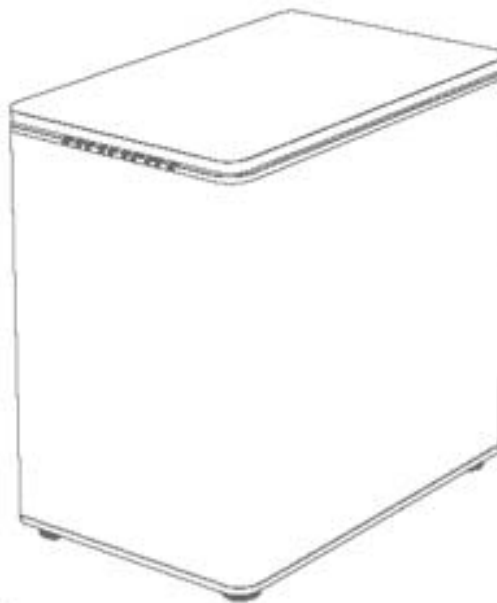# 4-Bay RAID System for 3.5" SATA HDD
Expands Storage Easily and Backup Data Safely

USB 2.0
eSATA
FireWire 400
FireWire 800

User's Manual

Table of Contents

GENERAL INFORMATION

COPYRIGHT

✎ The product information provided in this manual is subject to change without prior notice and does not represent a commitment on behalf of the vendor. The vendor assumes no liability or responsibility for any errors that may appear in this manual.

NOTICES AND CLASSIFICATIONS

FCC-B Radio Frequency Interference Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.
This device must accept any interference received, including interference that may cause undesired operation.

✎ 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 when the equipment is operated in a commercial environment. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

CONTACT US

We are committed to offer economical, high-quality connectivity and storage enclosure solutions to the market. Your questions, inquiries or comments are welcomed. For Technical Support, please go to our website at
www.onnto.com.tw

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⚠ <u>PRECAUTIONS FOR THE RAID SYSTEM</u>

♦ **Any loss, corruption, or destruction of data is the sole responsibility of the user of the RAID Unit. Under no circumstances will the manufacturer be held liable for the recovery or restoration of any data.**

♦ The main circuit board of the RAID System is susceptible to static electricity. Proper grounding is required to prevent electrical damage to the RAID System unit or other connected devices, including the host computer. **Always** place the RAID System unit on a smooth surface and avoid all dramatic movement, vibration and percussion.

♦ Do **NOT** allow water to enter the RAID System unit.

♦ Installation of additional equipment in the host computer may be required. Visit our website to download the latest product information updates.

♦ Do **NOT** attempt to service this unit yourself. Disassembling the RAID System unit's inner parts will expose you to dangerous voltages or other hazards.

♦ Do **NOT** block the ventilation. Proper airflow is required to ensure reliable operation and to prevent overheating.

♦ Do **unplug** the RAID System unit from the electrical outlet when not in use to provide an ecological friendly environment.

♦ **Use only** the power supply cable provided with the RAID System unit.

<u>INTRODUCTION</u>

Thank you for purchasing the DataTale 3.5" SATA HDD 4-bay RAID System. The DataTale 3.5" SATA HDD 4-bay RAID System provides massive storage capacity and advanced RAID configuration options in a desktop storage device. The RAID Mode Switch allows easy configuration of RAID 0 (Striping), RAID 1 (Mirroring), RAID 5, RAID 5+HotSpare, and RAID 0+1 RAID modes.

Please thoroughly read and follow the instructions provided in this manual. Failure to do so may result in damage to the RAID System, and any or all of the connected devices.

Features

- Supports current SATA II compliant HDDs, fully backward compatible with SATA 1.0 and SATA 1.0a compliant HDDs
- Connects flexibly via an eSATA, USB 2.0, 1394a or 1394b port
- Provides RAID 0 (Striping), RAID 1 (Mirroring), RAID 5, RAID 5+HotSpare, and RAID 0+1 for effective storage management
- Supports automatic rebuild in RAID 1, RAID 5, RAID 5+HotSpare, and RAID 0+1
- Configures RAID modes easily using switches, no IT expertise required
- Simplifies RAID management, no software installation required
- Monitors system status via LED indicators
- Prevents over-tightened HDDs with auto-limiting segmented screws
- Features a trayless function with the SmartGuider and user-friendly design enables effortless HDD hot-swapping
- Dissipates heat efficiently with aluminum housing
- Maximizes airflow with silent fans and mechanical designs
- Supports hot-plug and HDD hot-swap
- Supports both online and offline rebuild

Any loss, corruption, or destruction of data is the sole responsibility of the user of the RAID System. Under no circumstances will the manufacturer be held liable for the recovery or restoration of any data.

SmartGuider is a trayless device that utilizes the simplicity of a handle and screws. The integrated handle is attached to the HDD with auto-limiting segmented screws. Then, the entire setup can be slide into the unit by aligning the screws with the specially designed guides. This enables flexibility in removal and insertion of the HDDs with ease.

System Requirement

To use the 4-Bay RAID System, the minimum system configuration in the host computer require the following:

PC

- 266MHz or faster CPU (Windows Vista requires a minimum 800MHz CPU)
- 64MB of RAM (Windows Vista requires 512MB of RAM)
- Microsoft Windows 2000, XP, 2003, or Vista
- One available eSATA port, USB 2.0, IEEE 1394a, or IEEE 1394b port (Depends on model)

MAC

- Macintosh PowerPC or Intel Core Duo processor
- 64MB of RAM (Mac OS X 10.4 requires 256MB of RAM)
- Mac OS X 10.2 or higher (PowerPC) or Mac OS X 10.4 (Intel) or higher
- One available eSATA port, USB 2.0, IEEE 1394a, or IEEE 1394b port (Depends on model)

3.5" SATA compatible hard drive is required for the RAID System unit. Once the HDDs are formatted, the actual available storage capacity can vary depending on the selected operating environment (normally 5-10 % less).

Optional Accessories

- eSATA PCI, PCI-X, or PCI-Express Card

Package Contents

4-bay RAID

4 handles

HDD screws x 16

Quick Start Guide

FireWire 400 cable   FireWire 800 cable

4 spare HDD screws provided on back part of cover lid

USB Type B to A cable

eSATA cable

External power supply
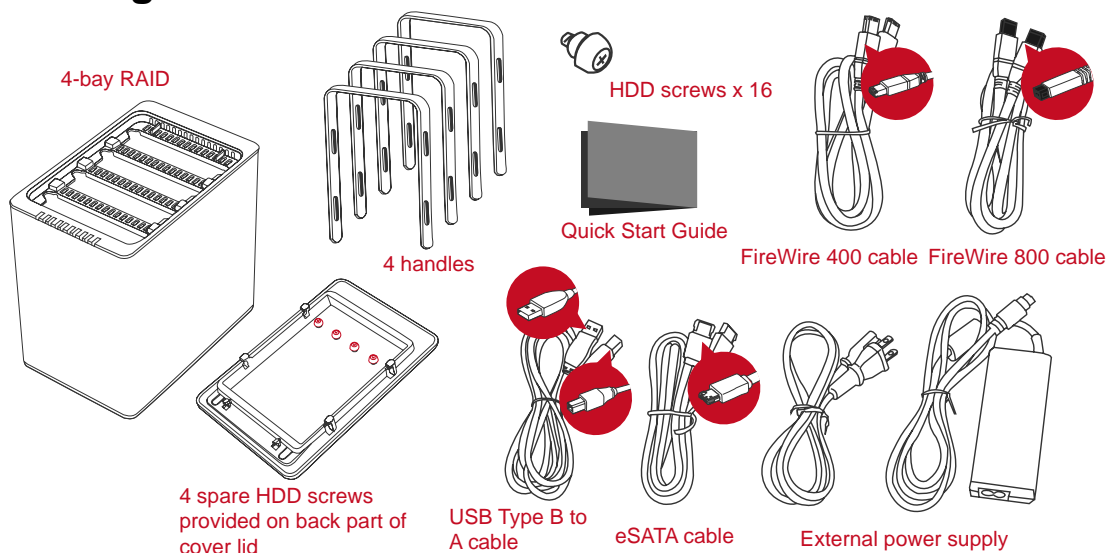
Please keep all package contents and packaging material in the event that the product must be returned.

SYSTEM UNIT VIEWS

Front View

1 LED Indicators

✎ The status indication of each LED indicator is listed under the LED INDICATORS section.

