RAID

4-BAY RAID ENCLOSURE
For 3.5" SATA I / II HARD DRIVE

fantec

Model: QB-35US3R

English

SUPERSPEED
USB
3.0
+eSATA

CONTENT

Please visit our website for more information:

http://www.fantec.de

If you have questions or need help with this device,
please visit our Fantec Support Forum:

http://www.fantec-forum.de/

OVERVIEW

DIAGRAM of FANTEC QB-35US3R

FRONT PANEL
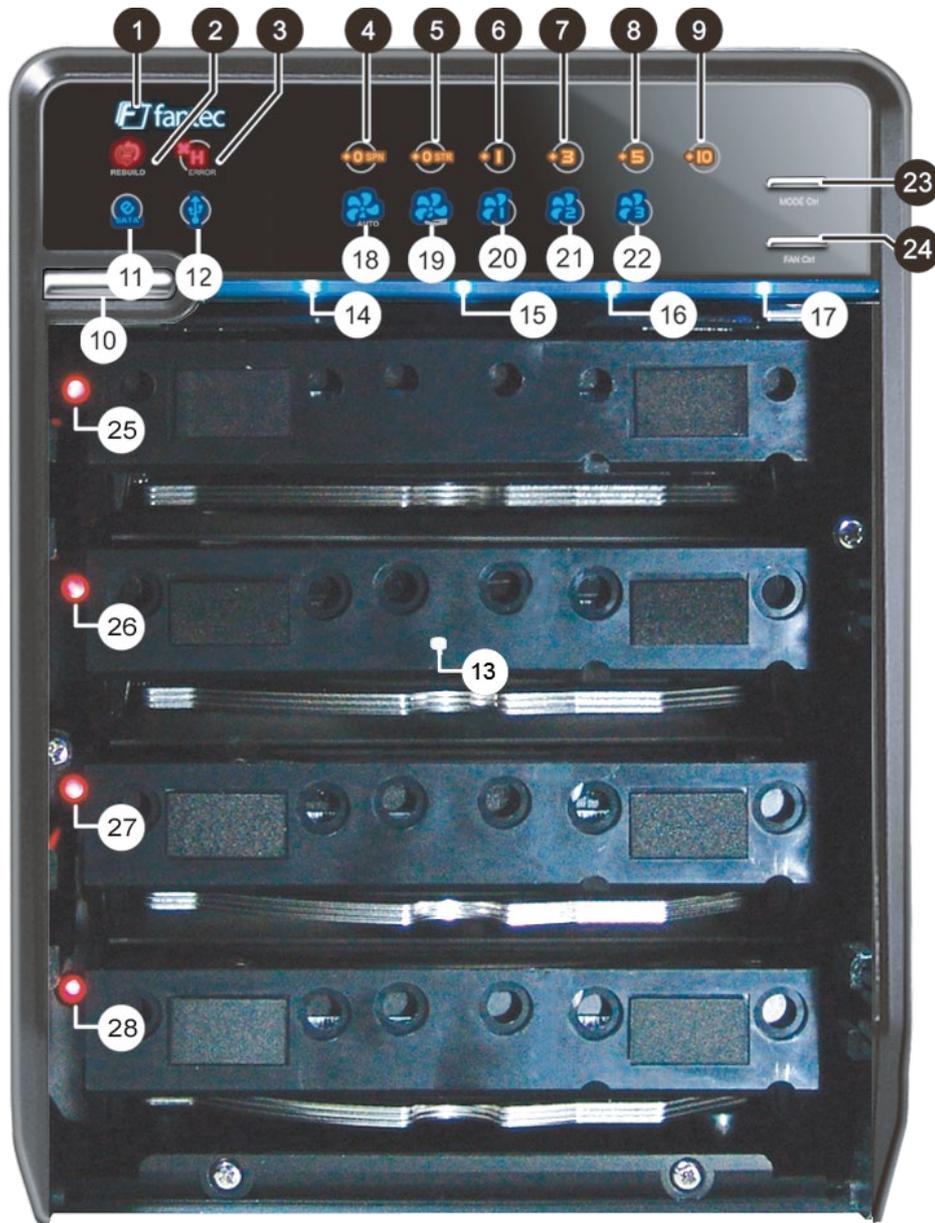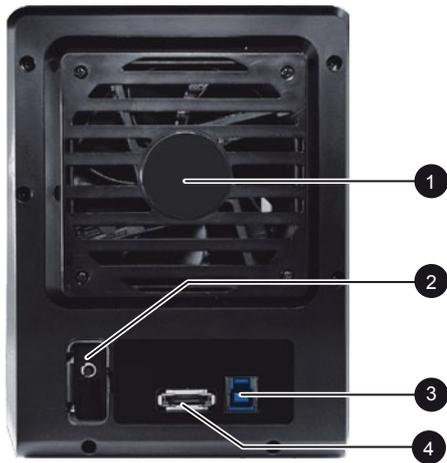
DESCRIPTION

LED INDICATION

1. Blue	Power on
Orange	Sleep mode
2. Rebuild	
3. HDD error	When any of HDD1~HDD4 has error, HDD error is on.
4. RAID 0	Spanning Mode / BIG
5. RAID 0	Striping Mode
6. RAID 1	
7. RAID 3	
8. RAID 5	
9. RAID 10	
10. Power button	It needs to be pressed for 3 seconds to power off. This design prevents accidental power off.
11. eSATA	in use / access
12. USB	in use / access
13. HDD Handle	
14.-17.	HDD1 / HDD2 / HDD3 / HDD4
Blue	active
Purple	access
Red	rebuild
18. Smart Fan automatic mode	
19. Smart Fan manual mode	
20. Fan speed	level 1
21. Fan speed	level 2
22. Fan speed	level 3
23. Mode	RAID mode button needs to be pressed for 3 seconds to switch the device's mode. This design will prevent accidental execution of this function.
24. Fan button	Controls auto & manual modes and fan speed from level 1 to level 3.
25. HDD1 error	
26. HDD2 error	
27. HDD3 error	
28. HDD4 error	

