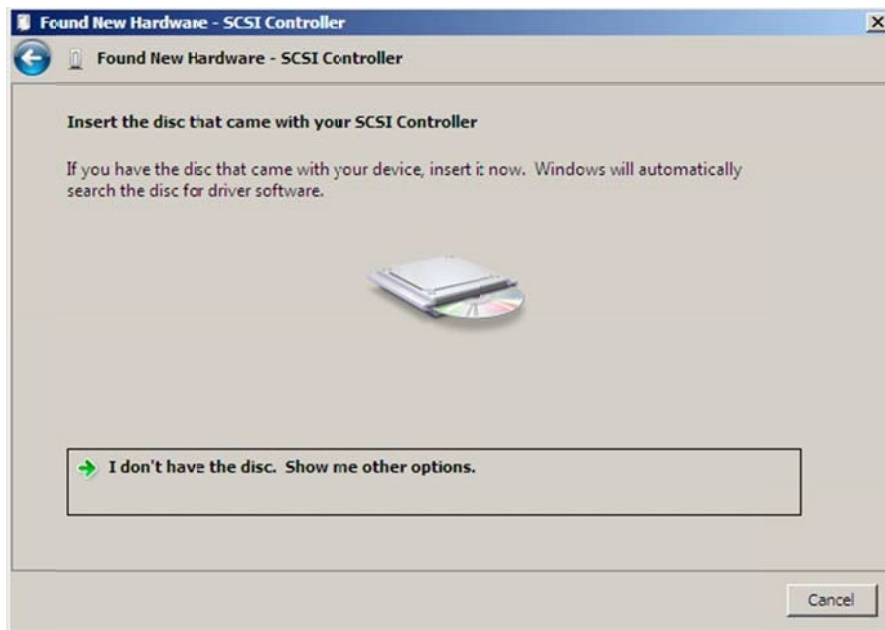


3. When asked to search online select “Don’t Search Online”.

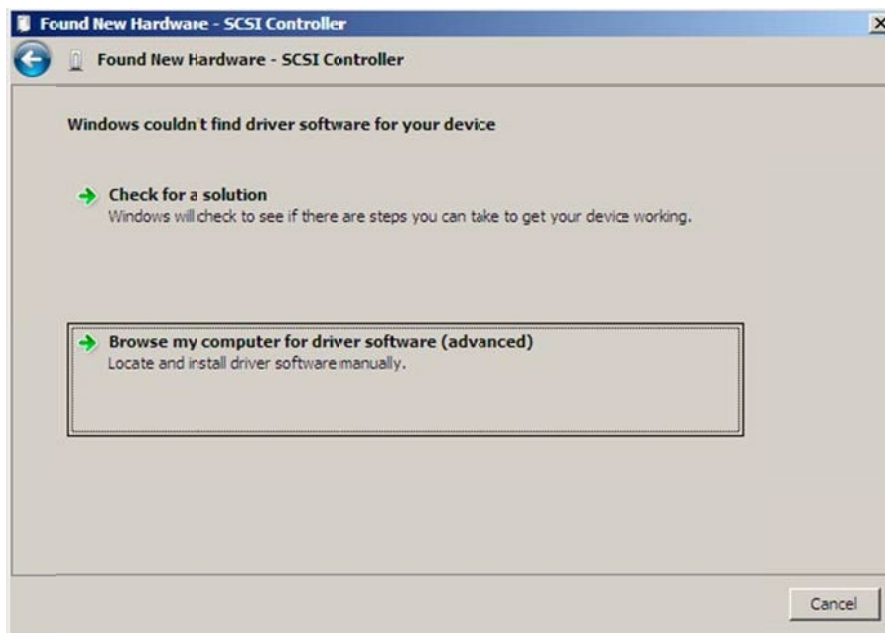




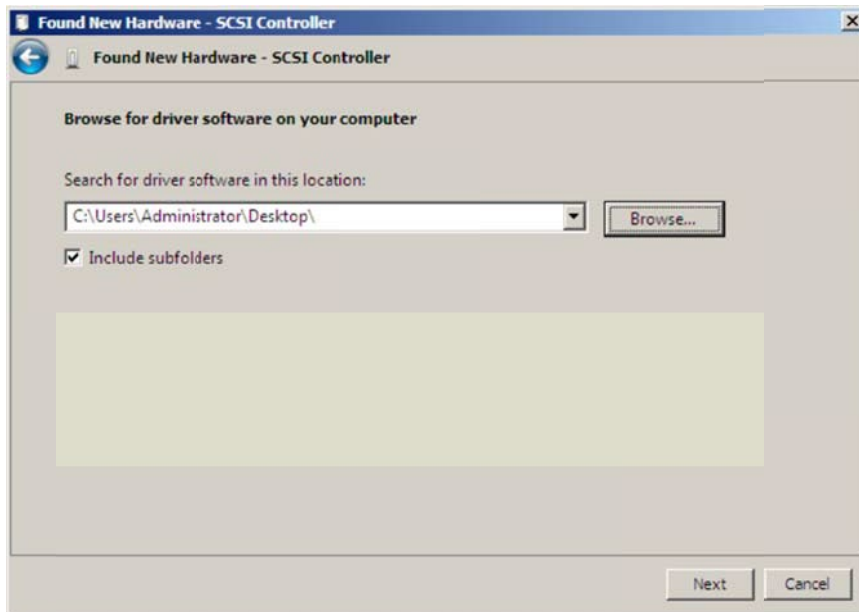
