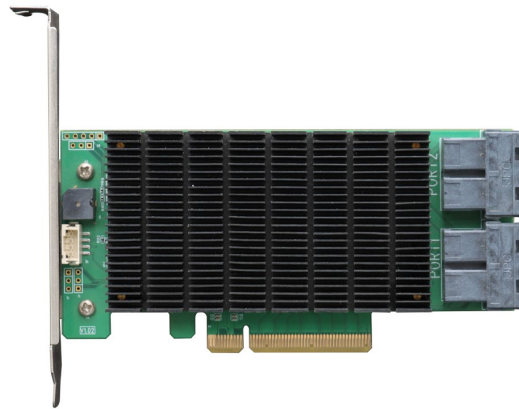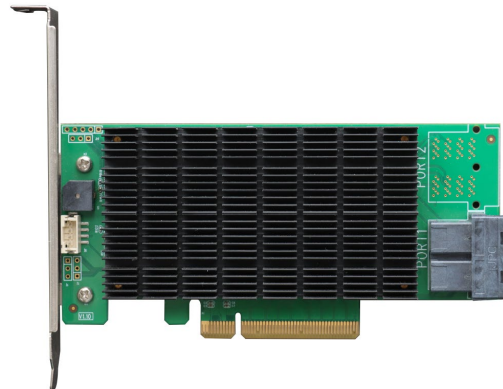# Rocket 700 Series

## SAS 12Gb/s PCI-Express 3.0 x8 RAID Controller

**R720**

**R710**

**User's Guide**
**v1.00**

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**Notice**

Reasonable effort has been made to ensure that the information in this manual is accurate. HighPoint assumes no liability for technical inaccuracies, typographical, or other errors contained herein.

**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)

# Table of Contents

# 1. HighPoint Rocket 700 Overview

HighPoint 12G SAS Connectivity HBAs are the industry's most cost-effective SAS/SATA storage solutions. The compact half-height PCIe 3.0 x8 HBAs can be easily integrated into any industry standard PCIe Gen3 or Gen4 platform, and are available with 8 or 16 dedicated device channels.

***Massive SAS/SATA Connectivity Solutions:***
The Rocket 710 & Rocket 720 12G SAS HBAs are capable of supporting up to 128 SAS or SATA hard disk drives or SSDs.

| Rocket 700 Technical Specifications | |
| --- | --- |
| Bus Interface | 8-lane, 8 GT/s PCI Express 3.0 Compliant |
| Number of Channel / Port | R720: 16x 12Gb/s SAS / 6Gb/s SATA Channels<br>R710: 8x 12Gb/s SAS / 6Gb/s SATA Channels |
| Number of Devices | 16x SAS/SATA Hard Drive / SSD |
| Data Transfer Rates | Up to 12Gb/s per port |
| Port Type | SFF-8643 mini-SAS HD and SFF-8644 mini-SAS HD |
| Number of Devices | 16x SAS/SATA Hard Drive/SSD |
| Bus Type | PCIe 3.0 x8 |
| Form Factor | Low Profile (Half-Height) |
| Dimensions | 5.51"W * 2.482"H * 0.67"D |
| Weight | 0.66 lbs |
| SAS Expansion | Maximum of 128 SAS/SATA HDDs/SSDs |
| RAID Level Support | RAID0,1,1/0 & JBOD |
| Operating System | Windows 11,10<br>Windows Server 2022, 2019, 2016<br>Microsoft Hyper-V<br>Linux (Support Linux Driver auto Compile)<br>Redhat/Ubuntu/Debian/Fedora/Proxmox (Kernel 3.10 and later)<br>Arch Linux (Kernel 5.17.5 and above)<br>*Only supports 64bit operating system.* |
| **RAID Feature Suite** | |
| Flash ROM for Upgradeable BIOS | |
| Storage Health Inspector | |
| Redundant RAID Configurations | |
| BIOS PnP (plug and play) and BBS (BIOS boot specification) support | |
| Bootable RAID Array | |
| UEFI support for PC Platforms | |
| Human Interface Infrastructure Support (HII) | |
| Multiple RAID Partitions supported | |
| Storage Configurations Support Details  (Direct Attached) | |
| Multiple RAID Adapters supported (Up to 4 RAID controllers per system) | |
| Online Array Roaming | |
| Online RAID Level Migration (ORLM) | |
| Online Capacity Expansion (OCE) | |
| RAID Quick Initialization for fast array setup | |
| Drive hot plug support | |
| Global Hot Spare Disk support | |
| Automatic and configurable RAID Rebuilding Priority | |
| Auto resume incomplete rebuilding after power on or reboot system | |
| Disk Format compatible:  512, 512e, 4Kn | |
| Larger than 2 TB Drive and RAID Array support | |
| Spin down Massive Arrays of Idle Disks support | |

| | |
|---|---|
| Native Command Queuing | |
| SAS TCQ | |
| Disk media scan and repair | |
| Device Error Recovery support | |
| Automatic remap and repair of bad blocks for RAID configurations (HDD) Redundant RAID Levels (RAID1, 10) | |
| Staggered Drive Spin Up | |
| Write Back and Write Through | |
| **RAID Monitoring and Management Suite** | |
| Configuration Management Suites | BIOS/UEFI/Firmware configuration tool User friendly Browser-based Management Interface CLI (Command Line Interface) – Scriptable configuration Tool API package Smart Email Alert Notification Alarm Buzzer |
| Enclosure Management Interface | SGPIO, SES-2 and I2C (Drive LEDs supported: SGPIO, SES-2 and LED Header) |
| Operating Temperature | Work Temp: $+5°C \sim +55°C$. Storage Temp: $-20°C \sim +80°C$ |
| Operating Voltage | PCI-e: 12 V / 3.3 V, Power: 14W |
| MTBF (Mean Time Before Failure) | 920,585 Hours |
| Certification Approval | CE FCC RoHS REACH WEEE |

## 2. Board Layout & Hardware Installation
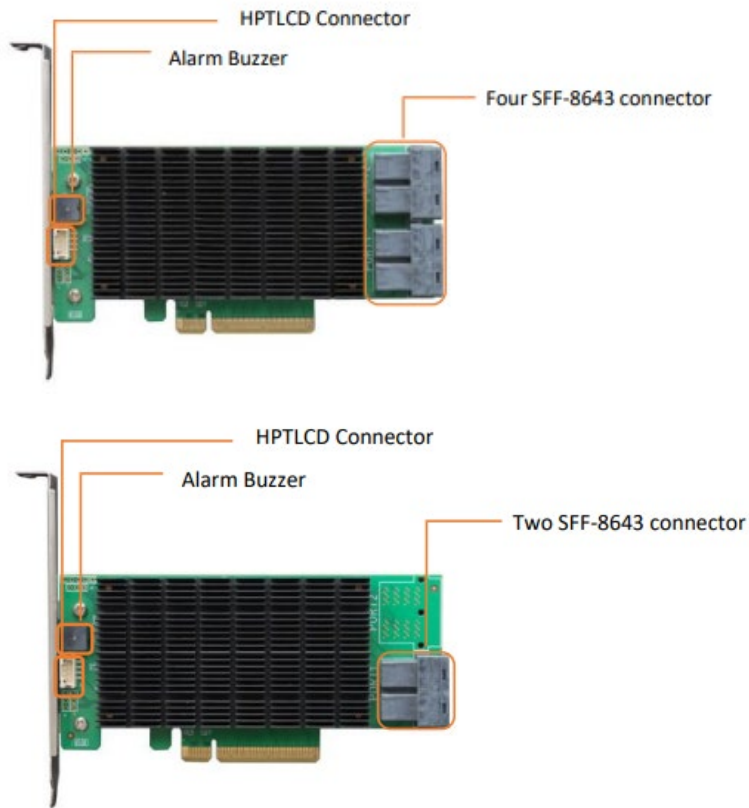




**SFF-8643 connector**

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

**Alarm Buzzer**

An audible alarm will sound if a disk failed status occurs.

**HPTLCD Connector**

Connector for the optional HPTLCD module.

## 3. What's in the Box

Make sure the following items are included in your purchase:

- R700 controller card
- Low Profile Bracket
- Quick Installation Guide

# 4. Using the Rocket 700

## 4.1. Using the Rocket Series HBA BIOS（Legacy）

### 4.1.1 BIOS Setting Utility

The Rocket 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.

Different motherboards will provide different Legacy settings. Please consult your motherboard's user manual for more information.

Set Legacy setting with SuperMicro X11DPi-NT motherboard as an example.