REAR PANEL

DESCRIPTION

1. Fan
2. RAID CONFIRMATION button
3. USB 3.0 / 2.0 port
4. eSATA port

SIDE PANEL right

DESCRIPTION

1. DC Jack
2. DC Power

HDD HANDLE   FRONT COVER   METAL FRAME
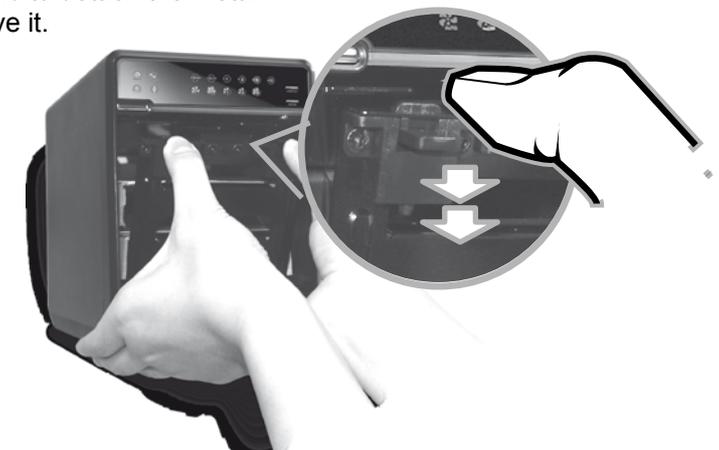
SELF-ASSEMBLY

Quick installation guide

A. Please use the provided handles to secure the 4 HDDs with screws.

B. Press the circular deepening to open the cover.

C. Press down the rib to detach the metal frame and remove it.

D. Take the transport paper
   board out of the device.

E. Slide 4 HDDs into the chassis and
   make sure they are securely
   installed in order from up
   to down.

F. Adjust the metal frame that was rem
   in Step C. Please make sure the
   bottom of the frame stays
   inside the track before
   closing the cover.

G. Connect the power supply to the device, plug in either USB, Firewire or eSATA
   cable in the rear panel and power on the device.

H. Set up RAID Mode.

SETUP

RAID mode setup

First install the HDD from up to down in the enclosure. Power on the device,
press RAID button for 3 seconds until LED flashes. Press it again, select the RAID mode
you want to use and press the Confirmation Button on the rear panel till the device shuts down.
Power the device on again and the RAID mode setup is completed.

● : Supported   ○ : N/A

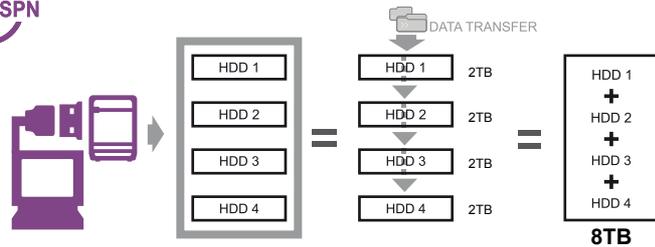| No. of HDDs / RAID MODE	2xHDD	3xHDD	4xHDD
RAID 0 (Spanning)	●	●	●
RAID 0 (Striping)	●	●	●
RAID 1 (Mirroring)	●	○	○
RAID 3	○	●	●
RAID 5	○	●	●
RAID 10	○	○	●

RAID mode confirmation button
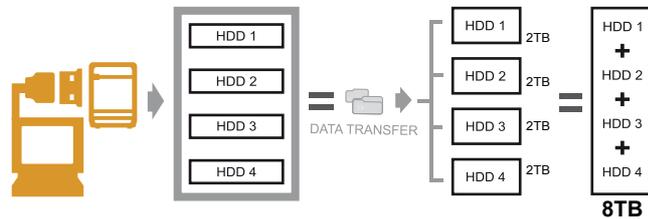
RAID O
Spanning

+ 0 SPN

Spanning concatenates multiple hard drives as a single large volume; resulting in a seamless expansion of virtual volumes beyond the physical limitations of separately connected hard drives. Thze data are written frim HDD1 to HDD4.

DATA TRANSFER

HDD 1		HDD 1	2TB		HDD 1
HDD 2		HDD 2	2TB	=	+ HDD 2
HDD 3	=	HDD 3	2TB		+ HDD 3
HDD 4		HDD 4	2TB		+ HDD 4

**8TB**

RAID O
Striping

+ 0 STR

Striping is a method of concatenating multiple hard drives into one logical storage unit. It is the automated process of writing data across multiple drives simultaneously. Striping is used to increase the performance of disk reads. The multiple hard drives will write data in "column" effect. If one drive in a striped set fails, all of the data in the stripe set is lost.

DATA TRANSFER

HDD 1		HDD 1	2TB		HDD 1
HDD 2		HDD 2	2TB		+ HDD 2
HDD 3	=	HDD 3	2TB	=	+ HDD 3
HDD 4		HDD 4	2TB		+ HDD 4

8TB

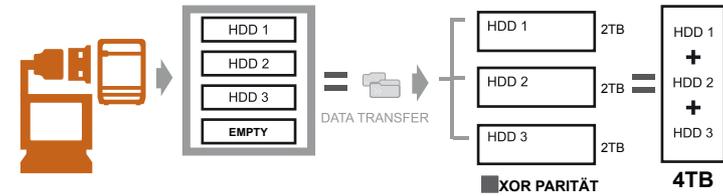## RAID 1
Mirroring

+ 1

Mirroring is the automated process of writing data to multiple drives simultaneously. Mirroring is used to provide redundancy. If one drive fails, the redundant drive(s) will continue to store the data and provide access to it. The failed drive can then be replaced and the drive set can be rebuild.

DATA TRANSFER

HDD 1		HDD 1	2TB		HDD 1
HDD 2		HDD 2	2TB	MIRRORING	+ HDD 2
EMPTY	=			=	
EMPTY					

2TB
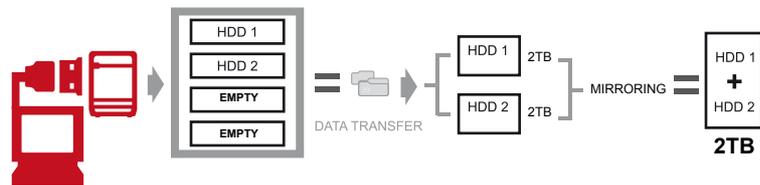
RAID 3
Striped set
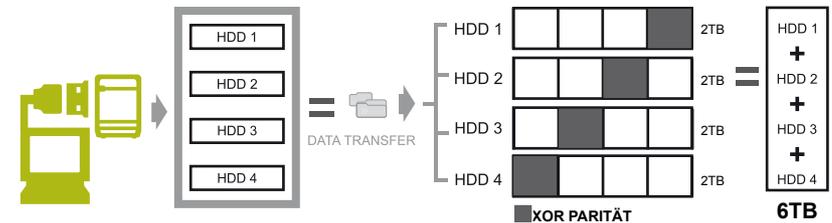### with dedicated parity

+ 3

This mechanism provides an improved performance and fault tolerance similar to RAID 5 but with a dedicated parity disk rather than rotated parity stripes.
The single parity disk is a bottle-neck for writing since every write requires updating the parity data. One minor benefit is the dedicated parity disk allows the parity drive to fail and operation will continue without parity or performance penalty.