Power | HDD 4 | HDD 3 | HDD 2 | HDD 1 | RAID Alert

Rear View

2 FireWire 800 (2 ports)

3 FireWire 400

4 USB 2.0 Type B

5 eSATA Port

6 RAID Mode Switch

7 HD Switch

8 Power Switch

9 DC IN

10 Lock Port / Slot

Top & Cover View (Exposed)

⑪ FRONT Indicator

⑬ HDD Slots
(indicate HDD 1 through HDD 4)

▲ FRONT ▲

④

③

②

①

4

3

2

1

⑫ 4 Spare HDD Screws

⑭ Handles
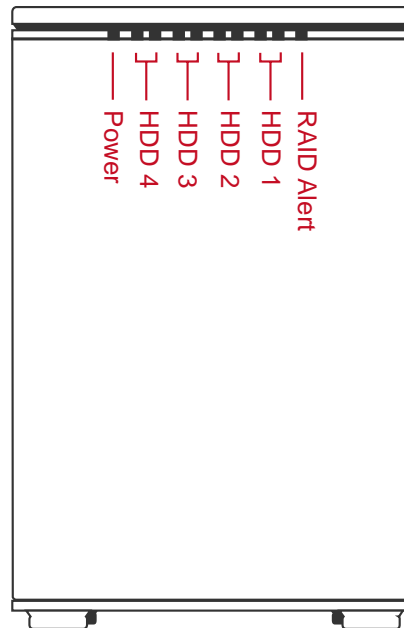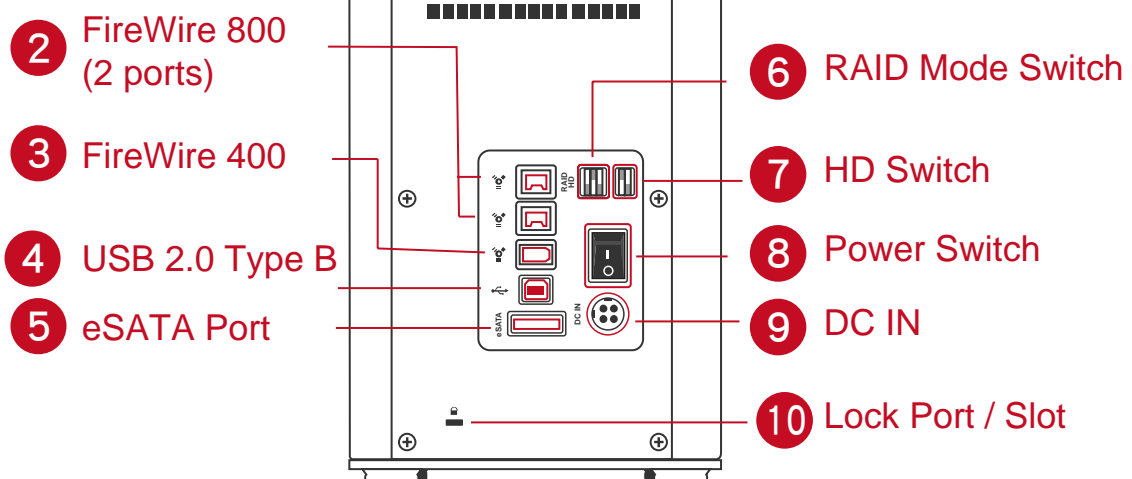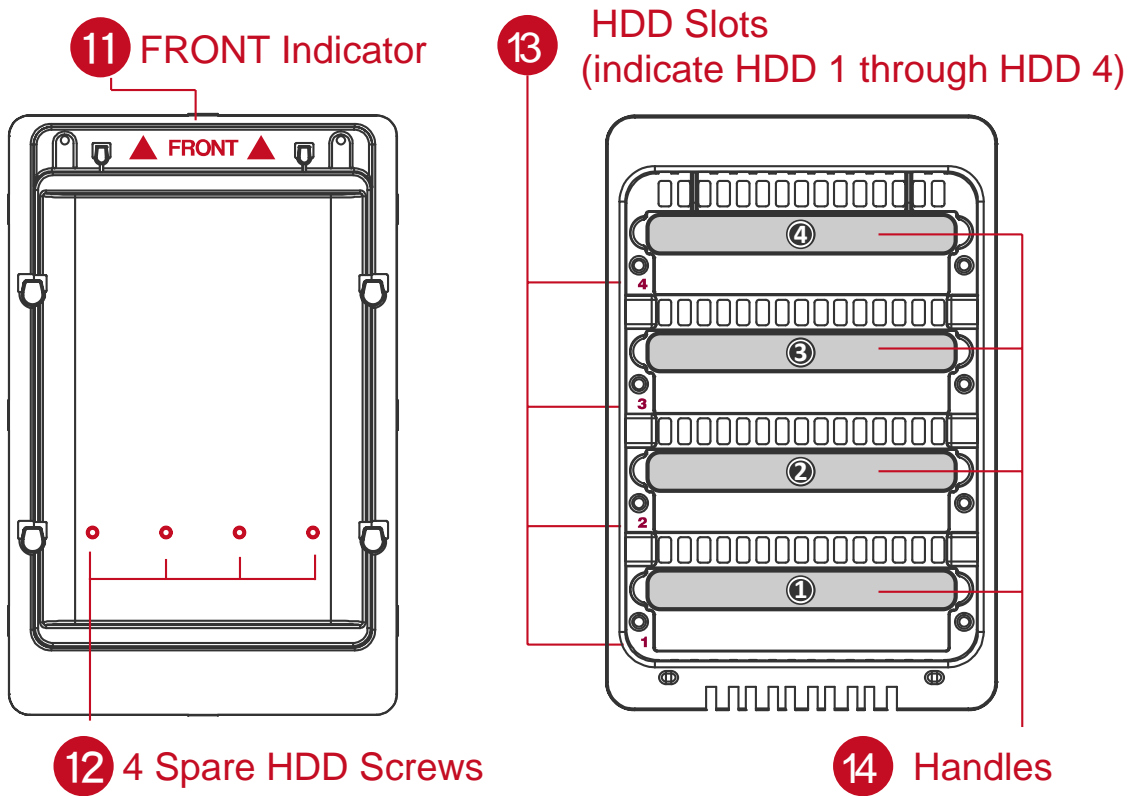
INSERTING/REPLACING THE HARD DRIVES IN THE RAID SYSTEM

1. Place the RAID System with its front view facing you. Position one hand on the front edge and one on the back edge of the top lid. Simultaneously, push the lid in the direction away from you, front to back, using your thumbs.
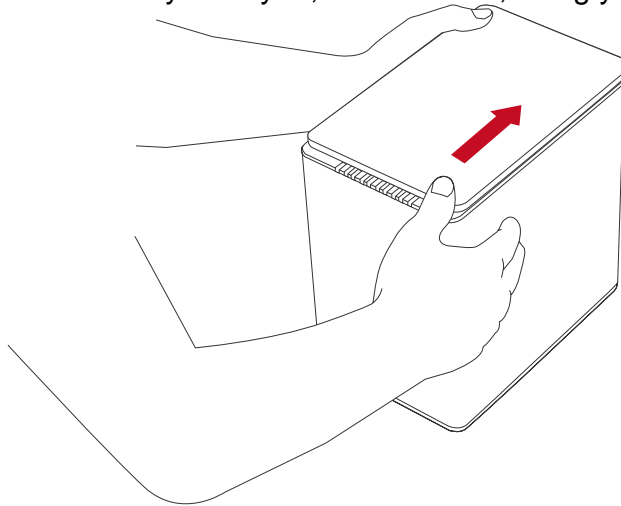
✎ A "click" sound would indicate the release of the top lid security clasp.

2. Lift the top lid up to remove and expose the top view (or HDD slots). Take out the handles from the enclosure itself and locate the HDD screws in the packaging box.
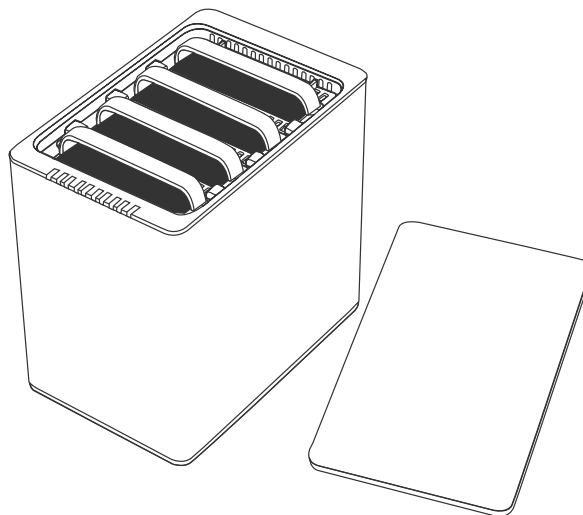
(Fasten the Handles onto the HDDs)

3. Place the HDD with the metal cover side facing up and ensure that the interface connectors are oriented toward your left side.
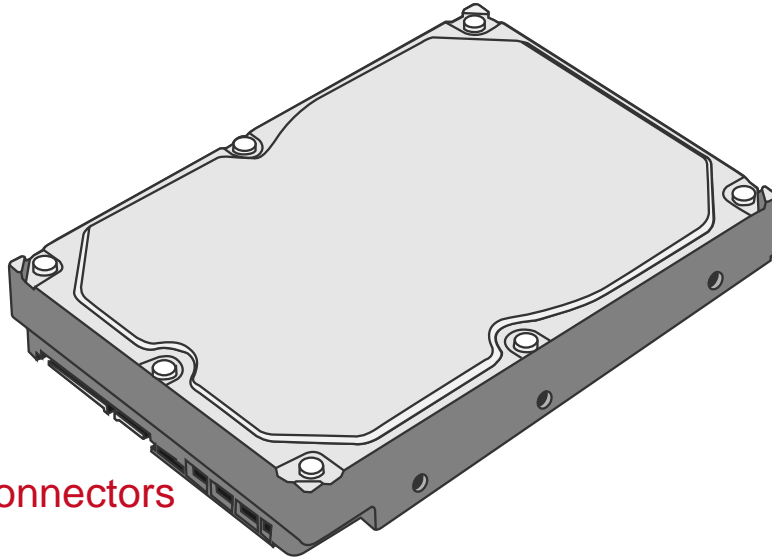
Connectors

4. Position the handle to the HDD end, which is facing away from the interface connectors, and align it with the screw hole openings.

