

# XtendLan

## **XL-RAID-SATA** **Data Backup System**

### User's Guide



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## Chapter 1 Introduction

### 1 -1 Functions and Features

The XtendLan disk array XL-RAID-SATA provides both RAID 1 and RAID 0 functions with its independent disk array microprocessor chips. It is considered as the best choice for storage expansion and instant online backup.

- No hardware driver needed and applicable to all operating systems

XL-RAID-SATA is equipped with the standard SATA Type 1 and ATA133 connection interfaces. The XL-RAID-SATA system not only possesses high transfer rate but also does not require specific system drivers. Therefore, it can be simply applied to any computer system without any concerns about incompatibility.

- Supports both SATA and E\_IDE hard drive  
XL-RAID-SATA comes with removable hard drive carrier that is compatible with these two types of enclosure module. It can be applied to hard drives with E\_IDE interface or to the SATA hard drives.
- Hot Swappable Drive  
Under the mirroring mode (RAID 1), when one hard drive is damaged, XtendLan allows the system to switch hard drive without pausing the system operations.
- Auto Data Rebuilding  
Under the mirroring mode (RAID 1), XL-RAID-SATA will treat one hard drive as the source hard drive and the other as the target hard drive. Therefore, it does not require any specific command or system interruption to rebuild the hard drive while the computer system is still running.

- **Hard Drive Backup**  
Under the mirroring mode (RAID 1), XtendLan can serve as hard drive backup. It can also be used as system backup or off-line data backup to avoid any virus attack.
- **LCD Display Screen**  
The LCD display screen will allow users to monitor and to maintain the system operations.
- **System Failure Buzzer**  
When system failure occurs, XtendLan will not only display the damage status on the LCD display screen but will also generate system alarm as well. The XtendLan system also utilizes Windows version graphic user interface monitoring software which will allow remote maintenance via internet. XtendLan will notify system maintenance technicians once malfunction is detected for immediate repair services.
- **Aluminum Alloy Frame**  
The aluminum alloy frame gives strong and durable structure and serves as the best heat sink.

## **1-2 Product Specification**

Disk Array Hardware Include disk array chips with individual microprocessor

Disk Array Type: RAID 0,1

Connection Interface: SATA Type1 and ATA133

Connection Transfer Rate: Up to 150 MB/ Up to 133 MB Hard drive

Interface: SATA Type 1 or ATA 133

Hot Swappable Drive: 2 x (1 inch IDE Hard Drive)

Cooling Fans: 5.2 cm ball bearing fan

Operating Temperature: 0 ~ 55 °C

Power Input: 12V 4 A, 5V 4 A

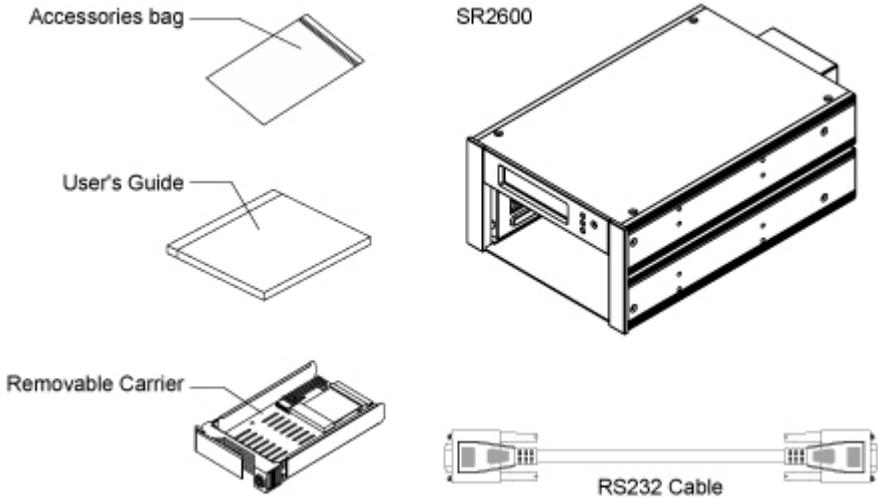
Dimension (MM): 146(width) x 238(length) x 85(height)  
Weight: 4kg(Hard Drive excluded)  
Aluminum Alloy Frame: Yes  
LCD Display: Yes  
Online Hot Swappable Drive: Yes  
Auto Rebuild: Yes  
System Driver Needed: No  
Certificates: CE, FCC Certificate

## **Chapter 2 Hardware Installation**

### **2-1 Contents in the product package**

The XL-RAID-SATA package contains:

<b>Object</b>	<b>Quantity</b>
<b>XL-RAID-SATA</b>	<b>1</b>
<b>RS232 Cable</b>	<b>1</b>
<b>Removable Carriers</b>	<b>2</b>
<b>User's Guide</b>	<b>1</b>
<b>RAIDGuide CD</b>	<b>1</b>
<b>Attachment Pack</b>	<b>1</b>
<b>(includes 6#-32 screws x 8 pcs , Key for keylock x 2 )</b>	



## 2-2 System Requirement

### □ Hardware Requirement

1. Computers or servers with SATA Type 1 or E\_IDE interface.
2. Hard drive with SATA Type 1 or E\_IDE interface.
3. The computer or server must run on the Windows system and has RS232 port to install the RAIDGuide GUI software.

