Generic Software Manual

Ultra 320 SCSI to Serial ATA

&

Fibre Channel to Serial ATA

Disk Array Systems

Version 1.1

Ultra 320 SCSI to Serial ATA

Disk Array System

&

Fibre Channel to Serial ATA

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Preface

About this Manual

This manual is designed to make the disk array system as easy to use as possible. Information contained in this document has been checked for accuracy, but no guarantee is given that the contents are correct. Information and specifications are subject to change without notice.

Copyright Notice

Conventions

Caution

This symbol is used to remind users to pay attention to important descriptions regarding usage and maintenance (repair) or additional important information related to this disk array system.

Note

This symbol is used to remind users of useful information that can make procedures such as configuration easier to accomplish.

1 Introduction

This chapter will guide you through the overview of the disk array system firmware features.

Easy Operation

As compared to a conventional disk array's long-winded setup procedures, your disk array can be ready to go after using the simple step by step built-in setup program. Management interfaces include LCD panel, serial communication port (terminal port), and Ethernet port (Global-Net, please refer to the Global-Net CD).

OS Independent

Supports virtually all popular operating systems, platforms and network environments.

RAID Functions

- Select NRAID, JBOD, or RAID levels 0, 1, 0+1, 3, 5, 30, or 50.
- Automatic failed disk drive detection.
- Automatic data rebuild: when a replacement disk is installed (or a hot spare disk is used), the system rebuilds data automatically without the user issuing any commands or pressing any function keys.
- On-line initialization option: data can be written to the array group while it is initializing.
- On-line expansion to allow adding drives while the array is in operation.
- Global spares support: newly added or unused drives are automatically assigned as global spares.
- SCSI ID 0 ~ 15 and multiple ID support.
- Support up to 8 array groups and 128 LUN (Logical Unit Number) maps.

SAN Support (For FC Products)

- SAN Masking
- Supports up to 32 hosts per host channel
- Multiple hosts can be mapped to a single LUN
- Host naming index

Data Protection (S.M.A.R.T.Cor.)

To deal with issues like bad block remapping and data errors during hard disk rebuilds, the disk array comes with comprehensive data protection features - S.M.A.R.T.Cor. (S.M.A.R.T. Correction). Features include, Disk Self Test (DST), Disk Scrubbing, and Disk Cloning. These functions are basically to diagnose hard disk health (DST and Disk Scrubbing), to correct bad blocks and parity errors in advance (Disk Scrubbing) and to clone the data suspected hard disks prior to a hard disk failure (Disk Cloning).

Disk Self Test

This function allows the user to enable the hard disk's own self test function while the disk remains in the disk array system. This can be done without moving each disk to a test computer to run the manufacturers proprietary disk utility. The test result is displayed on the LCD and RS-232 Terminal for the user to judge whether to replace the suspected hard disk or not. It is highly recommended to run this test before configuring RAID to secure a healthy RAID solution.

Disk Scrubbing

Even when data is not been accessed, the disk array can check its integrity in the background. When checking is enabled, the array can detect bad sectors in advance and correct parity errors to keep the RAID system in a good operational status. Bad block remapping is greatly reduced during run-time, because even unused sectors are checked and updated. This function also reduces the possibility of multiple bad blocks occurring in one stripe, which is the main cause of data loss.

Disk Cloning

By utilizing the hard disk's S.M.A.R.T. function and user-defined bad sector threshold, the disk array can perform periodical checking of hard disk health and automatically or manually clone data to a hot spare hard disk before the suspected hard disk fails. Once the suspected hard disk fails, the disk array system immediately switches to the cloned hard disk without waiting for an rebuild. This greatly reduces the possibility of a second hard disk failing while the RAID system is rebuilding.

The flows in "When to Use Data Protection Features" on page 3 illustrate the proposed configuration to maintain the best data availability by implementation of the above S.M.A.R.T.Cor. features.

Caution

RAID should never be considered a replacement for doing regular backups. It's highly recommended to conduct a backup strategy for critical data.

When to Use Data Protection Features

Note1: If time is enough, it is recommended to run Extended self test before storing data into disk array
Note2: If it failed to pass Extended self test, please replace the suspected HDD and run DST again

2 Quick Setup

The front panel interface includes an LCD screen and function buttons. Read this section to learn how to use them to set up a simple disk array.

LCD Screen Symbols

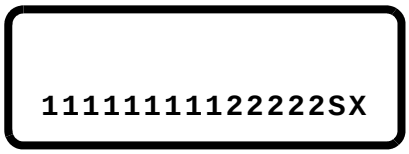
The LCD screen shows an overview of disk array system status. The following table explains the meaning of symbols that appear on the LCD screen.

Symbol	Meaning
R	The disk has an error or a fault.
I	The disk is being identified by the disk array system.
S	The disk is spare. This disk can expand or repair (Hot Spare) an array group.
X	There is no disk installed in this disk tray or the disk is offline.
W	The disk has too many bad sectors. This is a warning.
A	The disk is being added to an array group during online expansion.
C	The disk is a clone disk.
1~8	The disk is a member of array group 1~8
J	This disk is in JBOD mode. (No Configuration)

The following examples describe LCD screen status information.

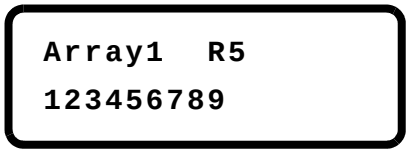
Example 1

- Disks 1 to 9 are members of array group 1.
- Disks 10 to 14 are members of array group 2.
- Disk 15 is spare.
- Disk 16 is not installed.



Example 2

- The configuration of array group 1 is shown.
- Array group 1 is configured at RAID level 5.
- Disks 1 to 9 are array group 1 members.



Menu Navigation, Data Entry and Alert Cancellation

The disk array system can be configured with the following function buttons.

Function Button	Description
↑	Moves up in the LCD menus or scrolls forward through each character during data entry
Esc	Returns to previous LCD menu without making changes
Enter	Selects a menu item or confirms a choice or entry
↓	Moves down in the LCD menus or scrolls back through each character during data entry

Sometimes you will be prompted to enter information such as a password or disk capacity. Use the Up ↑ and Down ↓ function buttons to scroll through each number, symbol, or character that appears on the LCD panel. Press **Enter** to select the character and move to the next position. Press **Esc** to delete the current character and move to the previous position.

The disk array system emits a loud beeping sound when an error or failure occurs. This alert can be turned off by simultaneously pressing both the Up ↑ and Down ↓ buttons twice.

Starting a Disk Self Test

Disk self test (DST) is used to test hard disk health while hard disks are installed in the disk array system. DST is done without running the proprietary hard disk utility supplied by the hard disk vendor. Hard disks do not need to be tested individually in the host system. DST predicts the likelihood of a hard disk degrading or becoming faulty in the near future.

Note

It is strongly recommended that a DST is done before storing data on a hard disk.

Follow these steps to start a disk self test from the front panel.

1. Switch on the disk array system.
2. Press **Enter** to access the disk array setup utility. The *Enter Password* prompt appears on the LCD panel.

```
Enter Passwd:
1111
```

3 Press ↑ or ↓ to select each character. Press **Enter** to confirm the selected character, or press **Esc** to go back to the previous character.

Note

The default password for DST is 1111 (four ones). Be sure to use this password to run DST.

4 Press ↑ or ↓ to select *DST* or *DST - All Disks*, then press Enter to confirm the selection.

```
DST
DST - All Disks
```

5 Press ↑ or ↓ to select *Short Test*, *Extended Test* or *Stop Test*, then press **Enter** to start or stop the test.

```
DST - All Disks
Short Test
```

Note

- Most hard disks support DST. Refer to the hard disk manufacturers data sheet to see if your hard disk supports DST.
- We recommend that you run the short test first. If a hard disk fails the short test, then perform an extended test. If a disk fails an extended test too, we suggest you swap the hard disk to secure data reliability.

Configuring a Single Array Group

The front panel interface guides you through the creation of an array group by prompting for each configuration parameter in sequence. Follow these steps to establish an array group quickly.

1 Switch on the disk array system.

2 Press **Enter** to access the disk array setup utility. The *Enter Password* prompt appears on the LCD panel.

```
Enter Passwd:
0■■■
```

3 Press ↑ or ↓ to select each character. Press **Enter** to confirm the selected character, or press **Esc** to go back to the previous character.

Note

The default password is 0000 (four zeros).

4 The *Re-config Array* prompt appears. Press ▲ to select *YES*, then press **Enter** to confirm the selection.

```
Re-config Array
YES
```

5 The *RAID Level* prompt appears. Press ▲ or ▼ to select RAID 0, 1, 3, 5, 0+1, 30, 50, NONE or NRAID, then press **Enter** to confirm the selected RAID level. Default "NONE" is in JBOD (Just a Bunch of Disk) mode.

```
RAID Level
NONE
```

Caution

Backup you data before changing RAID levels. All data is lost when RAID levels are changed.

6 If RAID 3 or 5 is selected, the *Hot Spare Disk* prompt appears. Press ▲ or ▼ to select *YES* or *NO*, then press **Enter** to confirm the selection.

```
Hot Spare Disk
NO
```

7 If the SCSI host interface model is being configured, then the *Set SCSI ID* prompt appears on the LCD Panel. Press ▲ or ▼ to select 0, 1, 2…15, or multiple to set the SCSI ID, then press **Enter** to confirm the selected SCSI ID.

```
Set SCSI ID
0
```

Note

You must assign a different SCSI ID to each SCSI device on the SCSI bus. The default SCSI ID is 0 (zero).

8 Press ▲ or ▼ to select *YES* or *NO*, then press **Enter** to confirm the selection

```
On-line Init
NO
```

9 The *Set Password* prompt appears. Press ▲ or ▼ to select each character, then press **Enter** to confirm the selected character, or press **Esc** to go back to the previous character.

```
Set Password
0■■■
```

Caution

Do not set the password to "1111", because this is used for special functions.

10 The *Save & Restart* prompt appears. Press ↑ to select *YES*, then press **Enter** to confirm the selection. The disk array system restarts and the disk array setup utility configures all disks according to your selections.

```
Save & Restart
NO
```

Caution

Saving configuration changes causes the disk controller's working parameters to change, which may result in unpredictable data transfer if the change occurs during input/output operations. Stop all activity between the disk array system and the host(s) before saving configuration changes.

