InTANK Series

iR2420-2S-S2

User Manual

v.1.0 (December, 2010)

Preface

With regard to this manual

Thank you for using the product of **Raidon Technology Inc.**
This manual will introduce **RAIDON iR2420-2S-S2**. Before starting to use **RAIDON iR2420-2S-S2**, we suggest you to first read this manual. Although the information in the manual have been carefully confirmed before publication, but the actual product specifications will base according to delivery. For any updated information related to product specifications, please inquire our website **www.RAIDON.com.tw** directly, our company will give no further notification.

Should you have any doubts regarding **Raidon Technology**'s product, or should you need to know the latest product information, application manual or firmware, please contact us at **supporting@raidon.com.tw**, we would reply you as soon as possible.

Note: **Raidon Technology** would only provide technical support and service to agents and dealers that purchased the product directly from us. For general consumers or customers who did not purchase the product from us directly, please contact the dealer or store where you bought the product in order to get better support and faster response. If you did not purchase the product directly from our company, please avoid contacting us directly as you would probably not receiving any reply from us.

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Chapter 1 An introduction to RAID

1.1 What is RAID?

The idea of RAID (Redundant Array of Inexpensive Disks) was first proposed by David A. Patterson, Garth Gibson and Randy H. Katz at University of California, Berkeley in 1988. The purpose of RAID is to store the same data in multiple hard disks at different places, and to improve the performance of storage system. The advantages of RAID are to provide better productivity effectiveness and data error tolerance, and these can be done by distributing workload parallelly to a number of disk drive entities to achieve better performance. And through multi-operation of data, whenever one (or several) hard disk or magnetic area has a problem, we can still find the mirror copy of data in another hard disk, and so to achieve error tolerance.

Not only does RAID controller be able to assist users in ensuring that they can see their operating system in logical disk drive, they can also feel at ease without having to worry on how to manage this complicated construction. Generally, in order to get better result, we suggest users to choose a hard disk in same brand and same model while installing them in RAID, as a matching performance of these hard disks would allow the array to operate better than a single hard disk.

1.2 Comparison of RAID 0 and RAID 1

RAID 0: Striping (fast speed but has no error tolerance; two hard disks are required)
RAID 0 is currently the fastest RAID. It is a type of performance-oriented disk mirroring method. The function of RAID 0 is that it is able to combine two or more hard disks to work as a large hard disk. While all the hard disks are reading or writing under Stripe mode, they will be started up simultaneously. Assuming that you are writing a 10MB file and you have two hard disks to work under Strip. At this instant, every disk will start up simultaneously to write this file and sub-divide it into two equal parts, and simultaneously write it in two hard disks (each in writing 5MB). Therefore, the writing time is only half the original time. When you want to retrieve this file, you only need to retrieve 5MB each from two hard disks vice versa, and so, the time needed is only half. As reading and writing of file by each hard disk is only half the original time, therefore, the reading and writing performances are the fastest among all RAIDs. However, as RAID 0 array does not backup data, whenever one of the disks is damaged, the entire array will be malfunctioned to result with all data lost in the array. Thus, we can say that RAID 0 does not have any error tolerance capability at all.

The computing method of RAID 0 hard disk capacity:
[total capacity] = [hard disk number] x [minimum capacity of hard disk]

RAID 1: Mirroring (possesses error tolerance capability; two hard disks are required)
As RAID 1 is composed of two hard disks, it can be referred to as disk mirroring. Each data will simultaneously be written in two disks and that the data in two disks are exactly the same. Whenever one of the disks fails, the system is still able to operate normally. RAID 1 features excellent data security, and is most commonly and widely used among all the RAID levels, and most compliance to the original design concept.

The computing method of RAID 1 hard disk capacity:
[total capacity] = [minimum capacity of hard disk]

The following is a comparison of two RAID levels:

RAID Level	Basic operation principle	Disk applicable space	Data reliability	Data transmit rate	Minimum hard disk requirement
0	Partition storage	Total hard disk capacity	Low	Fast	2
1	Mirroring	Half of total capacity of all hard disks	High	Slow	2

Chapter 2 Features and Specifications

2.1 Hardware Features

RAIDON iR2420-2S-S2 is an exclusive patented design of RAIDON, capable of combining two 2.5" hard disks or SSD into the space of one 3.5" hard disk. Under RAID 0 mode, it is able to combine the capacity of two hard disks and make good use of them and meanwhile, to provide a transmission rate higher than one 3.5" hard disk. And under RAID 1 mode, it is able to provide real-time data backup to ensure 100% data security.

