



# PROSATA™ SS8

**ULTRA 320 SCSI to SATA  
Disk Subsystem**

## **User Manual**

Revised February 19, 2007

## Preface

### About this Manual

Thank you for choosing WiebeTech products. If you have any questions, please e-mail [support@wiebetech.com](mailto:support@wiebetech.com) or call our tech support.

This manual is designed and written for users of the **ProSATA SS8**. Users should ideally be familiar and have some experience with RAID planning and data storage operations. However, this manual will provide instructions and education for those who have little or no experience in RAID to install and setup the **ProSATA SS8**.

### Notice

Product features and specifications described in this manual are subject to change without notice.

The manufacturer shall not be liable for any damage, or for the loss of information resulting from the performance or use of the information contained herein.

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# Chapter 1 Product Overview

## 1.1 Features

**ProSATA SS8** Subsystem is a high-performance RAID subsystem with the features listed below:

- Single channel performance is over 240MB/sec
- SATA II drive interface (Backward-compatible)
- Configurable N-way mirror for high data protection
- On-line volume expansion with no system down-time
- Extensible APIs for host server integration

When properly configured, **ProSATA SS8** provides non-stop data storage service with a high degree of fault tolerance through the use of RAID technology and advanced array management features.

**ProSATA SS8** connects to the host system through an U320 SCSI interface for optimized performance in speed. It can be configured to any RAID level to provide the most reliable data protection and fastest data transfer rates as required by user applications.

**ProSATA SS8** is designed with a new level of polynomial technology to implement the RAID 6 function. RAID 6 arrays allow up to two simultaneous HDD failures without impact on the existing data, making the **ProSATA SS8** the most reliable RAID system.

**ProSATA SS8** offers array migration and expansion technology to give users the flexibility to change RAID levels and increase array capacity for increased performance or data security to meet the changing demands of applications.

**ProSATA SS8** is the most cost-effective disk array subsystem with completely integrated high-performance and data-protection capabilities that meet or exceed the highest industry standards.

## 1.2 Technical Specifications

<b>Product Name/Code</b>	ProSATA (SS8)
<b>Supported RAID Levels</b>	RAID 0, 1, 0+1, 3, 5, 6 & JBOD
<b>Host Interface</b>	Ultra320 SCSI
<b>Drive Compatibility</b>	SATA1 and SATA2 hard disk drives
<b>RAID Processor</b>	Intel IOP80331 500MHz 64-bit RISC Processor
<b>Memory</b>	512MB DDR333 DIMM
<b>RAID Management</b>	Web browser & SNMP
<b>Remote Management</b>	Via Ethernet Port
<b>OS Independent &amp; Transparent</b>	Yes
<b>Security</b>	Separate key lock for each HDD
<b>LED Indicators</b>	Drive failure indicator for each drive Drive access indicators for each drive
<b>Thermal Monitoring</b>	Built-in heat and fan sensor with mutable alarm
<b>Cooling Fan</b>	1 x 8cm Hot-Swappable fan
<b>Power Supply (300W)</b>	Input Range: 100 to 240 VAC. 10% Voltage: +5V/25A +12V/10A 47-63Hz Agency Approval: EMI/RFI, CE, FCC B, BSMI Safety: UL, CUL, CB, TUV, CCC
<b>Operating Temperature</b>	10°C ~ 35°C (50°F ~ 95°F)
<b>Non-operating Temperature</b>	10°C ~ 50°C
<b>Operating Humidity</b>	5% to 95% noncondensing
<b>Supported Operating Systems</b>	Windows 98, NT, 2000, Millennium, XP, 2003 Mac 9.1 and above, including OSX, OSX Server, XSERVE Linux (all latest builds) which support SCSI.
<b>Shipping Weight</b>	32 pounds = 14.51kg (with drives)
<b>Dimensions</b>	12" x 6" x 17.5" (H x W x D)
<b>Certification</b>	FCC, CE
<b>Warranty</b>	3-year limited warranty with advance replacement within first 90 days after purchase. See warranty statement for details and limitations. 90 days of free phone support. For support by email, contact <a href="mailto:support@wiebetech.com">support@wiebetech.com</a> .

## Chapter 2 Environment Setup

### 2.1 Before installation

#### Requirement:

Prepare a host system with a SCSI HBA card. For optimized performance, a SCSI Ultra 320 HBA is recommended. The host system should have one free ethernet or COM port to be used for the initial setup. The management and configuration web GUI can be accessed remotely after proper setup.

#### Package contents

Check the accessories packaged with your ProSATA. Please contact WiebeTech if any items are missing or damaged. The box should contain:

ProSATA SS8 unit	1
Removable drive trays (inside unit)	8
Ultra320 SCSI terminator	1
Power cord	1
Key	1
Hard drive screws	32
User Manual and Warranty Statement	(on CD)



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- Before starting any type of hardware installation, please ensure that all power switches have been turned off and all power cords have been disconnected to prevent personal injury and damage to the hardware.
- To avoid overheating, ProSATA SS8 should be operated in a well-ventilated area and in such a way that sufficient airflow is maintained across the controller chips.
- Static electricity can damage electronic components. To guard against such damage:
  1. Work in a static-free environment
  2. Wear a grounded anti-static wrist strap
  3. Store uninstalled components in anti-static bags
  4. Handle PCBs by their edges and avoid touching chips and connectors.
- Environmental requirements:  
 Temperature: 10°C to 35°C (50°F to 95°F)  
 Humidity: 5% to 95%, non-condensing

## 2.2 Product overview

Front view

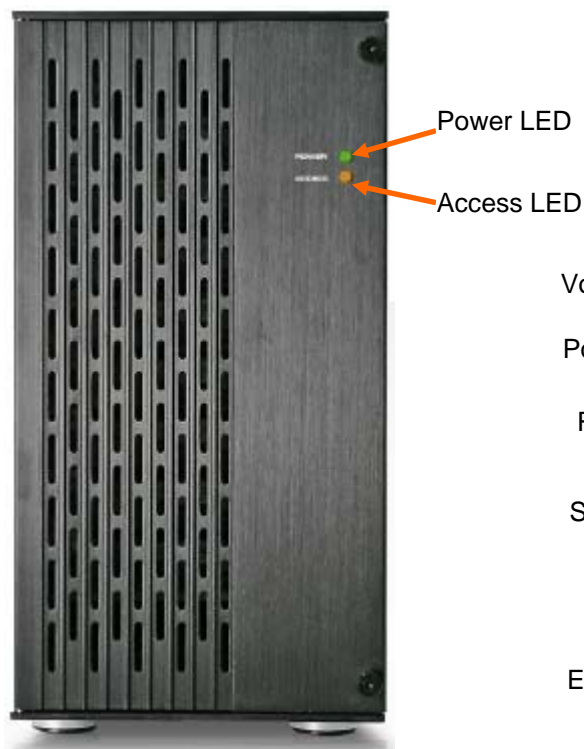


Figure 2.2.1

Rear view

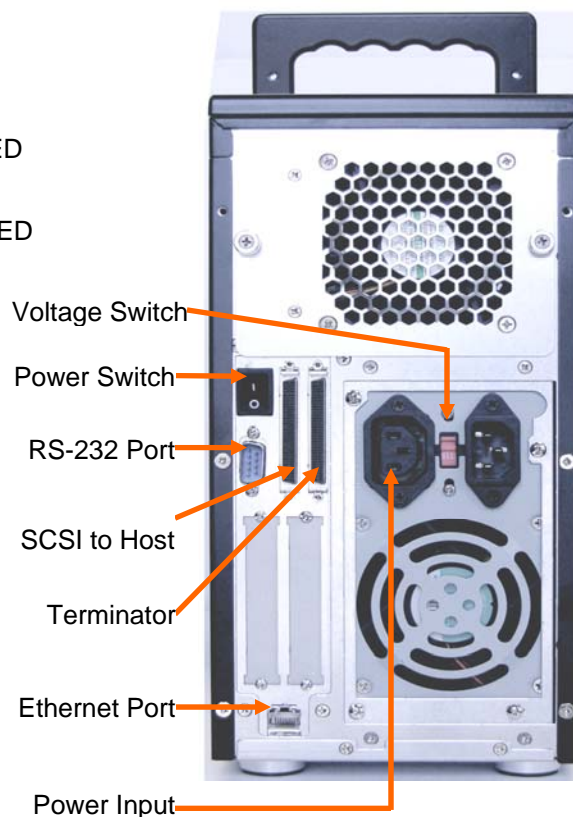
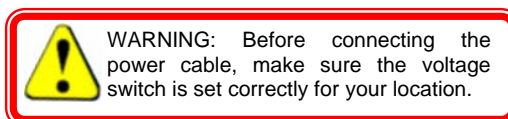


Figure 2.2.2



## 2.3 Install SATA disks

If the hard drives do not come with the RAID system, please follow the instructions for installation below.