Connectors
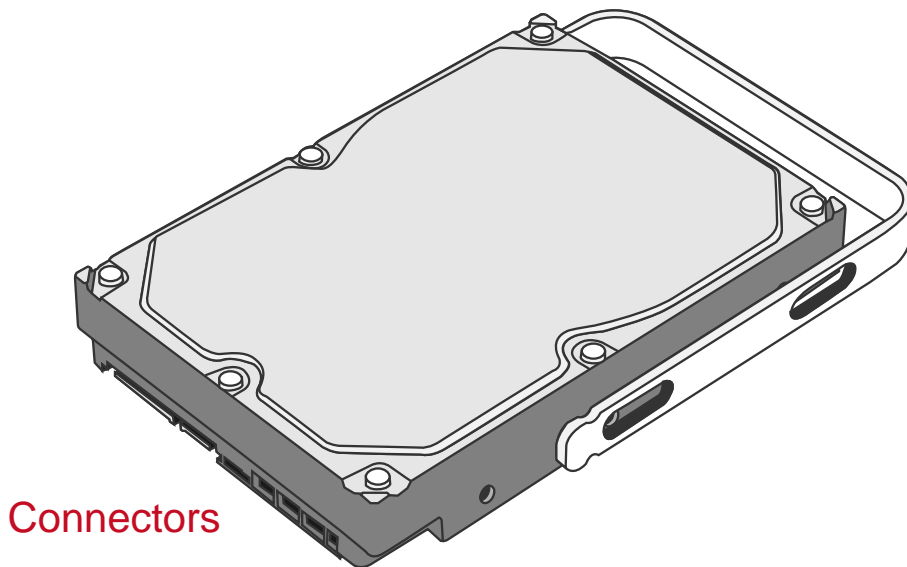
5. Fasten the handle onto the HDD by inserting and tightening the screws, the left one first, then the right one.
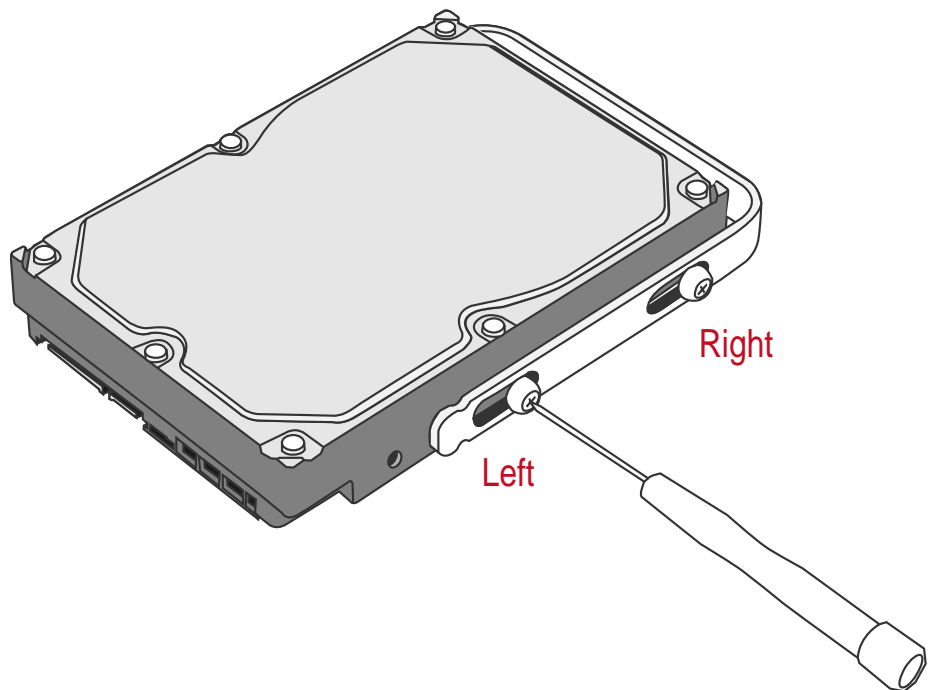
Right

Left

6. Now, flip the HDD so it is facing you with the PCBA (Printed Circuit Board) on top and the unfasten handle side facing you.
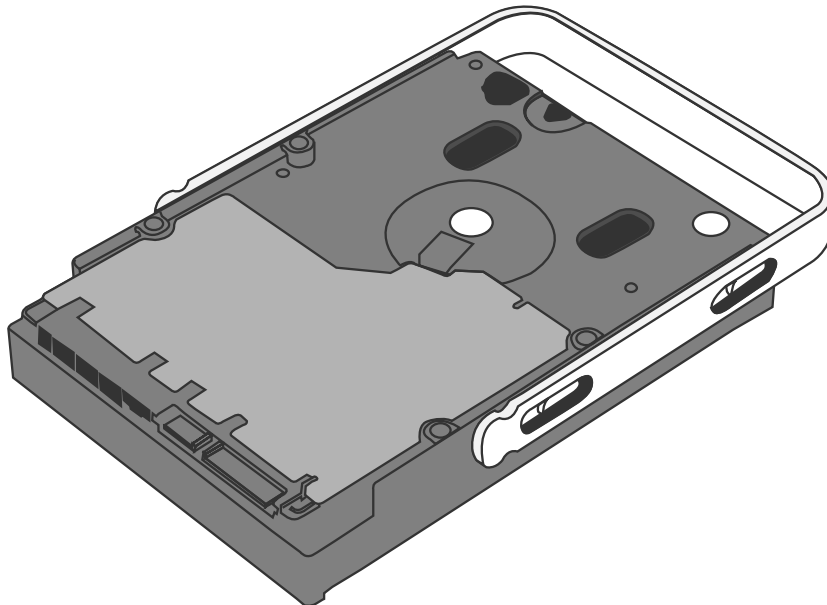
7. Insert and fasten the screws, the left one first, then the right one.

Right

Left
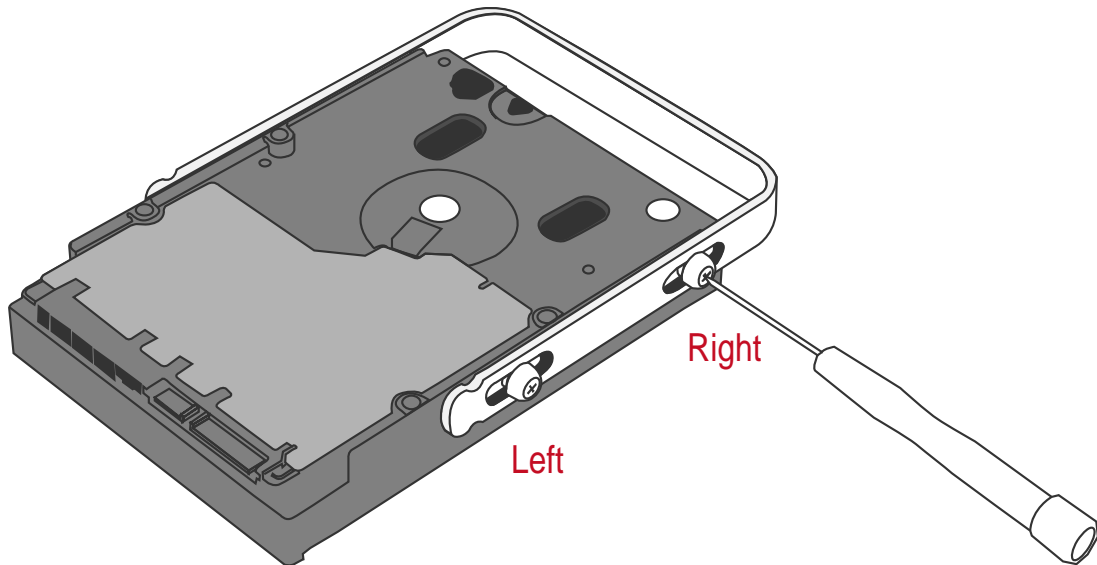
8. Finally, test sliding the handle to make sure that the holes glide smoothly on the screw guides.

Repeat the same procedures for the rest of HDDs.
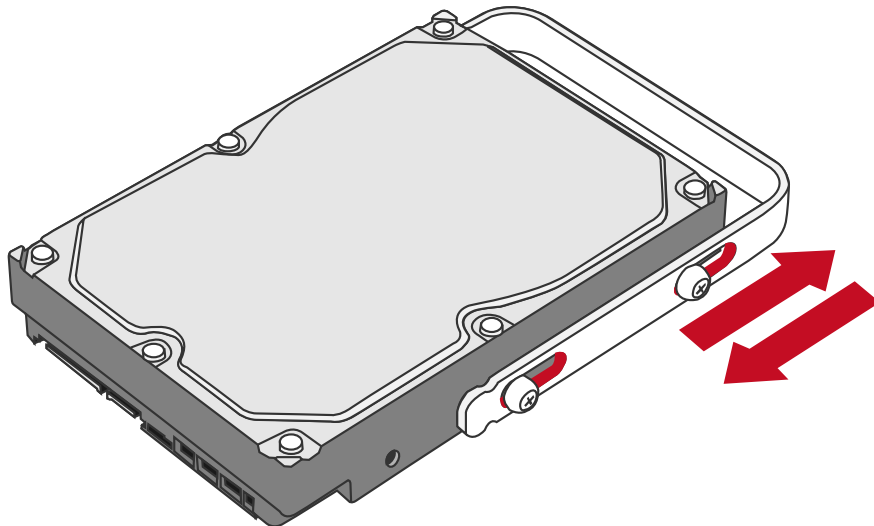
The auto-limiting segmented screws are designed to prevent the HDDs or/and the handles from damages due to over-tightening. Furthermore, this design makes the handle slide easily without any tightness.

9. Hold the HDD with the metal cover side facing you and the handle attached on the upward position.
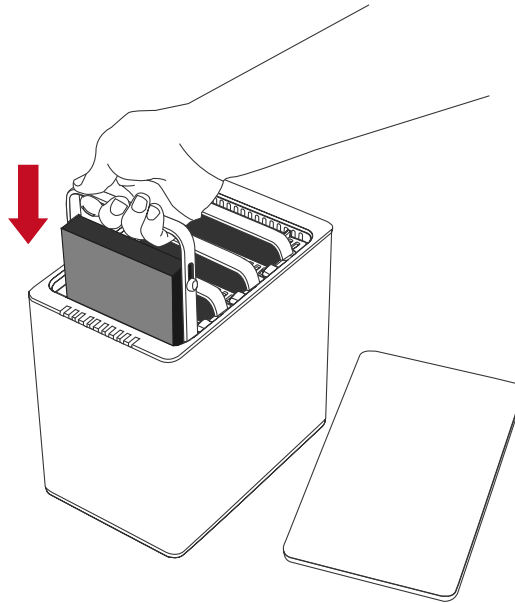
When inserting the HDD on its reverse side, the SmartGuider System won't be able to align and the HDD cannot be inserted.