Product features:

- Supports two 2.5" SATA I or SATA II hard disks or SSD simultaneously in the space of one 3.5" hard disk
- Same size as 3.5" hard disk
- Supports RAID 0 and RAID I applications

2.2 Hardware Specifications

Model	iR2420-2S-S2
Computing chip	SR2045
Host Interface	SATA II
Hard Disk Interface	SATA
Hard Disk Number	2
Hard Disk Size	2.5"
Hot-Swappable Hard Disk	Yes
Hard Disk Status Light	Yes
Transmission Rate	300MB/s
RAID Level	RAID 0, 1

Power Supply	SATA 15 Pin(DC 5V & 12V)
Product Power Consumption	10W (excluding hard disk)
GUI	Windows Only
Product Size (mm)	101.7(W) x 147(L) x 25.8(D)
Product Weight (kg)	0.8
Operating System	Windows XP / Vista / MAC OS / Linux / Windows 7

2.3 Product Applications

1. Real-time Backup Application of RAID 1

Select RAID 1 application will provide you with real-time data backup function. Even if one hard disk is malfunctioned, it is still able to ensure a normal operation of the system and to safeguard data security.

※ Specifying to install operating system and application software to iR2420 is able to avoid system operation being stopped in the event of a hard disk malfunction.

※ Storing important data in iR2420 and setting it as RAID 1 mode is able to avoid data damage caused by a hard disk malfunction.

2. Improve Access to RAID 0 Application Performance

RAID 0 relies mainly on Stripping to increase its operating speed. As iR2420 is the combination of two 2.5" hard disks to form RAID 0, its transmission rate is higher than one 3.5" hard disk, so it is suitable for video storage, editing and other applications that require higher transmission speed.

Chapter 3 Installation
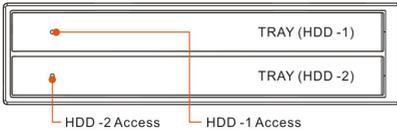
3.1 Product Appearance and Parts Inspection

Product Accessories
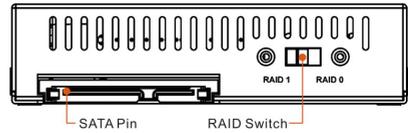After opening the packaging box, the contents inside the box should include the following accessories:

‧ iR2420-2S-S2 main unit
‧ CD(User manual)
‧ Quick Installation Guide
‧ Accessory pack

※ After opening the packaging box, please confirm whether the relevant accessories in the box are complete as of the model you bought and inspect whether there are any discrepancies in product appearance and functions. Should you discover any problems, please contact your retailer or agent you purchased the product as soon as possible.

Front view

| TRAY (HDD -1) |
| TRAY (HDD -2) |

HDD -2 Access   HDD -1 Access

Rear view

RAID 1   RAID 0

SATA Pin   RAID Switch

3.2 Light Signal Guide

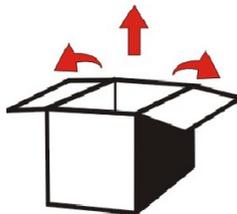| Status Description	LED Status
No HDD	Blue & Red / Blink alternatively & Buzzer Alarm
Access	Purple / Blinks
RAID Failure	Red / Lights On & Buzzer Alarm
Rebuilding (RAID 1)	Purple / Lights On (Source)
	Purple & Red / Blink alternatively (Target)
HDD Idling	Blue / Lights On

3.3 Environmental Requirements and Precautions

1. If you want to get better application results and for the sake of purchasing the hard disks conveniently, we suggest that you use hard disks of same capacity, model number and brand.

2. Under RAID 0 status, please ensure that the hard disks you use do not have bad sector as to avoid when one of them fails, it may cause a system crush or a risk to lose all data.

3. We suggest that you decide RAID 0 or RAID 1 mode before using. Once you have decided but reset later on, it will cause data damage in hard disk.