- Press the release button and pull the handle to remove the disk tray. The trays may have to be unlocked first using the key provided.
- Insert the disk into the disk tray with the connectors directed toward the open rear of the tray.
- Align the mounting holes of the disk with the tray.
- Mount the disk to the disk tray with the screws provided in the accessory pack.



- Slide the disk tray back into the empty slot of the chassis and make sure the handle clicks into place.
- Lock the tray with key provided to ensure disk security.

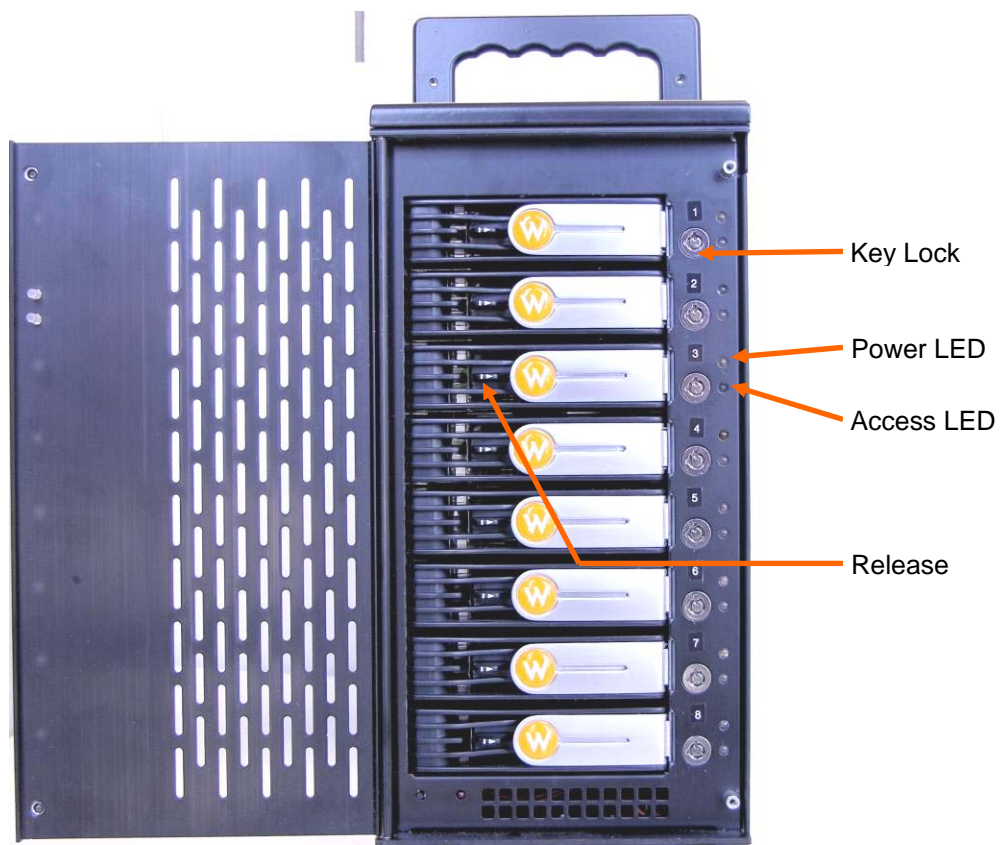


Figure 2.3.1

## 2.4 Connect cables

Please see Figure 2.2.2 as reference for cable connections.

- Connect power cord.
- Connect SCSI Ultra 320 cable and SCSI Ultra 320 terminator. The **ProSATA SS8** controller does not have a terminator on board and will need an external terminator to properly work.
- Connect console cable to the host server (RS-232).
- Connect LAN cable to your existing network setup (hub or switch), *or* connect console cable (RS-232) to the host server.

## Chapter 3 GUI Connection

### 3.1 GUI – http

**ProSATA SS8** supports graphic user interface (GUI) to manage the system by any web browser. Be sure to connect LAN cable to the network. The ProSATA will automatically obtain an IP address if connected to a network that has DHCP support. Check the ProSATA's LCD for this address (found on the bottom side of the unit). The GUI can be accessed by typing the IP address in the browser URL address bar, as follows:

**http://192.168.0.200**

If DHCP is not available on your network then manual configuration will be required. If connecting directly from the ProSATA to your computer then you will need a cross-over cable. You'll then need to set the IP of the ProSATA to something similar to the IP address of your computer: YYY.YYY.YYY.XXX (Ys being the same numbers as your computer's IP). More info on manually setting an IP address is found in section 4.4.1.

Upon clicking on any function for the first time, a dialog window will pop up to authenticate login name and password.

Login name: **admin**

Default password: **1234**

### 3.2 RS-232 serial port

Use RS-232 serial cable to connect console port.

Default baud rate: **115200**, 8 bits, 1 stop bit, and no parity.

Terminal type: **vt100**

Login name: **admin**

Default password: **1234**

### 3.3 Remote control – secure shell

SSH (secure shell) is required for **ProSATA SS8** to remote login. The SSH client software is available at the following web site:

SSHWinClient: <http://www.ssh.com>

Putty: <http://www.chiark.greenend.org.uk>

Host name: **192.168.0.200**

Login name: **admin**

Default password: **1234**

**Note**

Using ssh, the IP address has to be setup and the password is required for login.

### 3.4 LCM (LCD Control Module)

The LCM is found on the bottom side of the ProSATA. It has four buttons for controlling functions: ▲(up), ▼(down), **ENT** (Enter), and **ESC** (Escape).

▲ and ▼ are pressed to scroll through the functions and options.

**ENT** is pressed to enter functions and to accept selections.

**ESC** is used to exit to previous menu. Holding **ESC** will jump back to main menu.

After the system boots up, the following screen will be shown on the LCM:

**WiebeTech**  
(IP address) ↵

There are 6 functions accessible by the LCM: **Alarm Mute**, **Reset/Shutdown**, **Quick Install**, **View IP Setting**, **Change IP Config**, and **Reset to Default**.

**Alarm Mute** Select **Alarm Mute** to mute the alarm.

**Reset/Shutdown** Select **Reset** to restart the controller without powering down.  
Select **Shutdown** to prepare controller for shutdown prior to powering off.

Before powering off system, it is recommended to do **Shutdown** from the controller to clear the data from cache.

**Quick Install** Select **Quick Install** to setup a RAID array from the available drives. Please see Appendix for RAID level definitions and minimum requirements for each RAID level.







**View IP Setting** Select **View IP Setting** to display current IP address, IP subnet mask, and IP Gateway.

**Change IP Config** Select **Change IP Config** to modify IP address, IP subnet mask, and IP Gateway.

**Reset to Default** Select **Reset to Default** to reset to original manufacture settings. The login and password will return to default: **admin:1234**, and the IP address to default: **192.168.0.1**

# Chapter 4 GUI operation

## 4.1 ProSATA SS8 Menu

 Quick install	Step 1 / Step 2 / Step 3 / Confirm
 System config <b>IP address</b> <b>Password</b> <b>Date</b> <b>Mail</b> <b>SNMP</b> <b>Event log</b>	DHCP / Static Administrative password change Date and time setting Email alert setting SNMP alert setting View event log
 Volume config <b>Physical disk</b> <b>Volume group</b> <b>User data volume</b>  <b>Cache Volume</b> <b>Logical unit</b>	Free disc / Global spares / Dedicated spares / Details Create / Delete / Details / Rename / Migrate Create / Delete / Attach LUN / Details / rename / On/Off Line / Set read/write mode / Set priority Create / Delete / Details / Resize Attach / Detach
 Enclosure management <b>SAF-TE config</b> <b>Voltage &amp; Temperature</b> <b>SMART</b>	SAF-TE enable/disable View current voltage and temperature of system  View SMART disk monitor
 Maintenance <b>Upgrade</b> <b>Info</b> <b>Shutdown</b>	Remote upgrade firmware Current system firmware version Reboot / Shutdown
 Logout <b>Logout</b>	Logout of system menu

## 4.2 Login

**ProSATA SS8** supports graphic user interface (GUI) to operate and monitor the system via any web browser. Be sure to connect LAN cable. The default IP for the system is **192.168.0.200**, but if the ProSATA has been connected to a network with DHCP, this address will have been changed automatically. Open the browser and type:

**http://192.168.0.200**

Clicking on any function for the first time, a dialog window will pop up to authenticate login name and password.