11 After the disk array system restarts, *Init ARY1 DONE* appears on the LCD Panel. The array group is now ready to use.

```
INIT OK !
Init  ARY1  DONE
```

Notes

- To change RAID levels, re-configure the RAID level to NONE, then set the new level. Backup you data before changing RAID levels. All data is lost when RAID levels are changed.
- Disks inserted after building an array group are automatically used as spares for array group expansion or as hot spares for RAID 3 or 5.
- Array groups larger than 2 TB (terabytes) are automatically divided into slices then mapped to LUNs. LUN 0 is 2 TB and the remaining capacity is assigned to LUN 1. Refer to *Changing Slice Sizes* on page 23 to change slice sizes.

Shutdown

Shutdown allows the disk array system to complete all hard disk operations and wait for the power to be turned off.

Caution

Always turn off the disk array system after shutdown has completed to prevent data loss or corruption.

Follow these steps to shutdown the disk array system.

1 Press **Enter** to access the disk array setup utility. The *Enter Password* prompt appears on the LCD panel.

2 Press ↑ or ↓ to select each character. Press **Enter** to confirm the selected character, or press **Esc** to go back to the previous character.

```
Enter Passwd:
0000
```

Note

The default password is 0000 (four zeros).

3 The *Re-config Array* prompt appears. Ensure that *No* is selected, then press **Enter** to confirm the selection.

```
Re-config Array
NO
```

4 The *Set SCSI ID* prompt appears on the LCD Panel. Press **Enter**.

```
Set SCSI ID
0
```

5 The *On-line Init* prompt appears. Ensure that *No* is selected, then press **Enter** to confirm the selection.

```
On-line Init
NO
```

6 The *Set Password* prompt appears. Press **Enter**.

```
Set Password
0■■■
```

7 The *Save & Restart* prompt appears. Ensure that *No* is selected, then press **Enter** to confirm the selection.

```
Save & Restart
NO
```

8 The *Shutdown* prompt appears. Press ↑ to select *YES*, then press **Enter** to confirm the selection.

```
Shutdown
YES
```

9 The *complete* message appears. Switch off the disk array system.

```
Shutdown
Complete
```

3 Main Menu Setup

The firmware inside the disk array system allows many more features to be accessed through the RS-232 port than through the front panel. Read this section to learn how to use the most basic features to set up a simple disk array.

Setting up HyperTerminal in Windows 2000

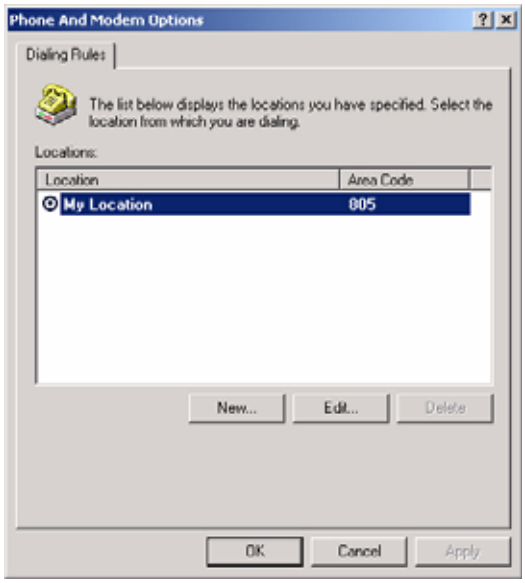
The disk array setup utility uses a VT100 terminal session to communicate over the RS-232 port.

Note

HyperTerminal is a VT100 terminal emulation program that is installed with most Windows XP/ME/2000/98 installations. Refer to Windows help if HyperTerminal is not installed on your computer.

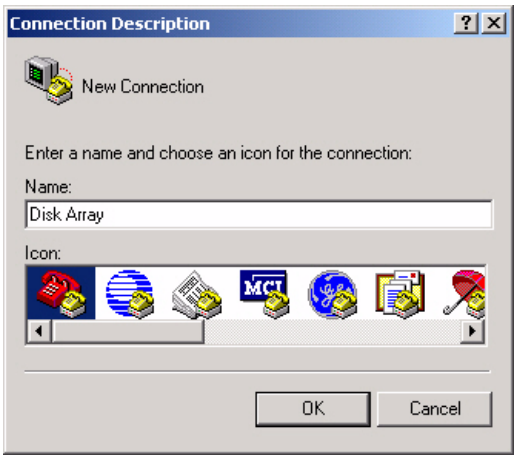
Follow these steps to configure HyperTerminal to communicate with the disk array setup utility.

1. Click **Start**, **Programs**, **Accessories**, **Communications**, then **HyperTerminal**.
2. Select your **country/region**, type your **area code**, then click **OK**.



3. The Phone and Modem Options appears. Click **OK**.

4 The Connection Description dialog box appears. Type a suitable name, such as “Disk Array”, then click **OK**. This is the name which the configuration will be saved as.



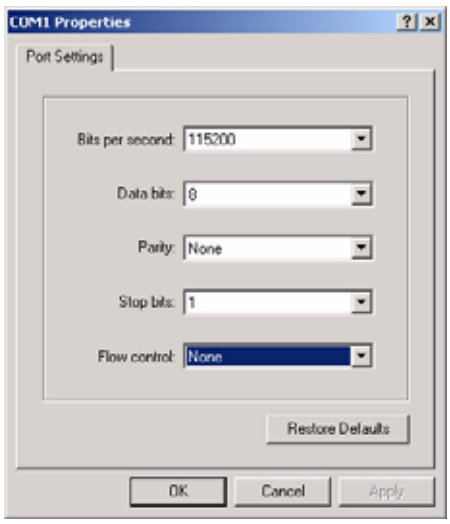
5 The Connect To dialog box appears. Select the COM port that the disk array system is connected to, then click **OK**.

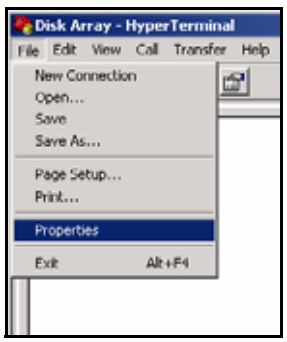
Note

Refer to your computer’s documentation for information on the COM port assigned to your computer’s RS-232 port. If you are unsure of the COM port, try COM1. If the connection is not made successfully, return to this step and try a different COM port.

---

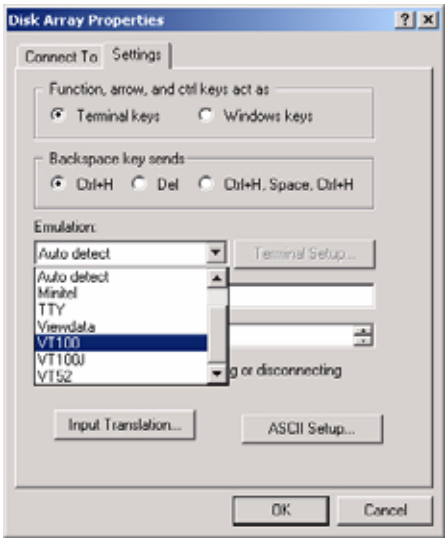
6 The COM Properties dialog box appears. Select **115200** in the *Bits per second* list, **8** in the *Data bits* list, **None** in the *Parity* list, **1** in the *Stop bits* list, and **None** in the *Flow control* list, then click **OK**.

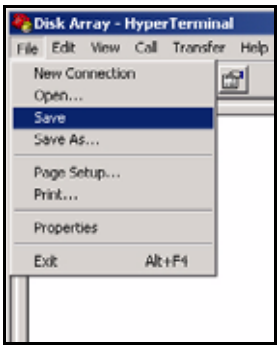




7 In HyperTerminal, click **File**, **Properties** to open the Disk Array Properties dialog box.

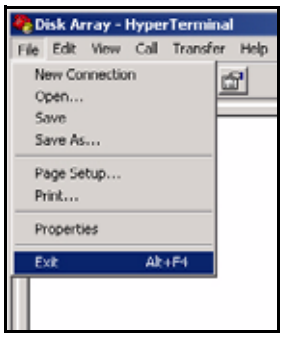
8 Click the **Settings** tab, select **VT100** from the *Emulation* drop-down list, then click **OK**.

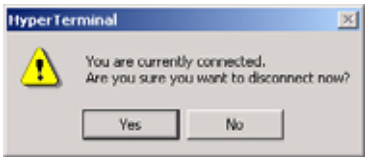




9 In HyperTerminal, click **File** and select **Save**.

10 In HyperTerminal, click **File**, **Exit**.





11 The HyperTerminal disconnection dialog box appears. Click **Yes** to close the connection and exit HyperTerminal.

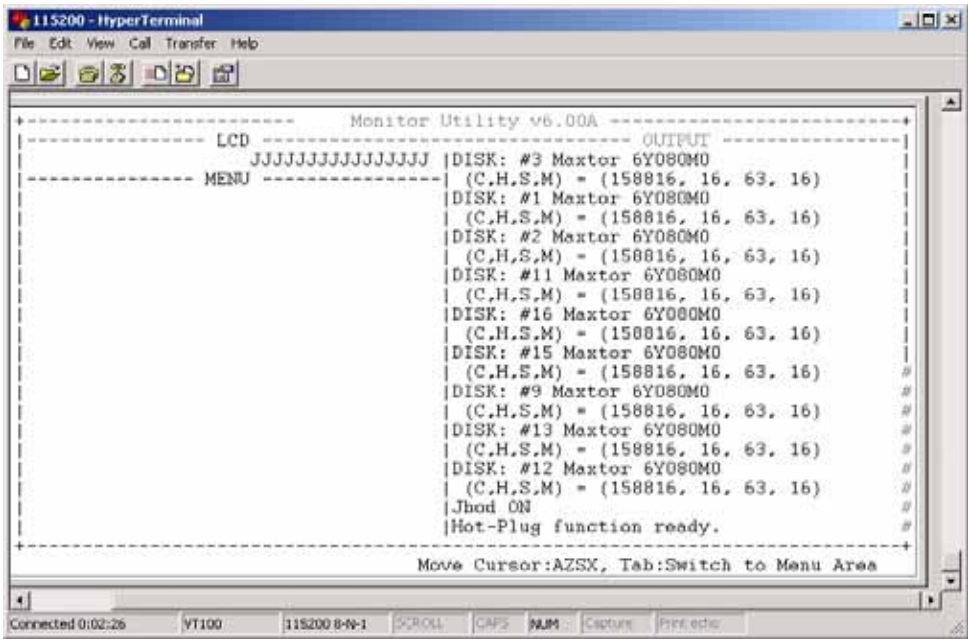
Note

It is not necessary to configure HyperTerminal again once the configuration is saved. The saved configuration is available in Start, Programs, Accessories, Communications, HyperTerminal.