## 2-3 Operation Requirement and Caution

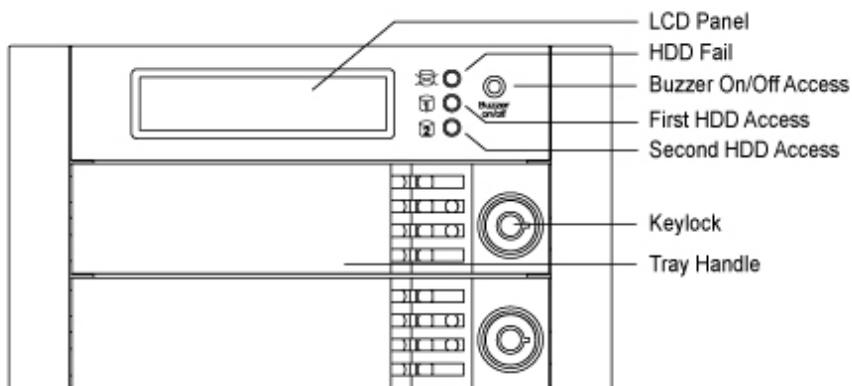
1. XL-RAID-SATA's brilliant design allows the user to simultaneously utilize two hard drives manufactured by different companies. However, if the user expects better efficiency, we strongly recommend the users to use hard drives manufactured by the same manufacturers.
2. Please carefully select the mode of disk array (RAID 0 or RAID 1) prior to usage. Unless high transfer rate and large storage capacity is needed, otherwise, please use the manufacturer's default mirror setting (RAID 1). Changing the disk array mode

- after the system setting is completed will result in complete loss and damage to the stored data.
3. Since the system uses more stringent factors to determine the disk corruption in the hard drive, please use noncorrupted hard drive with minimum storage capacity of 20 GB.
  4. Please set the first and second hard drive (IDE drives) in XL-RAID-SATA to **MASTER or Single Drive** mode. Otherwise, the system will not be able to detect the hard drives.
  5. The SATA and E\_IDE interfaces can not be used simultaneously. If the system detects the E\_IDE interface, the system will prefer to use the E\_IDE interface.
  6. The XL-RAID-SATA had undergone strict hard drive compatibility test. The result shows that it is compatible with most hard drives on the market such as Maxtor, Western Digital, Seagate, Fujitsu, Hitachi, and etc. However, due to the new types of hard drives appearing on the market, if your hard drive is not compatible with the system, please contact us at [www.xtendlan.com](http://www.xtendlan.com) or download the latest firmware updates.

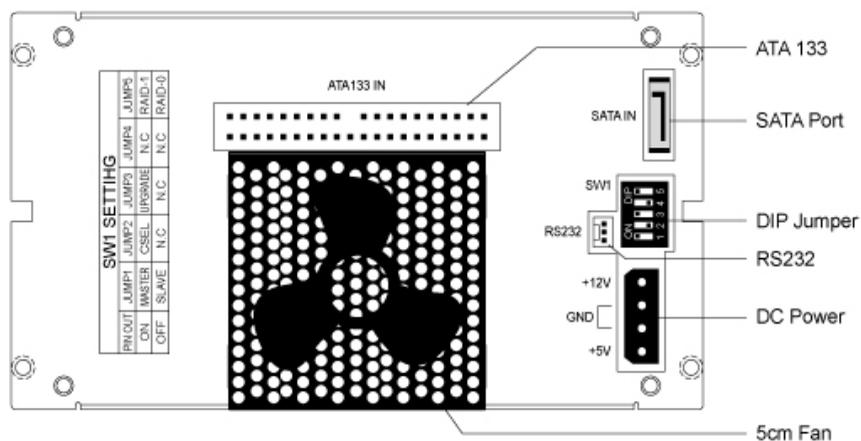
The XL-RAID-SATA is equipped with a 5.2 cm ball bearing cooling fan that will provide effective cooling for the 7200 rpm hard drive. We highly recommend using computer chassis with effective cooling design to avoid disk array crashing due to ineffective cooling.