10. Align the handle with the guide rails and slide the HDD into the indicated slot. Firmly push downward until a "thump" sound is heard. Repeat the same procedures for the rest of HDDs.
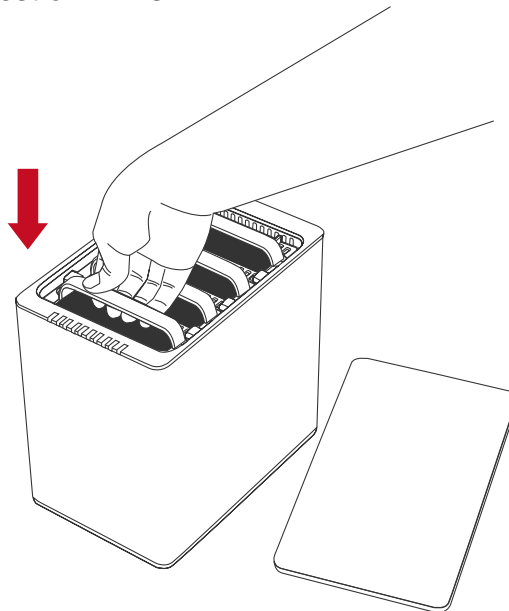
In most cases, you would need to firmly push the trays to a close until a "thump" sound is heard.

11. Place RAID System with its front view facing you and the top lid on. Position one hand on the front edge and one on the back edge of the top lid. Simultaneously, push the lid firmly downward and toward you, back to front.
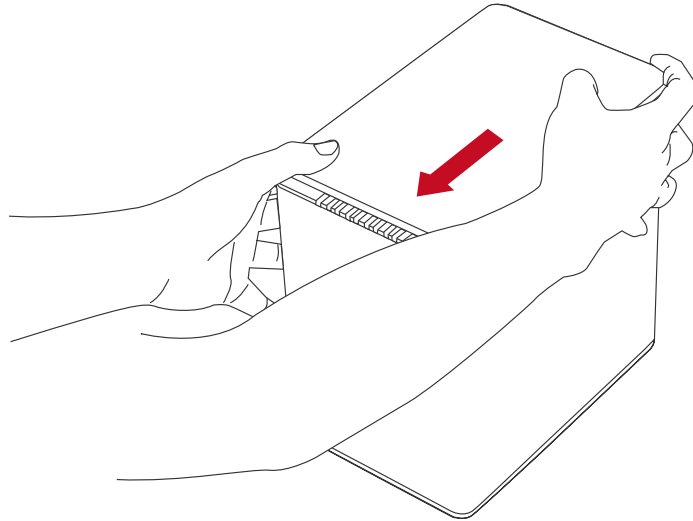
✑ A "click" sound would indicate grasp of the top lid security clasp.

12. Now, the RAID System is ready for connection to a computer!

Installing HDDs OK!

CONNECTING THE RAID SYSTEM TO A COMPUTER

Complete the following steps to connect the RAID System to a host computer.

✎ The RAID System should only be connected to a host computer via one interface. Connection of the system to a computer via two or more interfaces simultaneously <u>is not recommended</u>.

1. Connect the AC/DC power adapter.
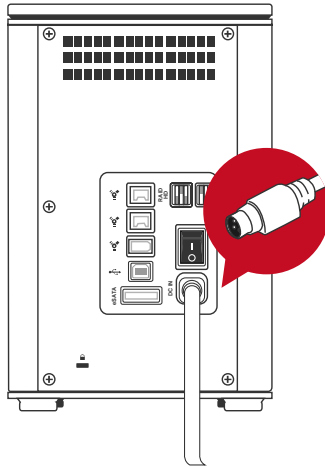
2. Insert both ends of the USB 2.0, eSATA, FireWire 400, or Fire Wire 800 cable(s) into the corresponding port of the RAID System and the host.
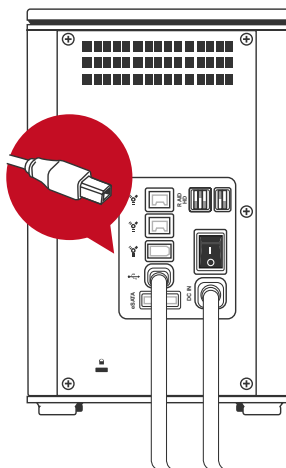
✎ It <u>is highly recommended</u> to select only one interface to do data transfer.

3. Turn the power switch to the "on" position.
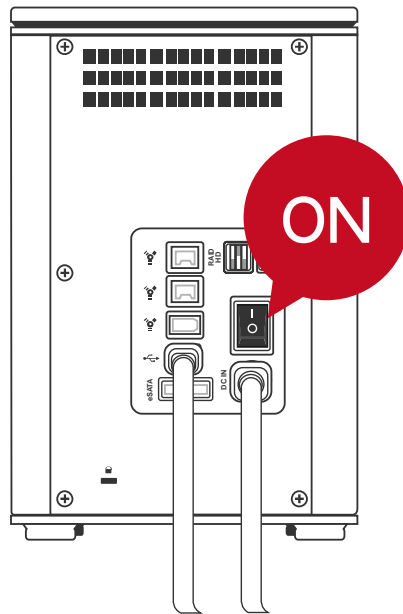
4. When connected, the Power LED light will become steadily green, and the HDD LED lights will become white and blink about 15 seconds. If the HDDs are inside the RAID System, the HDD LED lights will remain steadily white. If there are no HDDs inside the RAID System, the HDD LED lights will turn off after blinking.
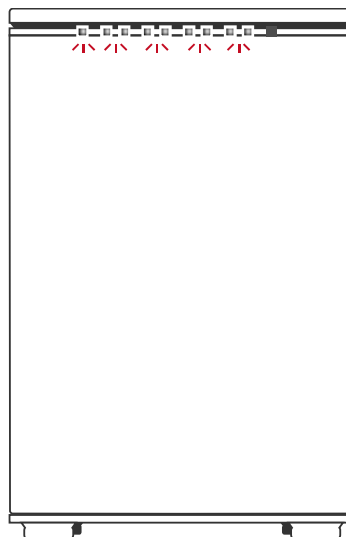
5. You are now ready to begin using your RAID System!

Due to compatibility issues, if you use the eSATA interface to do the data transfer, the Silicon Image eSATA host controller is highly recommended.

Connecting Multiple Devices

Using FireWire 400 or 800, you can connect other computer hardware or digital devices to your RAID System. This connection is called "Daisy chain". Items connected to the RAID System may be such as digital video camera, another HDD, DVD writer, and much more. However, you must use the same interface in order for the Daisy Chain to work. The computer will not recognize different interfaces if they are all used at the same time. In addition, if a mix of connections is used, the resulting speed will be limited to the lowest one available.

When an additional FireWire connector is plugged in, the connector will be viewed as a "daisy chain" port. When an additional USB or eSATA connectors is plugged in, the connector will be viewed as its originate port, either USB or eSATA respectively.

RAID MODES

A Redundant Array of Independent (or Inexpensive) Disks (RAID) is a system that utilizes multiple hard drives to share or replicate data among the disks. The benefit, depending on the selected RAID Mode (combinations of disks), is one or more of increased data integrity, fault-tolerance, throughput or capacity when compared to single drives.

Deleting the current partition prior to changing RAID modes is highly recommended.

Using identical HDDs with the same capacity and RPM, and from the same manufacturer are highly recommended for best capacity utilization.

RAID Mode Comparison List

RAID mode	Size	Safe	Fast
RAID 0 (Striping)	■■■■	★☆☆☆☆	★★★★★
RAID 1 (Mirroring)	■	★★☆☆☆	★☆☆☆☆
RAID 5	■■■	★★★☆☆	★★★☆☆
RAID 5 + HotSpare	■■	★★★★☆	★★☆☆☆
RAID 0+1	■■	★★★★★	★★★★☆

RAID 0 (Striping)

RAID 0 (Striping) is a performance-oriented, non-redundant data mapping technique. It combines multiple hard drives into a single logical unit. Instead of seeing several different hard drives, the operating system sees only one large drive. Striping splits data evenly across two or more disks simultaneously, dramatically increasing performance.

Striping can be implemented in disks of differing sizes, but the storage space added to the array by each disk is limited to the size of the smallest disk. Although Striping is an easily implemented, simple configuration, Striping should never be used for mission critical applications. The speed of operation is excellent in comparison to other RAID modes.

In Striping mode, it is not possible to see the HDDs as more than one unit. If you choose to insert all 4 HDDs, it will still be viewed as one single storage unit. When you choose to insert only two HDDs, there is not limitation on the order of HDD insertion or the slot number.

RAID 0

Disk 1	Disk 2	Disk 3	Disk 4
A1	A2	A3	A4
B1	B2	B3	B4
C1	C2	C3	C4
D1	D2	D3	D4
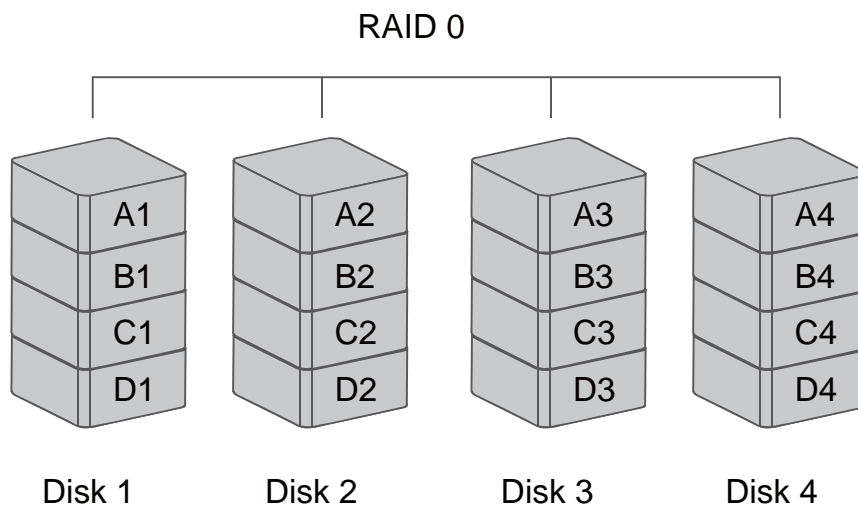
In Striping mode, if one disk in the RAID System fails, all data in installed disks will be lost.