DATA TRANSFER

HDD 1		HDD 1	2TB		HDD 1
HDD 2	=	HDD 2	2TB	=	+ HDD 2
HDD 3		HDD 3	2TB		+ HDD 3
EMPTY					

■ XOR PARITÄT   **4TB**

RAID 5
Striped set
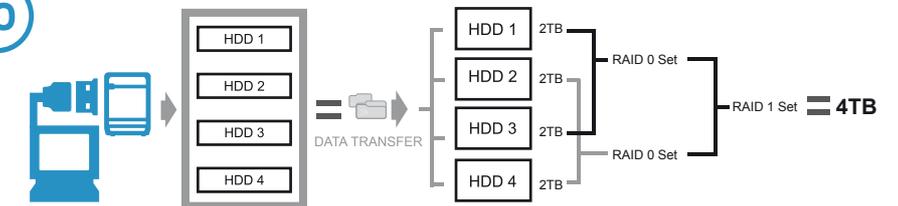### with distributed parity

+ 5

Distributed parity requires all drives but one to be present to operate; drive failure requires replacement, but the array is not destroyed by a single drive failure.
Upon drive failure, any subsequent reads can be calculated from the distributed parity such that the drive failure is masked from the end user. The array will have data loss in the event of a second drive failure and is vulnerable until the data that was on the failed drive is rebuilt onto a replacement drive.

DATA TRANSFER

HDD 1		HDD 1	2TB		HDD 1
HDD 2	=	HDD 2	2TB	=	+ HDD 2
HDD 3		HDD 3	2TB		+ HDD 3
HDD 4		HDD 4	2TB		+ HDD 4

■ XOR PARITÄT   **6TB**

RAID 10
Mirroring +
Striping

+ 10

RAID 10 is mirrored(Raid 1) sets in a striped(Raid 0) set .

DATA TRANSFER

HDD 1		HDD 1	2TB	RAID 0 Set
HDD 2	=	HDD 2	2TB	
HDD 3		HDD 3	2TB	RAID 0 Set
HDD 4		HDD 4	2TB	

RAID 1 Set **4TB**

LED Display Status

MODE   LED Display

RAID O
Spanning

When any of HDD1 ~ HDD4 is recognized by the PC,
HDD1 ~ HDD4 blue / active is on.

:-0 SPN

Blue / Active

Purple / Transferring Data

LED Display Status

MODE   LED Display

RAID O
Striping

When any of HDD1 ~ HDD4 is recognized by the PC,
HDD1 ~ HDD4 blue / active is on.

:-0 STR

Blue / Active

Purple / Transferring Data

LED Display Status

MODE	LED Display
RAID 1 Mirroring	When any of HDD1 ~ HDD4 is recognized by the PC, HDD1 ~ HDD4 blue / active is on.

Blue / Active

Purple / Transferring Data

Red / Rebuild

When the data is being rebuilt, LED of rebuild, HDD error and HDD (1-4, depends on which HDD is being rebuilt) error will be on.

LED Display Status

MODE	LED Display
RAID 3 Striped set with dedicated parity	When any of HDD1 ~ HDD4 is recognized by the PC, HDD1 ~ HDD4 blue / active is on.

Blue / Active

Purple / Transferring Data

Red / Rebuild

When the data is being rebuilt, LED of rebuild, HDD error and HDD (1-4, depends on which HDD is being rebuilt) error will be on.

LED Display Status

MODE

RAID 5
Striped set
with distributed parity

Blue / Active

LED Display

When any of HDD1 ~ HDD4 is recognized by the PC,
HDD1 ~ HDD4 blue / active is on.

Purple / Transferring Data

Red / Rebuild


When the data is being rebuilt, LED
of rebuild, HDD error and HDD
(1-4, depends on which HDD
is being rebuilt) error will be on.

LED Display Status

MODE

RAID 10
Striped sets
in a mirrored set

Blue / Active

LED Display

When any of HDD1 ~ HDD4 is recognized by the PC,
HDD1 ~ HDD4 blue / active is on.

Purple / Transferring Data

Red / Rebuild

When the data is being rebuilt, LED
of rebuild, HDD error and HDD
(1-4, depends on which HDD
is being rebuilt) error will be on.

INITIALIZATION

Windows 2000 / XP (32 / 64 bit)

If the HDD is uninitialized, you may have to initialize it by doing steps as followed: At first click "Start", "Execute" at your PC and key in "diskmgmt. msc". After that please press "RETURN" key.
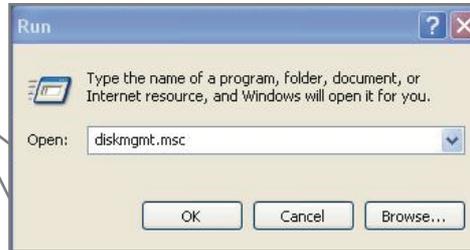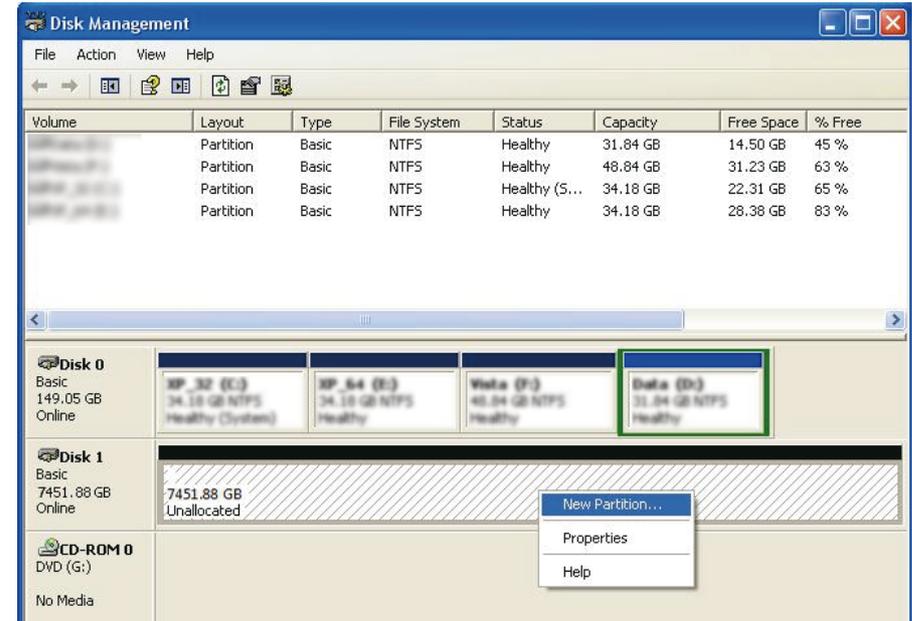
Windows 2000 / XP (32 / 62 bit) only support MBR.

