RAID SCSI TO IDE

Installation Reference Guide

Revision 1.0

P/N: PRO-OT-N8R

August 30, 2000

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is not guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna
2. Move the equipment away from the receiver
3. Plug the equipment into an outlet on a circuit different from that to which the receiver is powered.
4. Consult the dealer or an experienced radio/television technician for help

All external connections should be made using shielded cables.

FC CE

Table of Contents

Chapter 1

Introduction

The RAID subsystem is a Ultra 2 LVD SCSI-to-EIDE RAID (Redundant Arrays of Independent Disks) disk array subsystem. It consists of a RAID disk array controller, an environment controller and 8 disk trays.

The subsystem is "Host Independent" RAID subsystem supports RAID levels 0, 1, 3, 5 and 0+1. Regardless of the RAID level the subsystem is configured, each RAID array consists of a set of disks which to the user appears to be a single large disk capacity.

One unique feature of these RAID levels is that data are spread across separate disks as a result from the redundant manner in which data is stored in a RAID array. If a disk in the RAID array fails, the subsystem continues to function without any risk of data loss. This is because redundant information are stored separate from the data. These redundant information will then be used to reconstruct any data that was stored on a failed disk. In other words, the subsystem can tolerate the failure of a drive without losing data and operates independently from each other.

The subsystem is also equipped with an environment controller which is capable of accurately monitoring the internal environment of the subsystem such as its power supplies, fans, temperature and voltage. The disk trays allow you to install any kind of 3.5 inches hard drives. Its modular design allows hot-swapping of hard drives without interrupting the subsystem's operation.

1.1 Key Features

- IDE ATA-66(UDMA66) hard drives with failure management
  - 8 hot-swappable IDE ATA-66(UDMA66) disk trays
  - Fault tolerant hard drives using the RAID technology
  - LEDs indicating the status of the hard drives and failure alarm
  - Automatic detection and disconnection of failed drives
  - Hot-swapping of drives
  - Automatic online rebuild of new drives

- backplane board

- RAID management
  - RAID levels 0, 1, 3, 5 and 0+1
  - Intel i960RN/100 64-bit RISC processor

- Versatile user interface
  - 2x16 characters LCD back-light display and easy-to-use key controls on the front panel of the disk array controller for RAID disk array configuration and management
  - Serial monitor port allows you to connect a PC or terminal for RAID disk array configuration and management
  - Serial modem port for fax and pager remote notification and failure alarm

- Environment controller functions include:
  - Monitoring the internal temperature of the subsystem with real time display of temperature and overheat alarm
  - Monitoring the output voltage of the power supplies. If the output voltage is over or under +5V or +12V, an alarm will sound warning you of voltage irregularity.
  - Monitoring the status of the cooling fans and failure alarm
  - Monitoring the status of the power supplies and failure alarm

- Cache memory up to 128MB

- Bad sector reassignment
- Concurrent I/O tagged command queuing
- UPS connection (compliant with NetWare UPS management)

1.2 Unpacking the Subsystem

Before we continue, you need to unpack the subsystem and verify that the contents of the shipping carton are all there and in good condition. Before removing the subsystem from the shipping carton, you should visually inspect the physical condition of the shipping carton. Exterior damage to the shipping carton may indicate that the contents of the carton are damaged. If any damage is found, do not remove the components; contact the dealer where you purchased the subsystem for further instructions.

The package contains the following items:

- RAID subsystem unit
- One power cords
- One HD68M to HD68M external SCSI cables
- One external null modem cable
- Installation Reference Guide
- Spare screws, etc.
- Key set package

If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

1.3 The Front Panel

RAID LCD

Environment LCD

HDD power LEDs
HDD activity LEDs
HDD status LEDs

Keylock

Slot 1
Slot 2
Slot 3
Slot 4
Slot 5
Slot 6
Slot 7
Slot 8

Disk trays

HDD power LEDs: Green LED indicate power is on.

HDD activity LEDs: These LED will blink blue when the hard drive is being accessed.

HDD status LEDs: Red LED indicate the hard drive is failure.

► **Unlock Symbol**

► **Keylock:** Used to lock the disk tray and turn on disk power, turn key clockwise.

Keylock

HDD status LEDs

HDD activity LEDs

HDD power LEDs

RAID LCD

Environment LCD

Slot 8 Slot 7 Slot 6 Slot 5 Slot 4 Slot 3 Slot 2 Slot 1

Disk trays

1.4 The Rear Panel

Monitor port

Modem port / GUI Port

Host channel A

UPS port

Terminator

Fan 1

Fan 2

Fan 3

Fan 4

Power supply 1

Power supply 2

Important:
Please put the terminator include in package to host channel before using the subsystem. Make sure to disable the terminate at subsystem's host channel. Refer to Chapter 4 for more information.

Terminator

Fan 2   Fan 4

UPS port

Monitor port

Modem port
/ GUI Port

Host channel A   Fan 1   Fan 3   Power   Power
                                           supply 1   supply 2

Important:
Please put the terminator include in package to host channel before using the subsystem.