1. Set "Boot Mode Select" to "Dual"
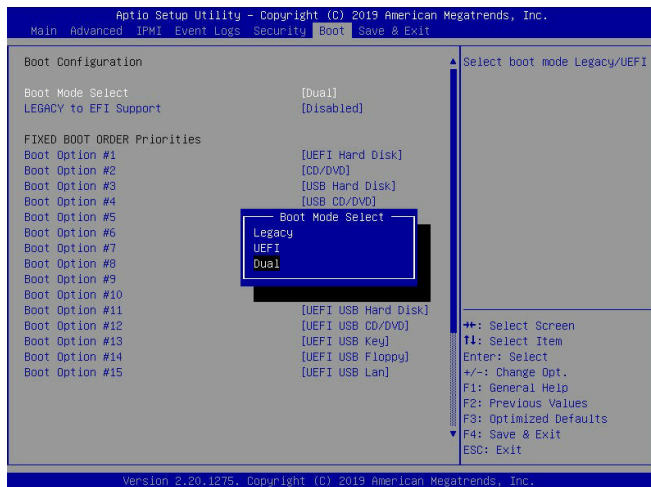


2. Under "Advanced->PCIe/PCI/PnP Configuration->, change "CPUx Slot x PCI-E OPROM" to "Legacy". "x" represents the PCIE slot assignment. For this example, the R720 is installed into "CPU1 Slot 2"
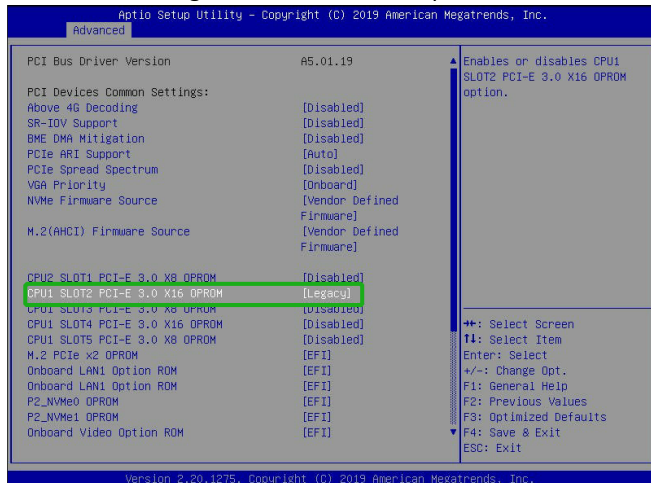


3. Reboot, use **Ctrl + H** key to log-in to the BIOS setting utility. The BIOS setting utility can be used for RAID management. The BIOS Utilitywill display information about hard drives attached to the adapter. Make sure all attached drives are detected by this utility. If any of the hard drives is not detected, power down the system and check the power and cable connections.
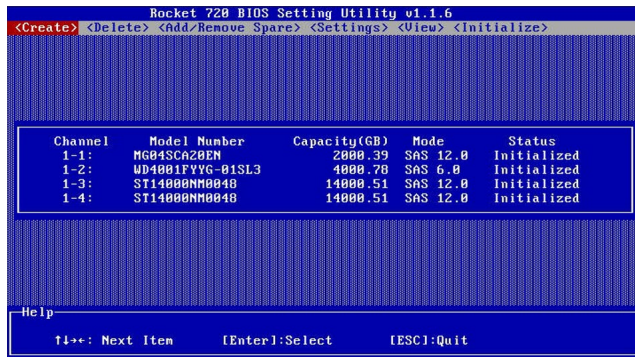
## 4.1.2 Using the BIOS Utility

The following keys are utilized by the Rocket 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.

## 4.1.3 BIOS Commands



**Create**: This command is used to create the RAID array.

**Delete**: This command is used to 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.

*Note：Disks must be initialized before they can be used to create arrays.*

## 4.1.4 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.
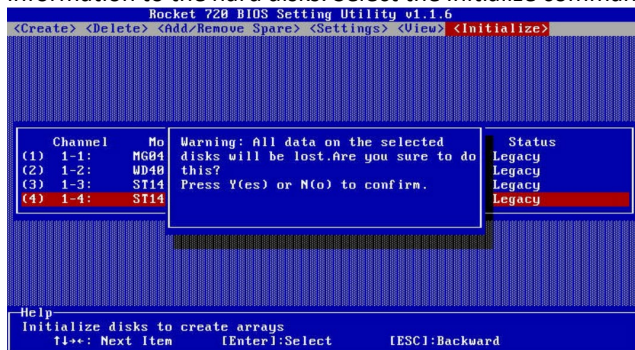
Highlight the target disks using the arrow keys, and then press the Enter key. A numeral will be displayed before each selected disk. Once all target disks have been selected, press ESC key. The utility will display a warning, and ask you to press Y (yes) to initialize, or N (no) to cancel. Once initialized, 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.
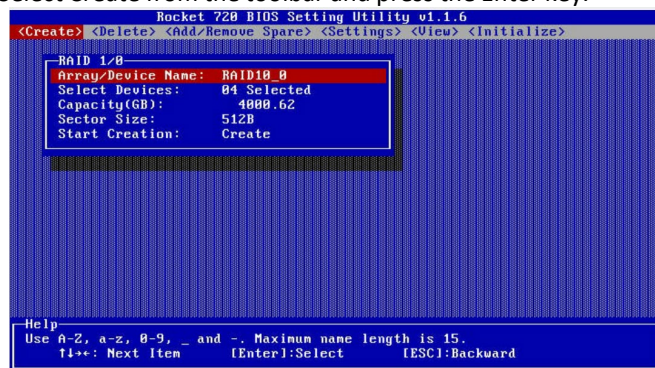


1. Use the arrow keys to select the RAID level and press the Enter key.
2. Use the arrow keys to highlight the Array Name option and press the Enter key. The array name dialogue box will appear. Use the keyboard to input a new Array Name, and press the Enter key.

*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.
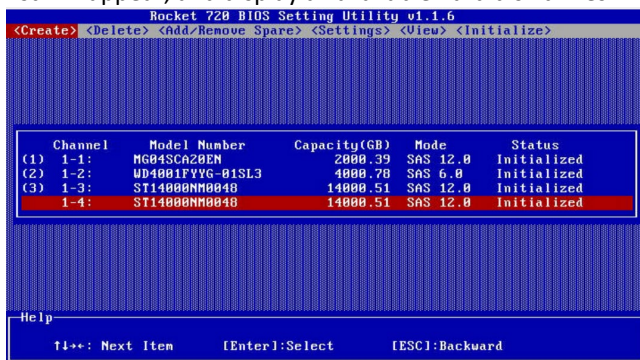


4. Highlight the target disks that you want to use, and press the Enter key to select them. A numeral will be displayed before each selected disk. This number designates disk order. After all of the disks have been selected and press the ESC key to return to the Create Menu.

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 setaside for this particular array, and press the Enter key.
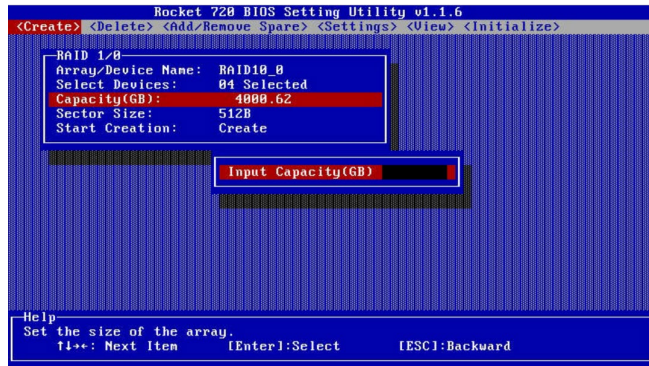
6. **Sector Size** – Also known as "Variable Sector Size". Use this option if you are using an older 32-bit Windows operating system. This allows older operating systems to support volumes over 2TB in size. Do not use if the operating system already supports large volumes (such as GPT).

## 4.1.5 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.
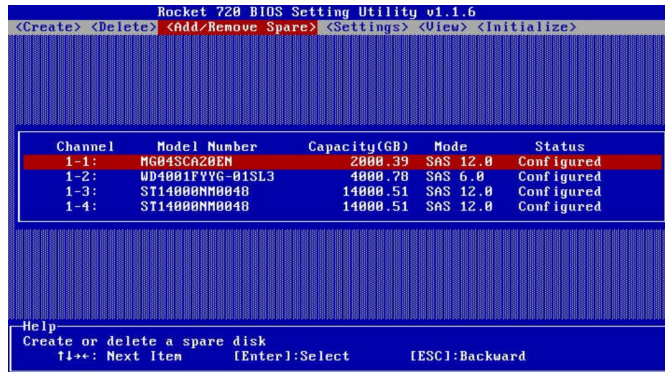
The utility will display a warning message. Press Y (yes) to delete the array, or select N (no) to cancel.
***Warning***: *All data stored on the array will be lost – do not delete if the array contains critical data.*
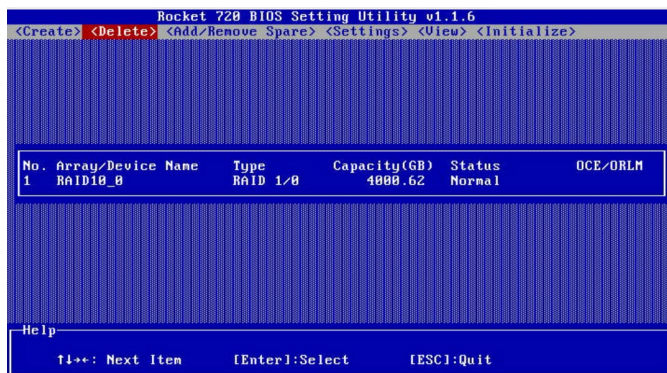


## 4.1.6 Add/Remove Spare Disks

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, 0, 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. Disk status changed from Initialized to Configured (Spare).

```
           Rocket 720 BIOS Setting Utility v1.1.6
<Create> <Delete> <Add/Remove Spare> <Settings> <View> <Initialize>




   Channel    Model Number    Capacity(GB)    Mode      Status
    1-1:      MG04SCA20EN        2000.39     SAS 12.0   Configured
    1-2:      WD4001FYYG-01SL3   4000.78     SAS 6.0    Configured
    1-3:      ST14000NM0048     14000.51     SAS 12.0   Configured
    1-4:      ST14000NM0048     14000.51     SAS 12.0   Configured




─Help──────────────────────────────────────────────────────
 Create or delete a spare disk
    ↑↓→←: Next Item      [Enter]:Select      [ESC]:Backward
```