When operating under Striping mode, it <u>is not recommended</u> to do HDD **Hot Swap**. Any attempt to do so may result in complete loss of all data.

RAID 1 (Mirroring)

RAID 1 (Mirroring) consists of at least two drives storing duplicate copies of the same data. In this mode, the data is simultaneously written to two disks. Thus, the storage capacity of a two-disk array is combined into a single disk and the capacity is limited to the size of the smallest disk. The speed of operation is very slow in comparison to other RAID modes.

During rebuild, the first HDD inserted into one of the HDD slots and is recognized by the RAID System as the source HDD. To rebuild existing data from a source HDD to a backup HDD (target HDD), the source HDD must first be inserted into one of the HDD slots. After the host detects the source HDD, the target HDD should then be inserted in the other HDD tray. The RAID System will then recognize the target HDD, the rebuild process will begin when the HDD LED starts blinking.

In Mirroring mode, only 2 HDDs are allowed for the function to perform properly. There is no limitation on the order of insertion or the slot number. However, if all 4 HDDs are inserted, the RAID System can only do Mirroring in the HDDs positioned in HDD 1 and HDD 2. It is not possible to process two sets of HDDs at the same time.

RAID 1

Disk 1   Disk 2
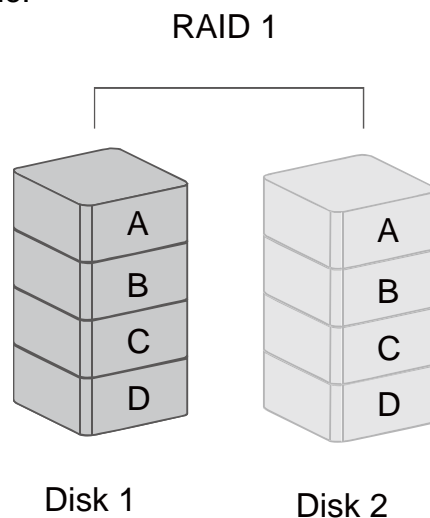
In Mirroring mode, if one of the disks fails, either source or backup, the data is still available. However, if the source disk fails during the rebuild process, the data in both disks will be lost.

It is NOT recommended to do **hot swap** for the source disk during the rebuild process because the data in both disks will be lost.

RAID 5

RAID 5 uses block-level striping with parity data distributed across all member disks. It is also called Parity RAID. Every time a block is written to a disk in a RAID 5 disk array, a parity block is generated within the same stripe. A block is composed of many consecutive sectors on a disk. A series of blocks (a block from each of the disks in an array) is collectively called a "stripe". The parity information inside the parity block is not the identical copy of the source data. It is generated via parity calculation. RAID 5 mode provides decent data protection and fault tolerance. The speed of operation is average in comparison to other RAID modes.

The number of disks supported by RAID 5 is 3 or 4. The storage capacity will become all disks in total but minus 1. The capacity is limited to the size of the smallest disks.

RAID 5

Disk 1	Disk 2	Disk 3	Disk 4
A1	A2	A3	Ap
B1	B2	Bp	B3
C1	Cp	C2	C3
Dp	D1	D2	D3
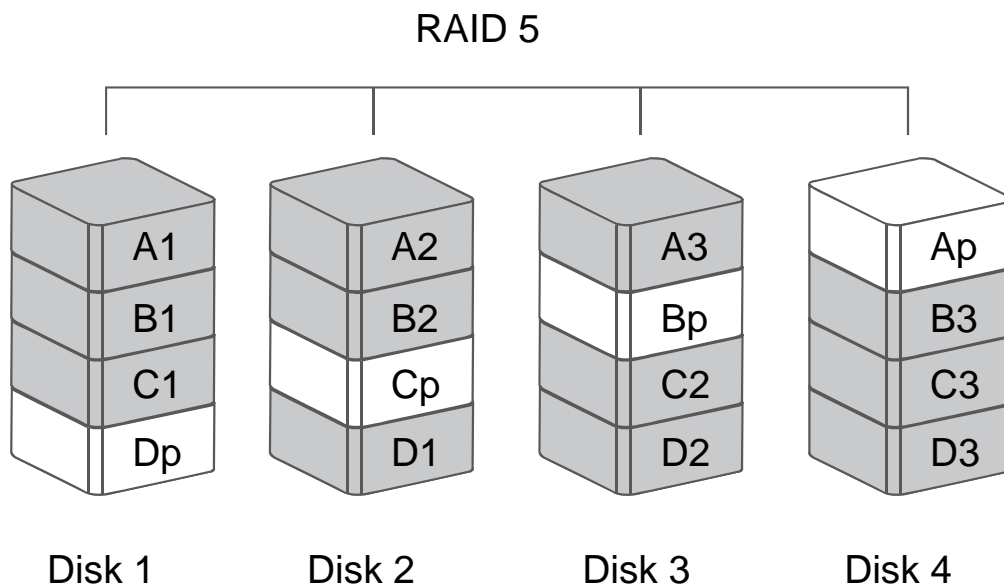
If one of the disks fails, the data can be reconstructed through parity calculation once the broken disk is replaced with a new one.

RAID 5 + HotSpare

In the RAID 5 + HotSpare mode, also called HotStand, the last disk in the system is left empty as backup.   When any of the disks in the system fails, the back up disk will <u>automatically</u> be rebuilt to replace the failure disk. RAID 5+HotSpare mode provides more than decent data protection and fault tolerance. The speed of operation is slow in comparison to other RAID modes.

Under the RAID 5+HotSpare mode, 4 HDDs in an array are required. The storage capacity will become 3 minus 1, totaling only 2 HDD storing capacity. But it is limited to the smallest size of HDDs, plus 1 more HDD as the backup disk.

RAID 5+HotSpare

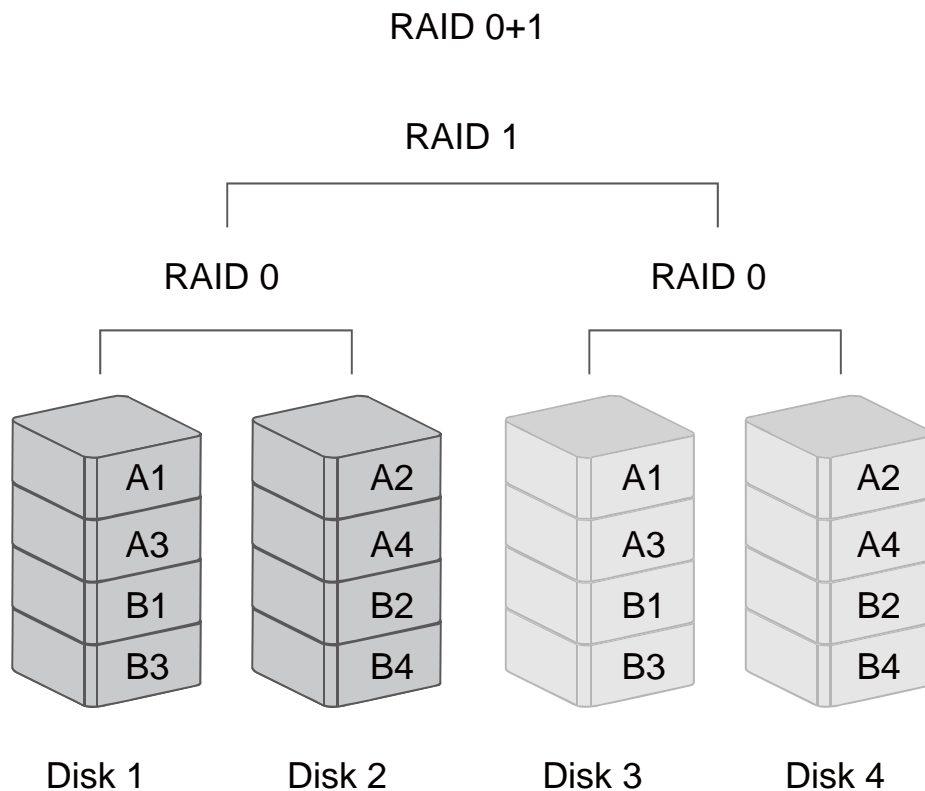| Disk 1	Disk 2	Disk 3	Disk 4
A1	A2	Ap	Spare
B1	Bp	B2	
Cp	C1	C2	
D2	Dp	D1	
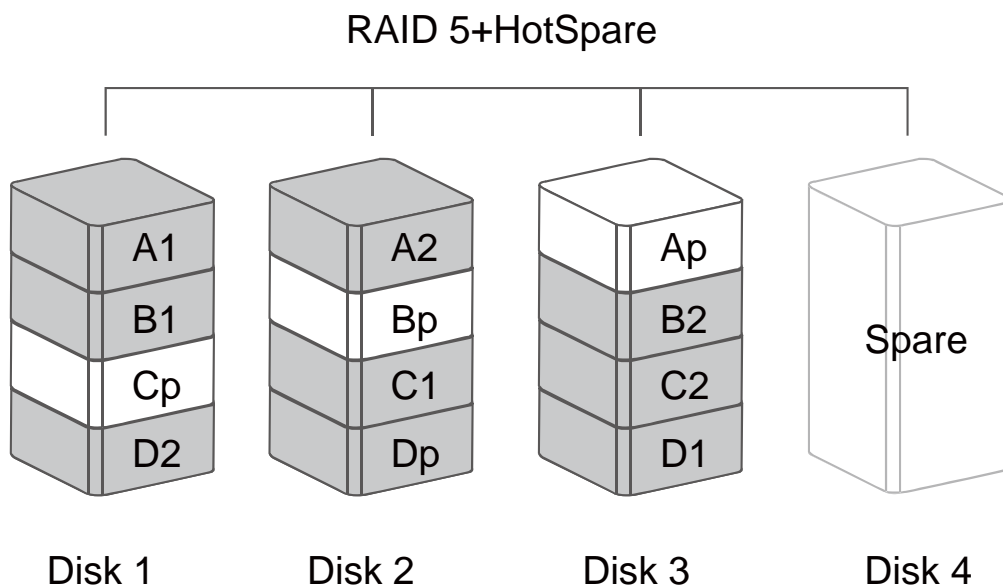
If one of the disks fails, the source data can be reconstructed through parity calculation without replacing it with a new disk. In the 4-Bay RAID System, the "Disk 4" is located in the "HDD 1" slot position.

