

RocketRAID 2840A

SAS 6Gb/s PCI-Express 3.0 x8 RAID Controller



User's Guide

v1.0

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1. HighPoint RocketRAID 2840A Overview

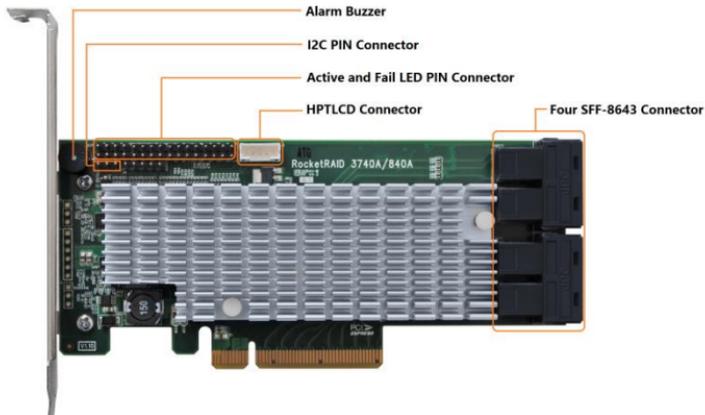
RocketRAID 2800 series host bus adapters are the world's most price competitive 6G SAS/SATA RAID controllers, and deliver unprecedented end-to-end Generation 3.0 PCI Express transfer performance with Professional class RAID Storage reliability and management capabilities.

RocketRAID 2800 series host bus adapters capitalize on HighPoint's two decades of RAID and storage technology to deliver professional grade RAID storage at a fraction of the cost of conventional host RAID solutions. Each adapter is powered by our industry proven RAID technology, superior Gen 3.0 PCIe express transfer bandwidth, and up to sixteen dedicated 6Gb/s SAS channels, which support robust, high-performance RAID 0, 1, 5 6, 10, 50 and JBOD configurations of SAS or SATA hard drives of any disk format, including 512, 512e and 4Kn.

Features and Specifications

- 8-lane, 8 GT/s PCI Express 3.0 Compliant
- Four SFF-8643 mini-SAS HD ports
- Support up to 16x SAS/SATA drives
- Onboard LED Indicators and Alarm Buzzer
- Multiple RAID Adapters supported
- Online RAID Level Migration (ORLM)
- Online Capacity Expansion (OCE)
- RAID Quick Initialization for fast array setup
- Disk Format compatible: 512, 512e, 4Kn
- Larger than 2 TB Drive and RAID Array support
- Disk media scan and repair
- Device Error Recovery support
- Automatic remap and fix drive bad block for RAID array
- Spin down Massive Arrays of Idle Disks support
- Staggered Drive Spin Up

2. Board Layout & Hardware Installation



SFF-8643 connector

Each SFF-8643 connector supports 4 disk channels. Connect the hard disks or disk backplane to the RAID controller using the appropriate data cables.

Active/FAIL LED PIN connector:

LED pins are provided for Active/Fail status for each of the device channels.

For more information about LED functionality and connection requirements, please refer to the document below:

http://www.highpoint-tech.com/PDF/LED_connection.pdf

Alarm Buzzer

Audible alarm will sound if a disk failed status occurs.

I2C Pin Connector

The I2C Pin connector can be used to connect an enclosure device with I2C protocol for enclosure management.

HPTLCD Connector

Connector for the optional HPTLCD module.

Hardware Installation

Note: Make sure the system is powered-off before installing the RAID Controller.

1. Open the system chassis and locate an unused PCIe (x8, x16) slot.
2. Remove the PCIe slot cover.
3. Gently insert the RAID controller into the PCIe slot, and secure the bracket to the system chassis.
4. After installing the adapter, attach the hard disks or disk backplane to the RAID controller using the appropriate data cables.
5. Close and secure the system chassis.