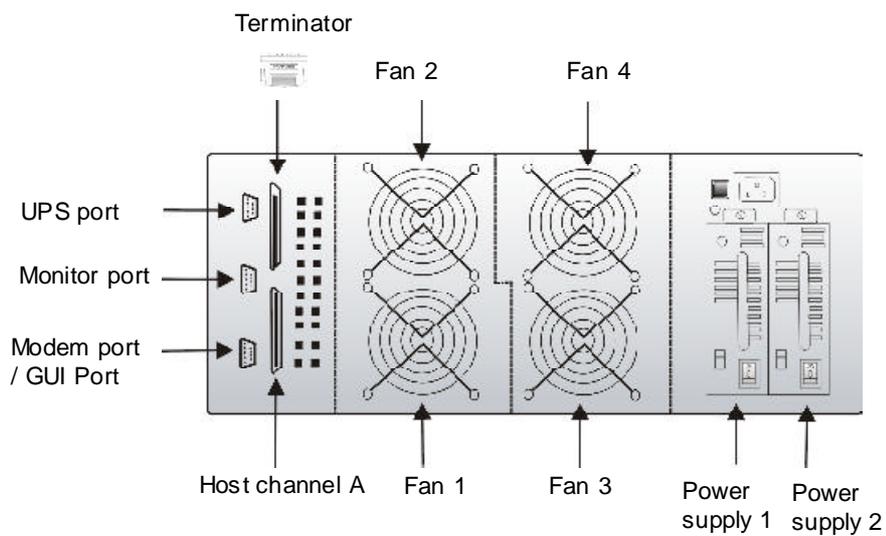Make sure to disable the terminate at subsystem's host channel. Refer to Chapter 4 for more information.
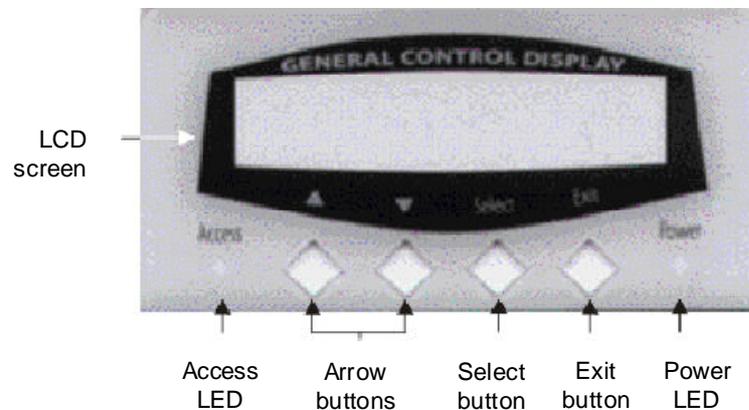
1.5 Front Panel LCD

The RAID LCD panel is where you will configure the RAID subsystem.

LCD screen

Access LED | Arrow buttons | Select button | Exit button | Power LED

Parts	Function
LCD screen	The LCD screen displays the configuration of the subsystem such as the memory size, firmware version, as well as the brand and capacity of the hard drives. You can also use this screen to enter the utility to further configure the subsystem.
Up or Down arrow buttons	Use the Up or Down arrow keys to go through the information on the LCD screen. This is also used to move between each menu when you configure the subsystem.
Select button	This is used to enter the option you have selected.
Exit button	Press this button to return to the previous menu.
Access LED	Red blinking LED indicates data is being accessed.
Power LED	Green LED indicates power is on.

Chapter 2

Installation Overview

2.1 Powering-on the Subsystem

1. Plug all the power cord or power connector, located at the rear of the subsystem.

> ⬦ **Important:**
>
> Configure the "Voltage Selector" according to the type of voltage you are using. Failure to do so may cause severe damage to the subsystem. The power supplies installed in the subsystem is capable of operating in 115V or 230V voltage.

2. Turn on the power.

3. The "Power" LED at the front panel will turn green.

> ⬦ **Note:**
> The factory default setting is 230V voltage for power supply.

2.2 Installing Hard Disk Drives

This section describes the locations of the number of hard drives supported by the subsystem and instructions on installing a hard drive.

2.2.1 Installing a Hard Drive in the Disk Tray

1. Pull out an empty disk tray. (You can install in any available slot.)

2. Unpack the hard drive. Set the HDD to 'Master' or 'Standalone' HDD.

> **Warning:**
> Static electrical discharge can damage your drive or other compo-
> nents without causing any signs of physical damage. To provide
> ESD protection, ground yourself by touching a metal of the sub-
> system chassis.
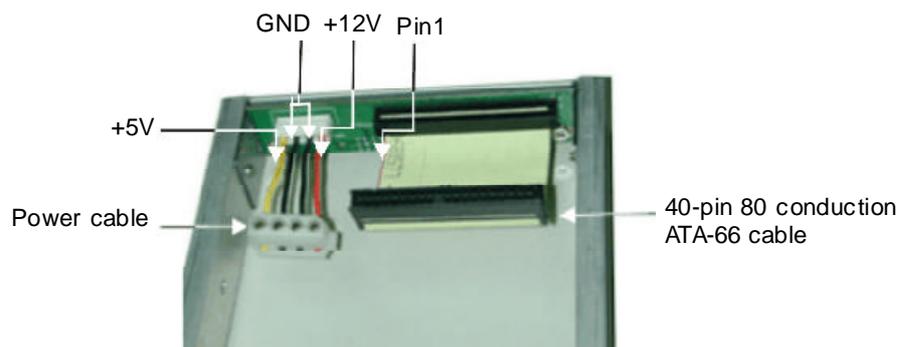
3. Connect the power cable to the power connector on the hard drive.

4. Connect the 40-pin 80 conduction ATA-66 cable to the IDE connector on
   the hard drive. Align the colored edge of the cable with pin 1 of the
   connector.

5. Place the hard drive in the disk tray.

6. Install the mounting screws on each side to secure the drive in the disk
   tray.

7. Slide the tray into a slot until it clicks into place. The HDD status LED
   will turn red at relative position of front panel.