RAID 0+1

In the RAID 0+1 mode, data is organized as stripes across multiple disks. And then, the striped disk sets are mirrored. It is usually called "a mirror of stripes". RAID 0+1 mode provides excellent data protection and fault tolerance. The speed of operation is fast in comparison to other RAID modes (except in RAID 0).

Under the RAID 0+1 mode, 4 HDDs in an array are required. However, the storage capacity is only as 2 HDDs, which the total will be based on the smallest size of the HDDs.

RAID 0+1

RAID 1

RAID 0   RAID 0

A1	A2	A1	A2
A3	A4	A3	A4
B1	B2	B1	B2
B3	B4	B3	B4

Disk 1   Disk 2   Disk 3   Disk 4

In RAID 0+1 mode, if any 2 of the 4 disks fail at the same time, the data can still be reconstructed when they are replaced with new HDDs. However, if both failed disks are in either HDD slots 2 & 3 or 1 & 4, the data will be lost.
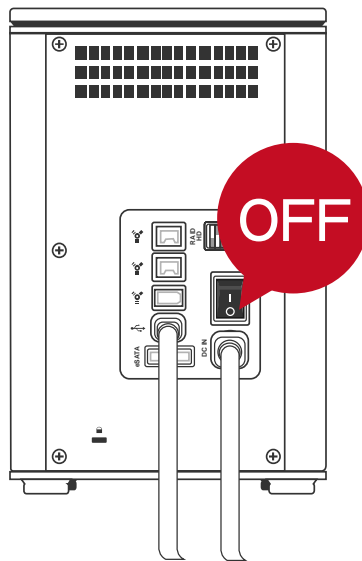
SETTING/CHANGING THE RAID MODE & NUMBER OF HDDS (MANUALLY)

Changing the RAID Mode deletes all data stored on the device. If you have saved data in the drives, backup all data before changing the RAID Mode.

1. Power "off" the RAID System.

2. Use a small, flat-blade screwdriver to select the RAID mode (RAID Switch).
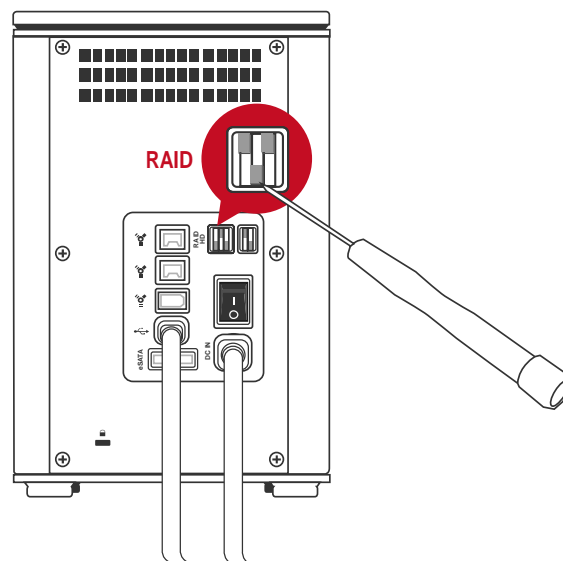
3. Next, use the same small, flat-blade screwdriver to select the number of HDDs (HD Switch).
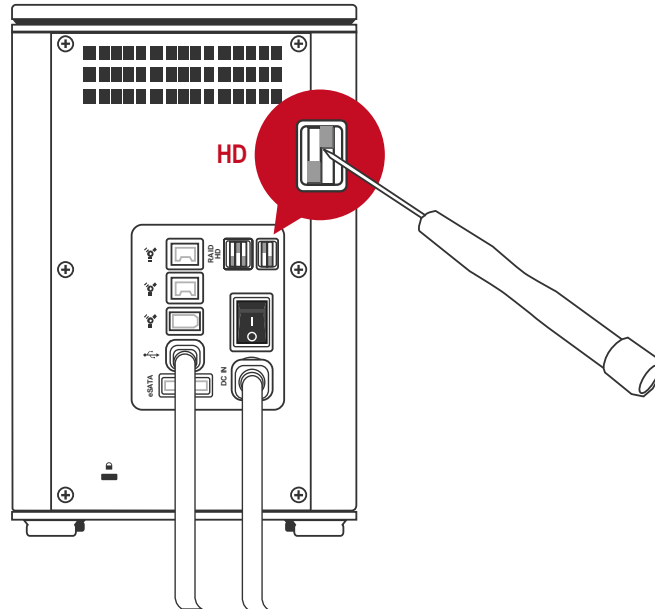
4. After setting the new RAID mode and the number of HDDs, power the RAID System "on".
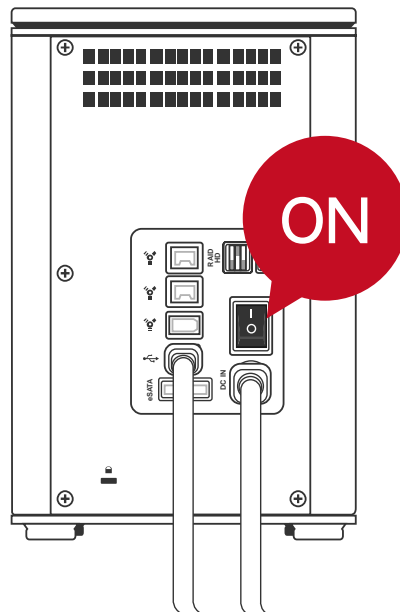
It <u>is highly recommended</u> to always power off the RAID System before setting or changing the RAID Mode Switch and the HD Switch to ensure the new changes are accepted by the System.

RAID Switch

RAID Mode Switch

RAID 0 (Striping)

RAID 1 (Mirroring)

RAID 5

RAID 5+HotSpare

RAID 0+1

HD Switch

Disk Number Setting	HD Switch
2	
3	
4	
4 (HotSpare)	

✎ If the HD Switch setting is not supported by the RAID mode desired, or the number of disk inserted is not the same as recommended, the RAID System cannot be created successfully and the RAID Alert LED will be on. (Please see more explanation in the LED INDICATORS section.)

NUMBER OF DISKS SUPPORTING EACH RAID MODE

RAID Modes	Number of Disk in RAID
RAID 0 (Striping)	2 or 4
RAID 1 (Mirroring)	2
RAID 5	3 or 4
RAID 5 + HotSpare	4
RAID 0+1	4

HDD SLOT NUMBER
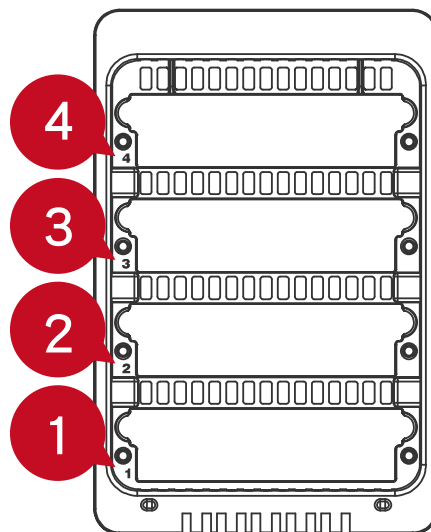
It is highly recommended to place the HDDs into the RAID System in order, from 1 through 4, consistently starting with slot "1" (indicated as "HDD 1").