Under Windows 2000 / XP, the HDD total volume shall not be more than 2,048GB, otherwise the device won't be recognized.
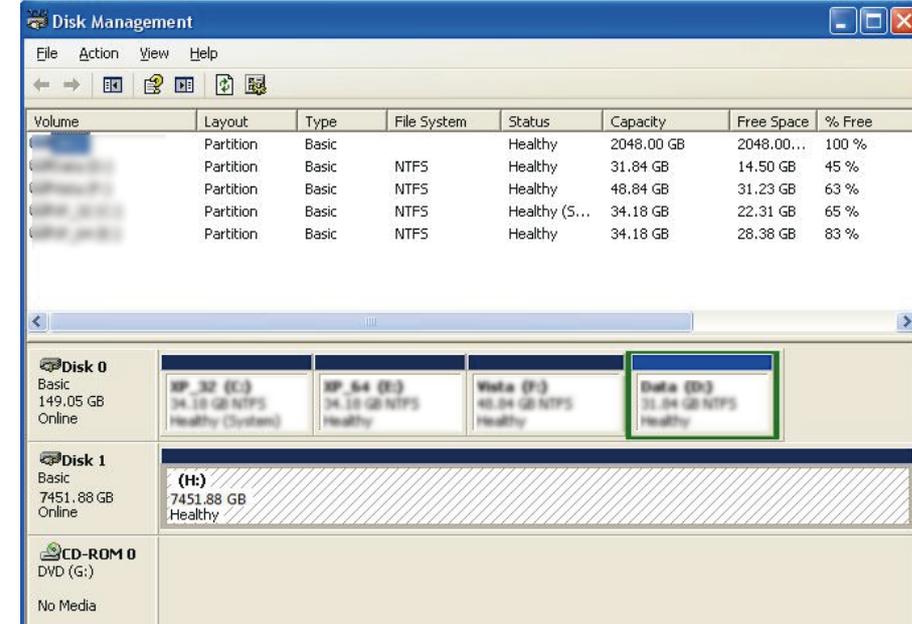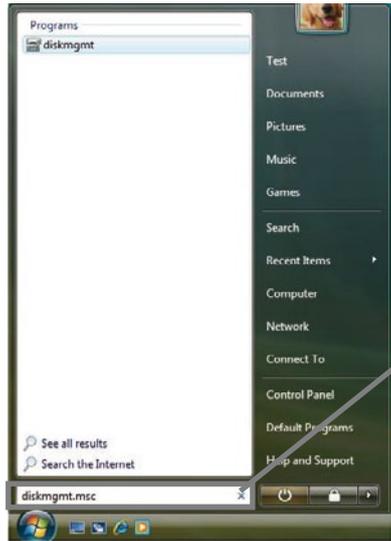
1. Start disk initialization.
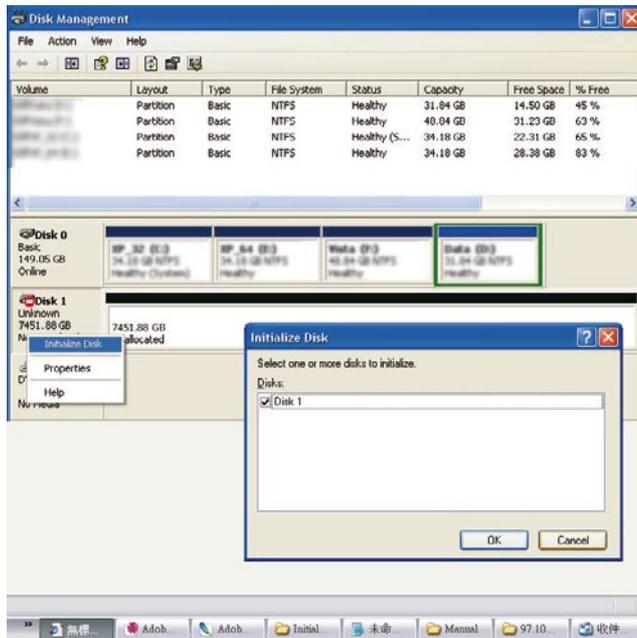
2. Create new partition and format disk.