## 4.1.7 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.

```
           Rocket 720 BIOS Setting Utility v1.1.6
<Create> <Delete> <Add/Remove Spare> <Settings> <View> <Initialize>
                          ┌─────────────────────────┐
                          │   Select Boot Device    │
                          └─────────────────────────┘




─Help──────────────────────────────────────────────────────
 Set boot mark to the logical device you select.
    ↑↓→←: Next Item      [Enter]:Select      [ESC]:Backward
```
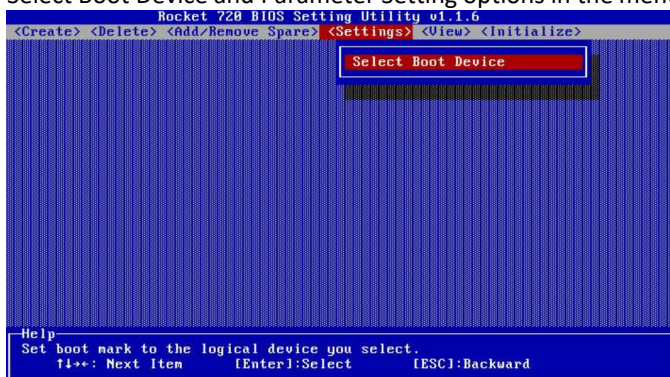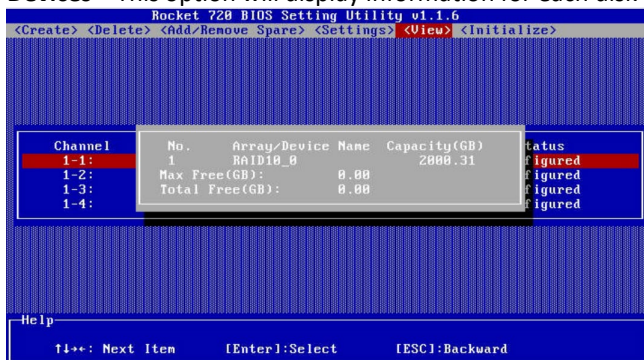
**Select Boot Device:**
Select which disk or array will act as the boot disk, if the motherboard BIOS instructs the card to act as the boot device.
- When booting up the system, press **CTRL** + **H** during the HighPoint Rocket splash screen to enter theBIOS RAID creation utility.
- Navigate to **Settings** 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

## 4.1.8 View

The View menu provides two options:
**Devices** – This option will display information for each disk hosted by the HBA.

```
           Rocket 720 BIOS Setting Utility v1.1.6
<Create> <Delete> <Add/Remove Spare> <Settings> <View> <Initialize>




   Channel  ┌ No.     Array/Device Name  Capacity(GB) ┐tatus
    1-1:     │ 1        RAID10_0            2000.31    │igured
    1-2:     │ Max Free(GB):      0.00                 │igured
    1-3:     │ Total Free(GB):    0.00                 │igured
    1-4:     └─────────────────────────────────────────┘igured




─Help──────────────────────────────────────────────────────
    ↑↓→←: Next Item      [Enter]:Select      [ESC]:Backward
```

**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.
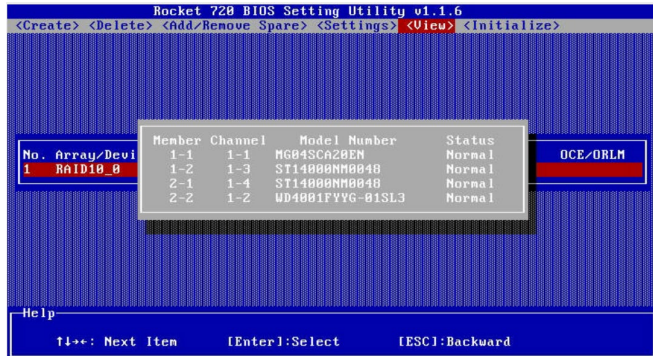


## 4.2. Using the Rocket Series HBA UEFI (UEFI HII)

*Note：After setting 'UEFI Setting', if there is no 'HighPoint RAID Management Utility' option in the motherboard BIOS, the motherboard does not support UEFI HII, please replace the other two methods.*

### 4.2.1 UEFI Setting Utility

The Rocket UEFI 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 UEFI should post during the system's boot procedure.
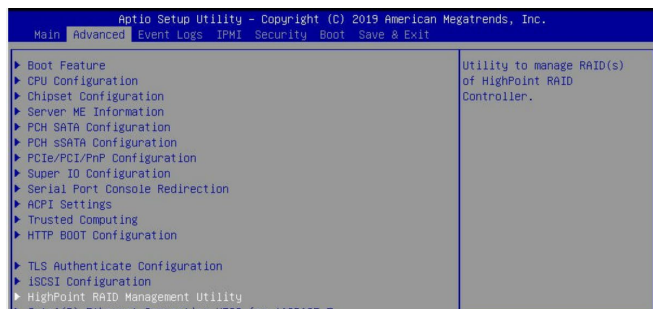


Different motherboards will provide different UEFI settings. Please consult your motherboard's user manual for more information.

Set UEFI setting with SuperMicro X11DPi-NT motherboard as an example.
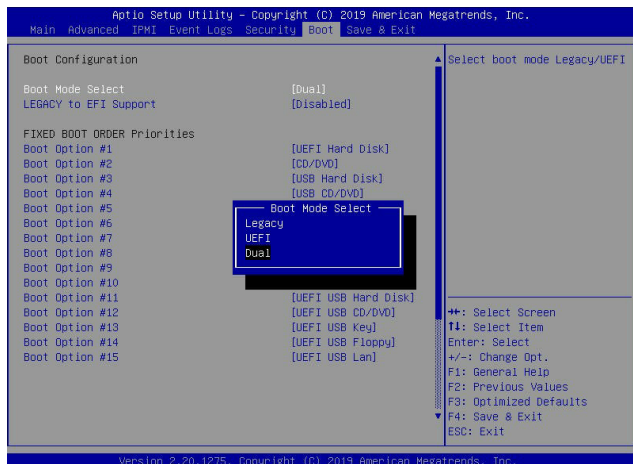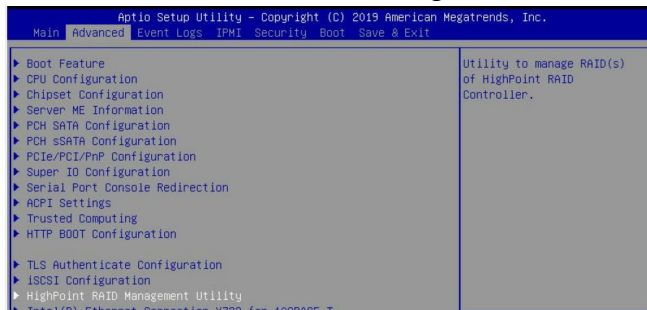
1. Set "Boot Mode Select" to "Dual"

2. Under "Advanced->PCIe/PCI/PnP Configuration->, change "CPUx Slot x PCI-E OPROM" to "EFI". "x" represents the PCIE slot assignment. For this example, the R720 is installed into "CPU1 Slot 2"
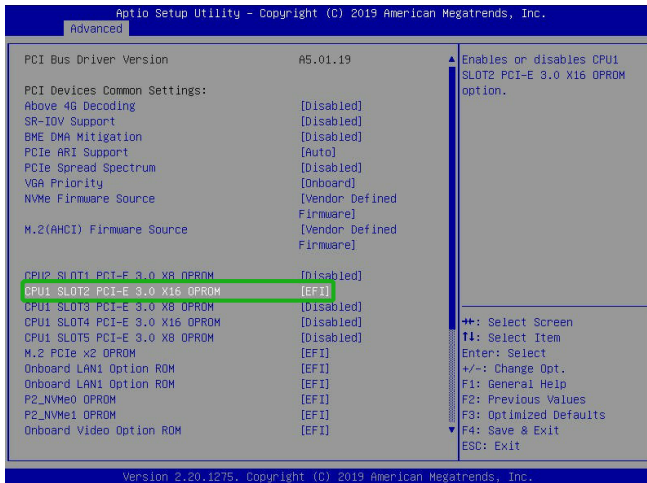


3. Reboot into the motherboard BIOS, "**HighPoint RAID Management Utility**" appears in the Advanced options.



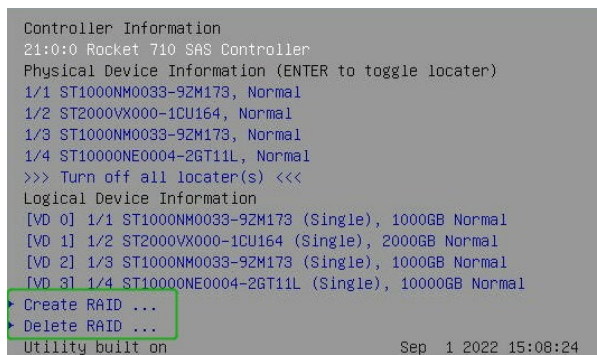## 4.2.2 Using the UEFI Utility (UEFI HII)

The following keys are utilized by the Rocket UEFI utility:

**Arrow keys** – Use these to move between different menu items.

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

**N or Esc** – Move back to the previous menu, cancel the selected operation, or exit the BIOS Utility.
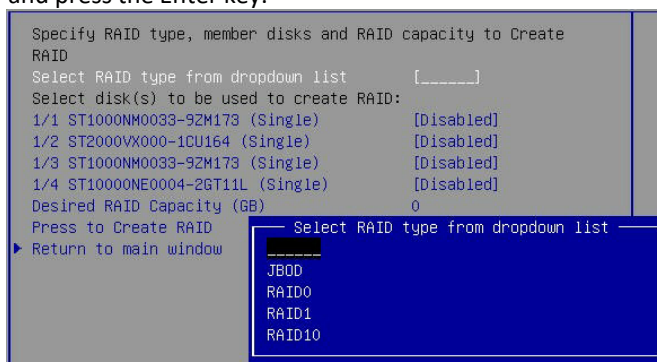
## 4.2.3 UEFI HII Commands