Login name: **admin**

Default password: **1234**

Please check section 4.4.1 for changing IP address.

After login, the selections listed can be accessed.




Figure 4.2.1

### 4.3 Quick install

Use the **Quick install** function to create a volume easily.

**Step 1:** Select **Quick install** then choose the RAID Level desired. After choosing the RAID level, click **>> NEXT** . It will take you to step 2 for **Bus ID**, **SCSI ID**, and **LUN** setup.

**Step 2:** In this step, the volume can be customized as needed. **Volume size**, **Bus ID**, **SCSI ID**, and **LUN** can be assigned specified numbers to be attributed to the volume. The maximum volume size is shown as default. The volume can only be less or equal to the number shown. By default, the **Bus ID**, **SCSI ID**, and **LUN** are set at 0. These numbers can be changed by the pull down menu. Click **>> NEXT** after desired volume size and IDs are set.



**Note**

Other UDV's can be created by Quick Install. The remaining capacity from the Volume Group will be shown and the controller will determine the next ID settings to avoid conflicts with other UDV's.

**Step 3:** Confirm page. Click **>> CONFIRM** if all settings are correct.

**Done:** A summary page with the User data volume will be shown as Figure 4.3.1.

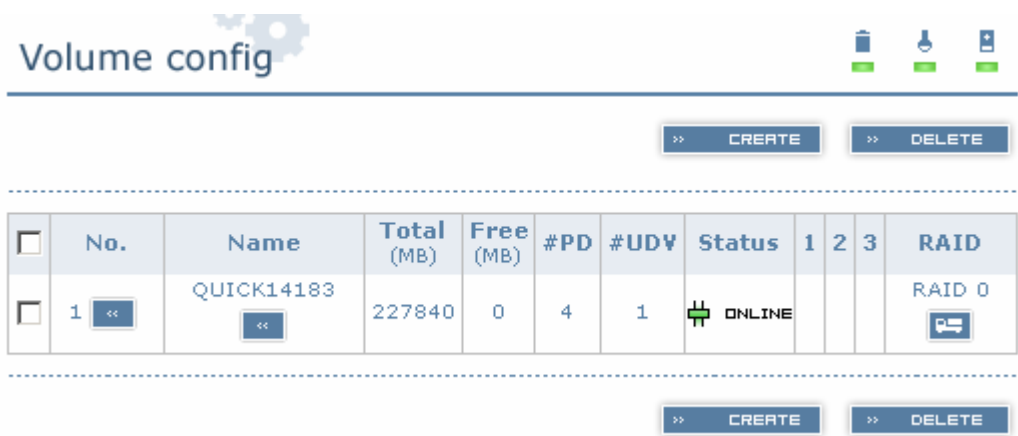
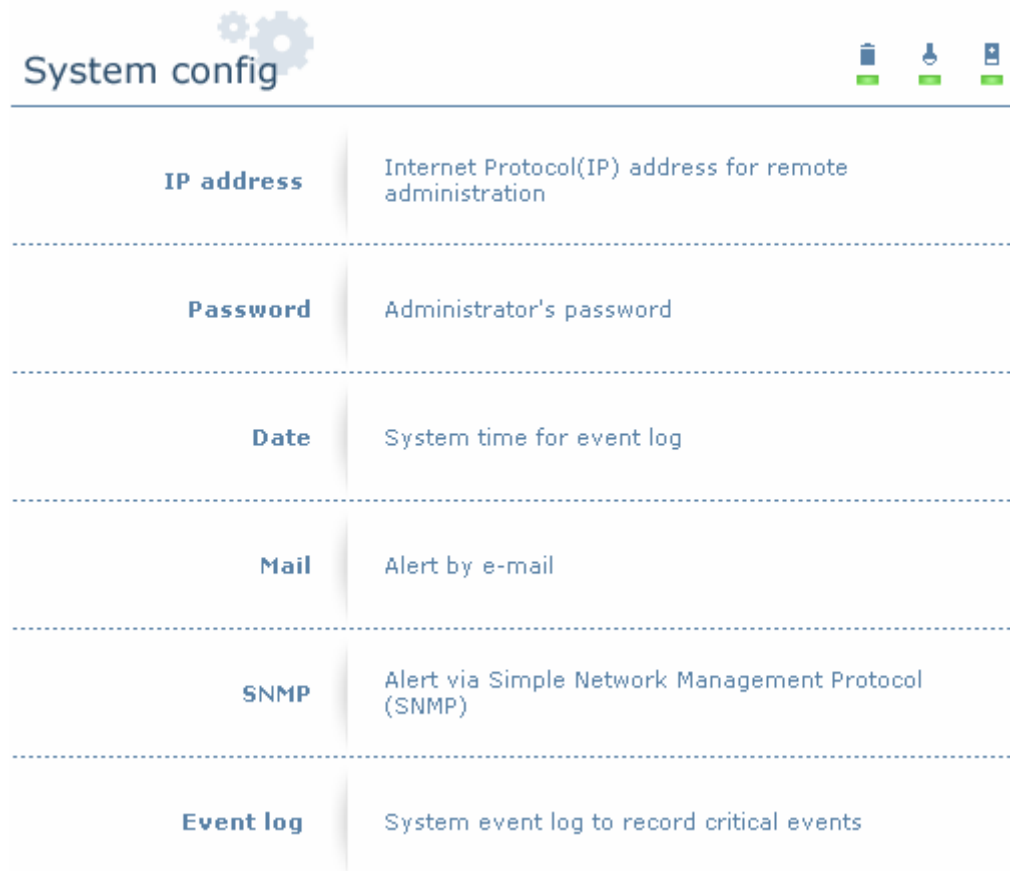


Figure 4.3.1

(Figure 4.3.1: A RAID 0 user data volume with the UDV name “QUICK14183”, named by the system itself, with the total available volume size 227840MB, or roughly 230GB.)

## 4.4 System config

**System config** selection is for the setting of **IP address**, **Password**, **Date**, **Mail**, **SNMP** and for viewing **Event log**.

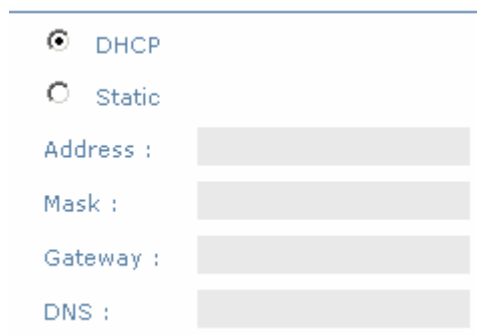
The image shows a screenshot of the 'System config' web interface. At the top left, the text 'System config' is displayed next to a gear icon. At the top right, there are three status icons: a battery, a temperature gauge, and a server rack, each with a green bar below it. Below the header is a table with six rows, each representing a configuration option. The first column of the table contains the option names in bold, and the second column contains their descriptions. The rows are: 'IP address' (Internet Protocol(IP) address for remote administration), 'Password' (Administrator's password), 'Date' (System time for event log), 'Mail' (Alert by e-mail), 'SNMP' (Alert via Simple Network Management Protocol (SNMP)), and 'Event log' (System event log to record critical events).

<b>IP address</b>	Internet Protocol(IP) address for remote administration
<b>Password</b>	Administrator's password
<b>Date</b>	System time for event log
<b>Mail</b>	Alert by e-mail
<b>SNMP</b>	Alert via Simple Network Management Protocol (SNMP)
<b>Event log</b>	System event log to record critical events

**Figure 4.4.1**

### 4.4.1 IP address

Enter **IP address** to change IP setting. There are 2 selections, **DHCP** (Get IP address from DHCP server) or static IP. Manually enter the IP address if setting is on **Static**.



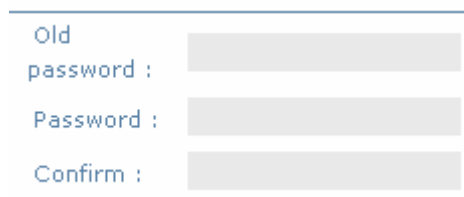
☒ DHCP  
☐ Static

Address :   
Mask :   
Gateway :   
DNS :

Figure 4.4.1.1

### 4.4.2 Password

Enter **Password** to change administrator password.