4. Select "I don't have disc, show me other options".



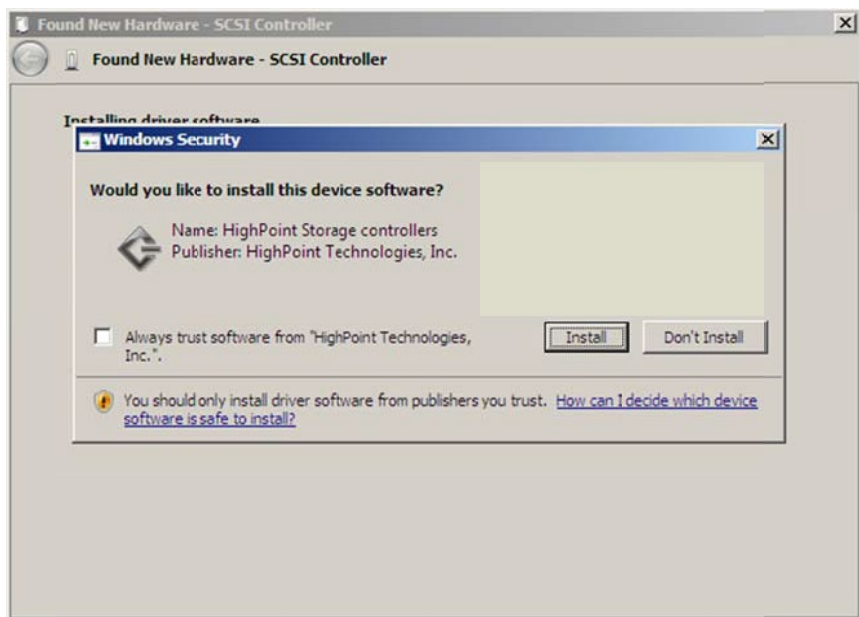
5. and then select "Browse my computer for driver software".