3. Using the RocketRAID 2840A

3.1. Using the RocketRAID Series HBA BIOS

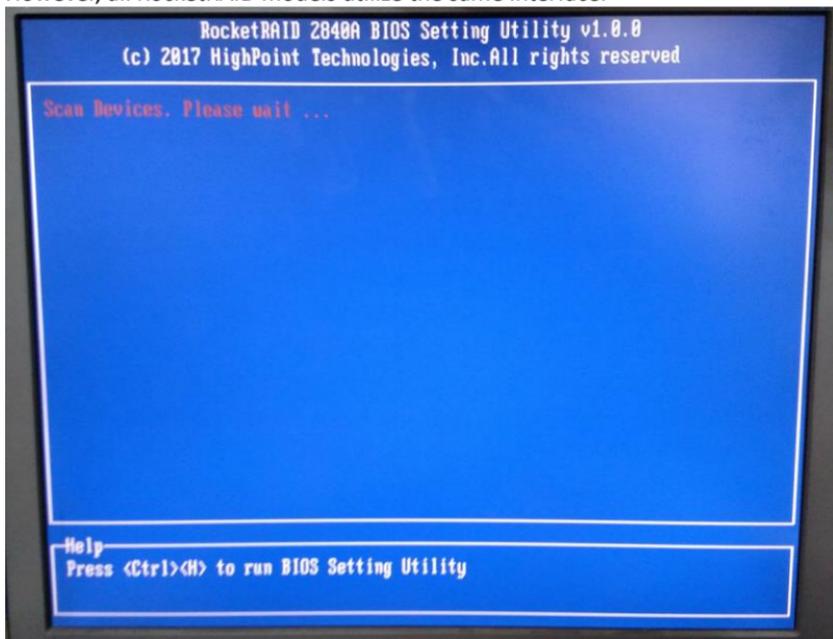
3.1.1 RocketRAID BIOS Setting Utility

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

After installing the RAID controller and powering on the system, the RAID controller BIOS should post during the system's boot procedure.

Use **Ctrl + H** key to log-in to the BIOS setting utility. The BIOS setting utility can be used for RAID management. 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 is not detected, power down the system and check the power and cable connections.

Note: The following screenshots depict the RocketRAID 2840A BIOS utility. However, all RocketRAID models utilize the same interface.



3.1.2 Using the BIOS Utility

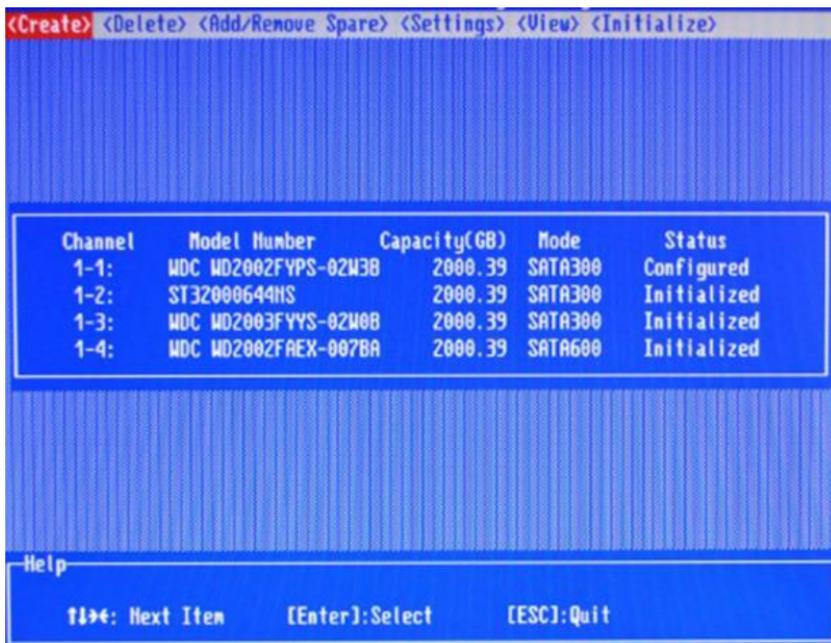
The following keys are utilized by the RocketRAID BIOS utility:

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.