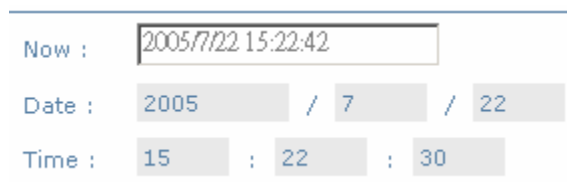


Old password :   
Password :   
Confirm :

Figure 4.4.2.1

### 4.4.3 Date

Enter **Date** to set up the current date & time before using.



Now :   
Date :  /  /   
Time :  :  :

Figure 4.4.3.1



4.4.4 Mail

Enter **Mail** to set up to 3 email addresses for receiving event notification. Some mail servers would check “Mail-from address” and need authentication for anti-spam. Please fill the necessary fields. Check “Send test mail” to send test emails to the specified email addresses.

Mail-from address :	<input type="text"/>
Mail-to address 1 :	<input type="text"/>
Mail-to address 2 :	<input type="text"/>
Mail-to address 3 :	<input type="text"/>
SMTP relay :	<input type="checkbox"/>
SMTP server :	<input type="text"/>
Authentication :	<div>None</div>
Account :	<input type="text"/>
Password :	<input type="text"/>
Confirm :	<input type="text"/>
Send test mail :	<input type="checkbox"/>

Figure 4.4.4.1

4.4.5 SNMP

Enter **SNMP** to enter up to three SNMP trap for alert via SNMP.

SNMP trap address 1 :	<input type="text"/>
SNMP trap address 2 :	<input type="text"/>
SNMP trap address 3 :	<input type="text"/>
Community :	<div>public</div>

Figure 4.4.5.1

4.4.6 Event log

Enter **Event log** to view the event messages.

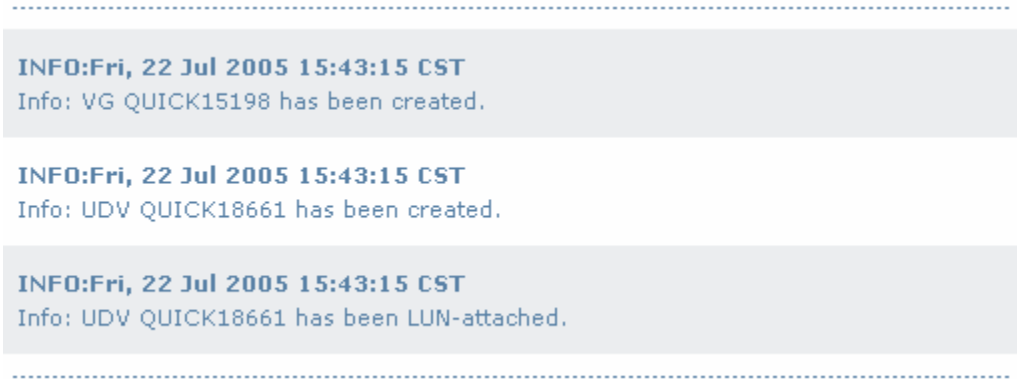


Figure 4.4.6.1

4.5 Volume config

**Volume config** is for the management and display of volume configurations. Functions include **Physical disk**, **Volume group**, **User data volume**, **Cache volume**, and **Logical unit**.

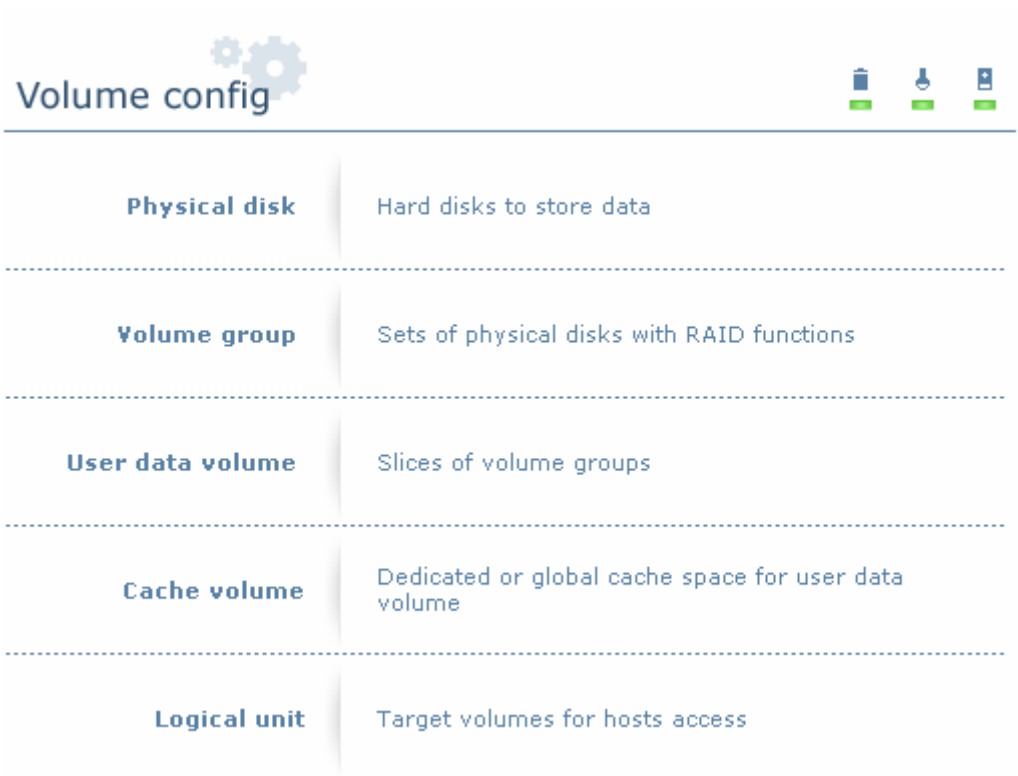


Figure 4.5.1

4.5.1 Physical disk

Enter **Physical disk** to view the status of hard disks installed in the system.

>> FREE DISC >> GLOBAL SPARES >> DEDICATED SPARES

<input type="checkbox"/>	Slot	WWN	Size (MB)	VG name	Status	1	2
<input type="checkbox"/>	1 <<	2008806100040224	78277		GOOD		
<input type="checkbox"/>	2 <<	2001001378000012	78277	VG-R0	GOOD		
<input type="checkbox"/>	3 <<	2007806100040224	78277	VG-R0	GOOD		
<input checked="" type="checkbox"/>	4 <<	2002806100040224	78277		GOOD		
<input type="checkbox"/>	5 <<	200f00137800000a	78277		GOOD		
<input type="checkbox"/>	6 <<	2004001378000012	78277		GOOD		

>> FREE DISC >> GLOBAL SPARES >> DEDICATED SPARES

Figure 4.5.1.1

(Figure 4.5.2: Physical disks 2 and 3 have been used for a VG named “R0”. Physical disks 1, 5, 6 are free disks. Disk 4 has been set as a global spare disk.)

- PD column description:**
  - Slot** The actual location of hard disks in relation to the controller. Click next to the slot number to display the details of the hard disk.
  - WWN** **World Wide Name.** It is created automatically when new hard disk is installed. WWN is a unique identifier for Fibre Channel storage network.
  - Size (MB)** Capacity of hard disk.
  - VG Name** Related volume group name.
  - Status** The status of hard disk.
    - GOOD** → The hard disk is good.
    - FAIL** → The hard disk has failed.
  - Status 1** → **RAID Disk.** This hard disk has been set as a member of a RAID array, or a Volume Group.



→ **FR**ee disk. This hard disk is free for use.




→ **D**edicated **S**pare. This hard disk has been set to be a dedicated spare for a specific VG.



→ **G**lobal **S**pare. This hard disk has been set to be a global spare for all VGs.



→ **ReS**erve. This disk was part of a VG and contains information from the VG. The reserved status may be caused by removal of drive while system was running. In reserved status, this disk can only be used to rebuild the VG. It can not be used as a member disk of a new VG. To make this disk usable, perform a Free Disc by manually selecting the disk and click .

## Status 2

**R** → **R**ecover. The disk is recovering.

**M** → **M**igration. The disk is migrating.

- **PD operations description:**

### FREE DISC



Set the selected hard disk(s) to be free for use.