3. Disk format completed.
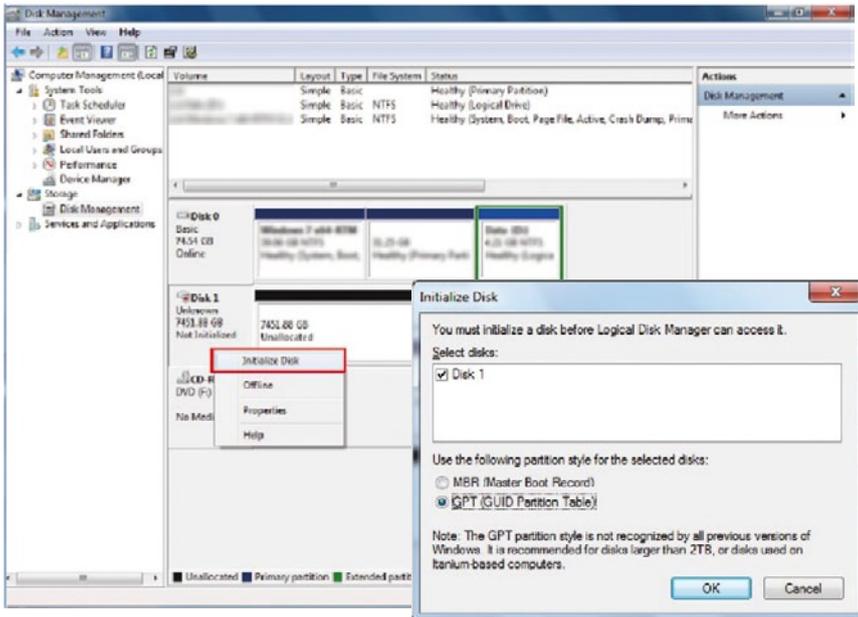
Windows Vista (32 / 64 bit)

If the HDD is uninitialized, you may have to initialize it by doing steps as followed: At first click "Start", "Execute" at your PC and key in "diskmgmt. msc". After that please press "RETURN" key.
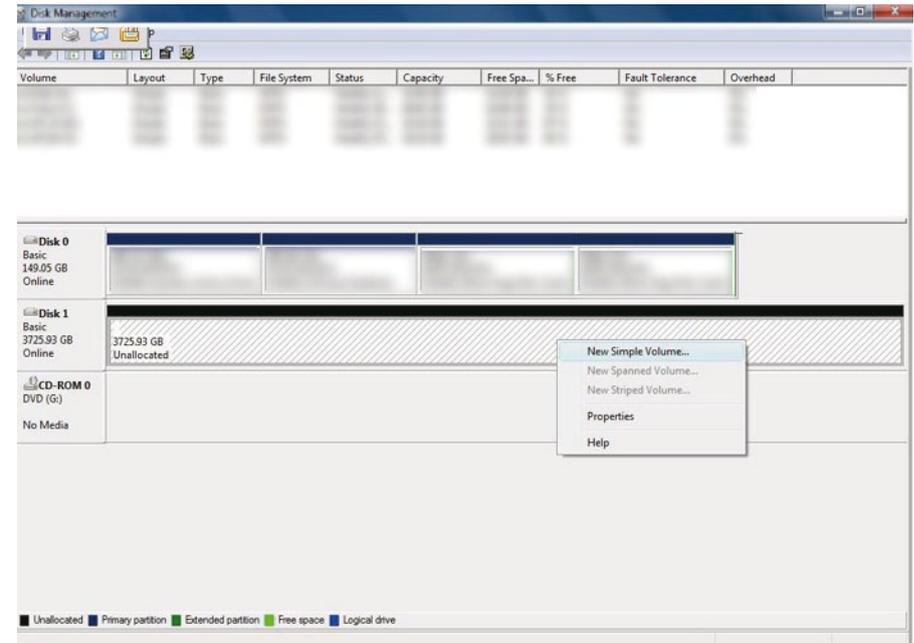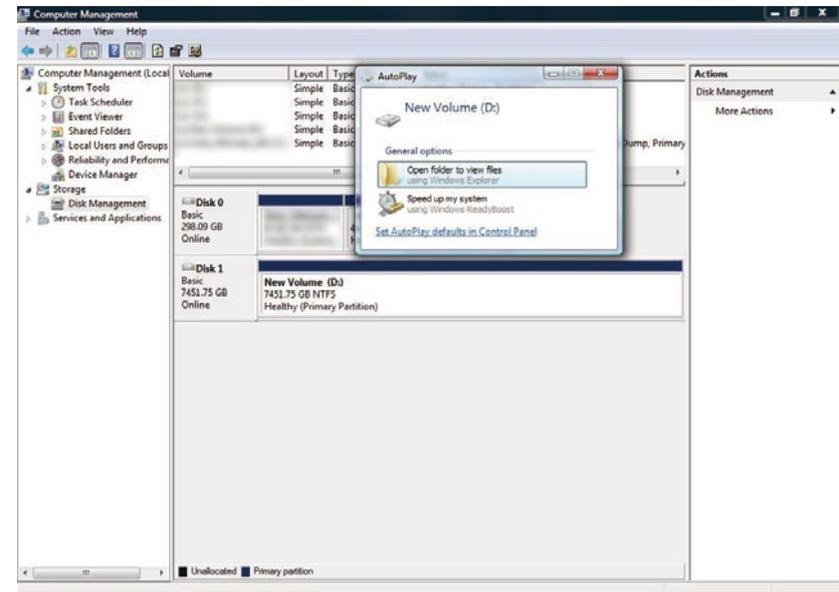
1. Start disk initialization.

Note: Please enable GPT* if the total capacity is more than 2TB and enable MBR if the total capacity is less than 2TB.

GPT mode*: Get more information on page 20.

2. Create new partition and format disk.
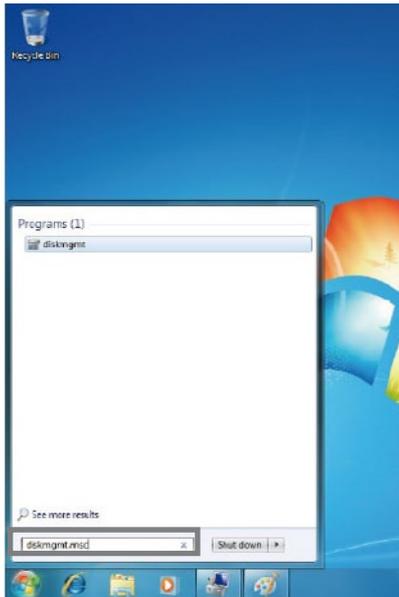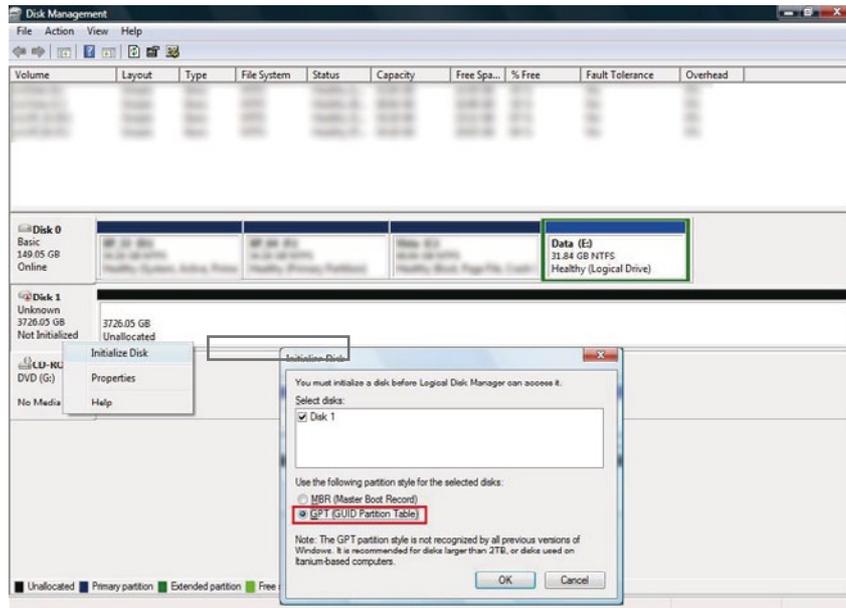