3.1.3 BIOS Commands



The screenshot shows the BIOS utility interface with a menu bar at the top containing: <Create> <Delete> <Add/Remove Spare> <Settings> <View> <Initialize>. Below the menu bar is a table with the following data:

Channel	Model Number	Capacity(GB)	Mode	Status
1-1:	WDC WD2002FYPS-02W3B	2000.39	SATA300	Configured
1-2:	ST32000644NS	2000.39	SATA300	Initialized
1-3:	WDC WD2003FYYS-02W0B	2000.39	SATA300	Initialized
1-4:	WDC WD2002FAEX-007BA	2000.39	SATA600	Initialized

At the bottom of the screen, there is a 'Help' section with the following navigation instructions:

- ↑↓←: Next Item
- [Enter]: Select
- [ESC]: Quit

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 (To selecting the boot disk/array, staggered drive spin up etc.)

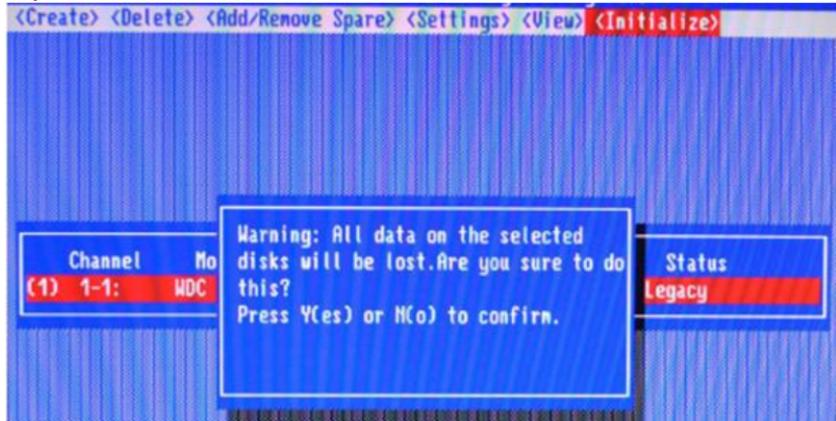
View: This command is used to view hard disk and RAID information.

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.

3.1.4 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 the Enter key.



Highlight the target disks using the arrow keys, and then press the Enter key. A numeral will be displayed before each selected disk. Once all target disks have been selected, press ESC key. 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. These disks will be displayed as “Initialized” (under Status).

Warning: Initialization will destroy all pre-existing data on the selected hard disks. Only initialize disks that do not contain critical data.

Create Arrays:

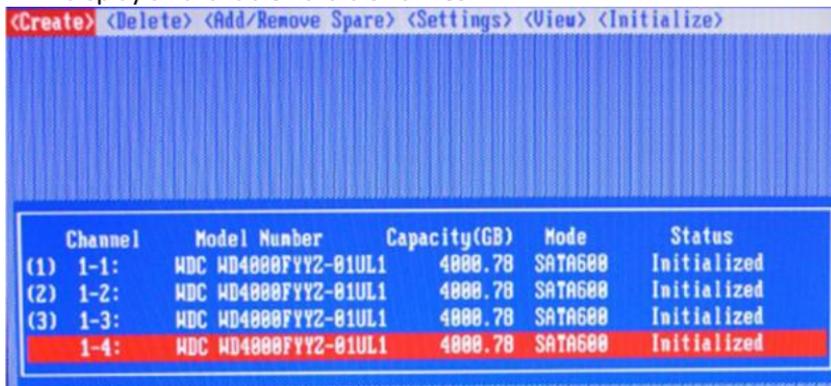
Select Create from the toolbar and press the Enter key.



1. Use the arrow keys to select the RAID level and press the Enter key.
2. Use the arrow keys to highlight the Array Name option and press the Enter key. 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 the Enter key. A device list will appear, and display all available hard disk drives.

A screenshot of a device list window. At the top, a menu bar contains the following options: <Create> <Delete> <Add/Remove Spare> <Settings> <View> <Initialize>. Below the menu bar, a table lists available hard disk drives. The table has six columns: Channel, Model Number, Capacity(CB), Mode, and Status. The row for '1-4:' is highlighted with a red background.