8. Insert the key (included in your package) into the keylock located on the left of the front panel and turn it clockwise. This will lock the disk tray into the subsystem providing data security. If you are replacing a new hard drive, make sure to unlock it by turning the key counter-clockwise.

9. The HDD power LED will turn to green, if the HDD power LED did not turn green, check the following:

    a. Make sure the hard drive cables are connected properly.

    b. Make sure the hard drive is in good condition.

10. If the hard drive is not being accessed, the HDD activity LED will not illuminate. The LED blinks only when being accessed.

2.3 Connecting RAID Subsystem to Host

The subsystem supports Ultra2 SCSI interface which provides fast 80MB/S data transfer rate using a 16-bit SCSI bus.

1. Configure the SCSI ID of subsystem (Unique SCSI ID in the same SCSI bus).

2. Attach a terminator to the last SCSI device. (Refer to your device's documentation.)

3. The package comes with one(1) HD68M to HD68M external SCSI cables. Attach one end of the SCSI cable to the SCSI in or host channel connector and the other end to the host adapter. (The host adapter is installed in your Host subsystem.)

4. If you are connecting another external device after subsystem, make sure to disable terminate at subsystem's host channel. The default host channel's termination are disabled. Refer to Chapter 4 for more information.
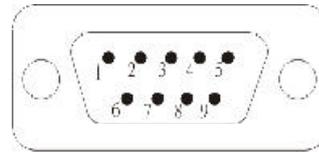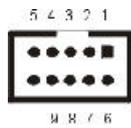
> **Important:**
> When one or more SCSI devices are connected, the total length of all cables (internal or external) must not exceed 1.5 meters to ensure reliable operation.

2.4 Connecting a Modem

The subsystem is equipped with a serial modem port located at the rear of the system unit. It allows you to connect an external modem for fax and pager remote notification

Pin	Description
1	Data Carrier Detect (DCD)
2	Transmit Data (TD)
3	Receive Data (RD)
4	Data Set Ready (DSR)
5	Signal Ground (SG)
6	Data Teminal Ready (DTR)
7	Clear To Send (CTS)
8	Ready To Send (RTS)
9	Ring Indicator (RI)

Note:
The default setting of the modem port is 19200 baud rate, non-parity, 8 data bit and Xon/Xoff.

Chapter 3

Quick Setup Guide

This Quick Setup Guide is intended as a shortcut so that experienced users can get their RAID subsystem started as quickly as possible. If this is your first time to configure the subsystem, the screen on the LCD panel will show the following message.

```
Config Error
XXXXXXXX Rx ID:0   □
```

Before configuring the subsystem, make sure the subsystem is able to detect all the hard drives in the subsystem. This is to ensure that the disk trays and hard drives are functioning normally. While subsystem detects for the hard drives after it is powered-on, the characters turn from "X" to "I" and will become "S" or "O" for the hard drives that have been detected. The screen will appear as shown below after the hard drives have been detected.
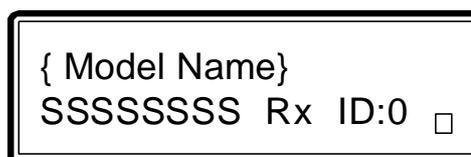
```
{ Model Name}
SSSSSSSS  Rx  ID:0  □
```

The characters on the second line of the screen denote the status of the hard drives installed in subsystem. The first character refers to the first drive, the second character refers to the second drive and so on.

"X" : No hard drive is installed in the slot.
"I" : Detecting for the hard drive in the slot.
"S" : The hard drive in the slot is a spare drive or an on-line spare drive.
"O" : The hard drive is on-line or operational.
"A" : Rebuilding the newly replaced drive.
"R" : The previous on-line drive has been removed.

Rx

"X" : No RAID level has been configured.
"0", "1", "3", "5" or "0+1" : Indicates the RAID level that has been configured.

ID:0

Refers to the SCSI ID of the host channel.

" □ " moving up and down at the lower right corner of the screen indicates that the subsystem is functioning normally. The " □ " becomes "zZ" if the host is accessing the subsystem. It becomes "wW" when memory is writing cache to a hard drive. If it is not moving, something must be wrong with the subsystem.

3.1 Entering the Password

The subsystem is preset with a password. After it initializes, press the "Select" button. You will be prompted to enter the password. Press 8 zeroes (00000000). The main menu will now appear on the screen.

3.2 Performing Quick Setup

1. To enter the Main Menu, press the "Select" button then enter the password. The screen will appear as shown below. (Quick Setup is the first field in the Main Menu.)

```
Main Menu
0   Quick Setup
```

2.   Press the "Select" button to enter Quick Setup.

```
0   Quick Setup
NO
```

3.   Press '   ' key to select Yes, then press "Select".

```
ReConfirm
NO
```

4.   Press '   ' key to select Yes, then press "Select".

5.   Subsystem will now restart and initialize for the settings to become effective.

Note:
By default, subsystem is preset with RAID 5, 8 hard drives.

```
Init  R5          1.1%
OOOOOOOO  R5  ID:0 □
```

6.   After the subsystem completes initialization, the screen will appear as shown below.

```
Init   R5        DONE
OOOOOOOO  R5 ID:0 □
```

7.   The drives that are READY and mapped to the host channel.

Chapter 4

Configuring the Subsystem

The subsystem has a setup configuration utility built in. It contains important information about the configuration and settings for various optional functions in the subsystem. This chapter explains how to use and make changes to the setup utility.