HDD ALLOCATION

It is highly recommended to use the numbering stickers provided in the package to help identify the HDD allocation. Although the HDD slots can help with organization, when the hard disks are pull out without remembering their arrangement order, the data may be lost if the HDD allocation is not the same as the one originally set in the RAID System.
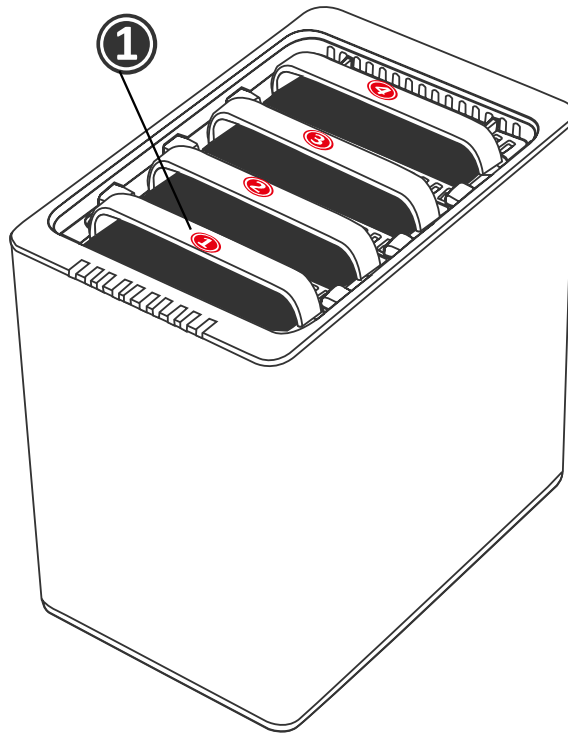
LED INDICATORS
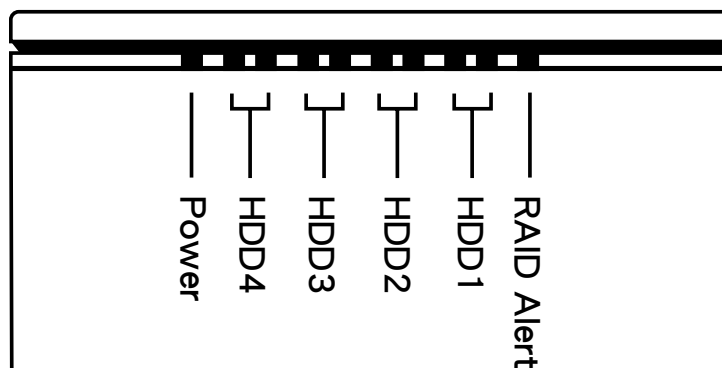
Power LED x 1

Indicators	Color
Power on	Green
Power off	None

RAID Alert LED x 1

Indicators	Color
Healthy	None
Danger	Blink Red
Error	Red

Danger: The RAID LED will blink if RAID status is in danger. For example, RAID 5 needs to have a minimum of 3 disks. If one of the disks is not working properly or fails, the LED indicator will blink and remind you to take actions. (Those actions may include replacing a healthy HDD.)

Error: The RAID Alert LED will be on in RED if RAID status is in error. When the number of disk set is not supported by certain RAID mode, or the number of disk inserted is not the same as HDD Switch setting, RAID cannot be created successfully.

HDD LED x 8

There are 2 LEDs for each HDD slot. The left LED indicates "Connection" and the right one indicates "Health/Access".

The Connection LED is only one-color (white). When the HDD is connected, the white LED will be on. The Connection LED also indicates HDD power status and disk rebuild status. When the target HDD is being rebuilt, the white LED will blink.

The Health/Access LED is dual-color (red/blue). The red color is for Health condition. The blue color is for Access condition. When the HDD is not healthy, the red LED will be on. When the HDD is being accessed, the blue LED will flash. When HDD is healthy and not being accessed, no LED color will be on.

Indicator		HDD (1, 2, 3, 4)			RAID mode
		Left (Connection)	Right		
			Color 1 (Health)	Color 2 (Access)	
Disk error		None	Red	None	RAID 0, RAID 1, RAID 5, RAID 0+1
Data access		White	None	Flash Blue	RAID 0, RAID 1, RAID 5, RAID 0+1
Disk Rebuild	Source HDD	White	None	Blue	RAID 1, RAID 5, RAID 0+1
	Target HDD	Blink White	None	Blue	RAID 1, RAID 5, RAID 0+1

The difference between a flashing LED and a blinking LED is that flashing refers to the read/write activity and blinking refers to slow but regular pulses.

SAFE REMOVAL OF THE RAID SYSTEM

Safe removal of the Enclosure from the host controller is highly recommended, especially when switching interfaces. In order to safely remove your Enclosure from the host controller, you would need to eject the device on your host controller system.

If using a Mac System, safe removal of the Enclosure from the host for all interfaces is necessary.

If using a PC System, safe removal of the RAID System from the host depends on the interface. Most current USB and FireWire host controllers handle USB and FireWire devices as external devices; thus, it is highly recommended that the Enclosure be safely removed from the host if you are using either one of the interfaces. However, if you are using the eSATA interface, depending on the eSATA controller, the host may handle external eSATA HDD devices as internal HDD devices. If so, safe removal of the Enclosure from the host is unnecessary.

EXTERNAL BOOTUP

External Bootup may be required if the user has two different operating systems set up in both the host computer and the RAID System.

PC

The External Bootup with different interface:

OS \ Interfaces	USB 2.0	FireWire	eSATA
Windows	No	No	Yes
DOS	Yes	No	Yes
Linux	No	No	Yes

MAC

The External Bootup varies with different platform and interfaces:

Platform \ Interfaces		USB 2.0	FireWire	eSATA Mac driver Built-in	eSATA No driver Built-in
Power PC CPU (G4 or Later)		No	No	Yes	No
Intel-based CPU	CoreDuo	Yes	No	Yes	No
	Core2Duo Or Later	Yes	Yes	Yes	No

✎ If the computer does not come with eSATA interface and an optional eSATA card is added, choosing the card that comes with the built-in driver in the operation system is highly recommended.

Disk Volume Over 2TB

The 2+TB HDD support is determined by the chipset used in the device and the operating system itself. The RAID System supports and recognizes 2+TB HDDs, but the actual 2+TB support will vary depending on the different operating systems used.

OS		USB	FireWire	eSATA
Windows	Windows 2000, XP, or older	No	No	No
	Windows XP 64-bit, Windows 2003 32-bit/64-bit (SP1 and SP2)	Yes	No	Yes
	Windows Vista, Windows 2008 32-bit/64-bit	Yes	Yes	Yes
Linux	Linux 32-bit/64-bit	No	No	No
Mac	Mac OS 9/10.1/10.2	No	No	No
	Mac OS 10.3/10.4/10.5	Yes	Yes	Yes

eSATA PCI EXPRESS CARD INSTALLATION

Complete the steps provided in this section to install the eSATA PCI Express Card to use with the RAID System. The eSATA PCI Express Card provides a host computer with two Windows and Mac compatible eSATA ports.

System Requirements

- Windows 2000 or later 32-bit/64-bit OS
- Mac OS 10.4.x or later
- An available PCI-Express slot
- CD-ROM or DVD-ROM drive

Hardware Installation

1. Power "off" and unplug your computer.
2. Remove the housing of your computer and locate an available PCI-Express slot on your motherboard.
3. Insert the card in the available PCI-Express slot. Ensure that the card is firmly seated in the slot.
4. Replace the housing of your computer.
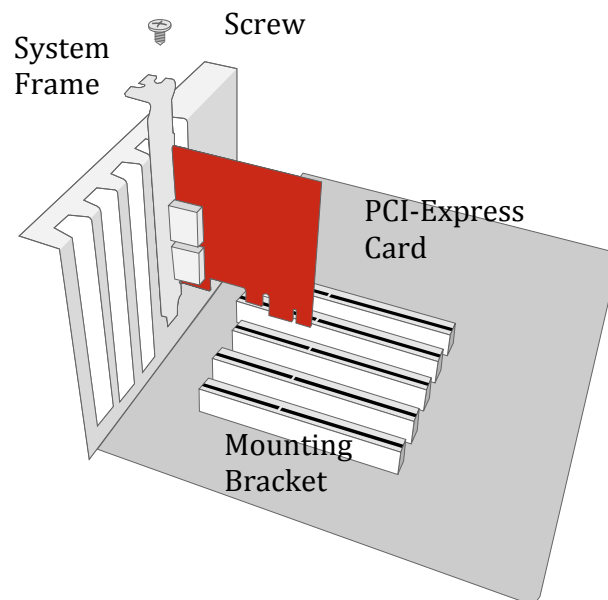
Driver Installation

Follow the provided prompts to complete the driver installation.

For the Windows system, the "Add New Hardware Wizard" will open automatically. Insert the installation CD included in the package, navigate to and open the installation file.

For Mac OS, insert the installation CD and locate the Mac driver installation file. Follow the provided instructions to complete the driver installation.

✎ Please refer to User's Manual under eSATA Host Card section on our website.

Verify Driver Installation

Mac OS:
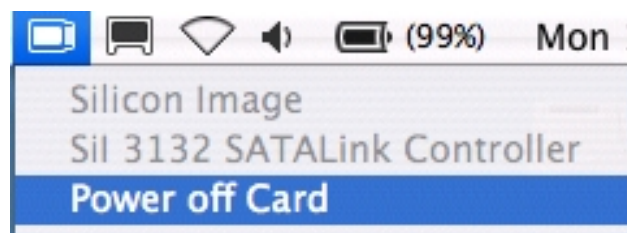
✎ If a driver installation failure error message appears after restarting the computer, follow the recommendations provided in the error message.

Windows OS:
1. Right-click the **My Computer** icon on your desktop and choose **Manage** from the pop-up menu.
2. Double-click **Device Manager**.
3. Double-click **SCSI** and **RAID** controllers.
4. Verify that the **Sil 3132 SATALink Controller** appears, as shown below.