**Create**: This command is used to create the RAID array.

**Delete**: This command is used to delete the selected RAID array.

## 4.2.4 Create RAID Arrays
Using UEFI Utility with SuperMicro X11DPi-NT motherboard as an example

1. Select **Create RAID...** from the HighPint RAID Management Utility.
2. On the Create menu. A device list will appear, and display all available hard disk drives.
3. Select RAID type from dropdown list. Use the up and down keys of the keyboard or the mouse to select the RAID type and press the Enter key.
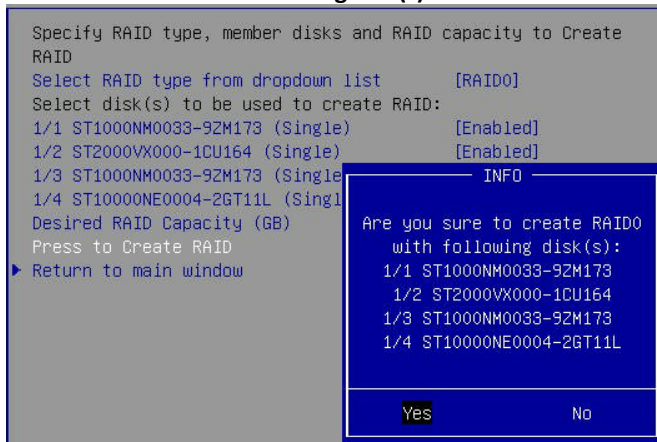
```
Specify RAID type, member disks and RAID capacity to Create
RAID
Select RAID type from dropdown list        [_____]
Select disk(s) to be used to create RAID:
1/1 ST1000NM0033-9ZM173 (Single)          [Disabled]
1/2 ST2000VX000-1CU164 (Single)           [Disabled]
1/3 ST1000NM0033-9ZM173 (Single)          [Disabled]
1/4 ST10000NE0004-2GT11L (Single)         [Disabled]
Desired RAID Capacity (GB)                0
Press to Create RAID      ── Select RAID type from dropdown list ──
▶ Return to main window      _____
                             JBOD
                             RAID0
                             RAID1
                             RAID10
```

**Supported RAID Type**：JBOD/ RAID0/RAID1 RAID10

4. Select the disk(s) that you want to configure an array with. Once a disk has been selected, the status will change from **disable** to **enable**.
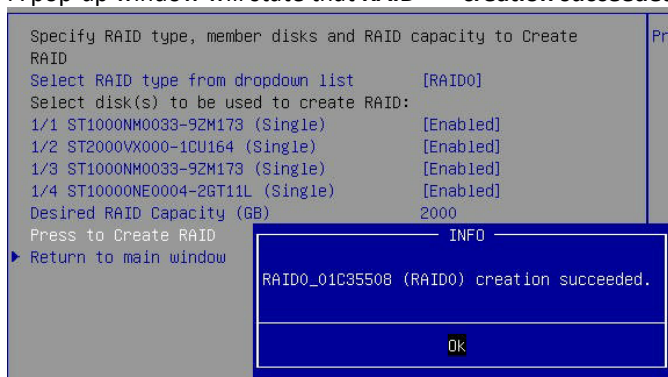
```
Specify RAID type, member disks and RAID capacity to Create
RAID
Select RAID type from dropdown list        [RAID0]
Select disk(s) to be used to create RAID:
1/1 ST1000NM0033-9ZM173 (Single)          [Disabled]
1/2 ST2000VX000-1CU164 (Single)           [Disabled]
1/3 ST1000NM0033-9ZM173 (Single)          [Disabled]
1/4 ST10000NE0004-2GT11L (Single)         [Disabled]
Desired RAID Capacity (GB)                0
Press to Create RAID
▶ Return to main window      ── 1/1 ST1000NM0033-9ZM173 (Single) ──
                             Disabled
                             Enabled
```

*Note：Disks don't need to be initialized before they can be used to create arrays.*

5. After all of the disks have been selected, you can decide how much storage capacity will be assigned to the array using.
   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 setaside for this particular array.
6. Next, select **press to create RAID** to complete the RAID Array creation. A pop-up window will prompt: **Are you sure to create RAID0 with following disk(s). Press 'Yes' to confirm.**

```
Specify RAID type, member disks and RAID capacity to Create
RAID
Select RAID type from dropdown list        [RAID0]
Select disk(s) to be used to create RAID:
1/1 ST1000NM0033-9ZM173 (Single)          [Enabled]
1/2 ST2000VX000-1CU164 (Single)           [Enabled]
1/3 ST1000NM0033-9ZM173 (Single ── INFO ──
1/4 ST10000NE0004-2GT11L (Singl
Desired RAID Capacity (GB)        Are you sure to create RAID0
Press to Create RAID                  with following disk(s):
▶ Return to main window                1/1 ST1000NM0033-9ZM173
                                       1/2 ST2000VX000-1CU164
                                       1/3 ST1000NM0033-9ZM173
                                       1/4 ST10000NE0004-2GT11L

                                      Yes              No
```

7.  A pop-up window will state that **RAID*** creation succeeded. Press ok to continue**.

```
Specify RAID type, member disks and RAID capacity to Create     Pre
RAID
Select RAID type from dropdown list        [RAID0]
Select disk(s) to be used to create RAID:
1/1 ST1000NM0033-9ZM173 (Single)          [Enabled]
1/2 ST2000VX000-1CU164 (Single)           [Enabled]
1/3 ST1000NM0033-9ZM173 (Single)          [Enabled]
1/4 ST10000NE0004-2GT11L (Single)         [Enabled]
Desired RAID Capacity (GB)                2000
Press to Create RAID              ┌──────── INFO ────────┐
▶ Return to main window           │                      │
                                  │ RAID0_01C35508 (RAID0) creation succeeded. │
                                  │                      │
                                  │         ┌─────┐      │
                                  │         │ Ok  │      │
                                  │         └─────┘      │
                                  └──────────────────────┘
```

*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.*

## 4.2.5 Delete RAID Arrays

Highlight the Delete command from the toolbar, and press the Enter key.
The UEFI utility will display a list of available RAID arrays.

1.  Select the array you wish to delete, and press the **Enter** key.

```
Select RAID and press ENTER to delete
  [VD 0] RAID0_01CC80BC (RAID0), 10001GB Normal
▶ Return to main window
```

2.  The utility will display a warning message. Press '**Yes**' to delete the array.

```
Select RAID and press ENTER to delete
  [VD 0] RAID0_01CC80BC (RAID0), 10001GB Normal
▶ Return to main window




                            ┌──────── WARNING ────────┐
                            │                         │
                            │ Are you sure to delete RAID: │
                            │      RAID0_01CC80BC      │
                            │                         │
                            │ ┌─────┐        ┌─────┐  │
                            │ │ Yes │        │ No  │  │
                            │ └─────┘        └─────┘  │
                            └─────────────────────────┘
```
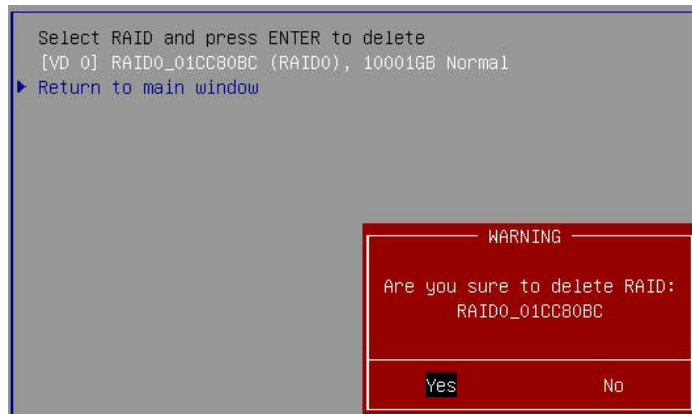
3.  Press **OK** key to confirm the operation again.
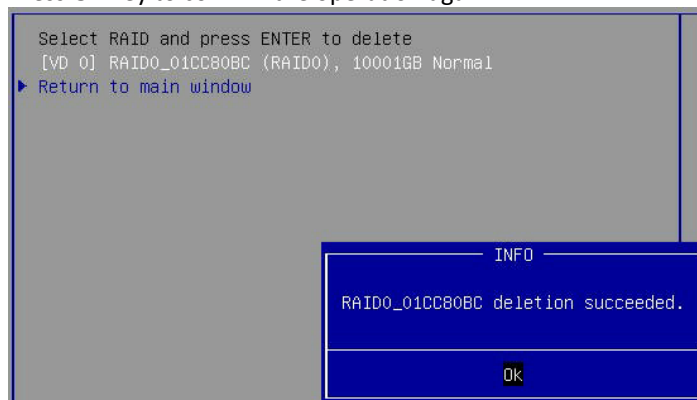
```
Select RAID and press ENTER to delete
  [VD 0] RAID0_01CC80BC (RAID0), 10001GB Normal
▶ Return to main window




                       ┌──────── INFO ────────┐
                       │                      │
                       │ RAID0_01CC80BC deletion succeeded. │
                       │                      │
                       │         ┌─────┐      │
                       │         │ Ok  │      │
                       │         └─────┘      │
                       └──────────────────────┘
```

*Warning: All data stored on the array will be lost – do not delete if the array contains critical data.*

### 4.2.6 Toggle Locater LEDs

The Locate LED function is used to identify the physical location of a hard drive or SSD by flashing the corresponding LED.