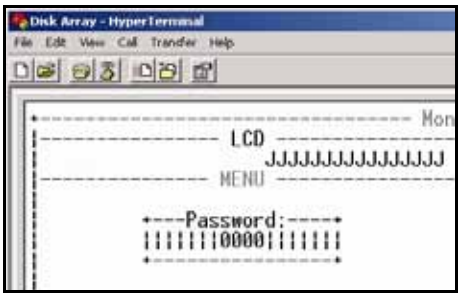
Accessing the Disk Array Setup Utility Menus

Follow these steps to access the disk array setup utility through HyperTerminal.

1. Click **Start**, **Programs**, **Accessories**, **Communications**, **HyperTerminal**, and click **Disk Array** (or the name you assigned to the configuration) to start a VT100 session.
2. Press <CTRL>+<D> to display the disk array setup utility main screen.



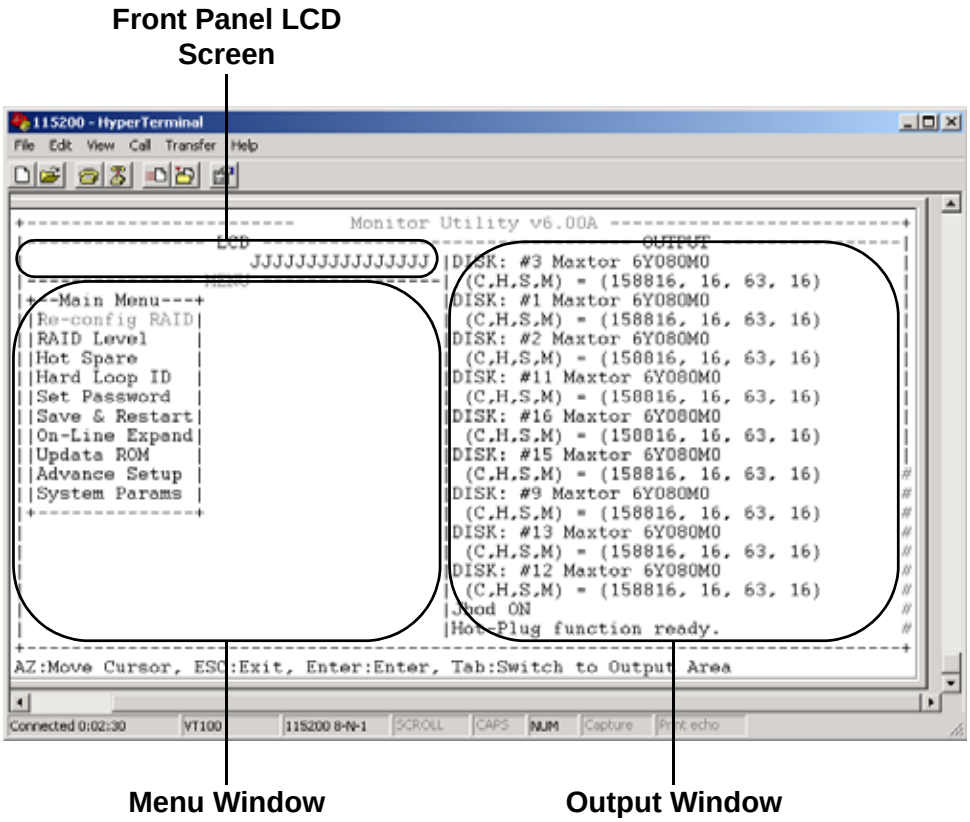
3. Press <Tab> to switch to the menu window. The MENU heading on the left of the disk array setup utility main screen is highlighted.
4. Press <Enter>. The Password prompt appears.



Note

The default password is 0000 (four zeros). Refer to *Setting the Password* on page 20 for information on changing the password.

5 Type the password and press <Enter>. The main menu appears.



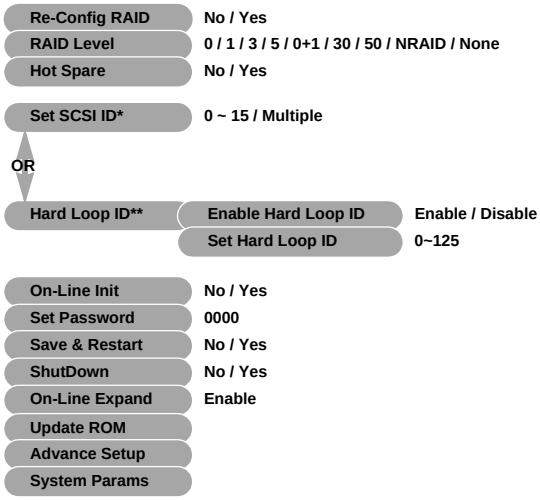
Area	Description
Front Panel LCD Screen	Shows whatever is on the Front Panel LCD screen
Menu Window	Shows menus and data entry boxes
Output Window	Shows the results of operations performed by the disk array setup utility

Notes

- Press <A> or <Z> to choose a menu item, then <Enter> to select it. Selecting a menu item causes a submenu, or data entry box to appear.
- Press <Esc> to exit a menu. Press <Esc> in the Main Menu to log out of the disk array setup utility.
- Press <Tab> to switch to the Output window, then press <A> or <Z> to scroll the contents up or down. Press <Tab> to return to the Menu window.

Introducing the Main Menus

The main menus are easy access menus that allow the disk array system to be set up as a single array group. An existing array group can also be expanded from the main menus.



*** SCSI host interface Model Only ** FC host interface Model Only**

Notes

- To set a RAID level, set Re-Config RAID to Yes, set the RAID Level, then save and restart.
- To change RAID levels, set the RAID Level to None, then set the new level. Backup you data before changing RAID levels. All data is lost when RAID levels are changed.

Creating a Single Array group / Change RAID Level

Re-Config RAID	No / Yes
RAID Level	0 / 1 / 3 / 5 / 0+1 / 30 / 50 / NRAID / None
Save & Restart	No / Yes

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to create a single array group that uses all available disks.

1. Select **Re-Config RAID**, then select **Yes**.
2. Select **RAID Level**, then select a **RAID Level**.
3. Select **Save & Restart**, then select **Yes**. The disk array system builds the array group.

Caution

Stop all activity between the disk array system and the host(s) before saving configuration changes.

The array group is now ready to use with the default host interface ID (0).

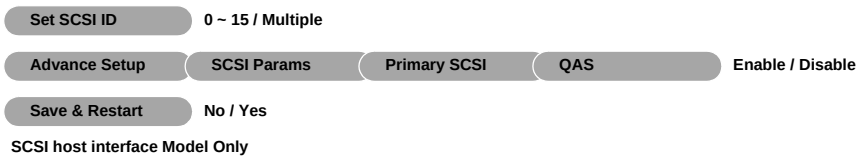
Notes

- To change RAID levels, re-configure the RAID Level to None and select “Save & Restart” first, then set the new level.
- Backup you data before changing RAID levels. All data is lost when RAID levels are changed.
- Disks inserted after building an array group are automatically used as spares for array group expansion or as hot spares for RAID 3 or 5.
- Array groups larger than 2 TB (terabytes) are automatically divided into slices then mapped to LUNs. LUN 0 is 2 TB and the remaining capacity is assigned to LUN 1. Refer to *Changing Slice Sizes* on page 23 to change slice sizes.

Setting the Host Interface ID

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to set the host interface ID.

SCSI ID



The SCSI host interface model default primary SCSI ID is 0 (zero). Change the default primary SCSI ID if there are other devices on the primary SCSI channel with a SCSI ID of 0.

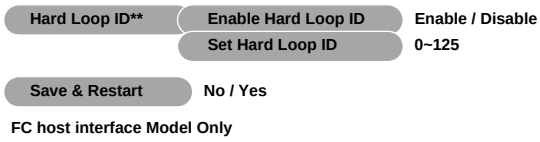
Notes

Because the LSI53C1030T SCSI chip had some compatibility issues with other host bus adaptor chips, the QAS menu item was created to avoid these issues. Configure the QAS setting according to the following table.

HBA Vendor	QAS setting
Adaptec	Enable (Default)
LSI	Disable
ATTO	Don't care

1. Select **Set SCSI ID**, then select a SCSI ID.
2. Select **Save & Restart**, then select **Yes**. The disk array system restarts with the primary SCSI channel set to the new SCSI ID.

Fibre Channel Interface Hard Loop ID



The FC host interface model default hard loop ID is Disable (auto select). Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to fix the primary hard loop ID.

1. Select **Hard Loop ID**, **Enable Hard Loop ID**, then select **Enable**.
2. Select **Set Hard Loop ID**, type a hard loop ID, then press <Enter>.
3. Select **Save & Restart**, then select **Yes**. The disk array system restarts with the primary fibre channel set to the new hard loop ID.

On-line Init

Array group initialization is the final part of array group configuration. Before, data could only be written after initialization was complete. This normally meant waiting several hours for large array groups. Now the on-line init function allows data to be written to the array group while it initializes.

Re-Config RAID	No / Yes
RAID Level	0 / 1 / 3 / 5 / 0+1 / 30 / 50 / NRAID /None
On-Line Init	No / Yes
Save & Restart	No / Yes

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to create a single array group that uses all available hard disks and is accessible during initialization.