### GLOBAL SPARES



Set the selected hard disk(s) to be global spares of all VGs.

### DEDICATED SPARES





Set the selected hard disk(s) to be dedicated spares of selected VGs.

4.5.2 Volume group

Enter **Volume group** to view the status of each volume group.

>> CREATE

>> DELETE

<input type="checkbox"/>	No.	Name	Total (MB)	Free (MB)	#PD	#UDV	Status	1	2	3	RAID
<input type="checkbox"/>	1 <<	VG-R0 <<	227840	127872	4	1	 ONLINE				RAID 0 


>> CREATE



>> DELETE

Figure 4.5.2.1

(Figure 4.5.2.1: RAID 0 setup, with 4 physical disks, named “VG-R0”, total size is 227GB. One associated UDV of 100GB has been created, so free space is 127GB. VG status is online.)

- VG column description:**
  - No.** Volume group number. Click << next to the Volume No. to display details of this VG.
  - Name** Volume group name. Click << next to the Name to change the name of this VG.
  - Total(MB)** Total capacity of this volume group.
  - Free(MB)** Remaining free capacity of this volume group.
  - #PD** The number of physical disks which the volume group is using.
  - #UDV** The number of user data volumes related to this volume group.
  - Status** The status of volume group.



 ONLINE → volume group is online.

 FAIL → volume group has failed.
  - Status 1**  → Degrad mode. This volume group is not complete due to a missing drive or failed drive.
  - Status 2** R → Recover. This volume group is in the process of rebuilding.

Status 3

M → Migration. This volume group is in the process of migration.

RAID

The RAID level which this volume group is using. The  button next to the RAID level is the Migration function. Click  to add disk(s) to perform expansion or change the RAID level of the Volume group.

- **VG operations description:**

CREATE

Create a volume group

>> CREATE

DELETE




Delete this volume group

>> DELETE

4.5.3 User data group

Enter “User data volume” function to view the status of each user data volume.

>> ATTACH LUN   > SNAPSHOT   >> CREATE   >> DELETE















<input type="checkbox"/>	No.	Name	Size (MB)	Status	1	2	3	4	R %	RAID	LUN	Snapshot (MB)	VG name	CV (MB)
<input type="checkbox"/>	1	UDV-R0	99968	 ONLINE						RAID 0	0	0/0	VG-R0	107

>> ATTACH LUN   > SNAPSHOT   >> CREATE   >> DELETE

Figure 4.5.3.1

(Figure 4.5.3.1: UDV created under name of “UDV-R0”, related to “VG-R0”, size is 100GB, status is online, write back, high priority, with cache volume of 107MB.)

- UDV column description:

<b>No.</b>	Number of this user data volume. Click  below the UDV No. to show the details of this User data volume.
<b>Name</b>	Name of this user data volume. Click  below the UDV Name to change the name of this UDV.
<b>Size(MB)</b>	Total capacity of this user data volume.
<b>Status</b>	<p>The status of this user data volume. Click  to bring this UDV ON or OFF line.</p> <p> <b>ONLINE</b> → user data volume is online.</p> <p> <b>OFFLINE</b> → user data volume is offline.</p> <p> <b>FAIL</b> → user data volume has failed.</p>
<b>Status 1</b>	<p> <b>WT</b> → Write Through.</p> <p> <b>WB</b> → Write Back.</p> <p> <b>RO</b> → Read Only.</p> <p>Click  below the status to change the cache write policy.</p>
<b>Status 2</b>	<p> <b>HI</b> → High priority.</p> <p> <b>MD</b> → Mid priority.</p> <p> <b>LO</b> → Low priority.</p> <p>Click  below the status to change the priority.</p>
<b>Status 3</b>	<p><b>I</b> → user data volume is initializing.</p> <p><b>R</b> → user data volume is recovering.</p>
<b>Status 4</b>	<p><b>M</b> → user data volume is in the process of migration.</p> <p><b>R%</b> → percentage complete for initializing or recovering.</p>
<b>RAID</b>	The RAID level that user data volume is using.
<b>#LUN</b>	The number of LUNs that this user data volume is attached to.

- VG name**                    The VG name that this user data volume belongs to.
- CV (MB)**                    The cache volume that user data volume is using.

• **UDV operations description:**

**ATTACH LUN**    Attach to a Bus ID, SCSI ID and LUN.



**CREATE**                    Create a user data volume function.



**DELETE**                    Delete this user data volume function.



**4.5.4 Cache volume**

Enter **Cache volume** function to view the status of cache volume.

The global cache volume is a default cache volume automatically created after system is powered on. This number can not be deleted or changed. The size of global cache is base on the RAM size. If 256MB RAM is installed, there will be 107MB left for cache volume after memory allocation for system.

CREATE

DELETE

<input type="checkbox"/>	No.	Size (MB)	UDV name
<input type="checkbox"/>	1 <div>&lt;&lt;</div>	107 <div>&lt;&lt;</div>	Global

Free : 0 MB

CREATE

DELETE

Figure 4.5.4.1

• **CV column description:**

**No.**                    Number of this Cache volume. Click 

<<

 next to the CV No. to display the details of the cache volume.

**Size(MB)**                    Total capacity of this cache volume Click 

<<

 next to the CV size to resize the CV. The CV size can be adjusted as needed.

**UDV Name**                    Name of the UDV.



- CV operations description:  
**CREATE** Create a cache volume function.  
    >> CREATE

- DELETE** Delete this cache volume function.  
    >> DELETE

4.5.5 Logical unit

Enter **Logical unit** function to view the status of attached logical unit of each UDV.

>> ATTACH

>> DETACH


<input type="checkbox"/>	Bus	SCSI ID	LUN	UDV name
<input type="checkbox"/>	0	0	0	UDV-R0

>> ATTACH

>> DETACH

Figure 4.5.5.1

- LUN operations description:  
**ATTACH** Attach a **Bus ID**, **SCSI ID**, and **LUN** to a user data volume.  
    >> ATTACH  
**DETACH** Detach a **Bus ID**, **SCSI ID**, and **LUN** from a user data volume.  
    >> DETACH



**Note**  
Note which channel the SCSI cable is connected to. The SCSI ID of the UDV must correspond to the SCSI channel and cable setup.

## 4.6 Enclosure management

**Enclosure management** function allows monitoring of enclosure and drive information including **SAF-TE config**, **Voltage and Temperature**, and **Smart** functions.

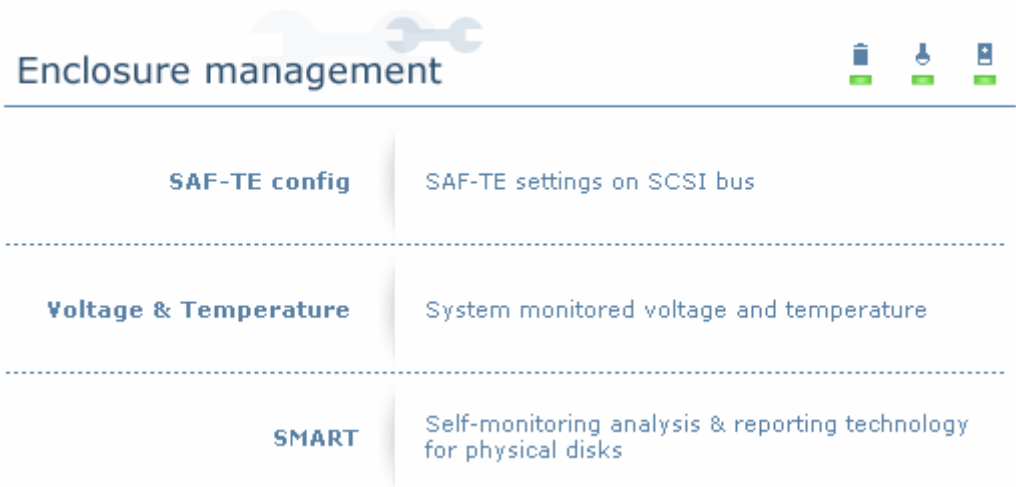


Figure 4.6.1

### 4.6.1 SAF-TE config

Enter **SAF-TE config** function to enable or disable the management of SAF-TE from buses.