*Note: This function can only be used on motherboards with backplanes that support SGPIO.*

1. Select the disk to be located and press **Enter,** When the **<Locator>** appears behind the disk, it means that the toggle locater LED is successful. At this point, the backplane light of the slot where the disk is located starts blinking.

```
Physical Device Information (ENTER to toggle locater)
1/2 ST2000VX000-1CU164, Normal<Locater>
1/5 WDC WD60EFRX-68MYMN1, Normal
1/6 ST14000NM0018-2H4101, Normal
1/7 ST4000VN008-2DR166, Normal
1/8 TOSHIBA DT01ACA300, Normal
>>> Turn off all locater(s) <<<
```

2. Press Enter again, the **<Locator>** disappear, and the back panel light of the slot where the hard disk is located is off.

```
Physical Device Information (ENTER to toggle locater)
1/2 ST2000VX000-1CU164, Normal
1/5 WDC WD60EFRX-68MYMN1, Normal
1/6 ST14000NM0018-2H4101, Normal
1/7 ST4000VN008-2DR166, Normal
1/8 TOSHIBA DT01ACA300, Normal
>>> Turn off all locater(s) <<<
```

3. You choose to locate one or more disks, you can use the **Turn off all locater(s)** to turn off the lights together.

```
Physical Device Information (ENTER to toggle locater)
1/2 ST2000VX000-1CU164, Normal
1/5 WDC WD60EFRX-68MYMN1, Normal
1/6 ST14000NM0018-2H4101, Normal
1/7 ST4000VN008-2DR166, Normal
1/8 TOSHIBA DT01ACA300, Normal
>>> Turn off all locater(s) <<<
```

## 4.3. Using the Rocket Series HBA UEFI Command Line (UEFI CLI Tool)

### 4.3.1 UEFI Setting Utility

1. **Preparing the USB Flash Drive：**

   When preparing the USB flash dive, make sure to format the USB partition as FAT32. If another file system is used, the USB drive may not be properly recognized, and will not appear as an option under the motherboard's UEFI BIOS menus.

2. **Preparing the UEFI Package：**

   The package must be unzipped directly to the root of the bootable USB flash drive (do not extract the contents to a new folder). All of the following items must be present in the root of the USB flash drive. For example (**R710**)

   - 📁 efi
   - 📄 710all.bin
   - 📄 710all.blf
   - 📄 ArrayCreate.efi
   - 📄 go
   - 📄 load.efi
   - 📄 load
   - 📄 r710.nsh
   - 📄 Readme
   - 📄 startup.nsh

   *Note: If the above content is not present in the root directory, the UEFI boot device will not be properly recognized*

3. Insert the USB flash drive into the appropriate USB port.
4. **Under the Boot Mode settings, select UEFI.**

Note, different motherboards will provide different UEFI related settings. Please consult your motherboard's user manual for more information.

With SuperMicro X11DPi-NT motherboard as an example.
01. Set "Boot Mode Select" to "Dual";
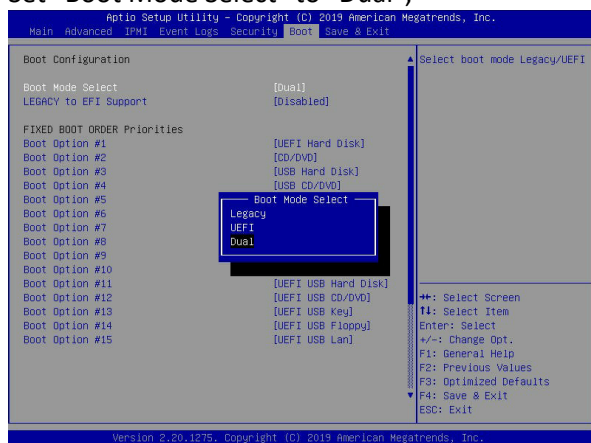


02. Under "Advanced->PCIe/PCI/PnP Configuration->, change "CPUx Slot x PCI-E OPROM" to "**EFI**". "x" represents the PCIE slot assignment. For this example, the RR3720 is installed into "CPU2 Slot
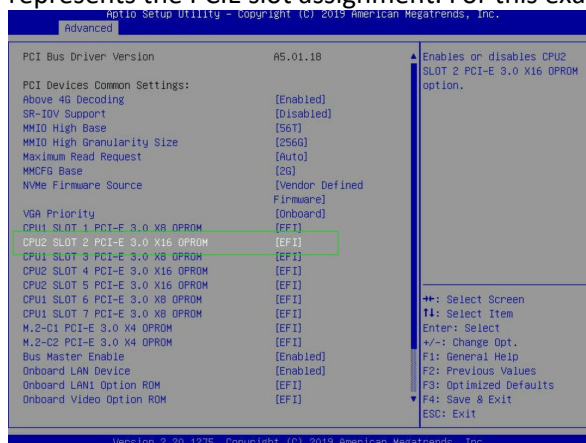


5. Boot from the UEFI USB flash drive and enter the UEFI interface;
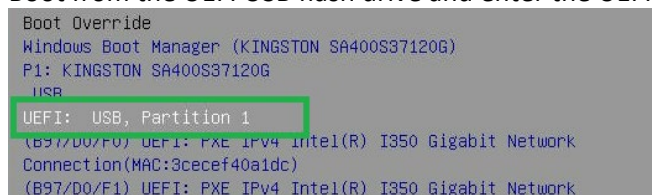


6. At the prompt, enter the following command to change the resolution:
**mode 100 31**
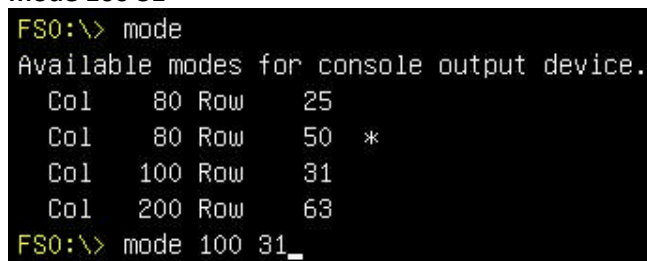
7.  Query the files in the USB flash drive and enter the command: **dir**

```
FS0:\UEFI\R710\v1.09\> dir
Directory of: FS0:\UEFI\R710\v1.09\
09/29/2022  15:25 <DIR>        16,384  .
09/29/2022  15:25 <DIR>        16,384  ..
09/07/2022  15:48            218,624  710all.bin
09/07/2022  18:05            218,952  710all.blf
10/14/2021  16:31             96,960  ArrayCreate.efi
09/07/2022  18:11              2,957  Readme.txt
09/07/2022  17:50 <DIR>        16,384  efi
08/12/2022  16:10                 24  go.bat
09/01/2022  17:46            110,144  load.efi
08/08/2022  15:10            119,766  load.exe
09/01/2022  19:09                 23  r710.nsh
03/28/2022  12:58                238  startup.nsh
          9 File(s)      767,688 bytes
          3 Dir(s)
```

8.  Next, enter the following command to enter the RAID creation utility:
    **ArrayCreate.efi**

```
FS0:\UEFI\R710\v1.09\> ArrayCreate.efi
Highpoint RAID utility for UEFI (version: 20211014)
==== Controller information:
  PCI Location: 17:00:00
        Vendor: HighPoint Technologies, Inc.
        Product: Rocket 710 SAS Controller

==== Physical device list(count 5):
1/2 ST2000VX000-1CU164-Z1E2HYQB, 2000398MB(MaxFree 0MB), Normal
1/5 WDC WD60EFRX-68MYMN1-WD-WX31DB48X74A, 6001175MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/6 ST14000NM0018-2H4101-ZHZ0ZN64, 14000519MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/7 ST4000VN008-2DR166-WDH109Q0, 4000787MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/8 TOSHIBA DT01ACA300-Y731JVGAS, 3000592MB(MaxFree 0MB), Normal [RA][WC][NCQ]

==== Logical device list(count 5):
 1 1/2 ST2000VX000-1CU164-Z1E2HYQB, 2000398MB(MaxFree 0MB), Normal
 2 1/5 WDC WD60EFRX-68MYMN1-WD-WX31DB48X74A, 6001175MB(MaxFree 0MB), Normal [RA][WC][NCQ]
 3 1/6 ST14000NM0018-2H4101-ZHZ0ZN64, 14000519MB(MaxFree 0MB), Normal [RA][WC][NCQ]
 4 1/7 ST4000VN008-2DR166-WDH109Q0, 4000787MB(MaxFree 0MB), Normal [RA][WC][NCQ]
 5 1/8 TOSHIBA DT01ACA300-Y731JVGAS, 3000592MB(MaxFree 0MB), Normal [RA][WC][NCQ]
---------------------------------------------------------------------
>>> Please specify command to execute:
<<< _
```

## 4.3.2 UEFI CLI Commands

```
Supported command: help/info/quit/exit/create/delete.
```

**H/h/help:** Show generic help about this utility.
**info:** Display physical device list and logical device list
**Q/q/quit/exit:** Quit the application
**create**:  This command is used to create the RAID array.
**delete**:  This command is used to delete the selected RAID array.

## 4.3.3 Create RAID Arrays
*Note: R710/720 only support RAID0/1/10/JBOD*
Create Array Type (JBOD/RAID0/RAID1/10) Member Disk list (1/1, 1/2|*) Capacity (100|*)

**Examples**
<<< create RAID0 * *
<<< create RAID0 *
<<< create RAID0
  create RAID0 array with all disks and with maximum capacity

```
>>> Please specify command to execute:
<<< create RAID0 * *
    Creating array: RAID0_4431B782.
    Array created successfully.
=====================================================================
>>> Please specify command to execute:
<<< create RAID0 *
    Creating array: RAID0_3AB50C2A.
    Array created successfully.
=====================================================================
>>> Please specify command to execute:
<<< create RAID0
    Creating array: RAID0_60B7ACD9.
    Array created successfully.
=====================================================================

==== Physical device list(count 5):
1/2 ST2000VX000-1CU164-Z1E2HYQB, 2000313MB(MaxFree 0MB), Normal
1/5 WDC WD60EFRX-68MYMN1-WD-WX31DB48X74A, 6001075MB(MaxFree 4000762MB), Normal [RA][WC][NCQ]
1/6 ST14000NM0018-2H4101-ZHZ0ZN64, 14000452MB(MaxFree 12000138MB), Normal [RA][WC][NCQ]
1/7 ST4000VN008-2DR166-WDH109Q0, 4000694MB(MaxFree 2000381MB), Normal [RA][WC][NCQ]
1/8 TOSHIBA DT01ACA300-Y731JVGAS, 3000504MB(MaxFree 1000190MB), Normal [RA][WC][NCQ]

==== Logical device list(count 1):
 1 [VD0-0] RAID0_60B7ACD9 (RAID0), 10001569MB (Stripe 64KB), Normal
    1/2 ST2000VX000-1CU164
    1/5 WDC WD60EFRX-68MYMN1
    1/6 ST14000NM0018-2H4101
    1/7 ST4000VN008-2DR166
    1/8 TOSHIBA DT01ACA300
--------------------------------------------------------------------
>>> Please specify command to execute:
<<< _
```