1. Select **Re-Config RAID**, then select **Yes**.
2. Select **RAID Level**, then select a **RAID Level**.
3. Select **On-Line Init**, then select **Yes**.
4. Select **Set Password**, type a password, then press <Enter>.
5. Select **Save & Restart**, then select **Yes**. The LCD screen shows that the initialization process has started. The array group can be accessed at the same time as initialization.

Notes

- To change RAID levels, re-configure the RAID Level to None, then set the new level. Backup you data before changing RAID levels. All data is lost when RAID levels are changed.
- Disks inserted after building an array group are automatically used as spares for array group expansion or as hot spares for RAID 3 or 5.
- Array groups larger than 2 TB (terabytes) are automatically divided into slices then mapped to LUNs. LUN 0 is 2 TB and the remaining capacity is assigned to LUN 1. Refer to *Changing Slice Sizes* on page 23 to change slice sizes.

Setting the Password

Set Password 0000

Save & Restart No / Yes

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to set the password.

1. Select **Set Password**.
2. Type a password, then press <Enter>.

Notes

- Keep the new password in a secure place for future reference.
- Secure passwords are a mix of letters, numbers, and symbols.
- Don't set up "1111".

3. Select **Save & Restart**, then select **Yes**. The disk array system restarts. The new password is now required to gain access to the disk array setup utility.

Expanding a Single Array Group

On-Line Expand Enable

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to expand a single array group to use all spare disks.

1. Install the new disk(s) as described in the hardware manual. The Front Panel LCD Screen and the corresponding Front Panel LCD Screen area of the disk array setup utility shows an "S" symbol for each new spare disk.
2. Select **On-Line Expand**, then select **Enable**. The array group is expanded to include the new spare disk(s).

Shutdown

Shutdown allows the disk array system to complete all hard disk operations and wait for the power to be turned off.

ShutDown No / Yes

Caution

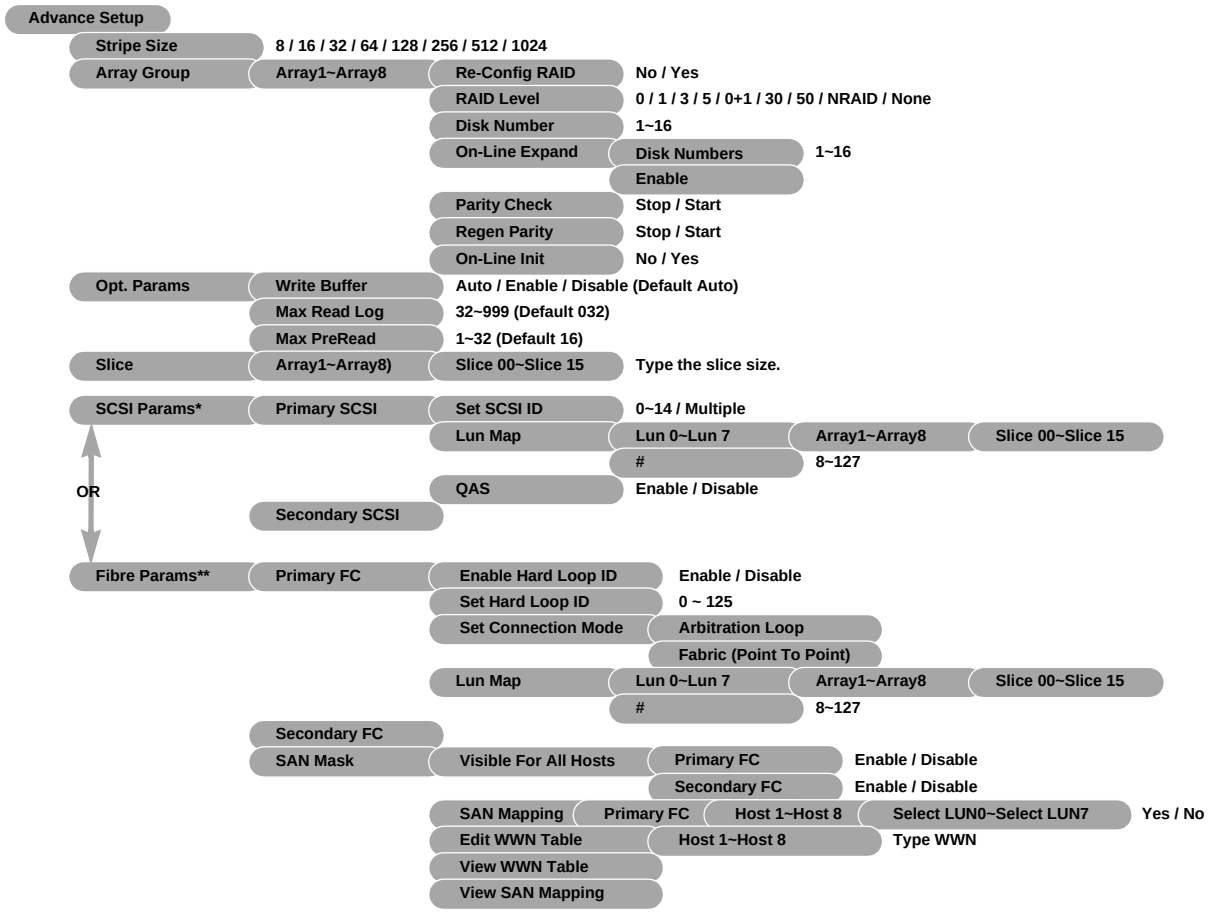
Always turn off the disk array system after shutdown has completed to prevent data loss or corruption.

Follow these steps to shutdown the disk array system.

1. Select **ShutDown**, then select **Yes**.
2. Switch off the disk array system when the complete message appears.

4 Advanced Setup

The advanced menus are accessed through the RS-232 port using a terminal emulation program such as HyperTerminal. The advanced menus allow the disk array system to be set up as multiple array groups. Existing array groups can also be divided into slices from the advanced menus. Disk array system models with a fibre channel host interface have menus for SAN (Storage Area Network) configuration.



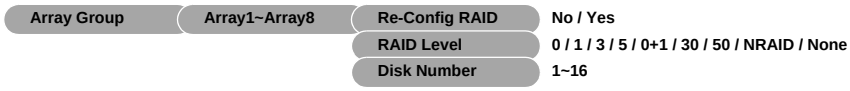
*** SCSI host interface Model Only ** FC host interface Model Only**

Notes

- To set a RAID level, set Re-Config RAID to Yes, set the RAID Level, then save and restart.
- To change RAID levels, re-configure the RAID Level to None, then set the new level. Backup you data before changing RAID levels. All data is lost when RAID levels are changed.

Creating Multiple Array Groups

The disk array system can be configured with multiple independent array groups. Each array group can be configured with different RAID levels and different numbers of disks. In addition, an existing array group can be reconfigured with a new RAID level and number of disks.



Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to create multiple array groups.

1. Select **Advance Setup**, **Array Group**, then select an array group.
2. Select **Re-Config RAID**, then select **Yes**.
3. Select **RAID Level**, then select a RAID level.
4. Select **Disk Number**, then select a number.

Note

How many disks to in clude in the array group.RAID controller will choose the disks to the array group automatially. **Disk Number** shows only the number of available disks.

5. Press <Escape> until the main menu appears.
6. Repeat steps 1 to 7 for each array group to be added.

Notes

- To change RAID levels, set RAID Level to None, then set the new level. Backup you data before changing RAID levels. All data is lost when RAID levels are changed.
- Array groups larger than 2 TB (terabytes) are automatically divided into slices then mapped to LUNs. LUN 0 is 2 TB and the remaining capacity is assigned to LUN 1. Refer to *Changing Slice Sizes* on page 23 to change slice sizes.

7. Select **Save & Restart**, then select **Yes**. The disk array system builds the array group. The chosen number of disks are labelled with the new array group number in the Front Panel LCD Screen area of the disk array setup utility.

Caution

Stop all activity between the disk array system and the host(s) before saving configuration changes.

Dividing Array Groups into Slices

Each array group can be divided into independent slices.

Slice > Array1~Array8) > Slice 00~Slice 15 > Type the slice size.

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to divide an array group into slices.

1. Select **Advance Setup**, **Slice**, then select an array group to divide into slices.
2. Select **Slice 00**, type the size of the slice in megabytes (MB), then press <Enter>. The Output Window of the disk array setup utility shows the new sizes each slice.

Note

The maximum capacity for each slice is 2 TB (terabytes).

3. Repeat step 2 to set other slice sizes until the array group is divided into the desired slices.

Changing Slice Sizes

Slice > Array1~Array8) > Slice 00~Slice 15 > Type the slice size.

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to change slice sizes.

Caution

All data is lost when slice sizes are set to 0 MB. Backup your data before changing slice sizes.

1. Select **Advance Setup**, **Slice**, then select an array group to divide into slices.
2. Select **Slice 00**, type 0, then press <Enter>. The Output Window of the disk array setup utility shows the new sizes each slice.
3. Repeat step 2 to set the other slice sizes to 0.
4. Select **Slice 00**, type the size of the slice in megabytes (MB), then press <Enter>. The Output Window of the disk array setup utility shows the new sizes each slice.

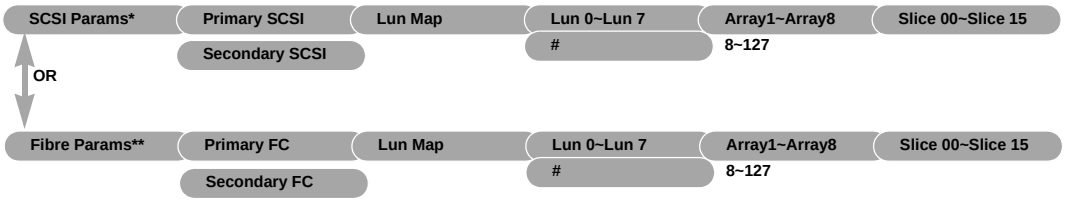
Note

The maximum capacity for each slice is 2 TB (terabytes).

5. Repeat step 4 to set other slice sizes until the array group is divided as desired.

Mapping Slices to LUNs

Slices can be given a Logical Unit Numbers (LUNs) on a primary or secondary host interface ID. System LUN assign LUN & slice automatically. This procedure allow user to change slice and LUN mapping manually.