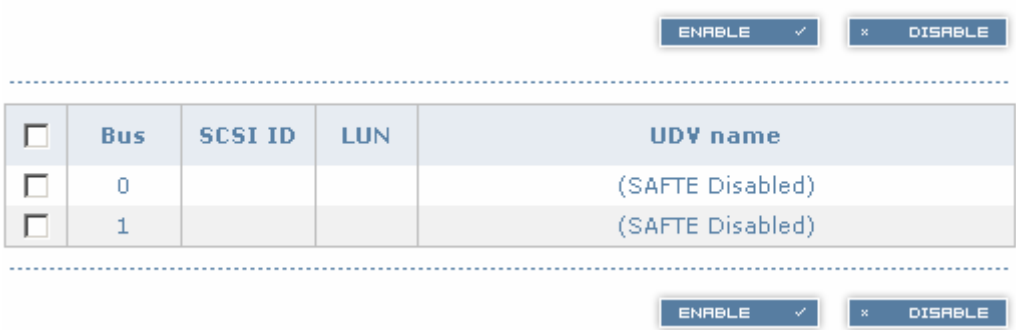


Figure 4.6.1.1

### 4.6.2 Voltage & Temperature

Enter **Voltage & Temperature** function to view the information of current voltage & Temperature.

Item	Information
+1.35V:	+1.36 V (min = +1.31 V, max = +1.43 V)
+3.3V:	+3.42 V (min = +3.10 V, max = +3.55 V)
+5V:	+5.02 V (min = +4.80 V, max = +5.25 V)
+12V:	+12.23 V (min = +11.40 V, max = +12.80 V)
+2.5V:	+2.61 V (min = +2.45 V, max = +2.70 V)
Core Processor:	+51.0 (C) (hyst = +0.0 (C), high = +70.0 (C))
Location 1:	+40.0 (C) (hyst = +0.0 (C), high = +58.0 (C))
Location 2:	+44.5 (C) (hyst = +0.0 (C), high = +60.0 (C))

Figure 4.6.2.1

### 4.6.3 SMART

Enter **SMART** function to view SMART (Self-monitoring analysis & reporting technology) for physical disks health information.







Slot	Read error rate	Spin up time	Reallocated sector count	Seek error rate	Spin up retries	Calibration retries	Temperature (C)	Status
1	100 (60)	134 (24)	100(5)	100 (67)	100 (60)		33	 GOOD
2	100 (60)	138 (24)	100(5)	100 (67)	100 (60)		35	 GOOD
3	100 (60)	125 (24)	100(5)	100 (67)	100 (60)		35	 GOOD
4	100 (60)	129 (24)	100(5)	100 (67)	100 (60)		35	 GOOD
5	100 (16)	107 (24)	100(5)	100 (67)	100 (60)		35	 GOOD
6	100 (60)	129 (24)	100(5)	100 (67)	100 (60)		33	 GOOD

Figure 4.6.3.1

## 4.7 Maintenance

**Maintenance** function allows operation of the system functions including **Upgrade** of the latest firmware, **Info** to show the system version and **Shutdown** to either reboot or shutdown the system.

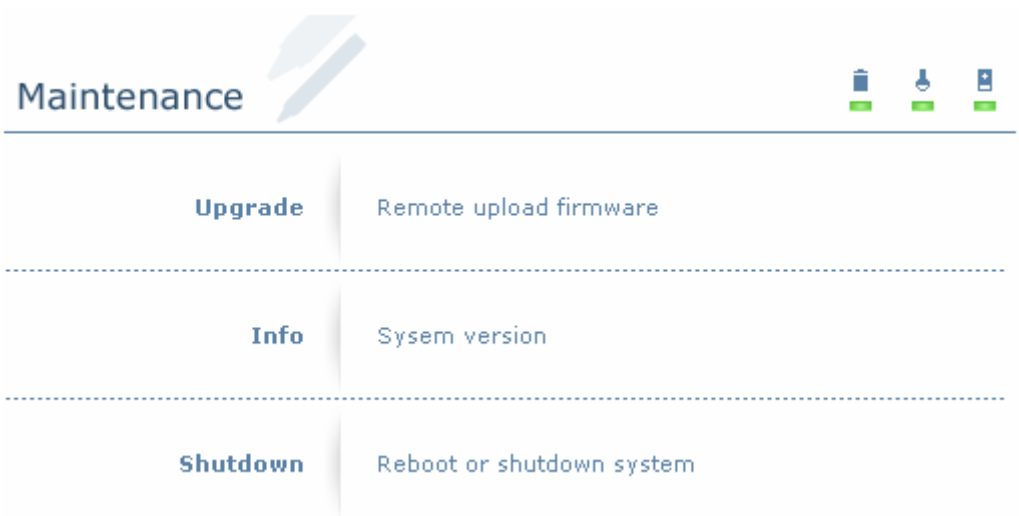



Figure 4.7.1

4.7.1 Upgrade

Enter **Upgrade** function to upgrade firmware. Please contact our tech support to receive the latest firmware. Once the firmware has been downloaded and saved to a designated location, press **Browse...** to select the file from the saved location. Click **CONFIRM** to start upgrade automatically. After upgrading finishes, reboot the system.



Figure 4.7.1.1



**Note**

Please contact us for the latest Firmware

4.7.2 Info

Enter **Info** function to display current system firmware version.

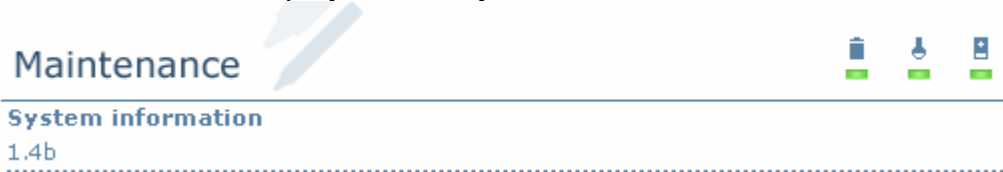


Figure 4.7.2.1

### 4.7.3 Shutdown

Enter **Shutdown** function to do a shutdown or reboot. Before powering off system, it is recommended to perform a system SHUTDOWN to allow the data from cache to be written to hard disks.



Figure 4.7.3.1

## 4.8 Logout

For security reason, **Logout** function will allow users to logout of GUI. Login name and password must be entered to get access again.



Figure 4.8.1

# Chapter 5 Advanced operations

## 5.1 Create volume group

To create the volume group, please follow these procedures:

Name :

VG-R0

RAID Level :

RAID 0

RAID PD slot :

2 3

>> SELECT PD

BACK <<

>> NEXT

Figure 5.1.1

1. Enter **Volume config**.

2. Enter **Volume group**.

3. Click **>> CREATE**.

4. Enter a VG Name, choose a RAID level from the pull down menu, press **>> SELECT PD** to choose the PD slot(s) that will be members of this VG, then press **>> NEXT**.

5. Check the setting. Press **>> CONFIRM** if all settings are correct.

6. Done. A summary page will be created to show the new VG.

>> CREATE

>> DELETE

<input type="checkbox"/>	No.	Name	Total (GB)	Free (GB)	#PD	#UDV	Status	1	2	3	RAID
<input type="checkbox"/>	1	VG-R0	306	306	2	0	ONLINE				RAID 0

>> CREATE

>> DELETE

Figure 5.1.2

(Figure 5.1.2: Setup of RAID 0 with 2 physical disks, named “VG-R0”. The total size is 306GB. Because no related UDV has been created yet, free size is still 306GB. VG status is online.)

## 5.2 Create user data volume

To create a user data volume (UDV), please follow these procedures.

The screenshot shows a configuration form for a User Data Volume (UDV). The fields and their values are as follows:

- Name : UDV-R0
- VG name : VG-R0
- CV no : Global ( 107 MB )
- Capacity (MB) : 100000
- Stripe height (kb) : 64
- Block size (b) : 512
- On/Off Line : ☒ Online ☐ Offline
- Read/Write : ☐ Write through ☒ Write back
- Priority : ☒ High ☐ Mid ☐ Low

At the bottom of the form, there are two buttons: "BACK" and "CONFIRM".

Figure 5.2.1

1. Enter **Volume config**.
2. Enter **User data volume**.
3. Click **CREATE**.
4. Enter a name for this UDV. Select which VG this UDV will be created from. Select the CV no. if a dedicated CV has been created (Global CV will be used as default). Set the capacity to be used for the UDV. Set the desired stripe height, block size, on/off line status, read/write mode and priority. Click **CONFIRM** after making sure all configurations are set correctly.
5. Done. A summary page will be created to show the new UDV.