3.4 Hardware Installation

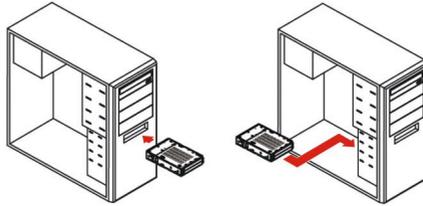Please refer to the following steps to install iR2420-2S-S2 hardware:
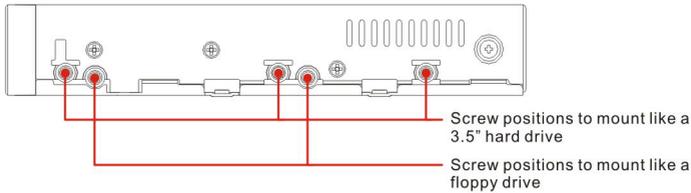
1. Open the packaging box and take the iR2420-2S-S2 out.

2. Select RAID 0 or RAID 1 mode. The factory default setting is RAID 1.

RAID 1   **RAID 0**

3. Install the iR-2420-2S-S2 in the computer case, connect the relevant cables and ensure that it is fastened with lock screws. Please use the 6#32*5 screws from the accessory bag.
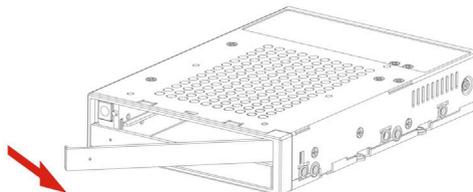

※ Screw holes guide

Screw positions to mount like a 3.5" hard drive

Screw positions to mount like a floppy drive

4. Press gently in the direction of arrow, the face cover will pop open automatically, pull the face cover straight until 90°.
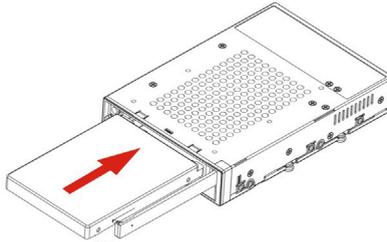
1). Press gently in the direction of arrow

2). Open the face cover until 90°

5. Install your hard disk in the hard disk slot and ensure that the hard disk is inserted and secured in the appropriate position. Replace the face cover.
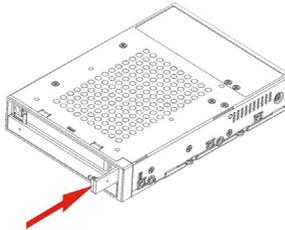

6. Hardware installation is complete. You may switch on the power to use relevant setting and application.
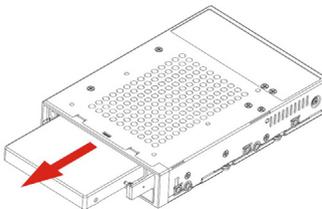
Your operating system will self-identify the hardware. After successful identification, please format your hard disk. After formatting, you may use the hard disk.

※ Should you need to change the hard disk in the future, you may open the face cover until 90° and gently push the face cover perpendicularly in the body until it touches the base. This will trigger the hard disk release device to enable the hard disk to retreat. While replacing the face cover, please ensure that it has been pulled out completely before closing it.

1). Push the face cover gently in the body until it touches the base.

2). The hard disk will be retreated

Installation 9

3.5 RAID Level Setting and Application Information

iR2420-2S-S2 is a disk array subsystem that supports RAID 0 and RAID 1. Once RAID has been set and if you want to change RAID mode halfway, it may result in data damage. Prior to setting RAID level, please first consider your purpose. If your requirement is data security, please set it in RAID 1 mode, and if your requirement is storage capacity expansion, then set it in RAID 0 mode.

Setting can be done via the RAID mode located at the rear of the unit. The factory default setting of iR2420 is RAID 1 mode.

⚠ Attention : 1. We suggest that you use two hard disks of similar configurations in order to achieve higher application results.
2. RAID 0 and RAID 1 cannot be used in similar operation simultaneously. You can only choose one of them to use.
3. Should you want to change RAID mode, please first backup your data and remove it, otherwise, the original data will get lost.

3.5.1 RAID 1 Mode (default value)

Please refer to the following installation guide:

1. Under power OFF status, install two hard disks in iR2420 body and replace the face cover.

2. After booting, the system will detect HDD status automatically and set HDD1 as the Source disk.

3. After detecting, please use the disk management tools provided by the operating system to "initialize" and "format" the hard disk (please refer to section 3.6).