<<< create RAID1 1/5,1/6 10
   create RAID1 array with disk 1/5 and 1/6 and with 10GB capacity.
```
>>> Please specify command to execute:
<<< create RAID1 1/5,1/6 10
    Creating array: RAID1_000041A7.
    Array created successfully.
=====================================================================

==== Physical device list(count 4):
1/5 WDC WD60EFRX-68MYMN1-WD-WX31DB48X74A, 6001075MB(MaxFree 5991075MB), Normal [RA][WC][NCQ]
1/6 ST14000NM0018-2H4101-ZHZ0ZN64, 14000452MB(MaxFree 13990452MB), Normal [RA][WC][NCQ]
1/7 ST4000VN008-2DR166-WDH109Q0, 4000694MB(MaxFree 4000694MB), Normal [RA][WC][NCQ]
1/8 TOSHIBA DT01ACA300-Y731JVGAS, 3000504MB(MaxFree 3000504MB), Normal [RA][WC][NCQ]

==== Logical device list(count 1):
 1 [VD0-0] RAID1_000041A7 (RAID1), 10000MB (Stripe 64KB), Normal
    1/5 WDC WD60EFRX-68MYMN1
    1/6 ST14000NM0018-2H4101
--------------------------------------------------------------------
```

<<< create RAID10 *
   create RAID10 array with all disks and with maximum capacity.
```
>>> Please specify command to execute:
<<< create RAID10 *
    Creating array: RAID10_10D63AF1.
    Array created successfully.
=====================================================================

==== Physical device list(count 4):
1/5 WDC WD60EFRX-68MYMN1-WD-WX31DB48X74A, 6001075MB(MaxFree 3000571MB), Normal [RA][WC][NCQ]
1/6 ST14000NM0018-2H4101-ZHZ0ZN64, 14000452MB(MaxFree 10999948MB), Normal [RA][WC][NCQ]
1/7 ST4000VN008-2DR166-WDH109Q0, 4000694MB(MaxFree 1000190MB), Normal [RA][WC][NCQ]
1/8 TOSHIBA DT01ACA300-Y731JVGAS, 3000504MB(MaxFree 0MB), Normal [RA][WC][NCQ]

==== Logical device list(count 1):
 1 [VD0-0] RAID10_10D63AF1 (RAID0), 6001008MB (Stripe 64KB), Normal
    RAID10_10D63AF1 (RAID1), 3000504MB (Stripe 64KB), Normal
        1/5 WDC WD60EFRX-68MYMN1
        1/6 ST14000NM0018-2H4101
    RAID10_10D63AF1 (RAID1), 3000504MB (Stripe 64KB), Normal
        1/7 ST4000VN008-2DR166
        1/8 TOSHIBA DT01ACA300
--------------------------------------------------------------------
```

<<< create JBOD 1/5,1/6 *
   create RAID1 array with disk 1/5 and 1/6 and with maximum capacity.

```
>>> Please specify command to execute:
<<< create JBOD 1/5,1/6 *
    Creating array: JBOD_4431B782.
    Array created successfully.
==========================================================================

==== Physical device list(count 4):
1/5 WDC WD60EFRX-68MYMN1-WD-WX31DB48X74A, 6001075MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/6 ST14000NM0018-2H4101-ZHZ0ZN64, 14000452MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/7 ST4000VN008-2DR166-WDH109Q0, 4000694MB(MaxFree 4000694MB), Normal [RA][WC][NCQ]
1/8 TOSHIBA DT01ACA300-Y731JVGAS, 3000504MB(MaxFree 3000504MB), Normal [RA][WC][NCQ]


==== Logical device list(count 1):
 1 [VD0-0] JBOD_4431B782 (JBOD), 20001528MB (Stripe 64KB), Normal
    1/5 WDC WD60EFRX-68MYMN1
    1/6 ST14000NM0018-2H4101
--------------------------------------------------------------------------
```

## 4.3.4 Delete RAID Arrays

**delete {array ID}**

**Example**
<<< delete 1
   delete the first array from Logical device list.
<<< delete 2
   delete the second array from Logical device list.

```
==== Logical device list(count 2):
 1 [VD0-0] JBOD_4431B782 (JBOD), 20001528MB (Stripe 64KB), Normal
    1/5 WDC WD60EFRX-68MYMN1
    1/6 ST14000NM0018-2H4101
 2 [VD0-1] RAID1_1C06DAC8 (RAID1), 3000504MB (Stripe 64KB), Normal
    1/7 ST4000VN008-2DR166
    1/8 TOSHIBA DT01ACA300
--------------------------------------------------------------------------
>>> Please specify command to execute:
<<< delete 2
    Deleting array: RAID1_1C06DAC8 idx 1 1e
<<<<<< hpt_delete_array: id 1e options 2
    Array deleted successfully.
==========================================================================

==== Physical device list(count 4):
1/5 WDC WD60EFRX-68MYMN1-WD-WX31DB48X74A, 6001075MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/6 ST14000NM0018-2H4101-ZHZ0ZN64, 14000452MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/7 ST4000VN008-2DR166-WDH109Q0, 4000694MB(MaxFree 4000694MB), Normal [RA][WC][NCQ]
1/8 TOSHIBA DT01ACA300-Y731JVGAS, 3000504MB(MaxFree 3000504MB), Normal [RA][WC][NCQ]

==== Logical device list(count 1):
 1 [VD0-0] JBOD_4431B782 (JBOD), 20001528MB (Stripe 64KB), Normal
    1/5 WDC WD60EFRX-68MYMN1
    1/6 ST14000NM0018-2H4101
--------------------------------------------------------------------------
```

## 4.3.5 Info command

<<< info
   display physical device list and logical device list

```
>>> Please specify command to execute:
<<< info
==========================================================================

==== Physical device list(count 4):
1/5 WDC WD60EFRX-68MYMN1-WD-WX31DB48X74A, 6001075MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/6 ST14000NM0018-2H4101-ZHZ0ZN64, 14000452MB(MaxFree 0MB), Normal [RA][WC][NCQ]
1/7 ST4000VN008-2DR166-WDH109Q0, 4000694MB(MaxFree 4000694MB), Normal [RA][WC][NCQ]
1/8 TOSHIBA DT01ACA300-Y731JVGAS, 3000504MB(MaxFree 3000504MB), Normal [RA][WC][NCQ]

==== Logical device list(count 1):
 1 [VD0-0] JBOD_4431B782 (JBOD), 20001528MB (Stripe 64KB), Normal
    1/5 WDC WD60EFRX-68MYMN1
    1/6 ST14000NM0018-2H4101
--------------------------------------------------------------------------
```

## 4.4. Driver & WebGUI Installation

### 4.4.1 Driver and WebGUI Installation (Windows)

Download and prepare the Windows Driver and WebGUI from the product download page.
**Rocket 700:**

https://www.highpoint-tech.com/rocket700-series

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.
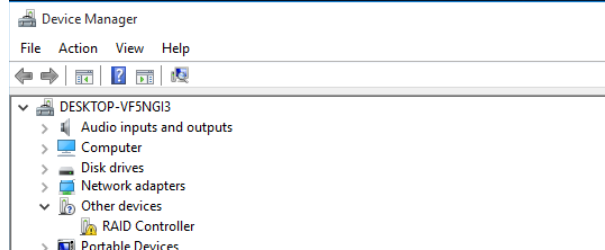


3. Extract the Windows driver and double click on the **Setup.exe** in the driver folder.
4. Restart the system for the driver to be loaded completely.
5. The Rocket 700 controller will be ready for use after Windows reboots.
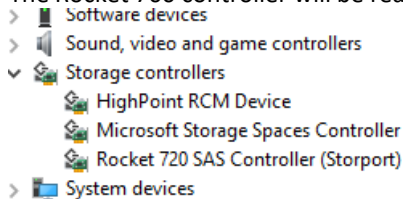


6. Extract the WebGUI package and double click the setup program to install.

### 4.4.2 Driver and WebGUI Installation (Linux)

Download and prepare the Driver and WebGUI from the product download page.
**Rocket 700:**
https://www.highpoint-tech.com/rocket700-series

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

## 4.5. Using the HighPoint WebGUI

Double click the Desktop ICON to start the Web browser. It will automatically log-in to the HighPointRAID Management.

The password can be set after the first log-in. To change the password, select **Setting>Security** from the menu bar.

### 4.5.1 Verify the Controller Status

The **Global View** Tab will display the overall status of the controller. The Virtual Disk is listed under **LogicalDevice Information**. The individual drives are listed under **Physical Device Information.**

## 4.5.2 Creating an Array

To create an array:

1. Log into HRM
2. Select the proper **controller** from the drop down on the top left
3. Click **Logical**
4. Click **Create Array**



**Array Type:**

An array is a collection of physical disks that will be seen as one virtual drive by your Operating System (OS).

The R700 is capable of creating the following array types:
- RAID 0 — Striping
- RAID 1 — Mirroring
- RAID 1/0 — Striping Mirrored array

Each RAID level has its pros and cons based on the application you use it for (Note: Refer to RAID level Quick Reference)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Array | Name: | the | name | that | will | be | displayed | in | Logical | Device | |

Information (Default: RAID_<level>_<array number>)

Initialization Method: Initialization of a disk sets all data bits to 0, essentially clearing all the data on the drive. It is important to initialize disks as previous data physically stored on the drive may interfere with new data.