3. Disk format completed.

Windows 7 (32 / 64 bit)

If the HDD is uninitialized, you may have to initialize it by doing steps as followed: At first click "Start", "Execute" at your PC and key in "diskmgmt. msc". After that please press "RETURN" key.
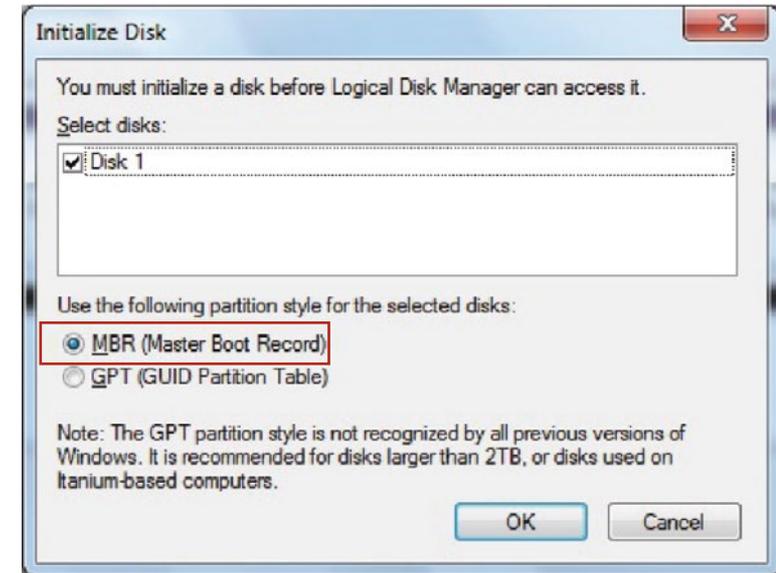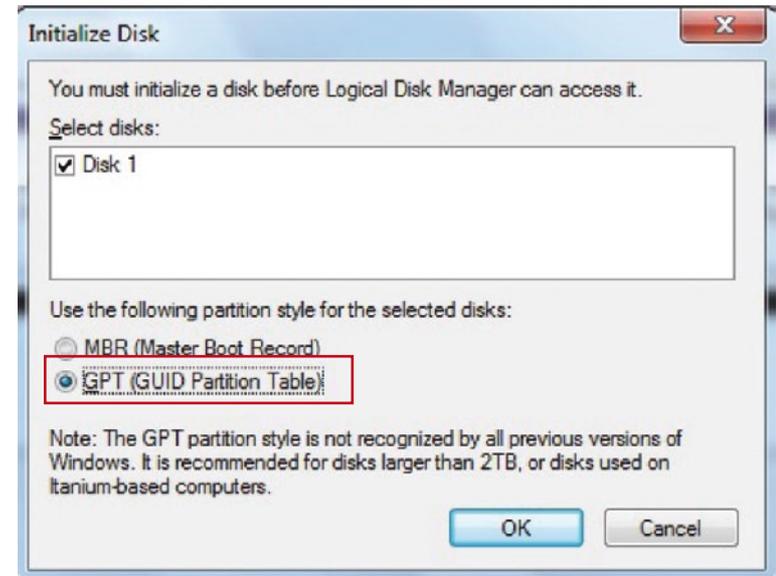

diskmgmt.msc

1. Start disk initialization.

Initialization with GPT or MBR mode.

Note: Please enable GPT if the total capacity is more than 2TB and enable MBR if the total capacity is lup to 2TB.
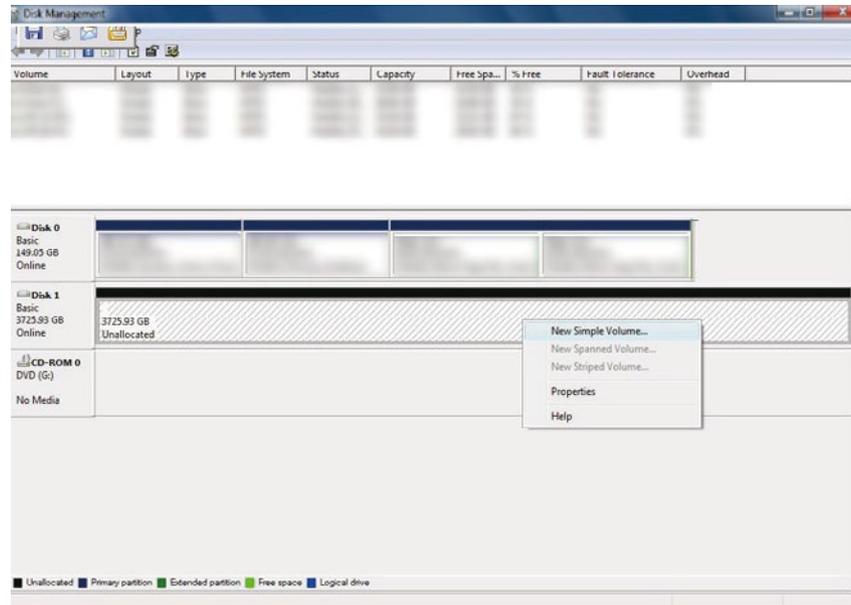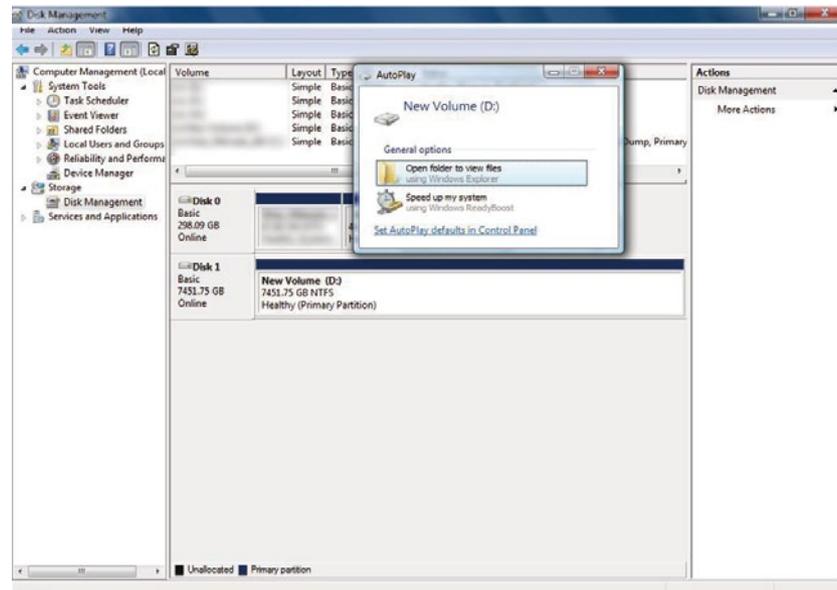
Activate MBR if total volume size is up to 2TB