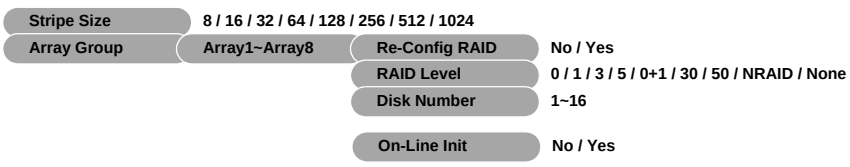
*** SCSI host interface Model Only ** FC host interface Model Only**

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to map slices to a LUNs.

1. Select **Advance Setup**, then select **SCSI Params** (SCSI host interface model) or **Fibre Params** (FC host interface model).
2. Select **Primary SCSI** or **Secondary SCSI** (SCSI host interface model); or select **Primary FC** or **Secondary FC** (FC host interface model).(If you want to change ID, please refer to page 18.)
3. Select **Lun Map**, then select a LUN. To select a LUN greater than 7, select **#**, type a number then press <Enter>.
4. Select an array group, then select a slice to map to the chosen LUN.
5. Press <Escape> until the main menu appears.
6. Repeat steps 1 to 5 for each slice to LUN mapping.
7. Select **Save & Restart**, then select **Yes**. The disk array system restarts with the new slice to LUN mappings.

On-line Init

Array group initialization is the final part of array group configuration. Before, data could only be written after initialization was complete. This normally meant waiting several hours for large array groups.Now the on-line init function allows data to be written to the array group while it initializes.



Start the disk array setup utility menu system, then follow these steps to create multiple array groups that are accessible during initialization.

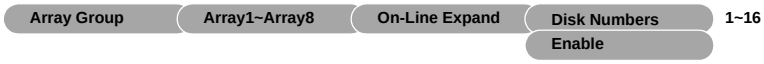
1. Select **Advance Setup**, **Array Group**, then select an array group.
2. Select **Re-Config RAID**, then select **Yes**.
3. Select **RAID Level**, then select a RAID level.
4. Select **Disk Number**, then select a number. The number of disks to add to the array group.

Note

Disk Number shows only the number of available disks.

5. Select **On-Line Init**, then select **Yes**.
6. Press <Escape> until the main menu appears.
7. Select **Save & Restart**, then select **Yes**. The LCD screen shows that the initialization process has started. The array group can be accessed at the same time as initialization.
8. Repeat steps 1 to 7 for each array group to be added.

Expanding Multiple Array Groups



Note

Install new disks in the disk array system before starting online expansion. These disks are labelled as spares in the Front Panel LCD Screen area of the disk array setup utility.

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to expand one or more array groups.

1. Select **Advance Setup**, **Array Group**, then select an array group.
2. Select **On-Line Expand**, **Disk Numbers**, then select the number of disks to add to the group.

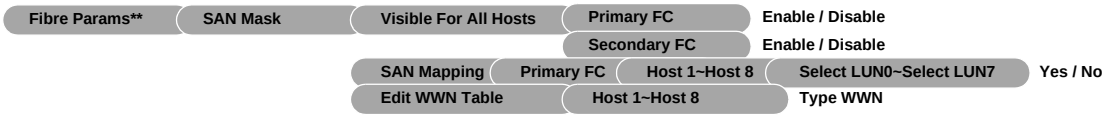
Note

Disk Numbers shows only the number of available disks.

3. Select **Enable**. The array group is expanded.
4. Repeat steps 1 to 3 for each array group to be expanded.

Setting the SAN Mask

The default is to allow all hosts in the SAN environment to view all the capacity un the RAID system. The SAN mask allows the use of a Fibre World Wide Name (WWN) to identify specific storage devices on a SAN. Follow these steps to set a SAN mask.



**** FC host interface Model Only**

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to create multiple array groups.

1. Select **Advance Setup**, **Fibre Params**, then select **SAN Mask**.
2. Select **Visible For All Hosts**, **Primary FC** or **Secondary FC**, then select **Disable**. The default (**Enable**) allows all SAN devices to get data via the fibre channel interface.
3. Press <Escape> until the **SAN Mask** menu appears.
4. Select **SAN Mapping**, then select **Primary FC**.
5. Select the host number, select the LUN number to map to the host number, then select **Yes** to activate the chosen mapping.
   This function limits access to the data on the chosen LUN number.
6. Press <Escape> until the **SAN Mask** menu appears.
7. Select **Edit WWN Table**, select the host to be given a new WWN, type the sixteen digit hex number of the fibre channel host interface card, then press <Enter>. Each fibre channel interface card has a unique WWN, or node name. Refer to the fibre channel host interface card documentation for more details.
8. Select **Save & Restart**, then select **Yes**. The disk array restarts with the new setup.

Viewing the SAN Mapping

Fibre Params** | SAN Mask | View SAN Mapping

** FC host interface Model Only

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to view the SAN mapping.

1. Select **Advance Setup**, **Fibre Params**, then select **SAN Mask**.
2. Select **View SAN Mapping**. The Output Window of the disk array setup utility shows the SAN Mapping Table. Y means that there is a mapping, and N means that there isn't a mapping.

Viewing the WWN Table

Fibre Params** | SAN Mask | View WWN Table

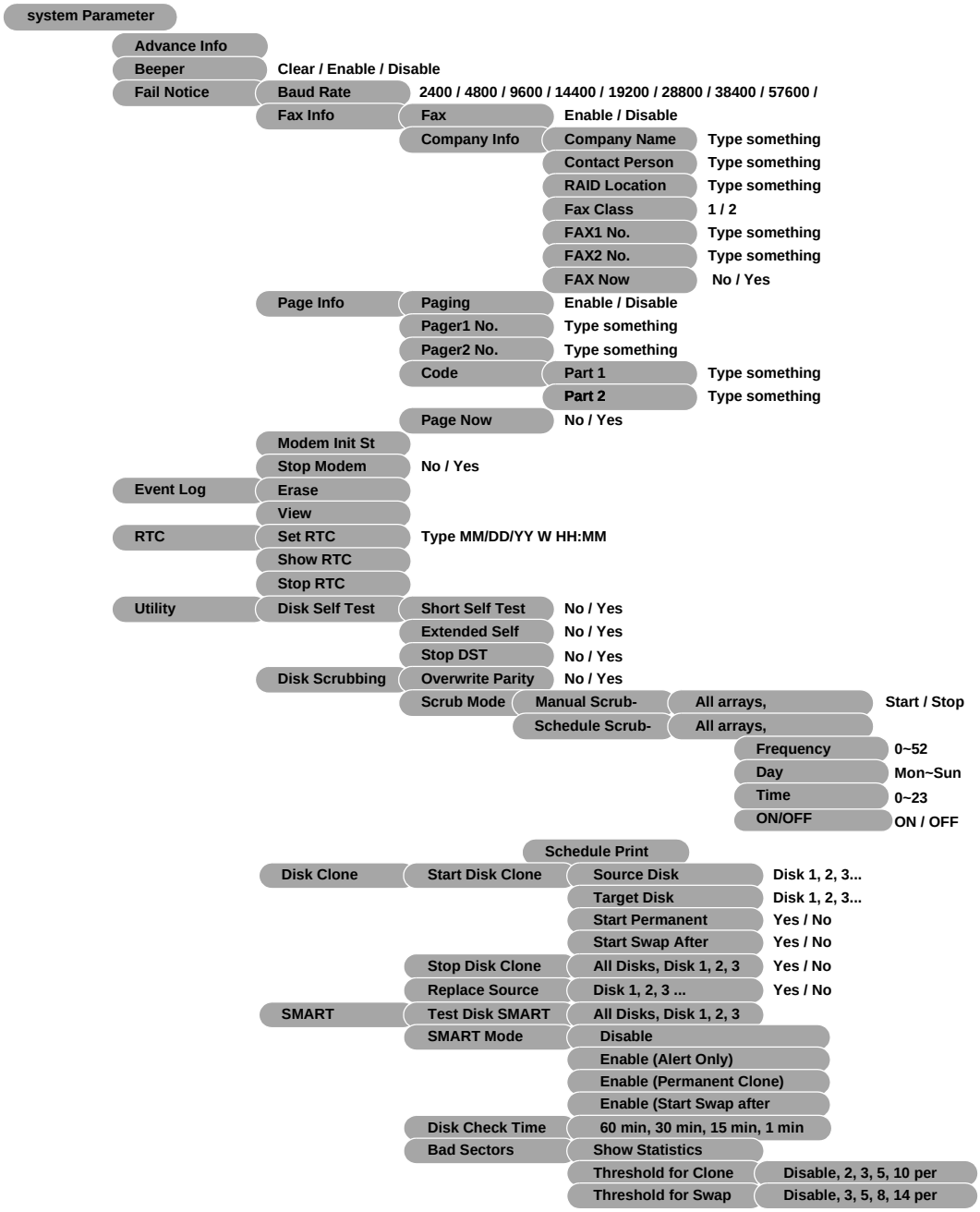
** FC host interface Model Only

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to view the WWN table.

1. Select **Advance Setup**, **Fibre Params**, then select **SAN Mask**.
2. Select **View WWN Table**. The Output Window of the disk array setup utility shows the WWN Table.

5 System Parameter Setup

The system parameter menus are accessed through the RS-232 port using a terminal emulation program such as HyperTerminal. The system parameter menus allow array groups of all RAID levels to be protected from disk failure by using S.M.A.R.T. and disk cloning. The health of array groups can also be maintained with disk scrubbing. Individual disks can be thoroughly checked by a disk self test before they enter service.



Advanced Info

Advance Info

Advance Info shows system, array, SCSI, Fibre, and RS-232 information in the output area.

System Info

Item	Description
Firmware Version	Revision of the disk array system setup utility
Serial Number	Unique number for the controller.
Installed Memory	Size of the controller cache memory.
Disk info	Disk Model, S.M.A.R.T. support, DST support
Power Module	Operational status and voltage levels.
Fan Module	Operational status and speed
Temperature	Real temperature in System

Array Info

Each array group is listed with the following information.

