



8 Bay USB 3.0 / eSATA RAID / JBOD Enclosure  
Model:MR8UT6G

User Manual

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# 1. Features

## 1.1 Overview

- External RAID case with eight bays for 2.5" and 3.5" SATA HDDs
- Support RAID Modes: RAID 00, RAID 0 x2, Spanning (Big), Spanning x2, RAID 5 x2, RAID 50, JBOD (Clean, individual drive mode)
- External interfaces: eSATA and USB3.0
- Aluminum enclosure provide excellent cooling
- Hot swappable trays for easy trouble-shooting
- LED indications for power, HDD activity and rebuild

## 1.2 SATA features

- Port Multiplier Functionality
- Auto-negotiation between SATA I (1.5 Gbps), SATA II (3 Gbps) and SATA III (6 Gbps)
- Hot-Swap support in CLEAN mode
- Supports Native Command Queue (NCQ)
- Supports Port Multiplier Aware and non-Port Multiplier Aware Host in RAID mode
- Supports Spread Spectrum Clocking
- Supports BIST and Loopback Mode
- Supports 48-bit LBA addressing

## 1.3 USB features

- Compatible with USB Super Speed, High Speed and Full Speed
- Compatible with OHCI/UHCI/EHCI hosts
- Supports Mass Storage Class

## 2. Specifications

- Tool free installation

Tool less installation for 3.5 inch Hard Drive.

- Plug and Play

Supports standard 2.5/3.5 inch SATA HDDs and SSDs.

- High Speed data transfer

USB 3.0 or eSATA Connectivity

- Aluminum Case

High-quality aluminum material with good heat dissipation

- Quiet cooling fan

Low speed cooling fan delivers highly efficient cooling

- RAID Level

Support RAID 0 / RAID 0 x2/ RAID 50/ RAID 5 x2/ Spanning /

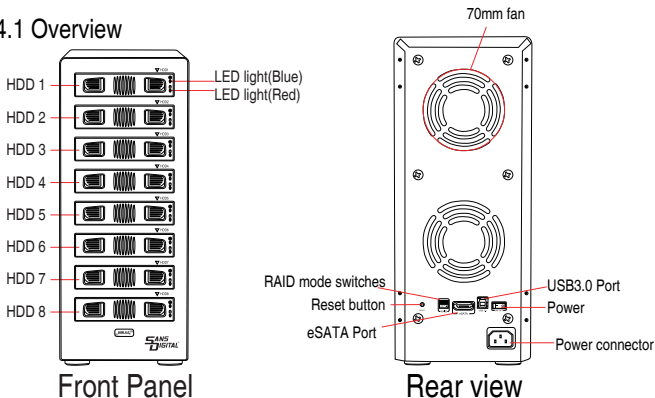
Spanning x2 / JBOD

## 3. System requirements

- Windows 2000/ Me/ XP /Vista/ 7/ 8/ 8.1/10 above, Mac OS 9.1/10. above

## 4. The device at a glance

### 4.1 Overview



## 5. Package contents

- 8 bay MR8UT6G RAID Enclosure
- USB 3.0 Cable ; eSATA Cable
- Mounting screws and driver
- Power Cable
- User Manual

## 6. Getting started

### 6.1 HDD installation

1. Unlock the HDD trays lock and remove the HDD trays from the 8-BAY RAID Enclosure (Fig.1).

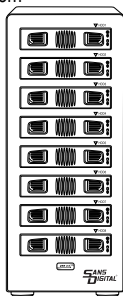


Fig.1

2. Place the HDD into the HDD trays (Fig. 2).

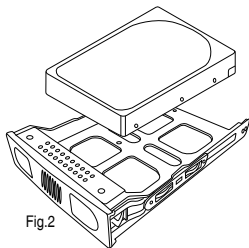


Fig.2

3. Use the mounting screws to securely attach the HDD to the trays (Fig. 3).

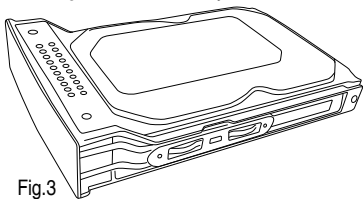


Fig.3

4. Slide the HDD trays back into the 8-BAY RAID Enclosure (Fig. 4).

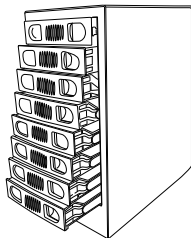


Fig.4

5. Slide the hard drive tray back into the slot to complete the HDD installation (Fig.5)

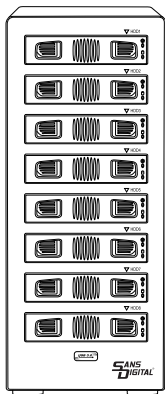
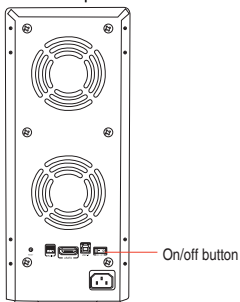