Channel	Model Number	Capacity(CB)	Mode	Status
(1) 1-1:	WDC WD4000FYYZ-01UL1	4000.78	SATA600	Initialized
(2) 1-2:	WDC WD4000FYYZ-01UL1	4000.78	SATA600	Initialized
(3) 1-3:	WDC WD4000FYYZ-01UL1	4000.78	SATA600	Initialized
1-4:	WDC WD4000FYYZ-01UL1	4000.78	SATA600	Initialized

4. Highlight the target disks that you want to use, and press the Enter key 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.
5. Next, Use the ↓ arrow key to highlight the Capacity (GB) option and press the Enter key. The total available capacity will be displayed. Press the Enter key 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 the Enter key.



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).

6. For redundant RAID arrays (RAID 5, 50), select the Cache Policy:
Write Back – Provides higher write performance for redundant RAID arrays. Data is at risk when there is a power failure, system kernel panic and unresponsive abnormal conditions.
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 the Enter key. The Window will show 2 options when creating a RAID 5 array: Background Initialization and No initialization.



Background initialization:

The RAID array is accessible while disk initialization is being performed.

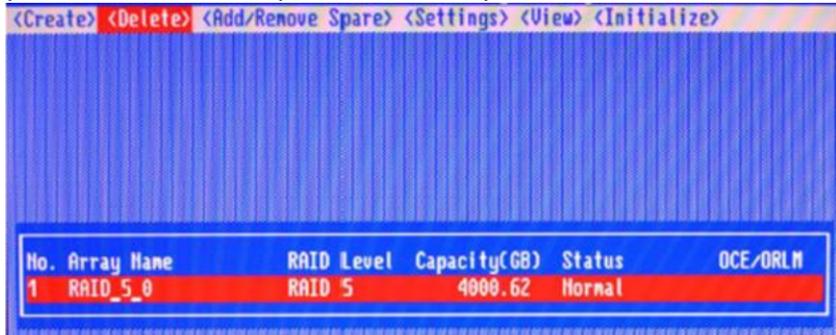
- This option will delete all content on the disks.
- The initialization time will be longer when compared to "Foreground" but the logical drives can be used during the initialization process.

No initialization:

The No initialization option is recommended for use when rescuing an original array of for testing purposes. This option will not make any changes to the data area of each disk. When you select this option, a pop-up window will display; press Y (yes) to create the array, or N (no) to cancel the creation process.

3.1.5 Delete Arrays

Highlight the Delete command from the toolbar, and press the Enter key. The BIOS utility will display a list of available RAID arrays. Select the array you wish to delete, and press the Enter key.



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.

3.1.6 Add/Remove Spare Disks

The 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 the Enter key. To remove the Spare Disk setting from a hard disk, highlight the spare disk, and press the Enter key. 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.

3.1.7 Settings

To access the Settings menu, highlight the Settings command from the toolbar, and press the Enter key. There are Select Boot Device and Parameter Setting options in the menu.



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.

- When booting up the system, press **CTRL + H** during the HighPoint RocketRAID splash screen to enter the BIOS RAID creation utility.
- Navigate to **Settings** using arrow keys.
- Press **Enter**.
- Press **Enter** again.
- Select the desired RAID array.
- You will return to the main screen once the **boot flag** is set

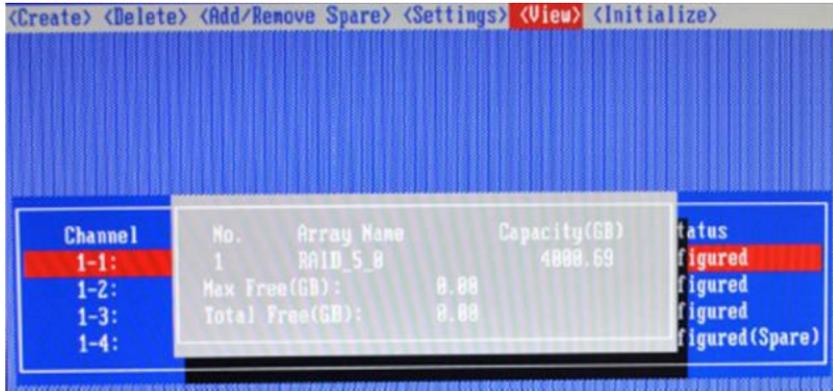
Staggered Spin up:

The default value of this option is disabled. 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.