Item	Description
RAID Capacity	Total size of the array group.
RAID Level	None, NRAID, or a RAID level.
Stripe Size	The number of sectors in each stripe
Write Buffer	Controller buffer mode: auto, enable, or disable.
RAID Members	List of disks in this array group.
Slice 0~15	SIze of each slice.

SCSI Info

Each SCSI host channel is listed with the following information

Item	Description
SCSI ID	The ID of the host adapter.
Speed	The data rate of the host interface channel.
Wide	The host bus is 16 bits if enabled or 8 bits if disabled.
QAS	Quick Arbitrate and Select.
LUN map	The mapping of host bus LUNs to array group slices.

Example **Lun Map: (10 11 20 21 x x x x x**
x x x x x x x x x x x x x x x x x x
……..x x x)

Lun **0** mapping to slice **0** of array **1**; Lun **1** mapping to slice **1** of array **1**.

Lun **2** mapping to slice **0** of array **2**; Lun **3** mapping to slice **1** of array **2**.

Fibre Info

Each fibre host channel is listed with the following information.

Item	Description
Hard Loop ID	The address of the disk array system.
Mode	The way in which the disk array system communicates with other devices.
Data rate	The data rate of the host interface channel.
LUN map	The mapping of host bus LUNs to array group slices.

Example **Lun Map: (10 11 20 21 x x x x x**
x x x x x x x x x x x x x x x x x x
……..x x x)

Lun **0** mapping to slice **0** of array **1**; Lun **1** mapping to slice **1** of array **1**.

Lun **2** mapping to slice **0** of array **2**; Lun **3** mapping to slice **1** of array **2**.

RS-232 Info

The modem and terminal RS-232 ports have the following information listed.

Item	Description
Baud rate	The data rate of the RS-232 interface.
Data bit	The number of data bits per frame.
Stop bit	The number of stop bits per frame.
Parity	The type of parity in each frame.

Battery Backup Module Info (Manufacturing Option)

The battery backup module (BBM) keeps powering 1GB of cache for up to 72 hours so that data is not lost if the disk array system suddenly shuts down. When disk array system power is restored, the data in the cache is written to hard disk.

Start the disk array setup utility menu system, then select **System Params**, **Advance Info** to view the battery backup module status.

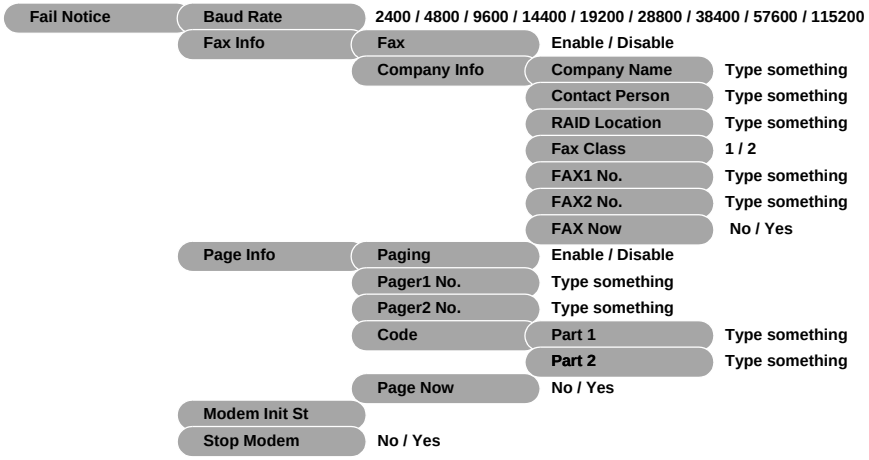
Item	Description
Battery temperature	How hot or cold the battery is.
Battery capacity	The current capacity of the battery.
Battery status	The charging status of the battery.
Battery serial number	A unique code for each battery.
Battery device chemistry	The technology of the battery.

Beeper

Beeper **Clear / Enable / Disable**

Select **Clear** to mute the current alert. Select **Enable** or **Disable** to enable or disable the beeper.

Failure Notification (Manufacturing Option)



Check that the rear of the disk array system has a modem port outlet. If not, please contact to your reseller.

Baud Rate

Check your modem's specification when setting the Baud rate.

Fax Alert Settings

Fax alert settings are entered and edited in the Fax Info submenu.

Fax: Enable or Disable the Fax alert function (Default: disable).

In the Company Info, set the message contents that you want to fax.

Company Name	Type the company name.
Contact Person	Type the contact name of the person.
RAID Location	Type the address of thedisk array system.
Fax Class	Enter the fax class supported by the modem, either 1 or 2.
FAX1 No.	Enter the first fax number.
FAX2 No.	Enter the second fax number.
FAX Now	Select Yes to send a test fax alert immediately.

Note

All FAX message may be up to 16 alphanumeric characters in length.

Pager Alert Settings

Pager alert settings are all entered and edited in the Pager Info submenu.

Paging: Enables or disables the pager alert function (Default: Disable).

Pager1 No: Enter the first pager's terminal telephone number (also called the port number or TAP port number) and the pager pin number (if required for pager). This field can be a maximum of 16 characters.

Pager2 No: Enter the second pager's terminal telephone number (also called the port number or TAP port number) and the pager pin number (if required for pager). This field can be a maximum of 16 characters.

Code: Enter the alert message for pager 1 under part 1.

Enter the alert message for pager 2 under Part 2.

Note

Pager alert messages may be up to 16 alphanumeric characters in length.

Page Now: Select Yes to instruct disk array system to send a test pager alert immediately.

Note

- When configuration done, the alert messages will sent 5 times every 5 minutes.
- When the above data has been entered, go to the Save & Restart sub-menu and press Yes. After reboot the configuration changes are saved.

Modem Settings

Before the fax and pager alerts are used the default Modem Initialization string should be confirmed or a new string entered. Do this in the Modem Init St submenu.

Modem Init St: Configures the modem you are using for the remote notification feature.

Note

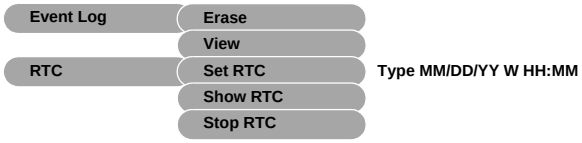
The default string is a generic string compatible with most modems. Refer to your modem user's guide to check if your modem requires a different string.

Stop Modem

Any time, whatever Fax and Page messages are being sent, select the Stop Modem submenu and press Yes to pause the modem.

Event Log and RTC

Real Time Clock, you must setup RTC first to get the correct data and time information on each event log RTC is also be of help for schedual Disk scrubbing. Read this section to see how to configure the event log and RTC.



Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then:

- Select **System Params**, **Event Log**, **Erase** to clear the event log.
- Select **System Params**, **Event Log**, **View** to view the event log.

Follow these steps to set the RTC.

1. Select **System Params**, **Event Log**, then select **RTC**.
2. Select **Set RTC** to set the RTC in the format "MM/DD/YY W HH:MM".

Symbol	Range	Description
MM	01~12	Month
DD	01~31	Day
YY	04	Year
W	1~7	(1 is Monday; 2 is Tuesday… 7 is Sunday) day of the week
HH	01~24	Hour
MM	00~59	Minute

Note

- MM, DD, YY, HH, and MM must be two digits. For example, you must enter “04” for April rather than just “4”, or the “RTC Parameters error” message will appear.
- “04/20/04 2 14:25” means April 20th, 2004, Tuesday, 02:25PM.

To show the current time select **System Params**, **Event Log**, **RTC**, then select **Show RTC**.

To stop the RTC select **System Params**, **Event Log**, **RTC**, then select **Stop RTC**.

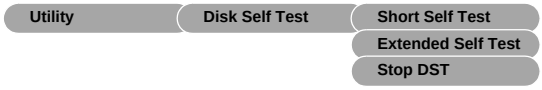
Disk Self Test

Disk self test (DST) is used to test hard disk health while hard disks are installed in the disk array system. DST is done without running the proprietary hard disk utility supplied by the hard disk vendor. Hard disks do not need to be tested individually in the host system. DST predicts the likelihood of a hard disk degrading or becoming faulty in the near future.

Note

It is strongly recommended that a DST is done before storing data on a hard disk.

DST checks the critical electrical, servo and surface parameters of a hard disk.



Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then:

- Select **System Params**, **Utility**, **Disk Self Test**, **Short Self Test** to start a short self test.

OR

- Select **System Params**, **Utility**, **Disk Self Test**, **Extended Self Test** to start an extended self test.

These messages are shown in the terminal output window:

```
Short (or Extended) Disk Self Test Completed:
Disk #1:  DST Completed without Error, PASS
Disk #2:  DST Completed with Electrical failure, FAIL
Disk #3:  DST Completed with Servo failure, FAIL
Disk #4:  DST Completed with Read failure, FAIL
Disk #5:  DST Not Completed, unknown test error
Disk #6:  DST Completed, unknown failure, FAIL
```

If the host requests access to the hard disk, this message is shown in the terminal output window:

```
Warning message:
Disk Self Test (DST): Disk Self Test (DST) Interrupted by host. Aborted.
```

Select **System Params**, **Utility**, **Disk Self Test**, **Stop DST** to stop a self test. This message is shown in the terminal output window:

```
Warning message:
Disk Self Test (DST): Disk Self Test Stopped by RAID Controller.
```

Note

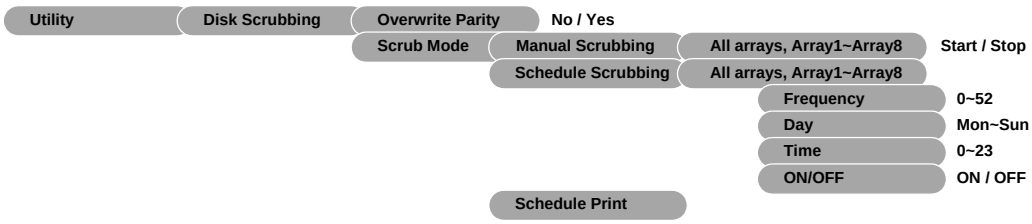
- Most hard disks support DST. Refer to the hard disk manufacturers data sheet to see if your hard disk supports DST.
- We recommend that you run the short test first. If a hard disk fails the short test, then perform an extended test. If a disk fails an extended test too, we suggest you swap the hard disk to secure data reliability.