Windows 2003 and XP:
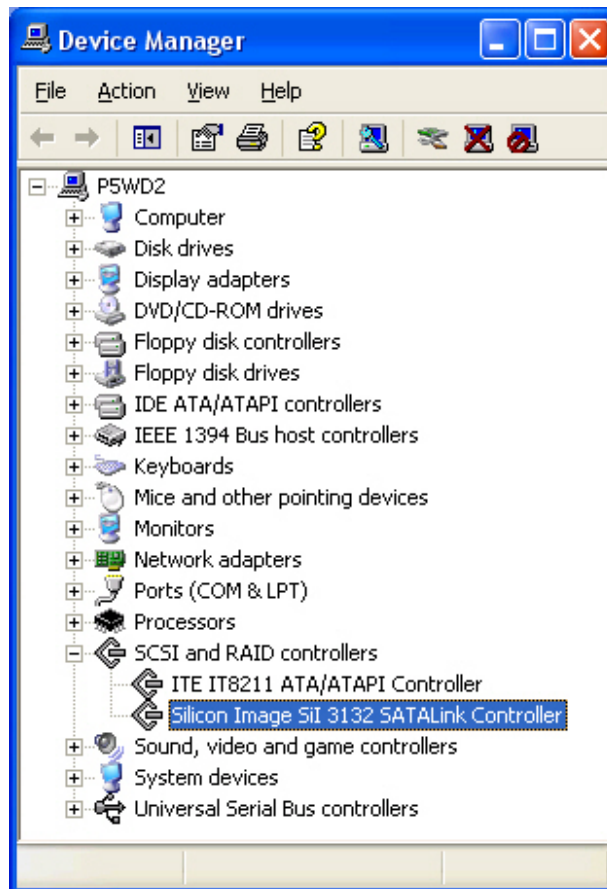
Windows 2000:
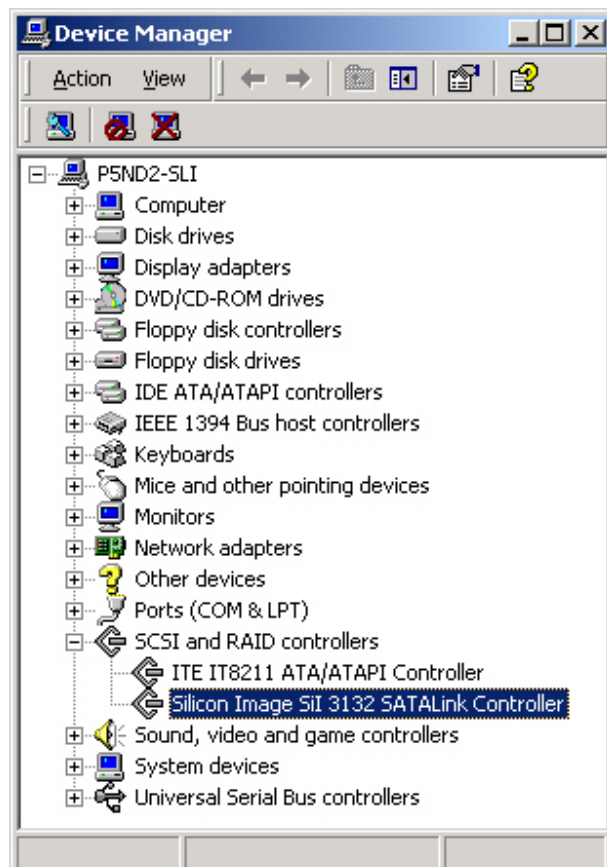
Q&As

General

Q: How do I choose the proper RAID mode for my RAID System based on the tasks I need to perform?

A: Since the RS-M4QO System is a "Mass Storage" device, which means its size capacity is sufficient for data management, the different RAID mode settings can help you administer the enormous data storage from the HDDs combination. It is highly recommended to choose the RAID mode based on what is the essential factor to complete your task. The most common three factors are size capacity, speed, and data protection. For example, if using the System to simply watch films for enjoyment, the RAID 0 mode is perfect because it can maintain decent speed and still have a large storage capacity. However, if the work requires you to process large files and to have a high volume of data access such as for a graphic designer or film editor, it'll be more efficient to choose RAID 5 or RAID 5+HotSpare modes. Both modes provide the ability to do HDD hot-swap without affecting the data itself, and have a higher data protection level. Lastly, if the work requires instant and continuous backup of data such as for a writer or editor, then RAID 0+1 would be the best choice since it can provide both high data protection and speed with less storage capacity.

HDD Capacity

Q: All my HDDs are at least 1TB or above, will the RAID System be able to support the gigantic storage capacity?

A: Yes, the RAID System will be able to support any HDDs over 1TB size capacity. However, most older host systems cannot support over 2TB of total capacity, only Mac OS 10.3 and newer, and PC Windows Vista or newer. In addition, based on the host system you have, there may be limitations on the port connections when the storage size is over 2TB. Please see the chart below.

OS		USB	FireWire	eSATA
Windows	Windows 2000, XP, or older	No	No	No
	Windows XP 64-bit, Windows 2003 32-bit/64-bit (SP1 and SP2)	Yes	No	Yes
	Windows 7, Vista, Windows 2008 32-bit/64-bit	Yes	Yes	Yes
Linux	Linux 32-bit/64-bit	No	No	No
Mac	Mac OS 9/10.1/10.2	No	No	No
	Mac OS 10.3/10.4/10.5	Yes	Yes	Yes

Q: I would like to format my hard drives with the FAT (a.k.a. File Allocation Table) format, which can be read and written by both Mac and PC. Is there any limitation on its capacity?

A: Yes, please check the table below for reference.

File System	NTFS	FAT32	FAT (Format by Win2000 / WinXP)	FAT16
Capacity Limitation	Vista: 16384TB XP: 2TB	Windows: 32GB Mac: 2TB	4GB	2GB

Discrepancy in Reported & Actual Size Capacity

Q: If I have a 750GB HDD, why does the RAID System only recognized the HDD available space as to be less than 750GB?
A: Many customers are confused by their host systems when it reports a discrepancy between reported capacity and actual capacity. Several factors can come into play when your host system views and reports the capacity of a hard drive. There are actually two different numbering systems used to express units of storage capacity:

> **Binary**, which says that a kilobyte is equal to 1024 bytes; and
> **Decimal**, which says that a kilobyte is equal to 1000 bytes.

Most commonly used to display storage capacity is in Decimal. The surprising fact is that even though it seems like you will have more bytes under Binary, the Decimal calculation system actually presents a greater storage capacity. More description on capacity issues can be found at the Seagate website under FAQs.

http://www.seagate.com/ww/v/index.jsp?locale=en-US&name=Storage_Capacity_Measurement_Standards_-_Seagate_Technology&vgnextoid=9493781e73d5d010VgnVCM100000dd04090aRCRD

HDD Allocation

Q: I've pulled out all the disks inside the RAID System and now I want to put them back, but I don't remember the HDD allocation. Will my data be safe if I put the HDDs back into the RAID System if they're not in the correct allocation?
A: No, it would NOT be safe for your data if the HDDs were not placed back into the RAID System in their original arrangement order. We would highly recommend all users to use the number stickers in the package to help identify which HDD belongs to which HDD slot. You may stick them onto the handles or HDDs as identification.

HDD Allocation
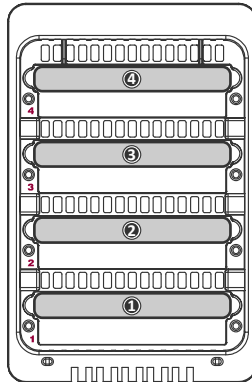
RAID 0

Q: If I have 4 HDDs, can I create two sets of storage units by using RAID 0 mode?
A: The RS-M4QO is designed to support 4 HDDs, but it cannot create or support two sets of storage units under the RAID 0 mode.

RAID 1

Q: If I inserted 4 HDDs into the RAID System to do RAID 1, and have already set the HD Switch to 4 HDDs, why are only HDD 1 and HDD 2 LED lights staying white?
A: The RS-M4QO can only process two HDDs under the RAID 1 (Mirroring) mode, under HDD 1 and HDD 2 slots only if all 4 HDDs are inserted. Based on the chipset, it is not possible to process two sets of HDDs at the same time.

RAID 5

Q: If I have inserted 4 HDDs, set the RAID Switch at RAID 5, but have the HD Switch set at 3 HDDs. Will this work?
A: Yes, you may do so, but the RAID System will automatically reset the RAID mode to RAID 5+HotSpare. The RAID System is created to determine first on the number of HDDs inserted into the System, then the RAID mode setting. Occasionally, the System will still reflect a "healthy" status even though the number of HDDs inserted is not the same as the HD Switch setting.

RAID 5 + HotSpare

Q: Why is the HDD 1 LED light off when the RAID System is operating under the RAID 5+HotSpare mode?
A: Due to the chipset design, the System is created to recognize HDD slot no. 1 as the backup HDD. Therefore, when one of the HDDs fails, the backup HDD in slot no. 1 will automatically start to rebuild to replace the failed disk.

RAID 0+1

Q: Normally when operating under the RAID 0+1 mode, two HDDs are allowed to fail without losing the data. Is there any special restrictions or limitations for the RS-M4QO?
A: As long as the two failed disks are not in the special combination of HDD slots nos. 2&3 or 1&4, the data can be rebuild once the failed disks are replace with new ones.

Rebuild

Q: Does the RAID System have to be connected to the host computer when it is in rebuild mode?
A: No, it does not have to be. The RAID System can support offline rebuild, which means it can perform the rebuild function without being connected to a host computer.

JBOD

Q: I have 4 HDDs. Can I use them as separate HDDs on the RAID System?
A: No, the RAID System does not support the JBOD (Just a Bunch Of Disks) function. The 4-bay RAID System is specially designed for power users who prefer enhanced storage capability and advanced RAID features.

APPENDIX: SPECIFICATIONS

Model Name	RS-M4QO
Connector	eSATA x 1, USB 2.0 x 1, 1394a x 1, 1394b x 2
HDD Support	3.5" SATA HDD* *Identical HDD recommended – same manufacturer, capacity and RPM
RAID Level	RAID 0 (Striping), RAID 1 (Mirroring), RAID 5, RAID 5+HotSpare, RAID 0+1
Data Transfer Speed	eSATA: up to 3Gbit/sec USB 2.0: up to 480Mbit/sec 1394a: up to 400Mbit/sec 1394b: up to 800Mbit/sec
System Material	Aluminum case with plastic parts
LED Indicators	Power / Connection / Health / Access / Rebuild / RAID Alert
Power Supply	Input: AC 90-264V Output: DC +12V/5A Peak current: 12A
FAN	Dimension: 80 x 80 x 10 mm x 2 Speed: 1900 R.P.M +-10% Noise: 17.13 dB(A) max
Dimension	210 (L) x 138 (W) x 213 (H) mm
Weight (without HDD)	2.3 KGS
Certification	CE, FCC