4.1 Configuration Methods

There are two methods of configuring the subsystem. You may configure through the LCD panel or by connecting a terminal on the serial monitor port located at the rear of the subsystem.

> **Important:**
> The subsystem allows you to access the utility using only one method at a time. You cannot use both methods at the same time.

4.1.1 Configuring through a Terminal

Configuring through a terminal will allow you to avail the same configuration options and functions that are available from the LCD panel. To start-up:

1. Connect a VT100 compatible terminal or a PC operating in an equiva-lent terminal emulation mode to the monitor port located at the rear of the subsystem.

> **Note:**
> You may connect a terminal even while the subsystem's power is on.

2. Power-on the terminal.

3. Run the VT100 program or an equivalent terminal program.

4. The default setting of the monitor port is 19200 baud rate, non-parity, 8 data bit and no flow control.

4.2 Starting the Monitor Utility

1. After connecting and powering-on the terminal, and nothing appears on the screen, press <Ctrl> <D>. The screen will refresh. Now press the <Tab> key to go to the "Menu" side (left side) of the screen. Press <Enter>. You will be prompted to enter a password.

Enter Passwd:
0   □
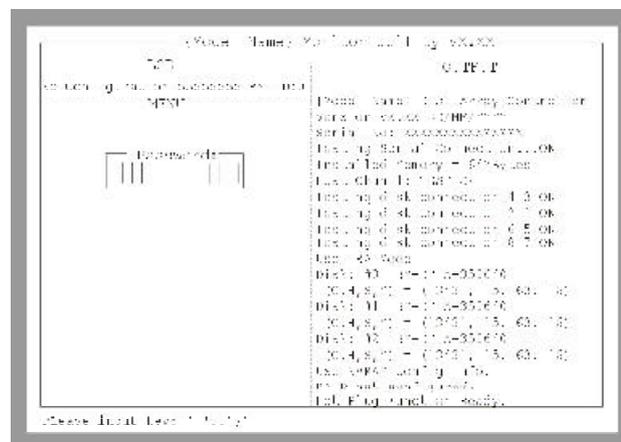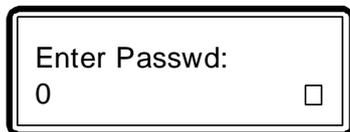
2. The preset password is 8 zeroes. Type "00000000".

```
Enter Passwd :
00000000            □
```
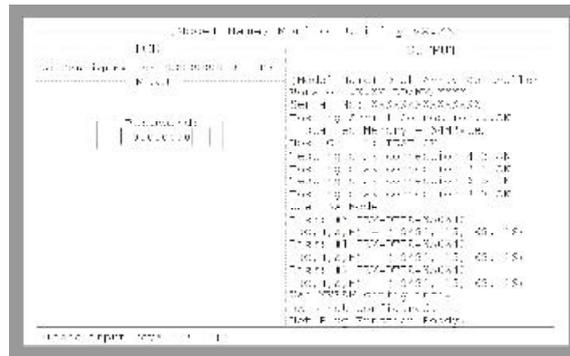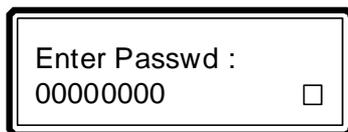

3. The Main Menu will appear.
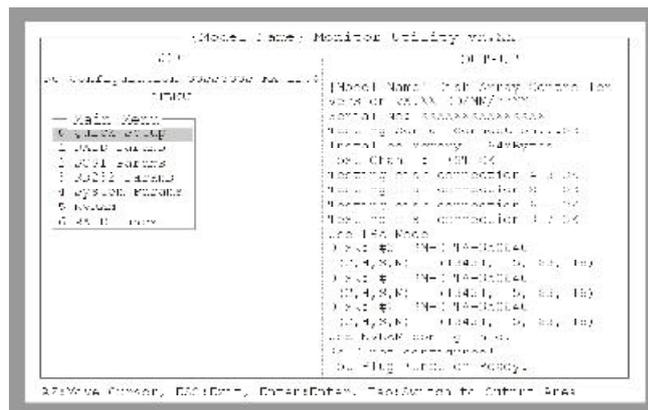
"AZSX": "A" - to move to the line above
         "Z" - to move to the next line
         "S" - Page Up
         "X" - Page Down
"Tab":   to move between the left column (Menu)
         and the right column (Output)

"Menu" on the left column of the screen consists of users menus that would allow you to configure the subsystem. The menus as same as LCD panel. "Output" on the right column shows the status and basic information about the subsystem.

4.3 Quick Setup

```
{Model Name}
SSSSSSSS Rx  ID:0  □
```

1.   Press 'Select' button from front panel and system will prompt you to
     enter the password.

```
Enter Passwd:
0                □
```

2.   Press ' ' or ' ' and 'Select' button to enter the system password. If
     you did not change the system default password please enter the default
     password eight zero '00000000' to enter the main menu.

```
Enter Passwd:
00000000         □
```

3.   The main menu appear.

```
Main Menu
0 Quick Setup
```

4.   Press 'Select' button to enter "Quick Setup" submenu.

```
0 Quick Setup
NO
```

5.   Press ' ' button to select YES and press 'Select' button to confirm.

```
┌─────────────────────┐
│ 0 Quick Setup       │
│ YES                 │
└─────────────────────┘
```

6. Confirm Again.

```
┌─────────────────────┐
│ ReConfirm           │
│ NO                  │
└─────────────────────┘
```

7. Press the ' ' key to select Yes, then press 'Select'.

```
┌─────────────────────┐
│ ReConfirm           │
│ YES                 │
└─────────────────────┘
```

8. Now the RAID system will be restart and starting initializing. Please wait the initialize complete.

```
┌─────────────────────┐
│ Init    R5    1.1%  │
│ OOOOOOOO R5 ID:0  ▫ │
└─────────────────────┘
```

9. When it complete.

```
┌─────────────────────┐
│ Init    R5    DONE  │
│ OOOOOOOO R5 ID:0  ▫ │
└─────────────────────┘
```

◈ **Note:**
  By default, subsystem is preset with RAID 5, 8 hard drives.