Fig.5

## 6.2 Power on/off

Press the power button to switch on the device. Press again to power it off.



## 7. Configuration

### 7.1 Preparation

#### 1. eSATA host connection

This installation guide assumes that you have already connected the 8-BAY RAID Enclosure to a SATA or eSATA host controller with Port Multiplier (PM) support.

#### Note:

If you use a host controller that does not provide Port Multiplier support (Such as Intel ICH), the CLEAN / JBOD mode will not work properly. Only one disk is available on the host computer.

#### 2. USB host connection

If you are connecting your 8-BAY RAID Enclosure using an USB connection to your host, the USB port should be compliant with USB2.0 or 3.0.

### 7.2 Changing the host connection

The 8-BAY RAID Enclosure supports both USB and eSATA host connections, but only one connection can be connected at the same time.

To switch from one connection to the other, the host computer and the 8-BAY RAID Enclosure should both be powered down prior to changing the host connection in order to avoid data loss. Power off the computer system first before power off the 8-BAY RAID Enclosure. When power on, power on the RAID Enclosure first before the computer system.

## 7.3 Disconnecting an USB device

USB 3.0 external devices provide support for Plug and Play connection so that the 8-BAY RAID Enclosure can be connected and disconnected while the computer is running. To prevent data loss or other failures, we recommend the following procedures when disconnecting your USB 3.0 from your host computer system:

Before you shut down your PC remove the 8-BAY RAID Enclosure from your system's hardware, Double-clicking the symbol in the task bar. A menu will open up. Select the 8-BAY RAID Enclosure to securely remove it. Power off the device.

## 7.4 HDD Hot Plug

The hard drives support hot-plug features, however, only hot-plug the hard drives when there are failure, or no data being access. Data lost can occur when hard drive is being access.

## 8. Setting the RAID mode

To setup the RAID mode for the first time, make sure that the hard disk drives are installed, setting the RAID mode switches on unit and hold the setup button. Power on the 8-BAY Enclosure while the setup button is held, and continues to hold for 5 to 10s.

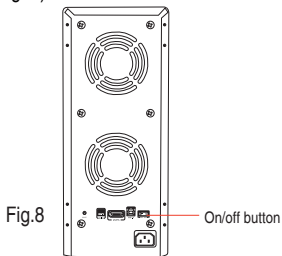
### Notes :

Creating new virtual volumes will destroy any existing data saved on the hard drives! Back up your data before setup or change RAID mode!



## 8.1 NORMAL (CLEAN / JBOD) mode

1. Switch off the device (Fig. 8)



2. Toggle the RAID mode switch to clean mode mode according to the following diagram (Fig. 9):

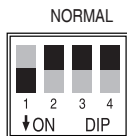
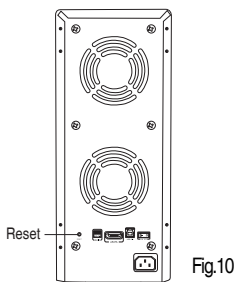
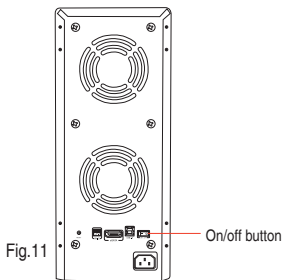


Fig 9

3. Press and hold the Reset button (Fig. 10).



4. Switch on the 8 bay RAID Enclosure with the Reset button held, and then release the reset button after the unit is on for 5s to complete the configuration (Fig.11).