### Note

If a dedicated cache volume is needed for UDV's, the cache volume will have to be created prior the UDV setup. More detail is in section 5.4

>> ATTACH LUN

SNAPSHOT

>> CREATE

>> DELETE

<input type="checkbox"/>	No.	Name	Size (MB)	Status	1	2	3	4	R %	RAID	LUN	Snapshot (MB)	VG name	CV (MB)
<input type="checkbox"/>	1	UDV-R0	99968	ONLINE	WB	HI				RAID 0	0	0/0	VG-R0	107

>> ATTACH LUN

SNAPSHOT

>> CREATE

>> DELETE

Figure 5.2.2

(Figure 5.2.2: Setup of a UDV named “UDV-R0”, created from “VG-R0”. The size is 100GB, status is online, write back, high priority with cache volume 107MB.)



**Note**  
VG & UDV can be deleted by simply checking the one you want to delete then clicking 

>> DELETE

.

### 5.3 Attach and detach Bus ID, SCSI ID, and LUN

This section will describe how to attach and detach Bus ID, SCSI ID, and LUN.

#### 5.3.1 Attach LUN to UDV

There are 2 methods to attach Bus ID, SCSI ID, and LUN to UDV.

1. Enter **Volume config**, then **User data volume**. Click 

>> ATTACH LUN

 to enter setup page.
2. Enter **Volume config**, then **Logical unit**. Click 

>> ATTACH

 to enter setup page.

UDV :

UDV-R0 (99968MB)

Bus id :

- 0 -

SCSI ID :

- 0 -

LUN :

- 0 -

BACK


<<


>>

CONFIRM

Figure 5.3.1.1



- 1. Select which UDV to attach.
- 2. Choose Bus ID, SCSI ID and LUN to attach, and then click .
- 3. Done.





**Note**

Note which channel the SCSI cable is connected to. The SCSI ID of the UDV must correspond to the SCSI channel and cable setup.

5.3.2 Detach Bus ID, SCSI ID and LUN from UDV

To detach IDs and LUN from the UDV, please follow the procedures below.



<input type="checkbox"/>	Bus	SCSI ID	LUN	UDV name
<input checked="" type="checkbox"/>	0	0	0	UDV-R0








Figure 5.3.2.1

- 1. Enter **Volume config**.
- 2. Enter **Logical unit**.
- 3. Select the UDV by checking the square for the appropriate UDV.  
Click .
- 4. A dialog window will pop up for confirmation. Choose .
- 5. Done.



**Note**

If you delete a UDV with attached IDs and LUN from the user data volume page, it will detach the IDs and LUN automatically.

## 5.4 Create dedicated cache

Each UDV will be associated with one specific cache volume (CV) to execute the data transaction, whether it's a global CV or a dedicated CV. Each CV can be assigned a different size. Unless specified, each UDV will use the default global cache volume. A dedicated cache volume must be created prior to setting up an UDV with the dedicated cache.

The total cache size will depend on the size of the RAM installed. By default, the total cache size is set to global cache. To create a dedicated cache volume, the desired CV size must first be determined then subtracted from the global cache. Resize the global cache by subtracting the amount needed for the CV. Finally create a new CV by setting the remainder cache to the new CV.

>> CREATE

>> DELETE

<input type="checkbox"/>	No.	Size (MB)	UDV name
<input type="checkbox"/>	1 <<	40 <<	Global
<input type="checkbox"/>	2 <<	20 <<	(Empty)


Free : 47 MB

>> CREATE

>> DELETE

Figure 5.4.1

1. Enter **Volume config**.
2. Enter **Cache volume**.
3. If no more free space remaining for creating a new dedicated cache volume, cut down the global cache size first by clicking << in the size column. After resizing, click >> CONFIRM to return to cache volume page.
4. Click >> CREATE to enter the setup page.
5. Fill in the desired size and click >> CONFIRM .
6. Done.



**Note**  
The minimum global cache volume size should be no less than 40MB. The minimum dedicated cache volume size should be no less than 20MB.

## 5.5 Set global spare and dedicated spare disks

Spare disks are used to provide an added layer of protection in case a member disk of a VG fails. The system will automatically switch a spare disk in place of a failed disk and start a rebuild. Global spares will be reserved to serve all VGs, while Dedicated spares will serve only the VG it is assigned to.

<input type="checkbox"/>	Slot	WWN	Size (MB)	VG name	Status	1	2
<input type="checkbox"/>	1 <<	2008806100040224	78277	VG-R5	GOOD	RD	
<input type="checkbox"/>	2 <<	2001001378000012	78277	VG-R5	GOOD	RD	
<input type="checkbox"/>	3 <<	2007806100040224	78277	VG-R5	GOOD	RD	
<input type="checkbox"/>	4 <<	2002806100040224	78277		GOOD	GS	
<input checked="" type="checkbox"/>	5 <<	200f00137800000a	78277	VG-R5	GOOD	DS	
<input type="checkbox"/>	6 <<	2004001378000012	78277		GOOD	FR	

Figure 5.7.1

(Figure 5.7.1: Physical disk of slot 4 has been set as global spare disk. Physical disk of slot 5 has been set as dedicated spare for VG named “VG-R5”.)

1. Enter **Volume config**.
2. Enter **Physical disk**.
3. Select the free disk(s) by checking the square for the disk, then click **GLOBAL SPARES** to set as global spares.

Or

Select a VG from the upper left pull down menu. Select the free disk(s) by checking the square for the disk, then click **DEDICATED SPARES** to set as dedicated spare for the selected VG.



### Note

The upper left box will not be present if no VG have been created or if the existing VGs are RAID 0 or JBOD. These RAID level will not be able to take advantage of the added protections from spare disks.

## 5.6 Migration / Expansion

Migration and expansion allows users to change RAID levels to improve performance and reliability, and to add drives to increase capacity. For migration and expansion, the total size of new array must be larger or equal to the original array. To perform an expansion, migrate to the same RAID level of the original VG with added drives.

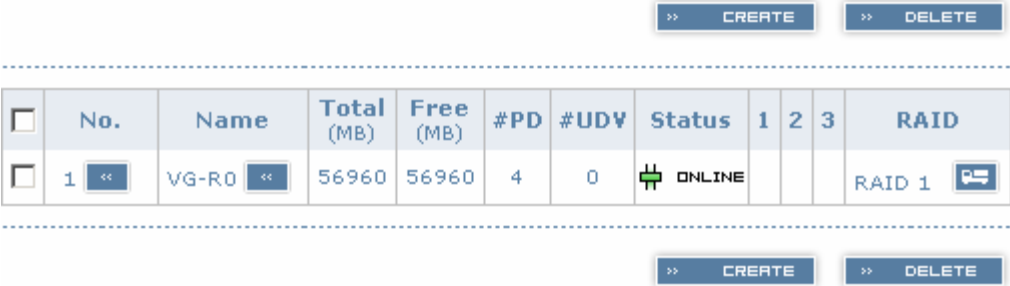








Figure 5.6.1

1. Enter **Volume config**.
2. Enter **Volume group**.
3. Select which VG to perform migration / expansion by clicking  in the RAID column next the RAID level.
4. Change the RAID level by selecting from the pull down menu RAID Level : . A warning window will pop up if the current available disks are not enough to support the new RAID level. Click  to increase or change hard disks to be included in the new RAID array, then click .
5. Check the setting of RAID level and RAID PD slots and click .
6. A confirmation page will show details of the current and new RAID array. Start the migration process by clicking .
7. During migration, **M** will be displayed in status 3 column of the VG page. In User data volume page, the status of the migration will also be shown in status 4 column and the percentage completion of migration in **R%**.

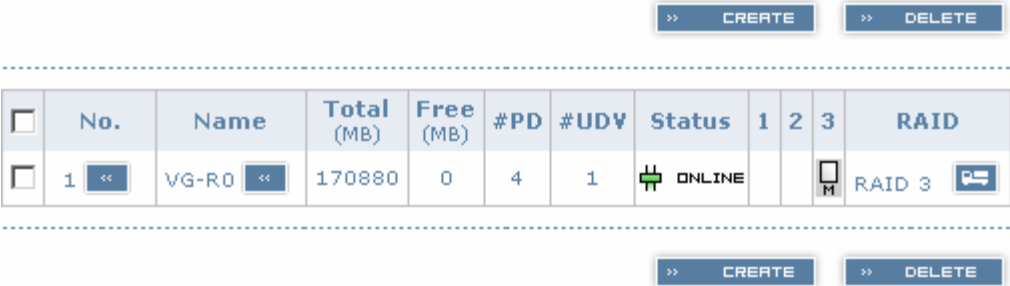


Figure 5.6.2

(Figure 5.6.2: A 4-Way RAID 1 array migrates to RAID 3 array.)