Disk Scrubbing

Bad sectors can form on hard disk areas that are not accessed for long periods of time. Disk scrubbing (DS) scans for bad sectors or parity errors in array groups. The disk array system reconstructs bad sectors from other sectors and reassigns the bad sectors to undamaged areas. At the same time disk scrubbing also detects parity inconsistencies.

DS is a proactive approach to maintaining data integrity. DS keeps the disk array system in a good condition.

It's recommend to run disk scrubbing in operate idle time to check all sectors of all hard disks in an array group, remapping bad sectors and ensuring that the parity is consistent.



Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to configure disk scrubbing.

Manual Scrubbing

Follow these steps to manually start and stop disk scrubbing.

1. Select **Utility**, **Disk Scrubbing**, then select **Manual Scrubbing**
2. Select **All arrays** or a single array group.
3. Select **Start** or **Stop**. The percentage of progress is indicated on the LCD screen.
4. Repeat these steps to start or stop scrubbing for other array groups.

Scheduled Scrubbing

Follow these steps to schedule disk scrubbing that starts automatically.

1. Select **Utility**, **Disk Scrubbing**, then select **Manual Scrubbing**
2. Select **All arrays** or a single array group.
3. Select **Frequency**, then type the number of weeks between scrubbing, or **0** for a one-off action.
4. Select **Day**, then select the day of the week to start scrubbing.
5. Select **Time**, then type the hour of the 24 hour clock to start scrubbing.
6. Select **ON/OFF**, then select **ON** to enable the schedule.
7. Repeat these steps to add scrubbing schedules to other array groups.

Note

Disk scrubbing stops if the:

- disk array system is not powered on at the scheduled time.

Overwriting Parity

A parity inconsistency means that a data error exists either on data hard disks or on parity hard disk. But algorithms in RAID 3 or 5 cannot distinguish whether the error resides on data hard disks or the parity hard disk. In order not to lose data in the event of hard disk failure, it's recommended to correct a parity error when an inconsistency is detected. To set overwrite parity to automatic:

Select **Utility**, **Disk Scrubbing**, **Overwrite Parity**, then select **Yes**.

Disk Scrubbing Reports and Event Log Entries

The terminal output window displays the following information when the disk scrubbing is completed or aborted:

```
Disk Scrubbing Result:
--1. Bad Block Check--
Disk # 1: Found 3 Bad Blocks, Recovered 3, Total 10+(3) Bad Blocks
Disk # 2: Found 6 Bad Blocks, Recovered 6, Total 0+(6) Bad Blocks
Disk # 3: Found 11 Bad Blocks, Recovered 10, Total 12+(11) Bad Blocks
……
Disk # 16:Found 0 Bad Blocks, Recovered 0, Total 19+(0) Bad Blocks

--2. RAID Parity Check (Overwrite Parity YES) --
RAID X: Found 3 Parity Errors, Overwrite Parity
Or
--2. RAID Parity Check (Overwrite Parity NO) --
RAID X: Found 3 Parity Errors, Overwrite Parity-NONE
```

The report does not include "Total XX+(YY) Bad Blocks" if the number of remapped blocks in the controller is zero.

Disk scrubbing records the following events.

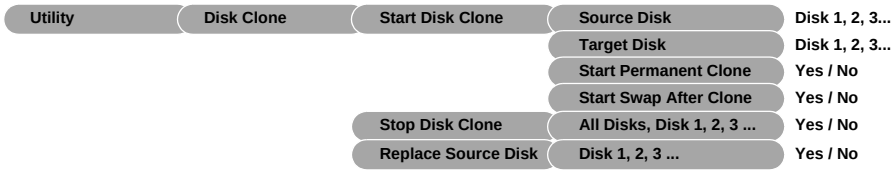
- The array group wasn't optimal when the controller tried to start disk scrubbing.
- Manual or scheduled disk scrubbing has started.
- Scheduled disk scrubbing has been skipped.
- Disk scrubbing has been completed.
- Disk scrubbing has been aborted by the operator or by an exception.
- The power has been turned off during disk scrubbing.
- An unrecoverable bad block has been found. The block and hard disk number are logged.
- A parity inconsistency has been found and/or fixed. The block and hard disk number are logged.
- A bad block has been re-mapped. The block and hard disk number are logged.
- A remapped bad block has been recovered. The block and hard disk number are logged.

Disk Cloning and S.M.A.R.T.

Disk cloning copies data from a source hard disk to a clone hard disk, so that the clone can replace a failing source hard disk with minimal performance impact. S.M.A.R.T. is used to predict hard disk failure and trigger cloning before the hard disk fails.

Manual Cloning

Hard disks are the most likely components to fail in a disk array system. Disk cloning (DC) is used to clone the data from the failing hard disk to a hot-spare hard disk manually. By backing up the data in advance, when the suspected hard disk fails, the cloned hard disk takes over the role of the failed hard disk and becomes an array group member immediately. DC greatly minimizes the chance of an array group entering the rebuild process and further minimizes the chance of a second hard disk failing while the array group is rebuilding.



Follow these steps to manually start disk cloning.

1. Select **Utility**, **Disk Clone**, then select **Start Disk Clone**.
2. Select **Source Disk** then select a hard disk that is a member of an optimal array group.
3. Select **Target Disk** then select a target (clone) hard disk.(Only the hot-spare disks will be displayed.)
4. Select **Start Permanent Clone** then select **Yes** to replace the source hard disk if it fails.

   OR

   Select **Start Swap After Clone** then select **Yes** to replace the source hard disk immediately after cloning is complete.

   The LCD screen shows the disk labelled with a “C” and the progress in percent.
5. Repeat these steps to clone other hard disks.

Note

- To perform a disk clone there must be at least one spare hard disk.
- The source hard disk is taken offline and labelled “X” on the LCD screen if cloning is finished and Start Swap After Clone was selected.

Follow these steps to manually stop disk cloning.

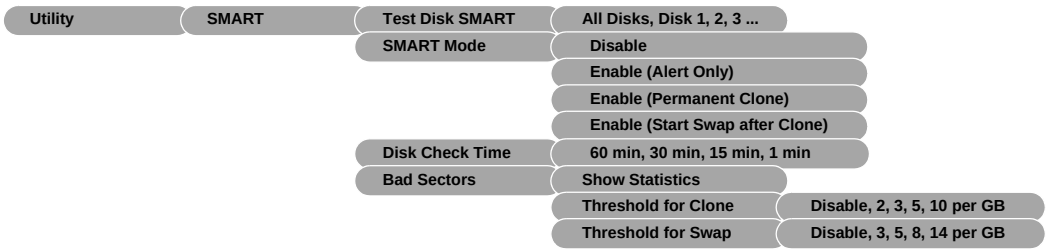
1. Select **Utility**, **Disk Clone**, then select **Stop Disk Clone**.
2. Select **All Disks** or a single hard disk, then select **Yes**.

Follow these steps to manually replace the source hard disk.

1. Select **Utility**, **Disk Clone**, then select **Replace Source Disk**.
2. Select a hard disk, then select **Yes**. The source hard disk is taken offline and labelled “X” on the LCD screen.
3. Replace the source disk with a new disk. The new disk will become a "spare" disk.

S.M.A.R.T. Capability and Status of Disks

S.M.A.R.T. (Self Monitoring Analysis and Reporting Technology) monitors hard disk health at a given polling time. When S.M.A.R.T. detects hard disk degradation or that the user-defined bad sector threshold has been reached, the cloning function is started immediately. S.M.A.R.T. is an intelligent and automatic way to protect user data.



S.M.A.R.T. warnings are usually indicated by a beeping sound and a “W” on the LCD screen, but S.M.A.R.T. warnings aren’t shown if the current S.M.A.R.T. mode setting is “Disabled” or the disk array system is powered cycled. To check the S.M.A.R.T. capability and health status of hard disks regardless of the current S.M.A.R.T. mode setting:

Select **Utility**, **SMART**, **Test Disk SMART**, then select **All Disks** or a single hard disk.

The following messages are shown in the terminal output window:

```
Test Disk S.M.A.R.T.:
Disk # 1 supports S.M.A.R.T. and Healthy
Disk # 2 does not support S.M.A.R.T.
Disk # 3 supports S.M.A.R.T. and Unhealthy
……..
Disk # 16 not installed……..
```

To show the number of remapped bad sectors:

Select **Utility**, **SMART**, **Bad Sectors,** then select **Show Statistics**.

The following messages are shown in the terminal output window:

```
Bad sectors statistics:
Disk # 1 has 100 bad sectors remapped
Disk # 2 has 200 bad sectors remapped
Disk # 3 has 300 bad sectors remapped
……..
Disk # 16 has 400 bad sectors remapped
```

Automatic Cloning

Disk clone can be automatically activated by a S.M.A.R.T. alert or the bad sector threshold.

Follow these steps to make disk cloning start when there is a S.M.A.R.T. alert.

1. Select **Utility**, **SMART**, **Disk Check Time**, then select a disk checking period. The default is 60 minutes. In this setup the SMART function will check HDD status every 60 mins.
2. Select **Utility**, **SMART**, then **SMART Mode**.
3. Select one of the following options. **Enable (Start Swap after Clone)** is recommended.
   - **Disable**: When S.M.A.R.T. detects a failure, an alert isn't produced and disk cloning is not started.
   - **Enable (Alert Only)**: When S.M.A.R.T. detects a failure, only produce an alert.
   - **Enable (Permanent Clone)**: When S.M.A.R.T. detects a failure, produce an alert and start disk cloning.
   - **Enable (Start Swap after Clone)**: When S.M.A.R.T. detects a failure, produce an alert and start disk cloning, then swap the clone and the source hard disks when cloning is complete. The clone hard disk will take over the source disk and source disk will be off-line.

Follow these steps to make disk cloning start when the bad sector threshold is exceeded.