## 2-4 Detail Description

Front View

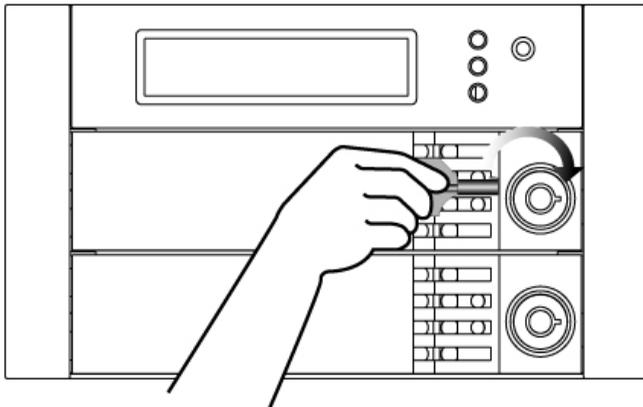


### Rear View

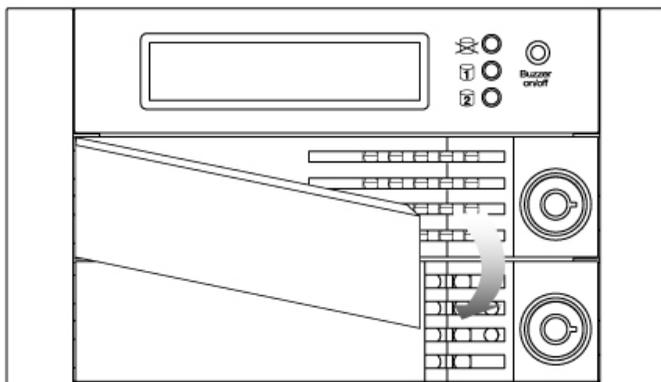


## 2-5 Installing Hard Drive

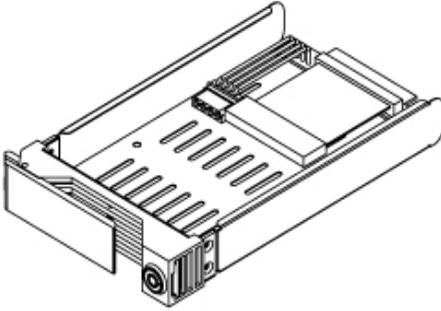
1. Insert key to the lock located at the right side of the tray handle.  
Turn the key clockwise to open the tray handle.



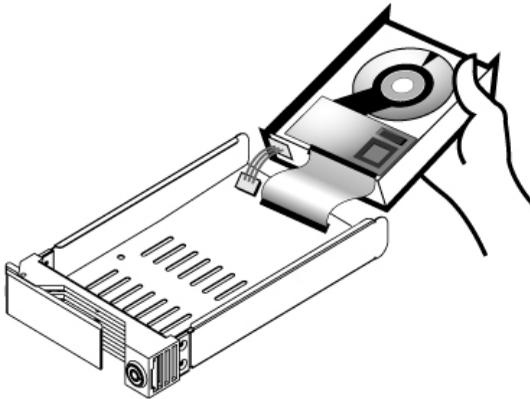
2. Pull the handle of the removable hard drive carrier.



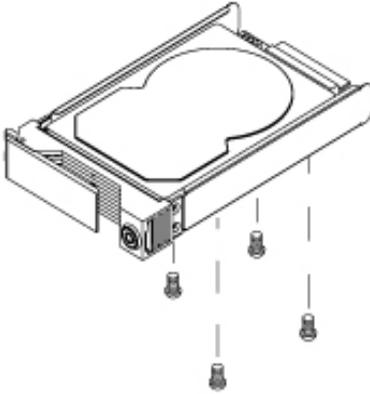
3. Remove the removable hard drive carrier.



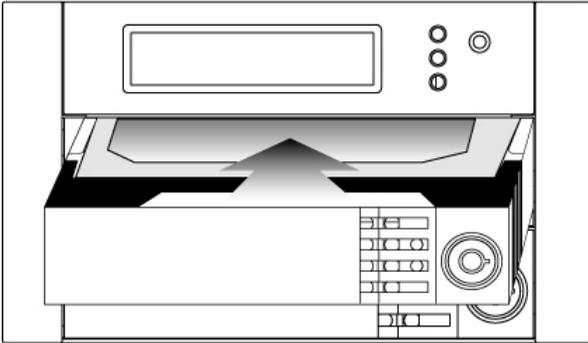
4. Connect the IDE cables on the removable hard drive carrier to the pins on the hard drive.



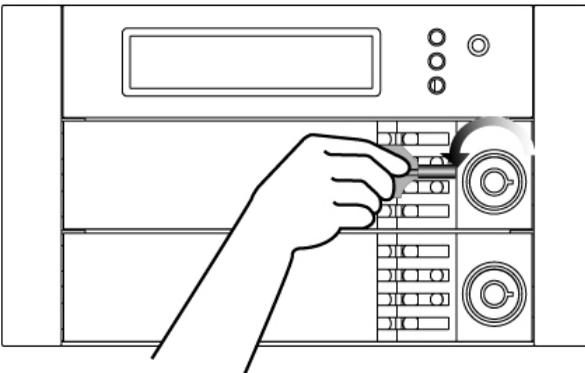
5. Secure the hard drive on the removable hard drive carrier by the screws provided in the accessory pack.