>> ATTACH LUN

📷 SNAPSHOT

>> CREATE

>> DELETE

<input type="checkbox"/>	No.	Name	Size (MB)	Status	1	2	3	4	R %	RAID	#LUN	Snapshot (MB)	VG name	CV (MB)
<input type="checkbox"/>	1	UDV-R0	56960	🔌 ONLINE	🔄	🟢 HI		M	9%	RAID 3	0	0/0	VG-R0	50

>> ATTACH LUN

📷 SNAPSHOT

>> CREATE

>> DELETE

Figure 5.6.3

(Figure 5.6.3: A 4-Way RAID 1 array migrates to RAID 3 array, completion is 9%.)

## Appendix A: Frequently Asked Questions (FAQ)

**Q: I've connected my ProSATA SS8 and can see the drives using the Web-based GUI, but I can't add the drives to a volume group. What's wrong?**

**A:** Before drives can be added to a volume group they must be set to the status "Free Disk". To do this, browse to the "Physical Disk" page under the "Volume Config" heading. From here select the drives you would like to use and click "Free Disk". Once you've done that you should be able to configure the Free Disks into any setup you like.

**Q: My ProSATA does not mount when I turn it on.**

**A:** Because the ProSATA utilizes an internal operating system, it's important to let it completely initialize before mounting the drive to a computer. The ProSATA should take 2-3 minutes to initialize each time you start it up. The unit will let you know this process is complete with a short, 3-toned beep code (high-low-high). After the beep code sounds, you will need to restart your computer before the ProSATA will mount. Your computer's OS should detect the SCSI device during boot up and your ProSATA should be mounted and ready for use once you reach the desktop.

**Q: Can I remove the sides for better access?**

**A:** Some users of the ProSATA may want to remove the side panels of the unit to allow for better access to internal components. However, doing this puts the unit at risk of overheating. Without the sides in place the fans are unable to provide the proper air flow necessary to keep the drives cool. When the unit is fully assembled, the fans are able to create a wind tunnel effect that constantly pushes fresh air through the unit and over the drives, keeping them from overheating.

**Q: What happens when the beep alarm goes off?**

**A:** If the unit starts to emit a regular beeping alarm, this is probably caused by a problem with the fan. Check the fan to make sure it is spinning. If so, make sure the wires connected to the fan are fully connected and are not caught in the fan's blades.

**Q: What type of cable connector plugs into the Ultra-320 SCSI port on the back of this product?**

**A:** The Ultra-320 SCSI port on the ProSATA SS8 is of the HD68 (female) connector type. A SCSI cable with a HD68 male connector will plug into the ProSATA.

**Q: I set up my ProSATA with a volume larger than 2TB, but when I connect to the Mac to format, Disk Utility shows the volume as exactly 2TB.**

**A:** This problem has to do with the block size that the ProSATA's volume is using. This option is set during the creation of a User Data Volume. The only way to change the block size is to delete the current UDV and re-create a new one. Use block size 4096 for volumes larger than 2TB and your Mac should have no trouble seeing the full capacity.

**Q: Can I move my drives from one ProSATA SS8 to another?**

**A:** Changing a set of trays/drives from one ProSATA to another is tricky. You must reattach the LUN (Logical Unit Number) in the GUI after swapping the drives. LUN is the identifying number assigned to a UDV (User Data Volume) that allows the host system to distinguish between different UDVs.

## Appendix B: RAID Explained

<b>RAID 0</b>	Disk striping of any number of drives. Minimum of 2 disks.
<b>RAID 1</b>	Disk mirroring of 2 disks.
<b>N-way mirroring</b>	Disk Mirroring of N disks. Choose N number of disks and set as RAID 1 array.
<b>RAID 3</b>	Striping with parity on the dedicated disk. Minimum of 3 disks.
<b>RAID 5</b>	Striping with interspersed parity over all member disks. Minimum of 3 disks.
<b>RAID 6</b>	2-dimensional parity protection over all member disks. Minimum of 4 disks.
<b>RAID 0+1</b>	Mirroring of RAID 0 volumes. Minimum of 4 disks and array needs to consist of even number of disks.
<b>RAID 10</b>	Striping over RAID 1 volumes. Minimum of 4 disks and array needs to consist of even number of disks.
<b>RAID 30</b>	Striping over RAID 3 volumes. Minimum of 6 disks. With 6 disks, two arrays of RAID 3 are striped into one array as RAID 30.
<b>RAID 50</b>	Striping over RAID 5 volumes. Minimum of 6 disks. With 6 disks, two arrays of RAID 5 are striped into one array as RAID 50.
<b>RAID 60</b>	Striping over RAID 6 volumes. Minimum of 8 disks. With 8 disks, two arrays of RAID 6 are striped into one array as RAID 60.
<b>JBOD</b>	The abbreviation of “ <b>J</b> ust a <b>B</b> unch <b>O</b> f <b>D</b> isks”. JBOD will set the disks as individual disks.

## Appendix C: Glossary

### CV

#### Cache Volume

Cache is memory used to speed up data transfer to and from a disk. A Cache Volume is assigned to each UDV for execution of the data transaction. Each CV can have different cache memory size.

#### Types of Cache Volume:

**Dedicated Cache** is a Cache Volume that is assigned to a specified UDV.

**Global Cache** is a Cache Volume that is shared by all UDVs.



#### Degrade mode

Degrade mode is a status alert on the GUI to show which VG has degraded or failed.

### GUI

#### Graphical User Interface

### HBA

#### Host Bus Adapter

HBA is a device that connects the host system to a storage system and allows users to pass and retrieve data on this bus.

### Host

#### Host System

A computer, typically a server or a workstation, which operates and monitors the storage system.

### LUN

#### Logical Unit Number

LUN is the identifying number assigned to a UDV that allows the host system to distinguish between different UDVs.

### PD

#### Physical Disk

The PD refers to the actual hard drive that can be selected to be a member of a volume group.

### RAID

#### Redundant Array of Independent Disks

RAID is a disk array consisting of two or more disks to provide fault tolerance and better performance. There are different RAID levels with different degrees of the data protection. Please see Appendix A.2 for more information on RAID levels and minimum requirements.







#### Reserved

This disk was part of a VG and contains data from the VG. The reserved status may be caused by removal of drive while system was running. In reserved status, this disk can only be used to rebuild the VG. To make this disk usable, perform a Free Disc by manually selecting the disk and click





<b>SAF-TE</b>	<b>SCSI Accessed Fault-Tolerant Enclosures</b> SAF-TE commands are used to monitor information about the status of the drives in the array, such as rebuilding, failed, and spare. SAF-TE also monitors certain environmental information about the system such as temperature, voltage, power supply, and fan health.
<b>SCSI</b>	<b>Small Computer System Interface</b>
<b>SMART</b>	<b>Self-Monitoring, Analysis and Reporting Technology</b> Monitoring tool to display drive's health status.
<b>Spare</b>	<b>Spare Disk</b> A disk that is assigned that be a spare is used automatically to replace a failed drive in a RAID array or a Volume Group. Spare disks remain idle until the systems detects a failed drive.
	<b>Types of Spares:</b>
	 <b>Dedicated Spare disks</b> These are spare disks that only belong to only one specified VG for recovery/rebuilding.
	 <b>Global Spare disks</b> The Global Spare disks are accessible by all VGs to do rebuilding/recovery.
<b>UDV</b>	<b>User Data Volume</b> Each VG could be divided into different UDV's. The UDV's from one VG share the same RAID level, but may have different volume capacity.
<b>VG</b>	<b>Volume Group</b> A Volume Group is a RAID array that consists of multiple physical disks.
	<b>Write-Back cache write policy</b> A caching method that delays copying data modification to system memory until absolutely necessary. This method offers a better performance than write-through method, but at the risk of losing the modifications if the system crashes.
	<b>Write-Through cache write policy</b> A caching method that writes data modifications to both the cache memory and system memory. This method provides data consistency between the cache and system memory, but at a slower performance than the write-back method.
<b>WWN</b>	<b>World Wide Name (WWN)</b> Also known as World Wide Identifier (WWID). WWN is an unique identifier created for each physical disk in a Fibre Channel storage network.