Activate GPT if total volume size is more than 2TB
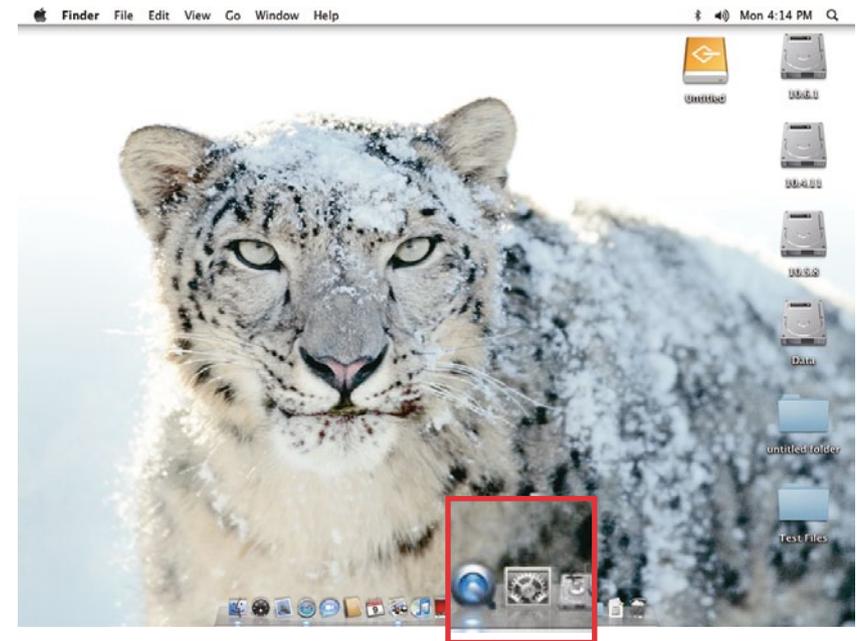
2. Create new partition and format disk.
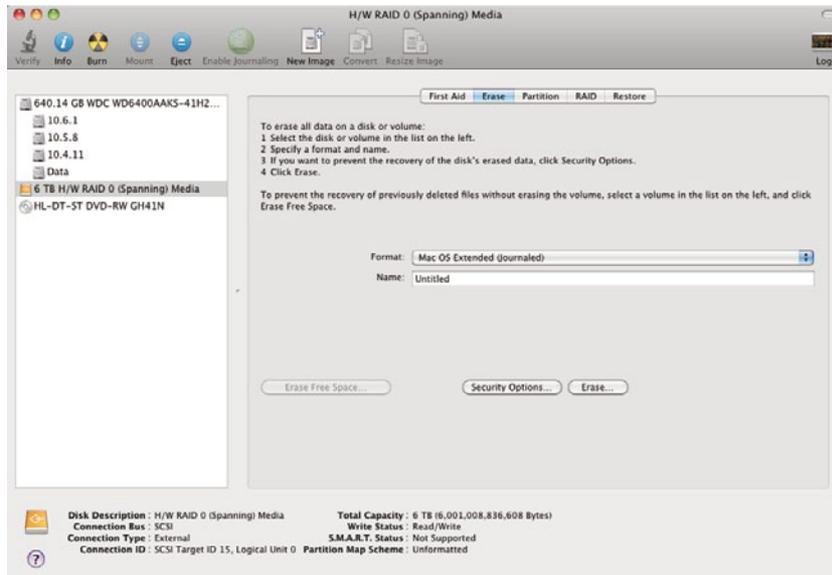