1. Select **Utility**, **SMART**, **Bad Sectors**.
2. Select **Threshold for Clone**, then choose a threshold. The recommended threshold is 3. This threshold is the number of bad sectors per GB to trigger cloning. For a 200 GB hard disk, setting the threshold to 3 means that 600 bad sectors must be detected on the hard disk to trigger cloning.
3. Select **Threshold for Swap**, then choose a threshold. The recommended threshold is 5. This threshold is the number of bad sectors per GB to trigger swapping the source hard disk with the cloned hard disk after cloning completes. **Threshold for Swap** should be larger than **Threshold for Clone**.

Note

- A clone hard disk is labelled "C" on the LCD screen when disk cloning starts.
- The source hard disk is taken offline and labelled "X" on the LCD screen if the Threshold for Swap is exceeded. Or a start swap after clone is enabled.

Disk Cloning Event Log Entries

Disk cloning records the following events.

- Manual or automatic disk cloning has started.
- Background copying for disk cloning has finished.
- Background copying for disk cloning has paused
- Background copying for disk cloning has resumed.
- Disk cloning has been aborted due to an exception condition.
- A source hard disk has been replaced.
- S.M.A.R.T. is enabled or disabled.
- A S.M.A.R.T. warning has been reported.
- There are no spare hard disks for disk cloning.

Appendix

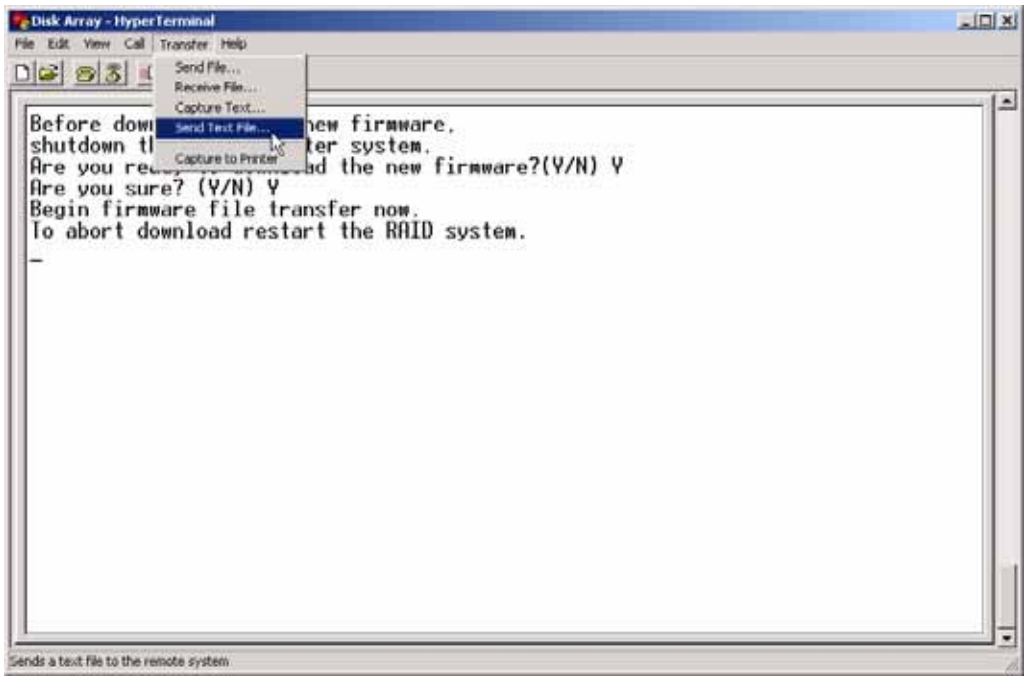
Upgrading Firmware

Start the disk array setup utility menu system, as described in *Accessing the Disk Array Setup Utility Menus* on page 14, then follow these steps to upgrade the firmware.

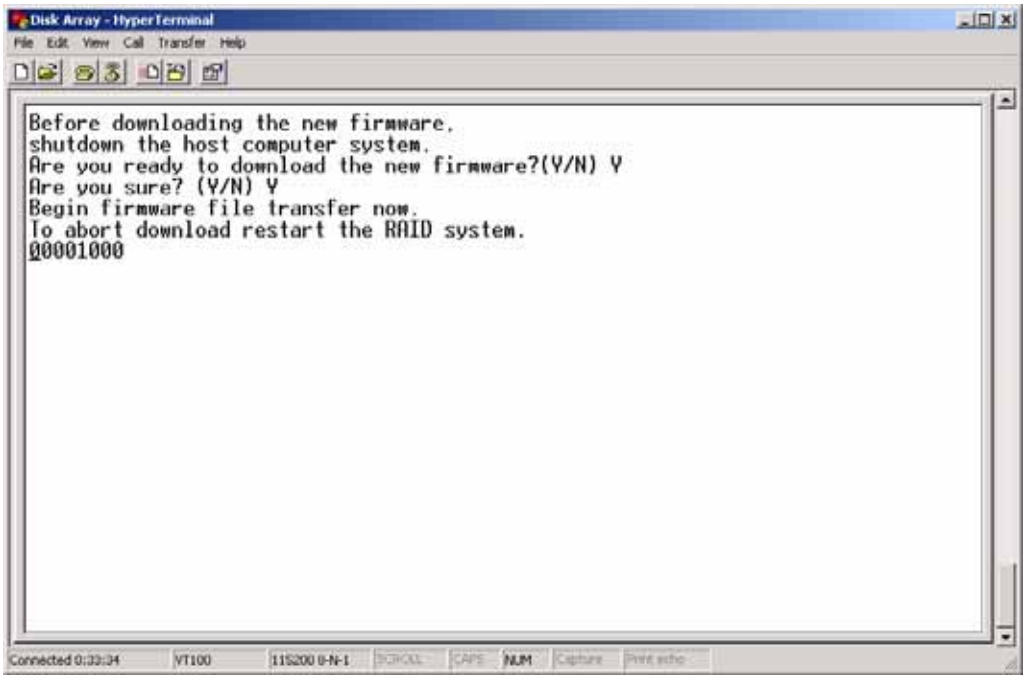
1. Save the new firmware on your computer's hard disk.

> **Caution**
>
> Do not attempt to upgrade the firmware when there is activity between the disk array and the host(s). Stop all activity to the controller before upgrading firmware.

2. Select **Update ROM**. The firmware download confirmation screen appears.
3. Press <Y> to confirm that you are ready to download the new firmware. A second confirmation appears. Press <Y> again. A prompt to begin firmware download appears.
4. Select **Transfer**, **Send Text File...** The Send Text File dialog box appears.



5 Select the new firmware file, then click **Open**. A progress counter appears. The firmware download takes about 1 hour and 20 minutes.



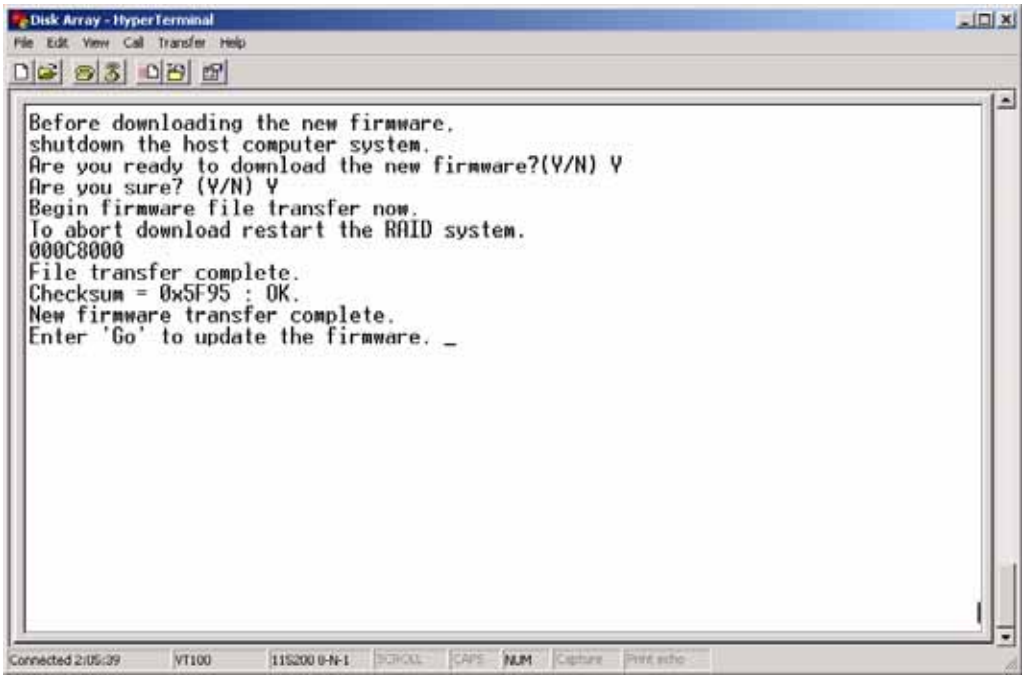
Note

The download is complete when the File transfer complete message appears.

6 Type “Go”. A second confirmation appears. Type “Go” again. A progress counter appears. The firmware update takes less than 30 seconds. The disk array system restarts to activate the new firmware, then the main screen appears.

Note

“Go” is case sensitive. You must type a capital “G” followed by a lower case “o”.



Recording your configuration

System Info

General Information	
Product Model Name	
Firmware Version	
Serial Number	
Installed Memory (MB)	

Hard Disk Information (Vendor, Model)	
HDD1	HDD9
HDD2	HDD10
HDD3	HDD11
HDD4	HDD12
HDD5	HDD13
HDD6	HDD14
HDD7	HDD15
HDD8	HDD16

Array Info

Stripe Size (sectors)	
Write Buffer (Auto, enable or disable)	

Array Group (1~8)	Slice (0~15)	RAID Level	Capacity (MB)	Hot Spare (Yes/No)	RAID member

SCSI Info

Channel (Primary, Secondary)	ID (0~15)	LUNs (0~127)	Speed (Ultra x)	QAS (Enable/Disable)

Fibre Info

Channel (Primary/Secondary)	ID (0~15)	LUNs (0~127)	Speed (Ultra x)	QAS (Enable/Disable)

Mapping status

Host Channel (Primary/Secondary)	ID (0~15)	LUNs (0~127)	Array Group, Slice (1~8, 1~8)	Slice Capacity (MB)