- **Keep Old Data:** This option skips the initialization process and all data on each physical disk of the array will be untouched.
- **Quick Init**: This option grants immediate access to the RAID array by skipping the initialization process, but it will delete all data. Note: Skipping initialization is generally not recommended as residual data on disks may interfere with new data in the future.

- **Foreground**: The array initialization process will be set at high priority. During this time array is not accessible, but the initialization process will complete much faster. (Recommended)
- **Background**: The array initialization process will have a lower priority. During this time the array will be accessible, but the initialization process will take much longer to complete.

**Note:** Initializing takes a significant amount of time (approximately 2 hours per 1 TB when using hard drives). Foreground initializing the array will completely zero out the data on the disks, meaning the disk will be completely wiped and every bit on the disk will be set to 0. Background initialization means the array will still be created, and you can still write new data onto the array. But when your array requires rebuilding, residual data left behind may interfere with the process.

**Cache Policy** (Default: Write Back)

**Write Back** – Any data written to the array will be stored as cache, resulting in better I/O performance at the risk of data failures due to power outages. Data will be stored as cache before it is physically written to the disk; when a power outage occurs, any data in the cache will be lost.

**Write Through** – Data written to an array is directly written onto the disk, meaning lower write performance for higher data availability. Without cache acting as a buffer, write performance will be noticeably slower but data loss due to power outages or other failures is significantly minimized.

**Block Size** (default: 64K)
[64K to 128K are the supported block sizes]

Adjusting the block size towards your disk usage can result in some performance gain.

In a typical RAID configuration, data of the virtual drive is striped (or spread across) the physical drives. Having a smaller array block size will increase the likelihood of accessing all physical drives when processing large I/O requests. Multiple physical drives working in parallel increases the throughput, meaning better performance.

For smaller I/O requests (512 bytes to 4 kilobytes), it is better to have each individual disks handle their own I/O request, improving the IOPS (I/O per second), rather than having one tiny I/O request being handled by multiple disks.

**Capacity** (Default: Maximum)

The total amount of space you want the RAID array to take up. When creating RAID levels, disk capacities are limited by the smallest disk.

An example of how disk capacities are limited by smallest disk.

- You have 2 drives connected to the enclosure.
- The first drive is 6 TB, the second is 4 TB
- After creating a RAID level 1 using both drives and maximum capacity, the first drive will have 2 TB, the second 0 TB of free capacity
- The free capacity on the second drive can be used to create a separate array with other drives.

You may also choose how much space each array will utilize. You can use the remaining space to create another array (up to 4 arrays are supported).

### 4.5.3 Adding Spare Disks

Spare disks are physical disks that will immediately replace critical disks in an array.

**To add spare disks:**
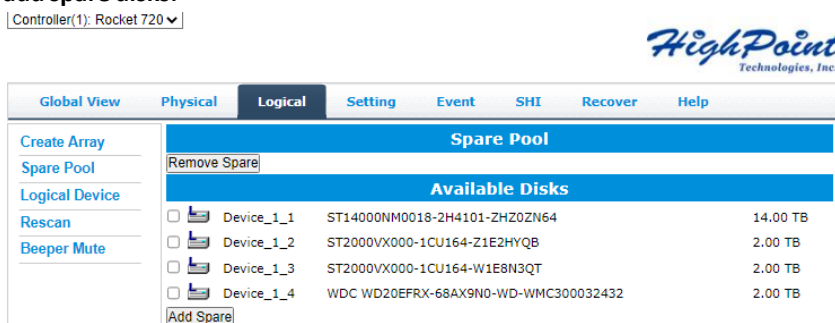


1.  Log into the **HRM;**

2.  Click **Logical;**

3.  Click **Spare Pool:**
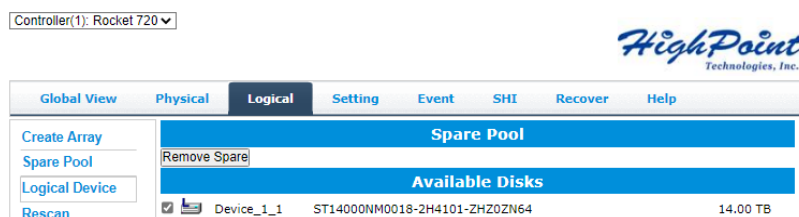


4.  Check the box for the disk you want as a spare under **Available Disks.**

5.  Click **Add Spare,** and confirm by selecting **OK** from the pop-up window**:**
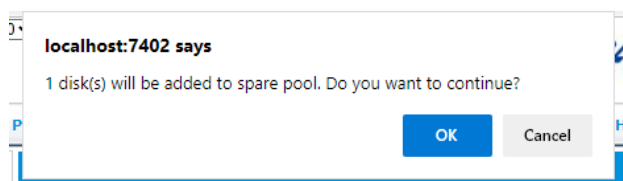


6.  The disk has now been assigned as a spare. Click **OK** to confirm:
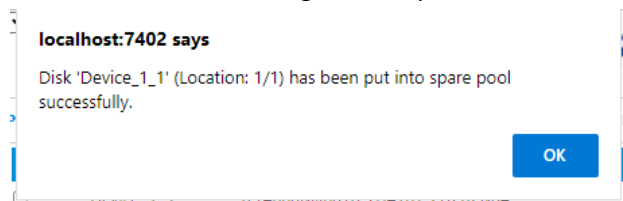


Disks added to the spare pool will be displayed under **Spare Pool** and can be removed by checking the box before the target drive, then click the **Remove Spare** button.

Physical drives marked as a spare will automatically be added to an array whenever there is a disk failure. This feature minimizes the chances of a data loss by reducing the time an array is in the critical status.

### 4.5.4 Obtaining Logical Device Information

The Logical device tab is the default page after clicking the Logical tab of the HRM. This page contains information about your RAID arrays and the individual disks your system detects.



**Logical Device Information**
Arrays you create and the properties associated with them will appear here.

**Maintenance**
Once an array has been created, the Maintenance menu provides options to maintain or edit it. To access the Maintenance menu, click the **Maintenance** button towards the right-hand side of the array name.

**Array Information**
Clicking on the maintenance button will show you the Array information box. Different array statuses (Normal, critical, disabled) will have different maintenance options.

### 4.5.5 Array Information &Maintenance Options: Normal Status

Arrays with the **Normal** status are healthy and functioning properly.

Arrays with the **Normal** status will have the following options:
**Delete** – deletes the selected RAID array

**Verify** – verifies the integrity of the RAID array

**Rename** – renames the RAID array.

## 4.5.6 Array Information & Maintenance Options: Critical Status



Arrays in the **Critical** status can be accessed and utilized, but are no longer fault tolerant. A Critical array should be rebuilt as soon as possible to restore redundancy.

A critical status array has all the **Normal** status options except the following:
- The Array can no longer be renamed
- **Add Disk** replaces the **Verify Disk** option

Once the array status changes to critical, the faulty disk will be taken offline and you can either:
- Reinsert the same disk
- Insert new disk

Reinserting the same disk should trigger the rebuilding status, since data on the disk would be recognized.

If you insert a new disk, clicking **Add Disk** will give you the option to select that disk and add it to the array.
If a spare disk is available, an array that has entered the critical state will begin rebuilding using the next available spare disk.

## 4.5.7 Array Information & Maintenance Options: Disabled Status



An array with the **Disabled** status means that the RAID level does not have enough disks to function.
- Your data will be inaccessible
- Rebuilding will not trigger, since the RAID array does not have enough parity data to rebuild.

Arrays with the **Disabled** status will have the following options:
**Delete** – deletes the selected RAID array
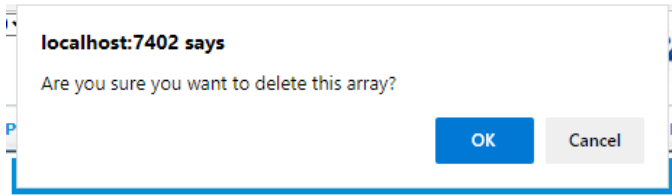
**Unplug** – Hot-plug remaining member disks

**Recover** – Recover Normal RAID.

You need to delete the current **Disabled RAID**, and then insert the Offline Disk back. Refresh the page, Offline Disk becomes normal status, and Logical Device Information appears **Disabled RAID**. Click the **Recover** to recover the original Normal RAID.

## 4.5.8 Physical Controller Information



- **Model Name**— model name of the driver connected
- **EFI Version** — the UEFI version of the controller
- **Vendor** — the controller's owner
- **Maximum Link Width —** PCIe width occupied by the motherboard
- **Current Link Width —** PCIe width occupied by drivers
- **Maximum Link Speed —** Maximum rate supported by the motherboard
- **Current Link Speed —** Rate of current bandwidth
-

## 4.5.9 Update BIOS

You can select the BIOS file to be updated by clicking the browse button, and then click Submit to complete.

## 4.5.10    Physical device Information



- **Location** ─ which controller and port the drive is located
- **Model**─ model number of the drive connected
- **Capacity**─ total capacity of the drive
- **MaxFree**─ total capacity that is not configured
- **Status**─ Current state of drive

**Rescan**

Clicking rescan will force the drivers to report the array status. For any disk(s) you hot plug into the device; do not click rescan until all physical drives are detected and appear under Logical Device Information.

## 4.5.11    System Setting



Using this tab, you can change the following:
- Enable auto-rebuilding
- Enable rebuilding on error
- Enable audible alarm
- Set Spindown Idle Disk(minutes)
- Restrict to localhost
- Set rebuild priority
- Change port number
- Change temperature unit
- Change HRM password

**System Setting**

**Enable auto rebuild** (default: Enabled)
When a physical drive fails, the controller will take the drive offline. Once you re-insert or replace the disk, the controller will not automatically rebuild the array unless this option is enabled.