4.4 *Creating a New RAID or Reconfiguring an Existing RAID*

```
{Model Name}
OOOOOOO  R5 ID:0  □
```

1. Press 'Select' button from front panel and system will prompt you to enter the password.

```
Enter Passwd:
0                  □
```

2. Press ' ' or ' ' and 'Select' button to enter the system password. If you did not change the system default password please enter the default password eight zero '00000000' to enter the main menu.

```
Enter Passwd:
00000000           □
```

3. The main menu appear.

```
Main Menu
0 Quick Setup
```

4. **Press** ' ' button to "RAID Params".

```
Main Menu
1  RAID Params
```

5. Press 'Select' button to enter "Re-Conf RAID" submenu.

```
1  RAID Params
11  Re-Conf  RAID
```

6. In the Re-Conf RAID menu, press the ' ' key to select Yes, then
    press 'Select'.

```
11 Re-Conf  RAID
YES
```

7. You will return to the RAID Params menu, press ' ' or ' ' and 'Select'
    button to enter "RAID Level".

```
1  RAID  Params
12  RAID  Level
```

8. In the RAID Level menu, press ' ' key to select which RAID Level
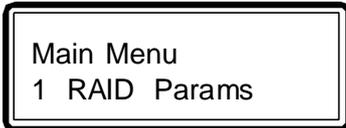   you want to set and press 'Select' button to confirm.

```
12  RAID  Level
5
```

9. You will return to the RAID Params menu, press ' ' or ' ' and "Select"
    button to enter "Disk Number".

```
1  RAID  Params
13  Disk  Number
```

10. In the Disk Number menu, press ' ' key to select the number of hard
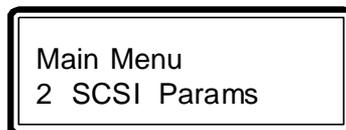   drive to be included in the RAID group.

```
13  Disk  Number
4
```
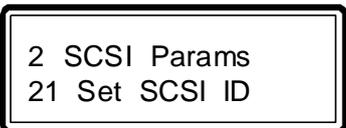
11.   Press 'Exit' button to "RAID Params".

```
Main Menu
1  RAID  Params
```

Warning:
Do not leave main menu before you save your change.

12.   Press ' ' button to select "SCSI Params".

```
Main Menu
2  SCSI  Params
```

13.   Press 'Select' button.

```
2  SCSI  Params
21  Set  SCSI  ID
```
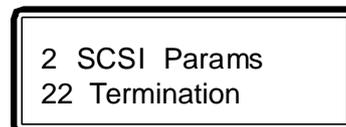
14.   Press ' ' or ' ' to select which SCSI ID you want to select and press 'select' button to confirm.

```
21  Set  SCSI  ID
0
```

Note:
By default, subsystem is preset SCSI ID with 0.

15.   You will return to the SCSI Params menu, press ' ' or ' ' and 'Select' button to enter "Termination".

```
2  SCSI  Params
22  Termination
```

16. In the Termination menu, press ' ' key to select Enable or Disable and press 'Select' button to confirm. If the subsystem will be the last SCSI device, disable this function.

```
22  Termination
DISABLE
```

17. You will return to the SCSI Params menu, press ' ' or ' ' and 'Select' button to enter "Tag Queueing".

```
2  SCSI  Params
23  Tag  Queueing
```

18. In the Tag Queueing menu, press ' ' key to select Enable. When enable, the SCSI channel is able to queue SCSI connect.

```
23  Tag  Queueing
ENABLE
```

Warning:
Do not leave main menu before you save your change.

19. Press 'Exit' button to return to the Main Menu,Press ' ' or ' ' and 'select' button to "NVRAM".

```
Main Menu
5  NVRAM
```

20. Press 'Select' button.

```
5  NVRAM
51  Update  NVRAM
```

21.   In the Update NVRAM menu, select Yes.

```
51 Update NVRAM
YES
```

22.   You will return to the NVRAM menu.Slect Restart.

```
5  NVRAM
53 Restart
```

23.   In the Restart menu, select Yes. Your subsystem will restart and
      initialize.

```
53  Restart
YES
```

4.5 Changing the Host Channel's SCSI ID

If you discovered that the SCSI ID you selected earlier has been used by a
device in the same SCSI bus, you can change the SCSI ID by following the
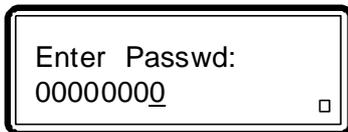steps below.

```
{Model Name}
OOOOOOOO  R5 ID:0 □
```