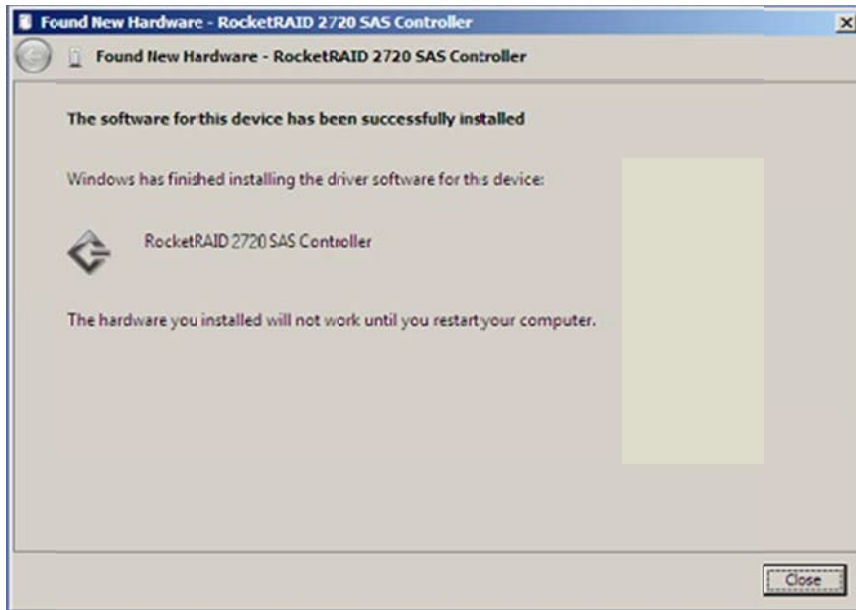
6. Browse to the location of the driver and click “Next”.



7. When asked “Would you like to install this driver software?” select “Install”.



8. Reboot the system when prompted. The RocketRAID host adapter will be ready for use after Windows reboots.



#### Installing the driver during a fresh Windows OS installation

1. Boot from the Windows Installation DVD.
2. When the screen “**where do you want to install Windows**” appears, click “Load driver” and browse for the driver location. Windows can install drivers from several media types: floppy diskette, USB flash disk or CD.
3. Select the RocketRAID 2700 controller driver, and click “**Next**”.
4. The driver is now installed – the disk or array will be recognized as available disk space. Windows setup will then proceed normally.

#### 7.2 Driver installation -Linux and FreeBSD

*Please refer to the Driver Installation Guide and README file under the driver package for the installation steps.*

Software location (RocketRAID Software CD):

**/Driver/RR272x\_1x/Driver**

*Please always check HighPoint website for latest software download.*

## 8 HighPoint Web RAID Management Software

The HighPoint RAID Management software provides RAID configuration and management features. The software can be installed from the HighPoint software CD. Browse to the location of the HighPoint RAID Management software.

### 8.1 Installing the Web RAID Management Software

#### Windows

1. Software location (RocketRAID Software CD):  
**/HighPoint RAID Management Software/Web RAID Management/Windows**
2. Double click the "setup.exe" setup program to install the management software.
3. After the setup is completed, double click the program shortcut on the Windows desktop to run HighPoint RAID Management software:

#### Linux -Red Hat Enterprise/CentOS, Fedora Core, Open SuSE

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. Software location (RocketRAID Software CD):  
**/HighPoint RAID Management Software/Web RAID Management/Linux**
2. Extract the .tbz file to the desktop, and 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-1.4-10.i386.rpm` (or `hptsvr-https-1.4-10.x86_64.rpm`)

#### Linux -Debian/Ubuntu Linux Distributions

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
```

## **8.2 Installing OS X Driver and Web RAID Management Software**

The RocketRAID 2711/2721/2722 is compatible with Mac OS X. The OS X software package includes the driver and Web GUI 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.

*Please refer to the Installation Guide under the software package folder for installation steps.*

## **8.3 Starting Using the Web RAID Management Software**

*Please refer to the online help of "How to Use Web RAID Management Software":*

<http://www.highpoint-tech.com/help/>

## **9 Thank You**

Thank you for purchasing the RocketRAID 272x/271x SAS/SATA RAID Host adapter. We appreciate your support, and welcome any questions, comments or product suggestions you may have.

## **10 Customer Support**

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

*HighPoint Technologies, Inc. websites:*

<http://www.highpoint-tech.com/>

*Web Support:*

<http://www.highpoint-tech.com/websupport/>