**Enable continue rebuilding on error** (default: Enabled)
When enabled, the rebuilding process will ignore bad disk sectors and continue rebuilding until completion. When the rebuild is finished, the data may be accessible but may also be inconsistent, due to any bad sectors that were ignored during the procedure. If this option is enabled, HighPoint recommends checking the event log periodically for bad sectors warnings.

**Enable audible alarm** (default: Enabled)

When the disk is dropped, the buzzer will beep. If this option is disable, you won't hear any sound.

**Set Spindown Idle Disk(minutes)** (default: Disabled)

If this option is disabled, the disk attached to the R720 will not stop spinning. If you set the time limit, the diskwill

stop rotating according to the specified time when the system is not reading or writing.

**Restrict to localhost access** (default: Enabled)
Remote access to the controller will be restricted when enabled; other users in your network will be unable to remotely log in to the HRM.

**Rebuild Priority** (default: Medium)
You can specify the amount of system resources you want to dedicate to rebuilding the array. There are 5 levels of priority [Lowest, Low, Medium, High, Highest]

**Port Number** (default: 7402)
The default port that the HighPoint HRM listens on is 7402. You may change it to any open port.

**Temperature Unit** (default: $℉$ )

**Password Settings**
You can switch the expression of temperature units between $℉$ and $℃$ temperature units.

**Changing your HRM password**

Under Password Setting, type your new password, confirm it, then click **Submit**.

**Recovering your HRM password**

If you forget your password, you can delete the file hptuser.dat. Then you need to restart the computer and open the WEBGUI to set a new password

For **Windows** Users:

1. Open file explorer
2. Navigate to **C:/Windows/**
3. Delete **hptuser.dat**
4. Reboot

**Email Setting**

The following topics are covered under email:
**SMTP Setting**
**Adding Recipients**

You can instruct the controller to send an email out to the recipients of your choosing when certain events trigger (for more information, see Event Tab).

**SMTP settings**

| SMTP Setting | |
|---|---|
| ☐Enable Event Notification | |
| Server Address (name or IP): | |
| Mail From (E-mail address): | |
| Login Name: | |
| Password: | |
| SMTP Port: | 25 |
| Support SSL: | ☐ |
| | Change Setting |

**To set up email alerts:**

1. Check the Enable Event Notification box.

2. Enter the ISP server address name or SMTP name

3. Type in the email address of the **sender** (email account that is going to **send** the alert)

4. Type in the account name and password of the sender

5. Type in the SMTP port (default: **25**)

6. Check support SSL box if SSL is supported by your ISP (port value will change to **465**).

**Note**: After you click **Change Setting,** the password box will become blank.

**How to Add Recipients**

| Recipients | | |
|---|---|---|
| **E-mail** | **Name** | **Event Level** |
| **Add Recipient** | | |
| E-mail: | | |
| Name: | | |
| Event Level: | | ☐Information ☐Warning ☐Error |
| Add   Test | | |

You can add multiple email addresses as receivers of a notice.

1. Type the email of the recipient in the **E**-**mail** text box
2. Type the name of the recipient in the **Name** text box
3. Check which type(s) of events will trigger an email using the respective **Event Level** check boxes.
4. (**Optional**) Click **test** to confirm the settings are correct by sending out a test email
5. Click **add** to add the 'recipient to recipient' list
6. The added recipient will display in under **Recipients**

The email will include the output recorded in the event log.
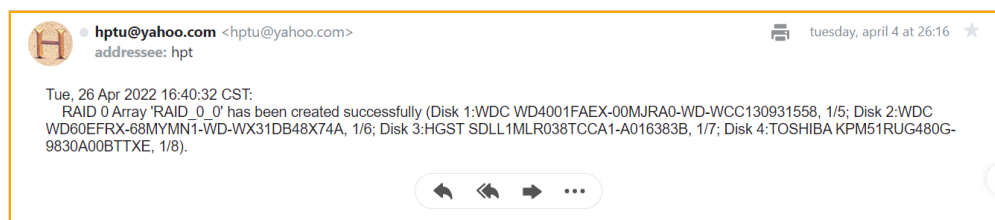
Example email message:



**Figure 1. Example event log email**

## 4.5.12    Event Tab

In the event tab, you can see log entries associated with the HighPoint device. The event log provides useful information when troubleshooting your set up.

In the event tab, there are four options available:
Download – Save the log file on your computer
Clear – Clears all log entries
Prev – View previous log page
Next – View next log page

## 4.5.13    SHI (Storage Health Inspector)

- S.M.A.R.T Attributes
- Schedule a task (Task list and Health Inspector Scheduler)

SHI outputs information collected using SMART (Self-Monitoring Analysis and Reporting Technology) Hard Drive Technology. The data provided on this tab helps you to anticipate any disk failures based on a variety of monitored hard disk properties.

**How to Enable SMART Monitoring**

To access SMART attributes of an individual disk:

1. Log in to the HRM
2. Select the proper controller using the drop down menu on the top left
3. Click the **SHI** tab
4. Click **Detail** on the desired disk

**How to Use the Health Inspector Scheduler**



The **Health Inspector Scheduler** (**HIS**) enables you to schedule disk/array checkups to ensure disks/array are functioning optimally.

**How to Create a New Verify Task**

All Redundant RAIDs will appear under New Verify Task.

1.  Log into the HRM.
2.  Select the proper controller from the top left drop down.
3.  Click **SHI.**
4.  Click **Schedule.**
5.  Select the array you want to schedule the verify task.
6.  Type the name in **Task Name** entry box.
7.  Choose whether you want to schedule.
8.  One time verify task on specific date (YYYY-MM-DD) at (HH:MM:SS, 24-hr clock).
9.  Or a specific schedule you can adjust based on Daily, Weekly, or Monthly options.
10.  Click **Submit.**
11.  Your entry will appear under **Tasks List.**

**Note**: New Verify Task box only appears if you have normal status arrays. If you have a critical array, New Rebuild Task will replace New Verify Task.

## 4.5.14    Help

Online Help
Register Product
Diagnostic

**Online Help** redirects you to additional documentation concerning the HighPoint HRM.

**Diagnostic** provides some basic information about the system and product.



It also provides one-click collection of controller information, and the collected content information is packaged into a compressed package and saved in the C drive. Log Location will show you where to save the log in detail.

## Table 1.HRM Icon Guide

| | |
|---|---|
| | **Critical – missing disk**<br>A disk is missing from the array bringing it to 'critical' status. The array is still accessible but another disk failure could result in data loss. |
| | **Verifying**<br>The array is currently running a disk integrity check. |
| | **Rebuilding**<br>The array is currently rebuilding meaning you replaced a failed disk or added a new disk to a 'critical' state array. |
| | **Critical – rebuild required**<br>The array has all disks, but one disk requires rebuilding. |
| | **Disabled**<br>The icon represents a disabled array, meaning more than one disk failed and the array is no longer accessible |
| | **Initializing**<br>The array is initializing. The two types of initialization are Foreground and Background. (See |
| | Initialization)<br>**Uninitialized**<br>The array initialization process has been interrupted, and the process is incomplete. |
| | **Not Initialized**<br>Disk is not initialized yet, and needs to be initialized before use |
| | **OCE/ORLM**<br>Array is performing a OCE/ORLM operation |
| | **OCE/ORLM has stopped**<br>The array expansion process has been stopped. |
| | **Legacy**<br>An existing file system has been detected on the disk. These disks are classified as legacy drives.<br>**Spare**<br>The device is a spare drive, it will automatically replace any failed drive part of an array. |
| | **Normal**<br>The array status is normal |
| | **Initializing**<br>The array is initializing, either foreground or background initialization |
| | **Initialization Stopped**<br>The initialization has been stopped. Current status is uninitialized. |
| | **Critical – Inconsistency**<br>Data in the array is inconsistent and needs to be rebuilt. |
| | **Critical – missing disk**<br>A disk has been removed or experienced failure, and user needs to reinsert disk or add a new disk. |
| | **Rebuilding**<br>The array is currently rebuilding. |
| | **Verifying** |

| | The array is performing a data consistency check. Array status will show 'verifying'. |
|---|---|
|  | Disabled<br>The array does not have enough disks to maintain the RAID level. A disabled array is not accessible. |
|  | OCE/ORLM<br>Array is expanding its capacity or migrating to a different raid level. Status will<br>display 'Expanding/Migrating' OCE/ORLM stopped |
|  | The 'Expansion/Migrating' process has been stopped. The status will display 'Need Expanding/Migrating' |
|  | Critical – OCE/ORLM<br>A disk member is lost during the OCE/ORLM process. |
|  | Critical – OCE/ORLM - rebuild<br>The expanding/migrating array requires a rebuild. |

**Table 2. RAID Level Reference Guide**

| Type | Description | Min. disks | Usable space | Advantage | Disadvantage | Application |
|------|-------------|-----------|-------------|-----------|--------------|-------------|
| JBOD | Just a bunch of disk | 1 | 100% | Each drive can be accessed as a single volume | No fault tolerance - failure of one drive results in complete data loss | Backup |
| RAID 0 | Disk Striping | 2 | 100% | Offers the highest performance | No fault tolerance - failure of one drive results in complete data loss | Temporary file, performance driven application. |
| RAID 1 | Disk Mirroring | 2 | 50% | Provides convenient low-cost data redundancy for smaller systems and servers | Useable storage space is 50% of total available capacity. Can handle 1 disk failure. | Operating system, backup, and transaction database. |
| RAID 10 | Disk Mirroring followed by stripe | 4 | 50% | High read performance and medium write performance with data protection for up to 2-drive failures | Useable storage capacity equals total capacity of all drives in the array minus two | Fast database and application servers which need performance and data protection |

# 5. Customer Support

If you encounter any problems while utilizing the Rocket 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/USA_new/main.htm