1.   Press 'Select' button from front panel and system will prompt you to
      enter the password.

```
┌─────────────────────────┐
│ Enter Passwd:           │
│ 0                       │
│                      □  │
└─────────────────────────┘
```
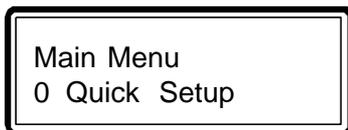
2. Press ' ' or ' ' and 'Select' button to enter the system password. If you did not change the system default password please enter the default password eight zero '00000000' to enter the main menu.
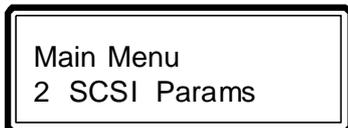
```
┌─────────────────────────┐
│ Enter  Passwd:          │
│ 00000000                │
│                      □  │
└─────────────────────────┘
```

3. The main menu appear.

```
┌─────────────────────────┐
│ Main Menu               │
│ 0  Quick  Setup         │
└─────────────────────────┘
```

4. Press ' ' button to select "SCSI Params".

```
┌─────────────────────────┐
│ Main Menu               │
│ 2  SCSI  Params         │
└─────────────────────────┘
```

5. Press 'Select' button.
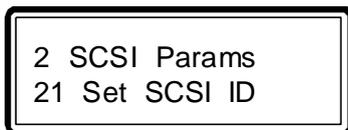
```
┌─────────────────────────┐
│ 2  SCSI  Params         │
│ 21  Set  SCSI  ID       │
└─────────────────────────┘
```

6. Press ' ' or ' ' to select which SCSI ID you want to select and press 'select' button to confirm. The SCSI ID that selected in the example below is 2.
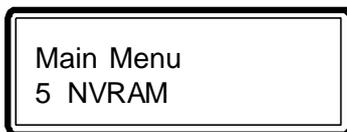
```
┌─────────────────────────┐
│ 21  Set  SCSI  ID       │
│ 2                       │
└─────────────────────────┘
```
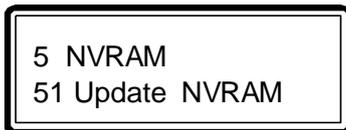
Warning:
Do not leave main menu before you save your change.

7. Press 'Exit' button to return to the Main Menu, press ' ' or ' ' and 'select' button to "NVRAM".

```
Main Menu
5 NVRAM
```

8. Press 'Select' button.

```
5 NVRAM
51 Update NVRAM
```

9. In the Update NVRAM menu, select Yes.

```
51 Update NVRAM
YES
```
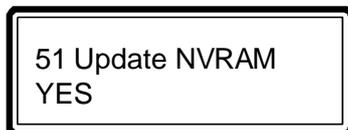
10. You will return to the NVRAM menu.Slect Restart.

```
5 NVRAM
53 Restart
```

11. In the Restart menu, select Yes. Your subsystem will restart.
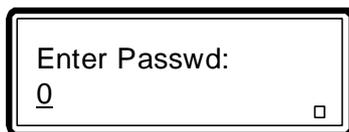
```
53 Restart
YES
```

4.6 Erasing an Exiting Configuration

```
{Model Name}
OOOOOOOO  R5 ID:0 □
```

1. Press 'Select' button from front panel and system will prompt you to enter the password.

```
Enter Passwd:
0               □
```

2. Press ' ' or ' ' and 'Select' button to enter the system password. If you did not change the system default password please enter the default password eight zero '00000000' to enter the main menu.

```
Enter Passwd:
00000000        □
```

3. The main menu appear.

```
Main Menu
0  Quick  Setup
```

4.   Press ' ' button to select "NVRAM".

```
Main Menu
5  NVRAM
```

5.   Press ' ' button to select "Erase NVRAM".

```
5  NVRAM
52  Erase NVRAM
```

6.   In the Erase NVRAM menu, select Yes.

```
52  Erase NVRAM
YES
```

7.   You will return to the NVRAM menu. Slect Restart.

```
5  NVRAM
53  Restart
```
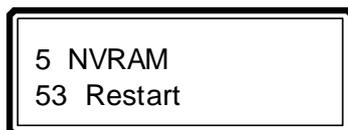
8.   In the Restart menu, select Yes. Your subsystem will restart.

```
53 Restart
YES
```

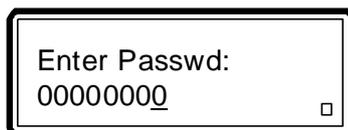## 4.7 Formatting Hard Drives

```
{Model Name}
OOOOOOO  R5 ID:0 □
```

1. Press 'Select' button from front panel and system will prompt you to enter the password.
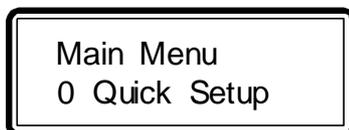
```
Enter Passwd:
0                    □
```

2. Press ' ' or ' ' and 'Select' button to enter the system password. If you did not change the system default password please enter the default password eight zero '00000000' to enter the main menu.
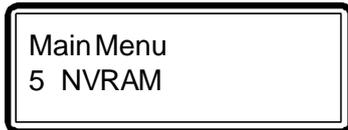
```
Enter Passwd:
0000000O          □
```
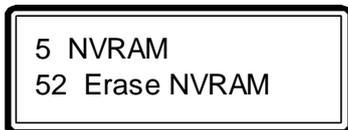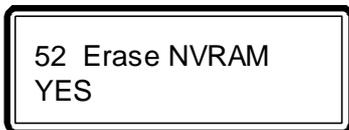
3. The main menu appear.

```
Main Menu
0 Quick Setup
```