6. Insert the removable hard drive carrier back to XL-RAID-SATA.

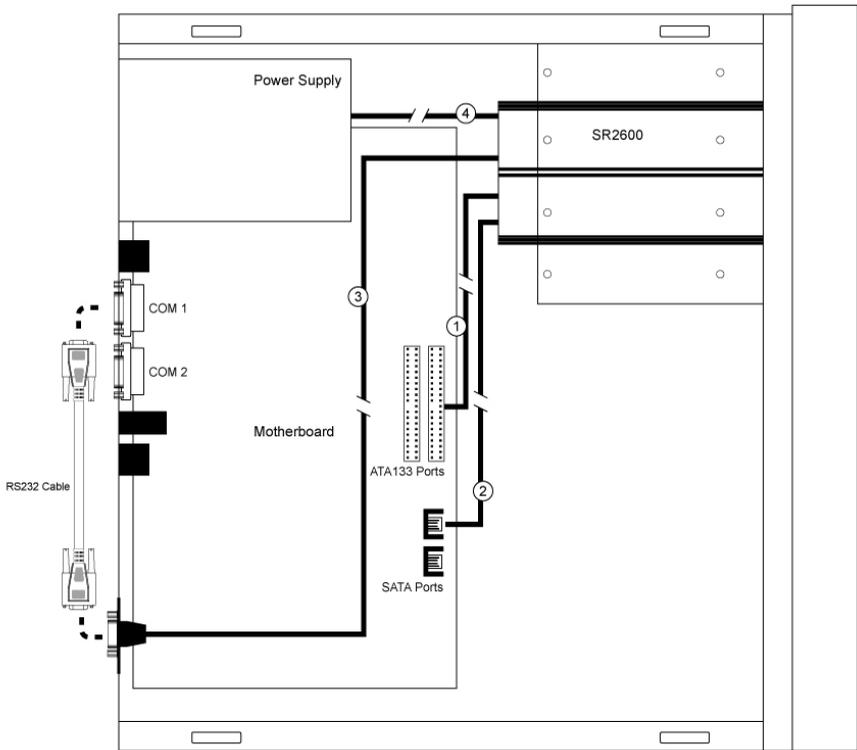
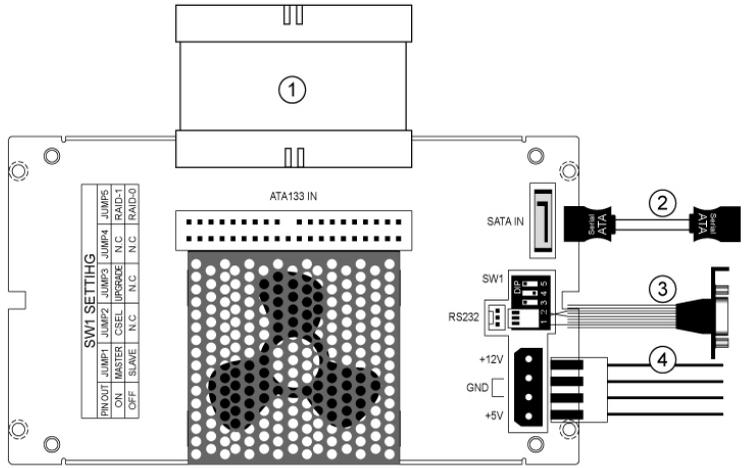


7. Lock the screen by turning the key counter clockwise.



## **2-6 Connecting XL-RAID-SATA to your computer**

- Set the Jumper at the back of XL-RAID-SATA
- Connect DC12V&4V power cables and SATA or ATA133 cables to XL-RAID-SATA.
- Secure RS232 set on the XL-RAID-SATA machine
- Connect XL-RAID-SATA to the motherboard COM 1 with RS232 cables included in the accessory pack as shown in the picture.



## Note

We do not recommend users to disassemble the machine without proper instructions and authorization. The manufacture warranty will not cover damage caused by unauthorized disassembling.

If exchange the parts of XL-RAID-SATA is absolutely necessary, please refer to the diagram in the user's guide.

## Chapter 3 How to Operate XL-RAID-SATA

### 3-1 Setting the Hard Drive Array Mode

XL-RAID-SATA can be set on either the mirror (RAID 1) or striping (RAID 0) mode. Once the hard drive array mode is selected, it can not be changed because any changes made afterwards will damage the data stored in the hard drive. Therefore, prior to selecting the hard drive array mode, please ensure the function desired for the XL-RAID-SATA – whether it is used to protect the data or as a hard drive with bigger storage capacity.

There is a switch on the back of the XL-RAID-SATA to allow the user to switch the disk array mode. The default mode is set on the mirror mode (RAID 1). The user can switch to the striping mode (RAID 0) by simply switching the Jumper.

#### Default Setting

- |                      |                      |
|----------------------|----------------------|
| ● RAID Setting       | Mirror Mode (RAID 1) |
| ● E_IDE Master/Slave | Master Drive         |
| ● Alarm Buzz         | On                   |

#### Setting Mirror Mode (RAID 1)

- **Installing two brand new hard drives**
  1. Place the two new hard drives into XL-RAID-SATA at the same time.
  2. Use the disk monitoring software in the operating system to partition and format the hard drive after turning the machine on. At this point, XL-RAID-SATA will be treated as a single hard drive. If hard drives with different storage capacity are installed, XL-RAID-SATA will automatically detect the storage capacity of each hard drive and treat the hard drive with larger storage capacity as the same capacity of the hard drive with smaller storage capacity.

### 3. Install RAIDGuide (Windows User)

- **Installing a brand new hard drive and a hard drive with existing data**

We highly recommend using the same brand of hard drives with the same or larger storage capacity when installing hard drives to XL-RAID-SATA. The user can use the auto rebuilding function to automatically format the new drive and subsequently to back up the data into the new hard drive.

1. Place the hard drive with existing data into slot 1 or 2 in the XL-RAID-SATA.
2. Since one of the slots is empty, the buzzer will alarm user about the empty slot when the computer is turned on. To shut off the buzzer alarm, just push the bottom located in the front display screen.
3. After turning on the operation system, please check whether the current XL-RAID-SATA setting is the same prior to hard drive installation. Then place the new hard drive in the removable hard drive carrier into another slot. Note: the storage capacity of the newly installed hard drive must be larger than or equal to the old hard drive.
4. The XL-RAID-SATA will start the auto rebuilding function shortly after (please refer to chapter 4 for the auto rebuilding function). The LCD screen will display the backup progress.
5. Please press the Buzzer bottom after auto rebuilding to reset the buzzer alarm and to return the system back to normal operation.