4. You may now start using iR2420 under RAID 1 mode.

⚠ Attention : 1. If you switch on the power before inserting the hard disk, the system will not act under RAID 1 mode.
2. If you install only one hard disk, please install it in HDD 1 location, otherwise, the system will display wrongly.
3. When you want to change the hand disk, please remember to use the hard disk of similar capacity or model larger than the currently used hard disk.

3.5.2 RAID 0 Mode

Should you choose RAID 0 mode, please pay attention to the following matters:

1. After you have finished installing and switched on the power, the operating system will perform automatic detection. After detecting, it will show a new disk device at Device Manager.

2. You may perform disk partition or direct formatting on the disk and then use it afterward (please refer to section 3.6).

3. Under RAID 0 mode, if one of the disk is damaged, then all the data will get lost.

4. Under RAID 0 mode, if the capacity of two disks are different, then it will operate according to the hard disk with minimum capacity and combining the capacity of two disks into one disk (i.e. multiplying 2 disks with minimum capacity to use it as one logical disk).

5. Due to the technical structure differences between SSD and HDD, RAID 1 mode is suggested when using SSD to maintain the best of operating performance, if RAID 0 mode is chosen when using SSD may cause degradation of operating performance.

3.6 Hard Disk Formatting

After you finish installing the hardware correctly and booting the computer, the operating system will automatically identify the hard disk. You need to first format the hard disk before being able to store data in the hard disk. For Windows users, please refer to the following steps to format the hard disk.
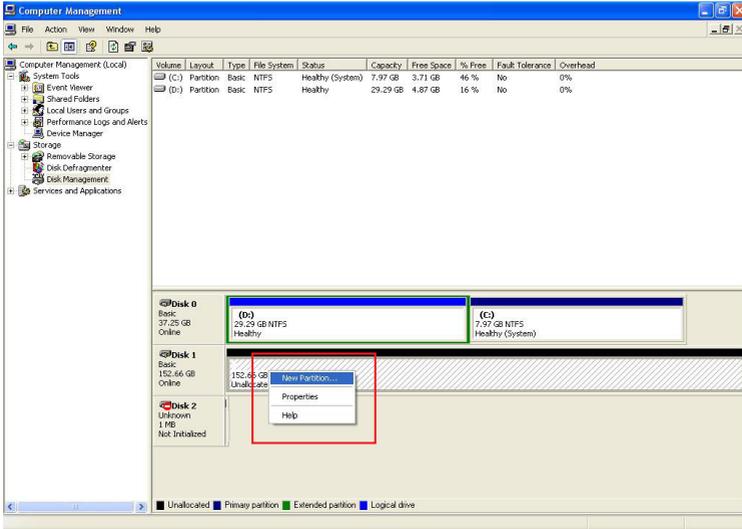
1. After the computer is switched on normally, the system will perform automatic detection. After detecting, it will display the following diagram.
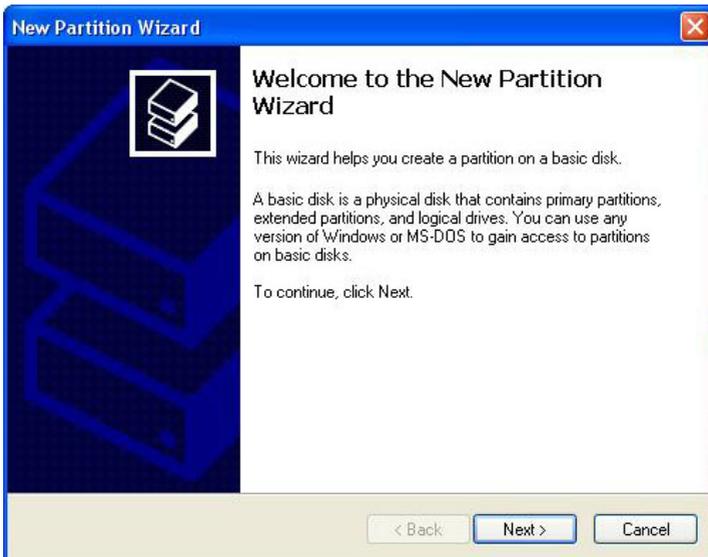