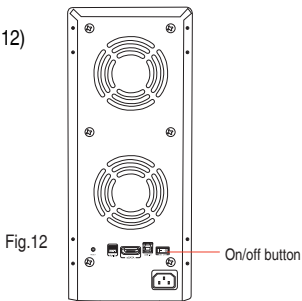


Warning :

For all other RAID mode, CLEAN Mode should be OFF

## 8.2 RAID modes

1. Switch off the device (Fig.12)



2. Toggle the RAID mode switches to the desired RAID mode according to the following diagram (Fig.13):

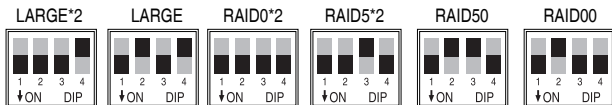
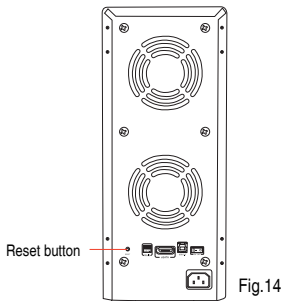
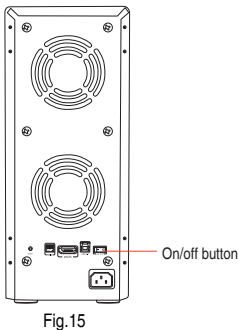


Fig.13

3. Press and hold the Reset button(Fig. 14).



4. Switch on the 8 bay RAID Enclosure with the Reset button held, and then release the reset button after the unit is on for 5s to complete the RAID mode configuration (Fig.15).



**NOTE :**

- The minimum hard drives used is two. The two HDDs are insert into position 1 and 5 respectively.
- If change the RAID mode, must change it to "Normal" mode firstly, then set other RAID mode.

## 9. Rebuilding a redundant drive

The 8-BAY RAID Enclosure protect against data loss due to drive failure in R50 mode. The following example illustrates the procedure of rebuilding a failure drive.

1. This example is based on drive 2 failure.If drive 2 fails, please remove it from the device (Fig.16).

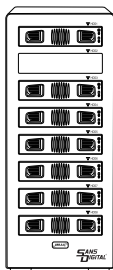


Fig.16

2. Switch off the device (Fig.17)

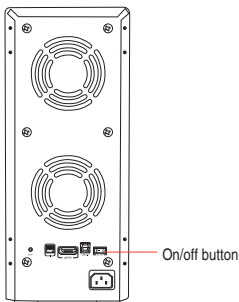
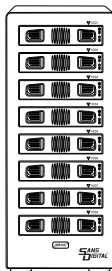


Fig.17

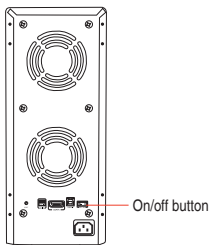
3. Replace the defective HDD with a hard disk drive of the same capacity or bigger (Fig.18)

Fig.18



4. Power on the device (Fig.19).

Fig.19



5. The 8-BAY RAID Enclosure will start rebuilding the RAID volume automatically (rebuild speed: approximately 200 GB/hour, depend on data usage).

## 10. Troubleshooting

### 1. Device is not recognized

Make sure all cables have been properly connected. For the USB 3.0 controller the latest drivers and the newest firmware must be installed. USB 3.0 controller may also need to power on based on the controller design.

### 2. Cannot copy or read in operating system

Make sure the device is properly partition and format in operating system.

### 3. Transfer speed is slow

Make sure the RAID enclosure is connected to USB 3.0 port. Additional power may needed on the add-on USB 3.0 controller card

Technical Support Contact: [tech@sansdigital.com](mailto:tech@sansdigital.com)

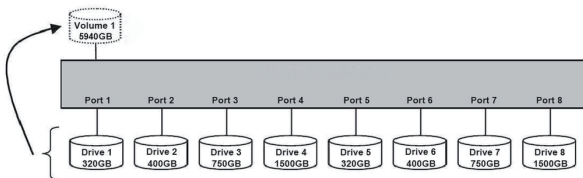
Phone: 800-980-1988

# 11. Appendix

## 11.1 LARGE mode (Spanning)

Function :

The LARGE mode concatenates a series of physical hard drives into a single large volume, creating a seamless expansion of virtual volumes beyond the physical limitations of singularly connected hard drives.



Notes :

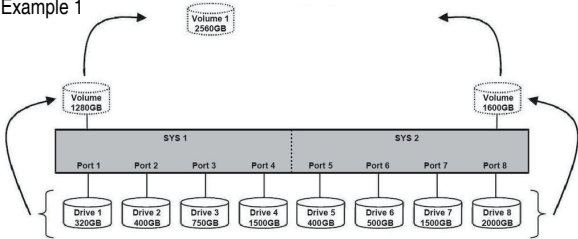
The hard drives 1 to 8 are concatenated into a single virtual volume in the Figure above with a storage capacity that is equal to the sum of each of the physical hard drives 1 to 8. It is also possible to create a LARGE volume using only a single hard disk drive connected to Port 1. However, it is not possible to expand an existing LARGE volume by adding another hard disk drive and still preserve any existing data on that volume.