### **Setting Synchronous Data Saving Mode (RAID 0)**

Under the synchronous data saving mode (RAID 0), we suggest to use two identical hard drives. Once the hard drives are installed, the original files in the hard drives will be removed.

- The storage capacity of XL-RAID-SATA is the sum of the two hard drives installed in the system.

Under the synchronous data saving mode (RAID 0), the data can not be protected. If one of the installed hard drives fails, the data will be completely damaged.

- Synchronous data saving mode (RAID 0) can not be used simultaneously with the mirror saving mode (RAID 1). This means that user can only choose one of these two modes before the operation.
- Do not turn off power if synchronous data saving mode (RAID 0) is selected. Otherwise, the data will be lost and damaged.

## 3-2 Computer Set Up

When the hardware setup for XL-RAID-SATA is complete, you are now ready to turn the machine on.

- After the hardware installation is complete, the XL-RAID-SATA will be treated as one single hard drive. Set the hard drive setup to AUTO in the computer's BIOS. When the computer is turned on, the system will retrieve the following information:
- At this point, the installation process is completely finished. The user can freely retrieve and save data to XL-RAID-SATA just like retrieving and saving data to a regular hard drive. If the user experiences any abnormality during the operation, please refer to the trouble shooting Q&A section in Appendix A.

### 3-3 LCD Display Message After Turning the Machine On

- **Left Hard Drive (Primary Hard Drive) Fail  
Right Hard Drive (Secondary Hard Drive) Normal**

<b>Pri HDD : Fail Sec HDD : OK</b>
--

- **Primary hard drive storage capacity larger than secondary hard drive**

<b>Wrong Capacity PRI&gt;SEC</b>
--------------------------------------

- **Secondary hard drive storage capacity larger than primary hard drive**

<b>Wrong Capacity SEC&gt;PRI</b>
--------------------------------------

## **Chapter 4 System Maintenance**

### **4-1 Hot Swap & Auto Rebuilding**

The hard drive Hot Swap and Auto Rebuilding functions are available only under the mirror mode (RAID 1). Synchronous data storage mode (RAID 0) does not support such functions.

The Hot Swap & Auto Rebuilding functions are applicable in :

#### **Off-line Back up**

When the data is stored within XL-RAID-SATA, the user can remove one of the hard drives from XL-RAID-SATA as back up drive for data such as system operation file, secured files, seldom modified files or image and music files. The user can periodically insert the hard drive back into XL-RAID-SATA to execute automatic backup to protect the system from being hit by computer virus or to avoid risk of having both hard drives failing at the same time.

#### **During Hard drive Failure**

When one of the two hard drives fails in the XL-RAID-SATA system, the system will alarm the hard drive failure message both in the LCD display screen and in the monitoring software. The user can remove the failed hard drive from the system while the system is still in operation without shutting down the machine. If the failed hard drive is replaced shortly, the system will automatically execute the Auto Rebuilding function without affecting the system operation and without any operation command from the user.

#### **The LCD Display Message During Hot Swap and Auto Rebuilding**

When the XL-RAID-SATA detects a hard drive missing or a hard drive failure, the Buzzer will go off and the LCD display screen will display the following messages:

Pri HDD : OK Sec HDD : Fail	Pri HDD : Fail Sec HDD : OKI
--------------------------------	---------------------------------

1. After removing the failed hard drive and replacing with a new hard drive, if the hard drive is properly installed, the LCD display screen will display the following messages:

Pri HDD : OK Sec HDD : OK
------------------------------

2. After few seconds of installing the new hard drive, the LCD display screen will display the data rebuilding progress:

Rebuilding ... Pri->Sec XXX%
Rebuilding ... Sec->Pri XXX%

Pri->Sec represents that the data in the original hard drive (primary hard drive) is copied to the new hard drive (secondary hard drive). XXX % represents the rebuilding completion percentage.

3. When the rebuilding is fully completed, the LCD display screen will again display the following messages:

Pri HDD : OK Sec HDD : OK
------------------------------

## **4-2 Firmware Update**

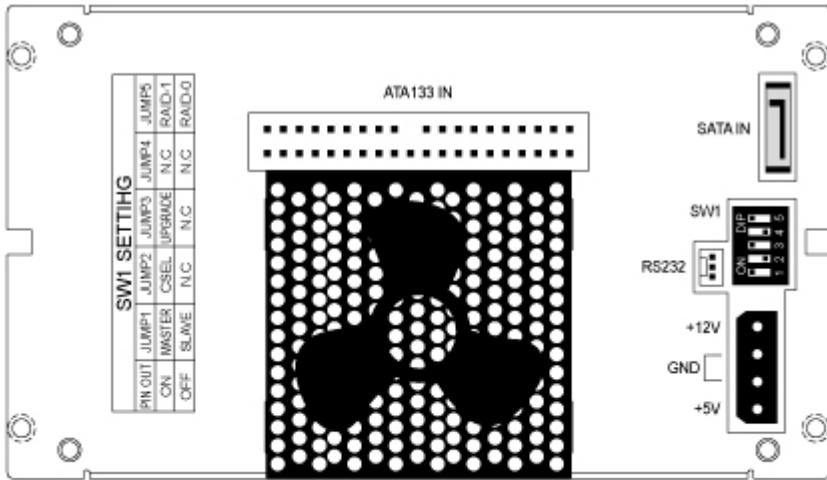
Since the specification of computer hardware is constantly upgraded due to the advancement in the computer technologies, some of the Firmware might not be fully compatible with XL-RAID-SATA. Prior to installing the new version of Firmware, the user must first examine the system specification to ensure the new Firmware version is supported by the user's system. Ensuring the compatibility of the new version of Firmware will prevent the system from failing to start. Please contact our local distributor representative and our technical support staff for any questions concerning Firmware update.