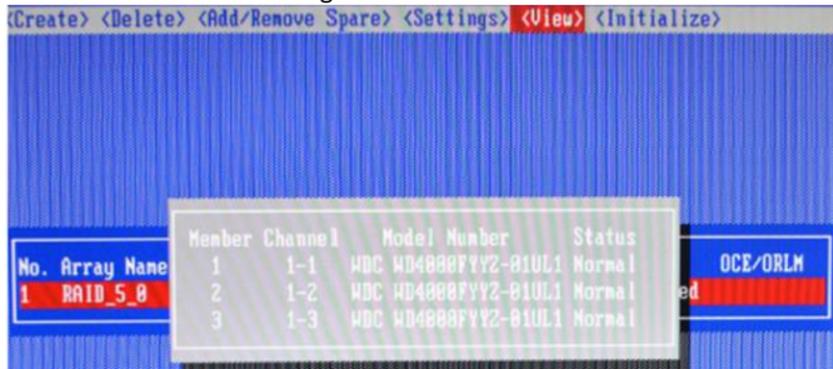
3.1.8 View

The View menu provides two options:

Devices – This option will display information for each disk hosted by the HBA.



RAID Array – This option will display information about each RAID array hosted by the HBA. Highlight the target device and press the Enter key to view details about the configuration.



3.2. Driver & WebGUI Installation

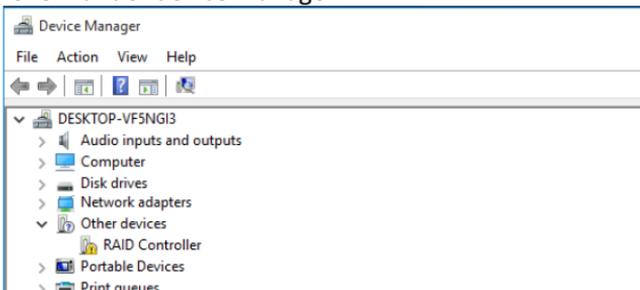
3.2.1 Driver installation - Microsoft Windows

Download and prepare the Windows Driver and WebGUI from the product download page.

RocketRAID 2840A:

http://www.highpoint-tech.com/USA_new/series_rr2840a-Download.htm

1. After installing the RAID controller, boot to the Windows operating system.
2. Windows should automatically detect the card as a new “RAID Controller” under device manager.



3. Right click the “RAID Controller” and select update/install the driver.
4. Select “Browse my computer for driver software”.
5. Browse to the location of the driver and click “Next”.
6. Reboot the system when prompted. The RocketRAID 2840A controller will be ready for use after Windows reboots.
 - > Sound, video and game controllers
 - > Storage controllers
 - HighPoint RCM Device
 - Microsoft Storage Spaces Controller
 - RocketNVME Virtual Controller
 - RocketRAID 2840A SAS Controller (Storport)
 - RocketUSB RAID Controller
 - > System devices
 - > Universal Serial Bus controllers
7. Extract the WebGUI package and double click the setup program to install.

3.2.2 Driver and WebGUI Installation (Linux or FreeBSD)

Download and prepare the Driver and WebGUI from the product download page.

RocketRAID 2840A:

http://www.highpoint-tech.com/USA_new/series_rr2840a-Download.htm

Refer to the README file and Installation Guide under the software folder for the appropriate installation procedure.

3.3 Using the HighPoint WebGUI

Please refer to the Online Help guide for more information about using the WebGUI:

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

4. Customer Support

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

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

HighPoint Technologies, Inc. websites:

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