3.HDD format completed
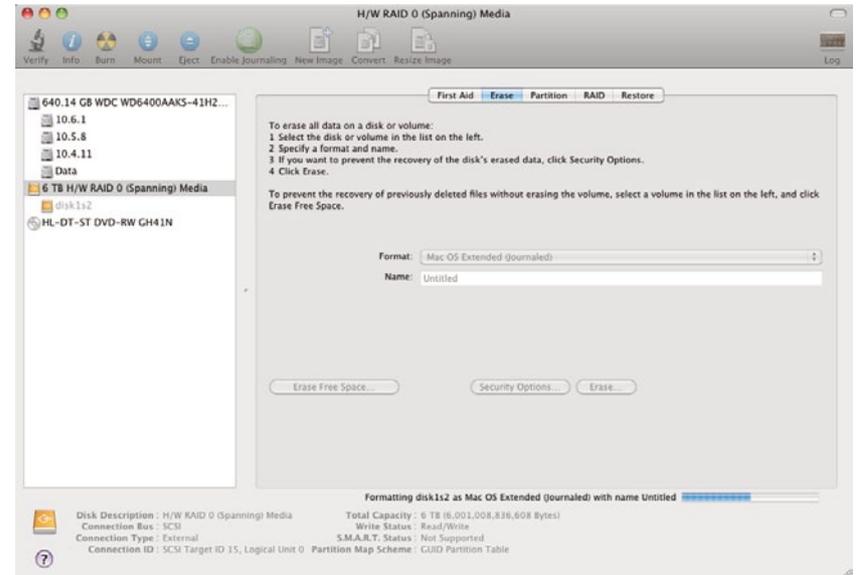

Macintosh O.S. 10.X

1. Click Disk Utility icon.

2. HDD initialize...

3. Click Erase

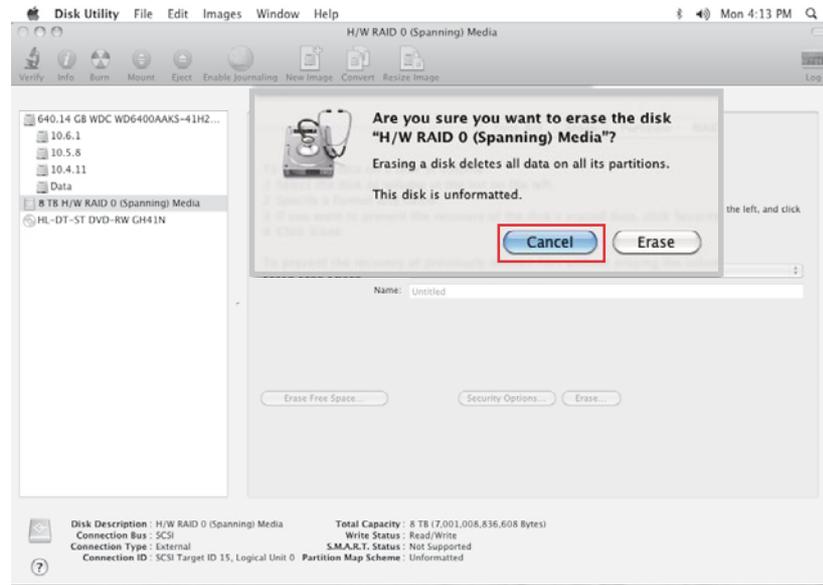4. Click Erase

5. HDD format in process

6. Format completed

REFERENCES

1. Changing the RAID mode will cause data lost.

2. Please refer to the instructions when switching the RAID mode, otherwise the execution might fail.

3. Interface of USB or eSATA can not be used at the same time.

4. When using RAID function, HDDs with the same brand, model and capacity is recommended.

5. When using RAID function, more than one HDD partition is not recommended.

6. Windows Vista/7 users can enable GPT when initializing HDD with a total capacity of more than 2TB.

7. Older OS may not recognize the device if you use a different operation system than Windows Vista.

   For more detailed information about GTP, please visit:

   http://www.microsoft.com/whdc/device/storage/GPT_FAQ.mspx

8. If you enable MBR by mistake, in order to clean the partition table, you have to switch

   another RAID mode and do the RAID mode switch all over again referring to Setup. Then go

   back to the RAID mode you want, repeat the previous actions and enable GPT when initializing HDD.

9. For Macintosh users: the total capacity of more than 2TB could be recognized only for the

   operation system is 10.4.11 Tiger or later.

10. Do not connect the device to the SATA on board port of the motherboard. Either use SATA to eSATA

    PCI-Express or SATA to eSATA PCI add-on card, otherwise the PC may not recognize the device.

11. In RAID 1, HDD1 and HDD2 must be installed, otherwise the PC can not recognize the device.

12. Rebuild time is based on the capacity, e.g. it takes about 1 hour for 200GB.

13. When the USB or eSATA cable is plugged out, the device goes to sleeping mode

    automatically.

14. To take the HDD out from the device, slightly press down the handle of the tray and pull it out.

15. Setting up motherboard's power management in S3 is recommended.

    (For more details, please refer to the user guide of motherboard BIOS setting).

16. If the device takes too long to initialize, please check if the HDD is securely installed or

    update the eSATA host driver version.

17. If the transfer rate is not normal, please check if the setting of SATA disk jumper is 1.5 or 3.0Gbps .

18. If there is noise with the fan, power off the device, unscrew the fan, take out the cover ,

    clean the fan and assemble it back.

Positive (electrode)   Negative (electrode)
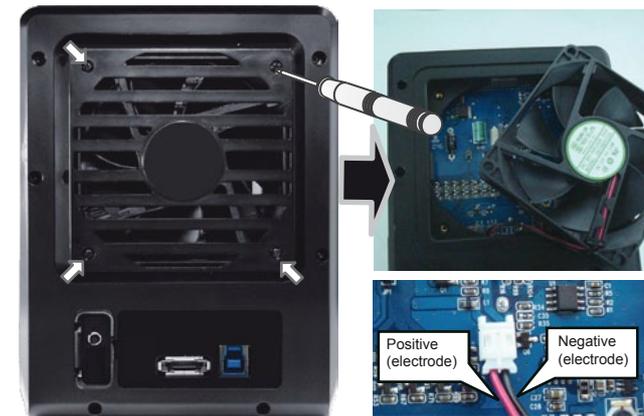
19. If the noise is still present, you can change the fan with another identical fan of size 80x80x20mm

    referring to Figure-2.

●: HDD installed

20. If you have forgotten to attach the metal frame before you closed the cover, simply press down

the rib and the cover will slowly release and open outwards. Please do not attempt to pull the

cover with something sharp.

21. If the fan stops working, do not dismantle it. Please send back to the retail store immediately.

22. Temperature -20 ~ 60 °C

Humidity 90 ％ RH

23. Smart fan controlled by the built-in thermal sensor and it comes with 2 modes (auto / manual)

and 3 levels of speed:

Level 1 :   below 45 °C   1200-1800rpm

Level 2:   45 °C ~ 54 °C   1800-2500rpm

Level 3:   hotter than 55 °C   2500-3500rpm

24. Operation System:

Windows 2000 / XP / Vista/7 32/64bit (with MBR enabled, supports total capacity up to 2TB)

Vista/7 32/64bit (with GPT enabled, supports total capacity more than 2TB)

Macintosh 10.3.x or later

25. Support USB transfer speeds of Low speed (1.5Mbps), Full speed (12Mbps),

High Speed (480Mbps), Super Speed (5Gbps), eSATA transfer speed (1.5~3.0Gbps).

26. The chart below shows you that the device still functions when one HDD has error.

RAID MODE	
RAID 1	When one HDD has error, the device still functions well but you may have to replace it with a new one immediately.
RAID 3	
RAID 5	

27. RAID 10

a) When one HDD has error, the device still functions well but you may have to replace it

with a new one immediately.

b) The chart below shows you that the device still functions when two HDDs have error.

●: HDD installed

RAID MODE	RAID10					
Error status / HDD No.	Error 1	Error 2	Error 3	Error 4	Error 5	Error 6
HDD 1	●	●		●	●	●
HDD 2	●	●	●		●	●
HDD 3	●	●	●	●		
HDD 4	●		●	●	●	
Status of device	OK	OK	OK	OK	OK	LOSS

RAID MODE	RAID10				
Error status / HDD No.	Error 7	Error 8	Error 9	Error 10	Error 11
HDD 1			●	●	
HDD 2		●			●
HDD 3	●	●	●		
HDD 4	●			●	●
Status of device	LOSS	OK	OK	OK	OK