### **Upgrade Preparation and System Requirements**

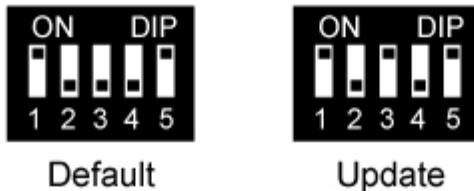
1. Please prepare a Windows 98 or DOS operating system boot disk or boot hard drive.
2. Please prepare an E\_IDE Cable since the Firmware upgrade must be done through the E\_IDE interface.
3. From the attached CD in the XL-RAID-SATA package, copy the Firmware upgrade tool program "Kflash.exe" to the boot disk or to the boot hard drive.
4. Copy the desired Firmware upgrade files to the boot disk or the boot hard drive.

### **Upgrade Procedure**

1. Please open the system frame and connect the E\_IDE interface.
2. Set the Switch on the rear of the XL-RAID-SATA to the Update Firmware status.



### Firmware Switch Updating Table:



3. Boot up the system with the boot disk or boot hard drive.
4. Execute upgrade software after turning the system on.

### **filePath\kflash x filepath\filename**

filepath : The path of flash211.exe and new firmware

Filename : The name of new firmware

X : The location of XL-RAID-SATA series

- As
- x=0 is master on primary IDE channel
  - x=1 is slave on primary IDE channel
  - x=2 is master on secondary IDE channel
  - x=3 is slave on secondary IDE channel

5. System will ask you whether to save the old version firmware or

not?

6. Start to upload firmware.

7. Update is successful in case of no any errors displayed.

PS: There is no driver required when carrying out the firmware updating.

# Chapter 5 Installing RAIDGuide

## 5.1 Software Introduction

RAIDGuide is a graphic user interface monitoring program which is designed to control the RAID system. It can receive the RAID system information via the PC serial ports and displays such information on the monitor screen. The displayed information include system status, hard drive status (hard drive failure, system failure, hard drive insert and confirmation) and the data rebuild progress. This program provides users with monitoring interfaces that are simple and easy to operate.

### Function and Features

- Support the connection between two RAID systems.
- Notify the technicians about system or hard drive failures via email.
- Support the PC sound alert function and activate wav or midi files in case of system or hard drive failures.
- Support up to 20 users to remotely monitor the RAID system.
- Minimize window and automatically restart the windows operating system in case of system and hard drive failure.
- Provide instant cooling fan operation status, current temperature, hard drive operation status, and system failure detection.

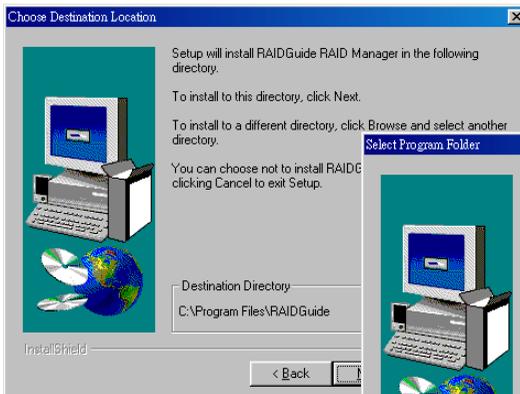
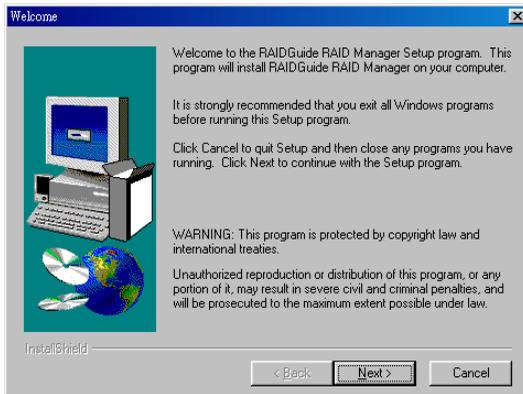
### Operating system requirement :

Hardware	Specification
Processor	Pentium
Memory	64MB
Connector cable	1 Set
Hard drive storage capacity	10 MB
Screen resolution (recommended)	800 ×600

## 5.2 Installing RAIDGuide

Place the RAIDGuide graphic user interface monitoring program CD into the CD ROM. Double click the Set.exe file to begin the installation process. You can select under which file folder or directory destination the program will be installed. After completing the RAIDGuide graphic user interface monitoring program installation, you can immediately use this software without restarting the computer.