## 11.2 RAID00 mode

Function :

In RAID00 mode the data is spread across all hard disks.

Example 1

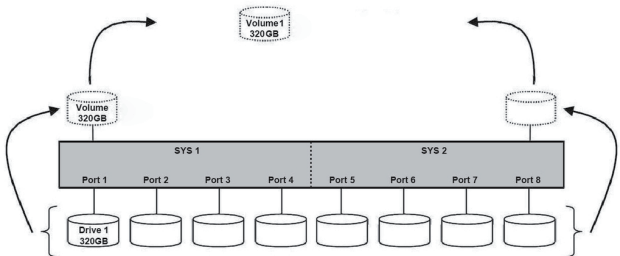


Advantage/disadvantage :

RAID00 mode provides the highest data speed but no data redundancy. RAID00 mode accelerates hard disk drive operating speed by using many disks simultaneously.

To implement the RAID00 mode, the 8-BAY RAID enclosure creates two single virtual volumes (SYS1 and SYS2) that are striped across all hard drives of SYS1 and SYS2, with a storage capacity that is four times of the smallest drive. SYS1 and SYS2 are then striped again across both virtual volumes. The storage capacity is twice the capacity of the smallest virtual volume.

Example 2

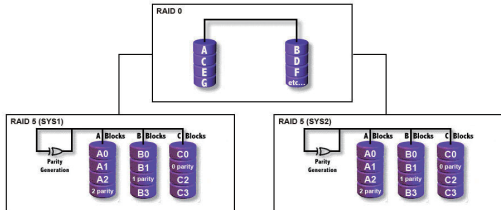




## 11.3 RAID50 mode

Function :

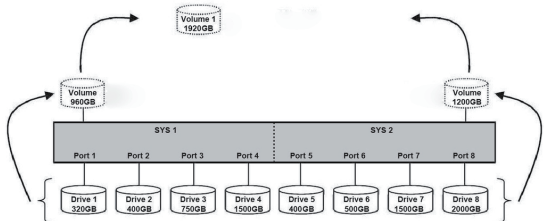
The R50 mode adds fault tolerance to drive striping by including parity information with the data. R50 mode dedicates the equivalent of one drive for storing parity stripes. The data and parity information is arranged on the drive array so that parity is written to all drives (SYS1 and 2). The following example illustrates how the parity is rotated from drive to drive.



Advantage/disadvantage :

The R50 mode uses less capacity for protection compare to RAID 1 / mirroring and is the preferred method to reduce the cost per megabyte for larger installations.

In exchange for low overhead necessary to implement protection, the R50 mode degrades performance for all write operations. The parity calculations for R50 mode may result in write performance. The resulting storage capacity of the virtual R50 volume will be "n minus 2" where (n=number of disks) of the smallest drive capacity.

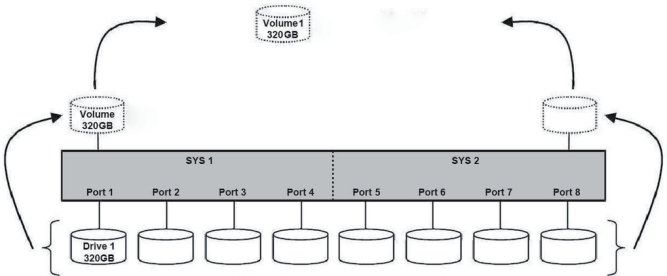


If one drive fails, the virtual R50 volume is still usable, but it is in a vulnerable state because additional drives failure will have data lost. When the defective drive is replaced, the enclosure begins a rebuild process immediately to restore data redundancy. During this procedure the LED indications will notify you that a rebuild is in progress.

## Notes :

Although the volume remains available during the rebuild process, the volume is in degrade and possible data loss if more drives fail. Host access takes higher priority over the rebuild process to allow data backup and continues usage. If you continue to use the virtual R5 volume during the rebuild, the rebuild process will take a longer time to complete. The host data transfer performance will also be affected during rebuilding.

The R50 mode can also be implemented using a single disk :



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