4.   Press ' ' button to select 'RAID Funcs'.

```
Main Menu
6 RAID Funcs
```
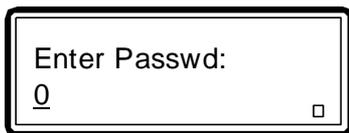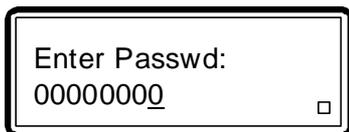
5.   Press ' ' button to select "Format Disk".

```
6  RAID Funcs
61   Format Disk
```
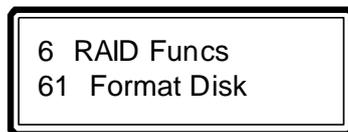
6.   In the Format Disk menu, select the hard drive you want to format. If you wish to format all the hard drives in your subsystem, select Format All. The hard drive that was selected in the example below is the drive in the first slot.

```
61  Format Disk
611   Format Disk1
```
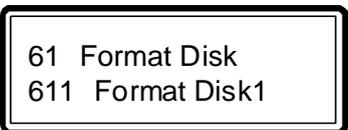
7.   In the Format Disk1 menu, select Start.

```
611  Format Disk1
START
```
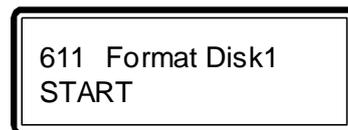
8.   Press 'Exit' button to return to the Main Menu, press ' ' or ' ' and 'select' button to "NVRAM".

```
Main Menu
5  NVRAM
```
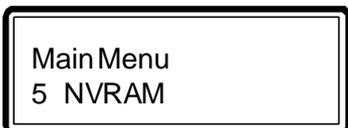
9.   Press 'Select' button.

```
5  NVRAM
51  Update  NVRAM
```

10.   In the Update NVRAM menu, select Yes.

```
51  Update NVRAM
YES
```

4.8   Configuring the Terminal

```
{Model Name}
OOOOOOOO  R5 ID:0 □
```

1.   Press 'Select' button from front panel and system will prompt you to
enter the password.

```
Enter Passwd:
0                    □
```

2.   Press ' ' or ' ' and 'Select' button to enter the system password. If you
did not change the system default password please enter the default
password eight zero '00000000' to enter the main menu.

```
Enter Passwd:
00000000            □
```

3.   The main menu appear.

```
Main Menu
0 Quick Setup
```
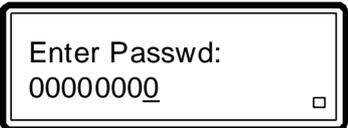
4.   Press ' ' button to select "RS232 Params".

```
Main Menu
3 RS232 Params
```

5.   Press ' ' button to select "Terminal Port".

```
3 RS232 Params
32 Terminal Port
```

6.   In the Terminal Port menu, select "Baud Rate".
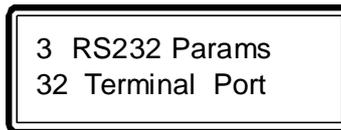
```
32 Terminal Port
321 Baud Rate
```
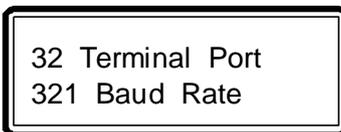
7.   In the Baud Rate menu, select the baud rate of your terminal.

```
321 Baud Rate
19200
```

8.   You will return to the Terminal Port menu. Select "Stop Bit".

```
32 Terminal Port
322 Stop Bit
```
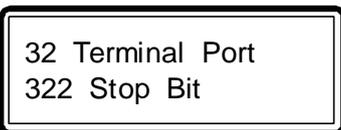
9. In the Stop Bit menu, select the appropriate stop bit.

```
322 Stop Bit
1
```

10. You will return to the Terminal Port menu. Select "Data Bit".

```
32  Terminal  Port
323  Data  Bit
```

11. In the Data Bit menu, select the appropriate stop bit.

```
323  Data  Bit
8
```

12. You will return to the Terminal Port menu. Select "Parity".

```
32  Terminal  Port
324  Parity
```

13. In the Parity menu, select ODD, EVEN or NONE.

```
324 Parity
NONE
```

14. Press 'Exit' button to return to the Main Menu, press ' ' or ' ' and 'select' button to "NVRAM".

```
MainMenu
5 NVRAM
```

15. Press 'Select' button.
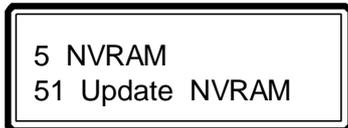
```
5  NVRAM
51  Update  NVRAM
```

16. In the Update NVRAM menu, select Yes.
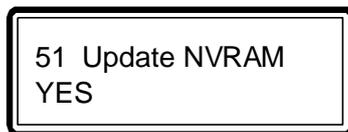
```
51  Update NVRAM
YES
```

4.9 Setting a Password

Warning:
Do not forget revised password after you change it.

```
{Model Name}
OOOOOOO  R5 ID:0 □
```

1. Press 'Select' button from front panel and system will prompt you to enter the password.

```
Enter Passwd:
0                    □
```

2. Press ' ' or ' ' and 'Select' button to enter the system password. If you did not change the system default password please enter the default password eight zero '00000000' to enter the main menu.
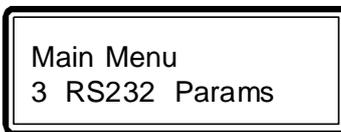
```
Enter Passwd:
0000000 0           □
```

3.   The main menu appear.

```
Main Menu
0 Quick Setup
```
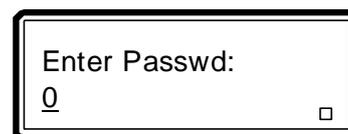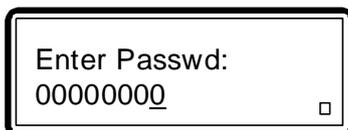
4.   Press ' ' button to select "System Params"'.

```
Main Menu
4  System  Params
```