Please refer to her RAIDGuide user's guide in the program CD for instructions on how to use the RAIDGuide.



# Appendix A Trouble Shooting Q&A

## Unstable system after connecting XL-RAID-SATA

**Q1: After installing XL-RAID-SATA, we are unable to start the computer or the computer can not locate XL-RAID-SATA upon startup.**

**A:**1. Please check whether the readings on the XL-RAID-SATA LCD display screen appear normal.

2. Please check whether the IDE and/or SATA Cable connection cables are properly connected to the computer system and whether IDE and/or SATA drives are functioning normally. If both the IDE and SATA cables are connected, the computer system will choose to run the IDE drive first.

3. If everything is functioning properly but the user still can not start the computer system, then the problem might be the system incompatibility. If such incompatibility takes place, please contact our technical support department.

**Q2: When the XL-RAID-SATA is in use, the computer system is functioning normally but the XL-RAID-SATA access speed is abnormal.**

**A:**1. Please first check whether the XL-RAID-SATA is in the progress of executing data auto-rebuild.

1. Please examine if the length of the connection cables, SATA Cable or IDE Cable, that connect the drives to the computer system is too long and whether the specification these cables complies with the requirements.

2. If both the lengths and specification of the cables are checked out ok, please turn off XL-RAID-SATA and remove the hard drive from XL-RAID-SATA. Test the hard drive directly with the computer

system since it might be the bad sectors in the hard drive that are causing the longer than normal system down time.

### **Hard Drive Failure**

**Q3: Under the mirror mode (RAID 1), what will be the system's total storage capacity when adding a brand new hard drive?**

- A:**
1. The total storage capacity for XL-RAID-SATA is determined by the storage capacity of the primary hard drive installed during the initial usage.
  2. The storage capacity will not increase after initial installation even when place a brand new hard drive with larger storage capacity.

**Q4: Why does the error message appear when I installed the second hard drive?**

- A:**
1. The storage capacity of the second hard drive must be larger than the first hard drive. Otherwise, XL-RAID-SATA can not rebuild the new hard drive and the LCD display screen will display "Wrong Capacity".
  - 2 The LCD display screen might display rebuilding error messages such as Pri(s)->Sec(s) or Sec(s)->Pri(s). The term (s) signifies that both hard drives are treated as original hard drive. The user must determine which hard drive will be the original hard drive prior installing the hard drives into XL-RAID-SATA. Once the original hard drive is designated and installed in XL-RAID-SATA, the user can place in the second hard drive by taking advantage of XL-RAID-SATA's Auto Rebuilding function.

**Q5: My hard drive is obviously operating properly but why is it shown as failed in the XL-RAID-SATA display?**

- A:**
1. XL-RAID-SATA uses more strict requirements and standards to examine the bad sectors in the hard drive. The user can first overwrite the bad sector on a PC before placing the hard drive into XL-RAID-SATA.
  2. The Hard Drive Jumper is not properly set on the Master or Single Drive position. The manufacture setting of current

hard drives on the market is set on Cable Select and XL-RAID-SATA will be able to detect the hard drive only if the setting is on Cable Select.

### **About Auto Rebuilding Function**

**Q6:** What will happen if we turn off the computer's power while XL-RAID-SATA is still executing data auto rebuilding?

**A:** Under the mirror mode (RAID 1), if the power is out in the middle of auto rebuilding process, the controller will remember when completion percentage of the auto rebuilding process and resume the rebuilding process when the power is back on.

**Q7: Is it possible to lose any part of the data during the data auto rebuilding?**

**A:1.** The data auto rebuilding function will copy data from one sector to another sector. Technically speaking, the data will not be lost during the auto rebuilding process. However, if the original hard drive is detected with bad sectors during the rebuilding process, XL-RAID-SATA will make hypothetical duplication instead of treat the bad sectors as hard drive failure. Therefore, the data stored in the bad sectors could potentially be lost during rebuilding.

**Q8: Under the mirror mode (RAID 1), why does the computer slows down during the data rebuilding process? Or why does the data rebuilding process slows down when the data is being processed?**

**A:** If the XL-RAID-SATA system is executing data rebuilding simultaneously while the computer system is saving the data, the auto rebuilding process and the saving process will take longer than normal time. This is because the XL-RAID-SATA must divide its resources between the normal system operation and the data rebuilding process.

However, the priority for the XL-RAID-SATA is to maintain the proper system operations. Therefore, the data rebuilding speed will be extremely slow until the system finished with the data saving operations.

### **Other Possible Situations**

**Q9: The Buzzer will not stop when the XL-RAID-SATA is in operation.**

**A:** Please check whether the readings on the LCD display are normal or if there is a hard drive failure. Please also pay attention to any other symbols displayed in the LCD display. For example, if the “F” symbol is displayed, this means that there is a cooling fan failure. If the “T” symbol is displayed, this means that the system is overheated.

**Q10: How to turn on and off the Buzzer?**

**A:** 1. The manufacture default setting for the Buzzer in XL-RAID-SATA is Buzzer On.  
2. The user can use any pointed materials to push the bottom on the front dash board to turn on and off the Buzzer.