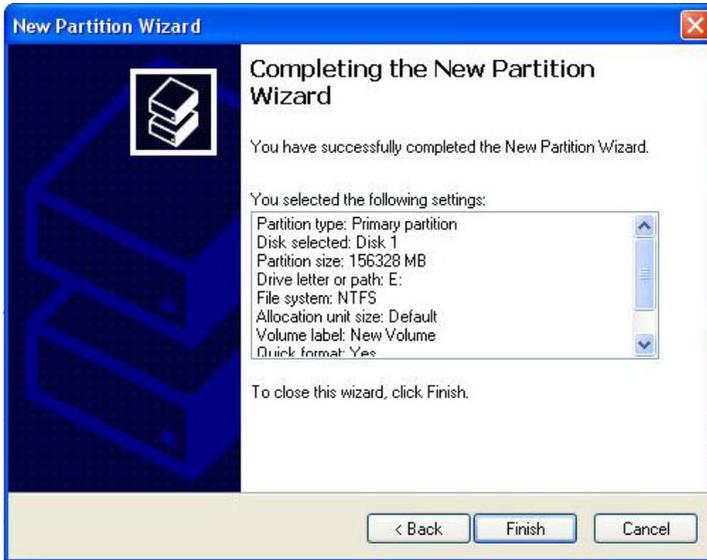2. Please enter into "Device Manager," you will be able to see the newly added hard disk.

3. Enter into "Device Manager" and click on the new hard disk, first "initialize" it, and after the initialization, you can follow your habit or requirement to "format" the file type you want.
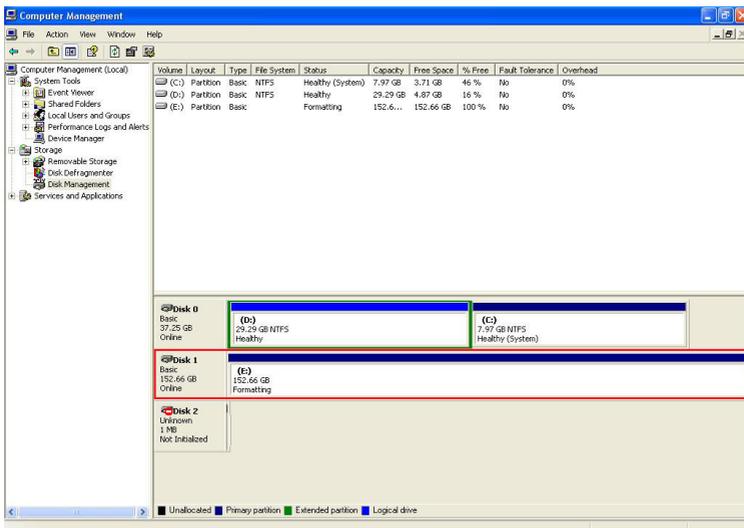

4. After clicking on "New Partition," the system will show the relevant window to guide you to format the hard disk. You only need to click in sequence to complete.
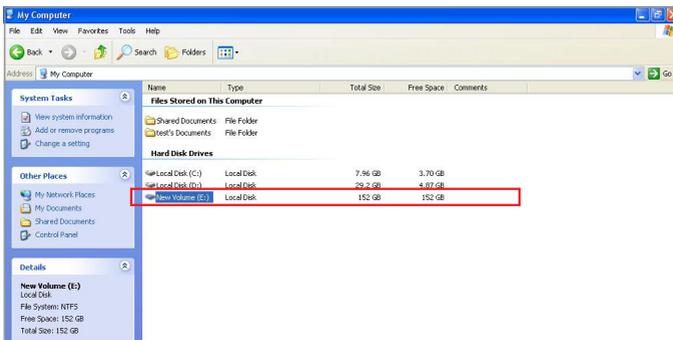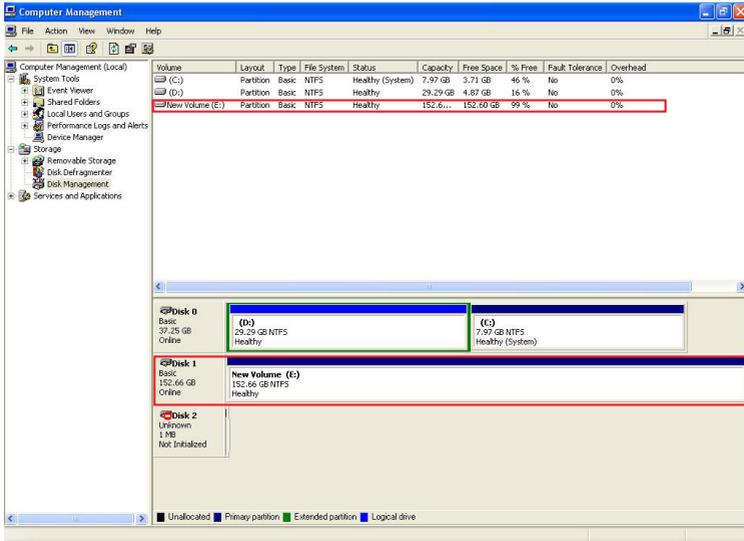
5. After setting the hard disk format and partition you want, the system will automatically begin to format it.