# Appendix B Pin Definitions for each connection port

## RS-232 PORT PIN OUT

RS-232 PIN OUT		
PIN-1	PIN-2	PIN-3
RX	TX	GND

## POWER PORT

DC POWER PIN OUT			
PIN-1	PIN-2	PIN-3	PIN-4
12V	GND	GND	5V

## JUMPER SETUP

SW1 SETTING					
PIN OUT	JUMP1	JUMP2	JUMP3	JUMP4	JUMP5
ON	MASTER	CSEL	UPGRADE	N.C	RAID-1
OFF	SLAVE	N.C	N.C	N.C	RAID-0

NOTES: BLUE WORD IS DEFAULT

# Appendix C LCD Display Symbol Definition Chart

## XL-RAID-SATA LCD List

### 1. Mirroring Mode

#### Case 1 : Power On

	LCD display
Power On	"2044 06/09 03:00" "Mirror           "
Normal	" Pri HDD : OK" " Sec HDD: OK"
X-Drive Fail or EmptyTray	" Pri HDD : OK" " Sec HDD: Fail"
Y-Drive Fail or EmptyTray	" Pri HDD : Fail" " Sec HDD: OK"
Non-X-Drive	" Pri HDD : Off" " Sec HDD: OK"
Non-Y-Drive	" Pri HDD : OK" " Sec HDD: Off"
Non-X-Drive & Non-Y-Drive	" Pri HDD : Off" " Sec HDD: Off"

#### Case 2: HDD Swap Out or Failed

	LCD Display
X-Drive Swap Out or Failed	"Pri HDD: OK" "Sec HDD: Fail"
Y-Drive Swap Out or Failed	"Pri HDD: OK" "Sec HDD: Fail"
XY-Drive Swap Out or Failed	" Pri HDD : Off" " Sec HDD: Off"

#### Case 3 : New Swap-in and Rebuild Mode

X-Drive	Y-Drive	Active	LCD display
S (Source)	S (Source)	System Failed	RebuildFlag ERR <b>PRI: S SEC: S</b>
T (Target)	T (Target)	System Failed	RebuildFlag ERR PRI:T SEC: T
N (No Flag)	N (No Flag)	Normal operation	Pri HDD: OK Sec HDD: OK
S (Source)	N (No Flag)	Rebuilding	Rebuilding ...

		Y-Drive be Target	Pri => Sec 00%
S (Source)	N (No Flag)	Rebuild Check Err 1	RebuildFlag ERR Muti-sector Err
		Rebuild Check Err 2	RebuildFlag ERR UDMA Mode Err
		Rebuild Check Err 3	RebuildFlag ERR SATA Mode Err
		Rebuild Check Err 4	RebuildFlag ERR Wrong Capacity
N (No Flag)	S (Source)	Rebuild Check Err 1	RebuildFlag ERR Muti-sector Err
		Rebuild Check Err 2	RebuildFlag ERR UDMA Mode Err
		Rebuild Check Err 3	RebuildFlag ERR SATA Mode Err
		Rebuild Check Err 4	RebuildFlag ERR Wrong Capacity
S (Source)	T (Target)	Rebuilding	Rebuilding ... Pri => Sec ??%
S (Source)	U (Unknown)	System Failed	RebuildFlag ERR PRI: S SEC: X
N (No Flag)	S (Source)	Rebuilding X-Drive be Target	Rebuilding... Sec => Pri 00%
T (Target)	S (Source)	Rebuilding	Rebuilding... Sec => Pri ??%
T (Target)	U (Unknown)	System Failed	RebuildFlag ERR PRI: T SEC: X
N (No Flag)	T (Target)	System Failed	RebuildFlag ERR PRI: N SEC: T
N (No Flag)	U (Unknown)	System Failed	RebuildFlag ERR Unknow Flag
U (Unknown)	S (Source)	System Failed	RebuildFlag ERR PRI: X SEC: S

U (Unknown)	T (Target)	System Failed	RebuildFlag ERR PRI: X SEC: T
U (Unknown)	N (No Flag)	System Failed	RebuildFlag ERR Unknow Flag
U (Unknown)	U (Unknown)	System Failed	RebuildFlag ERR Unknow Flag

Case 4: After Rebuild finish:

	LCD Display
Rebuild finish	“Pri HDD : OK” “Sec HDD: OK”

2. Striping Mode

Case 1 : Power On

	LCD display
Power On	"2044 06/09 03:00" " 2Strip "
Normal	" Pri HDD : OK" " Sec HDD: OK"
X-Drive Fail or EmptyTray	" Pri HDD : OK" " Sec HDD: Fail"
Y-Drive Fail or EmptyTray	" Pri HDD : Fail" " Sec HDD: OK"
Non-X-Drive	" Pri HDD : Off" " Sec HDD: OK"
Non-Y-Drive	" Pri HDD : OK" " Sec HDD: Off"
Non-X-Drive & Non-Y-Drive	" Pri HDD : Off" " Sec HDD: Off"

Case 2: HDD Swap Out or Failed

	LCD Display
X-Drive Swap Out or Failed	“Pri HDD: OK” “Sec HDD: Fail”
Y-Drive Swap Out or Failed	“Pri HDD: OK” “Sec HDD: Fail”
XY-Drive Swap Out or Failed	" Pri HDD : Off" " Sec HDD: Off"

3. Other

	LCD Display
FAN Fail	F
Temperature alarm	T