6. After formatting, the window will display the current hard disk status. At "My Computer," you will also be able to see the newly added hard disk.

Finish. You may start using the new hard disk.

3.7 GUI Monitoring Software

You can install GUI software to monitor RAID status. This can be done by installing RAID_GUI. exe. software from CD-ROM.

3.7.1 RAID Information

After connect to PC, when GUI has detected iR2420, the software will display the relevant information.
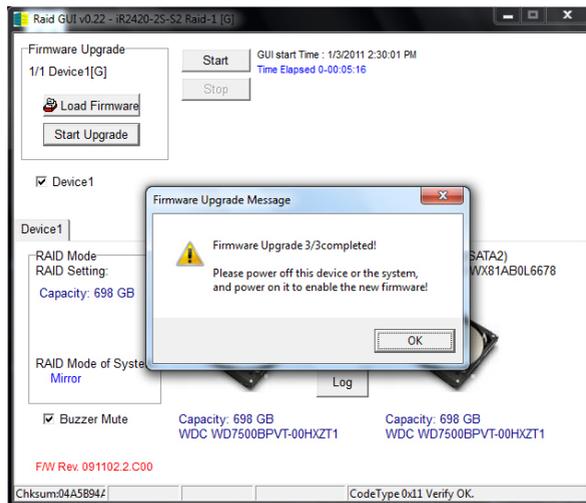

3.7.2 Firmware Updating

1. You may update FW through GUI by clicking "Load Firmware" to select the firmware you want.

2. After selecting, click "Start Upgrade" to start updating.

3. After updating, it will show a successful message and will start using the new firmware after you reboot your computer.

⚠ Attention : Downloading firmware at will may cause your system unable to operate normally. If your system is functioning normally, we suggest that you do not update your firmware. Should you have any doubts on firmware updating, please first contact the technical service staff of Raidon Technology Inc. or email us at: supporting@raidon.com.tw. For Taiwan users, please email us at: supporting@savemore.com.tw.

Appendix A Frequently Asked Questions

Q: Is it alright to use RAID 1 to do hard disk backup function?

A: Yes. RAID 1 is a mirror function itself. If your hark disk requires RAID 1 to do backup function, please place your hard disk containing data in HDD1 (Source) position to set as RAID 1, and after booting, place the new hard disk in HDD2 (Target) position. The system will do data backup function automatically. After iR2420 has finished rebuilding, the data in two hard disks would be exactly the same.

Q: Is it alright to use a single hard disk under RAID 1?

A: Yes, but it would completely lose its originally RAID 1 data security function. We suggest that you use two hard disks under RAID 1 mode to ensure data security. Under a single hard disk, RAID 1 is unable to perform mirroring function. If one hard disk is damaged, the interior data would be destroyed completely. Whenever one hard disk is damaged, we suggest users to replace it with a new one as soon as possible.

Q: When an error has happened to iR2420 hard disk, what should I do?

A: If you are using RAID 0 mode, please ensure which hard disk has caused the error and switch off the power of iR2420, remove the damaged hard disk and replace it with a new one. After rebooting, the system will rebuild RAID 0 system, but the original data would all be lost.
If you are using RAID 1 mode, please remove the damaged hard disk and replace it with a new one directly without having to switch off power. After the new hard disk has been inserted, the system will start to "rebuild" program automatically. After finish rebuilding, you can then use it normally. Please note that during the process of system data rebuilding, do not remove any hard disk to ensure data integrity.