5.   Press ' ' button to select 'Terminal Port'.

```
4  System  Params
41  Passwd  Info
```

6.   In the Passwd Info menu, select "Passwd Check".

```
41  Passwd  Info
411  Passwd  Check
```

7.   In the Passwd Check menu, select "Enable".

```
411  Passwd  Check
ENABLE
```

8.   You will return to the Passwd Info menu. Select "Set Passwd".

```
42  Passwd  Info
412  Set  Passwd
```

9.   In the Set Passwd menu, enter your password .

```
412 Set Passwd
0
```

10.   Press 'Exit' button to return to the Main Menu, press ' ' or ' ' and
      'select' button to "NVRAM".

```
Main Menu
5 NVRAM
```

11.   Press 'Select' button.

```
5 NVRAM
51 Update NVRAM
```

12.   In the Update NVRAM menu, select Yes.

```
51 Update NVRAM
YES
```

4.10 R5(RAID Level 5) / R3(RAID Level 3) Consistency Check

This function is used to verify the integrity of the initialized RAID system.

```
{Model Name}
OOOOOOO  R5 ID:0
```

1.   Press 'Select' button from front panel and system will prompt you to
      enter the password.

```
┌─────────────────────────┐
│ Enter Passwd:           │
│ 0                       │
│                    □    │
└─────────────────────────┘
```

2. Press ' ' or ' ' and 'Select' button to enter the system password. If you did not change the system default password please enter the default password eight zero '00000000' to enter the main menu.

```
┌─────────────────────────┐
│ Enter Passwd:           │
│ 00000000                │
│                    □    │
└─────────────────────────┘
```

3. The main menu appear.

```
┌─────────────────────────┐
│ Main Menu               │
│ 0 Quick Setup           │
│                         │
└─────────────────────────┘
```

4. **Press** ' ' button to select "RAID Funcs".

```
┌─────────────────────────┐
│ Main Menu               │
│ 6  RAID Funcs           │
│                         │
└─────────────────────────┘
```
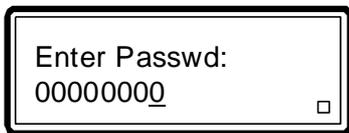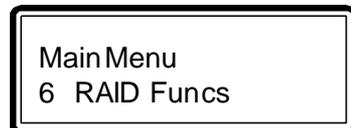
5. Press ' ' button to select "R5 / R3 Chcek".
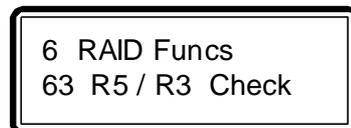
```
┌─────────────────────────┐
│ 6  RAID Funcs           │
│ 63 R5 / R3  Check       │
│                         │
└─────────────────────────┘
```

6. In the R5 / R3 Check menu, select START.
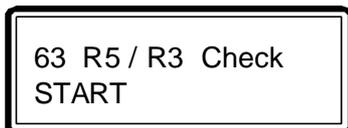
```
┌─────────────────────────┐
│ 63 R5 / R3  Check       │
│ START                   │
│                         │
└─────────────────────────┘
```

Chapter 5

RAID Environment Controller

5.1 Front Panel of the Environment Controller

The environment controller accurately monitors the internal environment of the subsystem such as the power supplies, temperature, voltage and cooling fans. This ensures high performance and reliability of the subsystem. When an abnormal condition occurs, the "Alarm" LED will turn red and an alarm will sound. You will also see an error message appear in the LCD screen. Press the "Alarm Reset" button to stop the alarm.
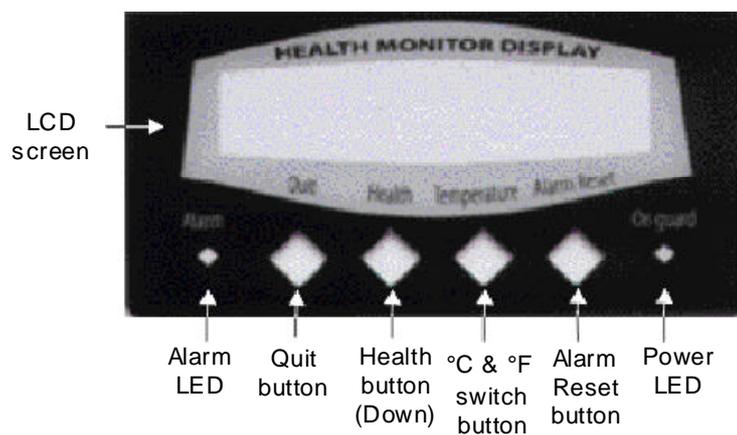
Parts	Function
LCD screen	The LCD screen displays the internal environment of the sub-system such as the power supplies, temperature, voltage and cooling fans.
Quit button	Press this button to return to the previous menu.
Health button (Down)	Use this button to go through the information on the LCD screen.
°C & °F switch button	Use this button to switch °C & °F temperature display. $°F=32°+°C * (9 / 5)$
Power LED	When the subsystem is powered on, this LED will turn green.
Alarm LED	When an abnormal condition occurs, this LED will turn red and an alarm will sound.
Alarm Reset button	Press this button to stop the alarm.

5.2 Monitoring RAID Environment

After configuring the subsystem, the screen on the RAID Environment Controller LCD panel will show the following message.
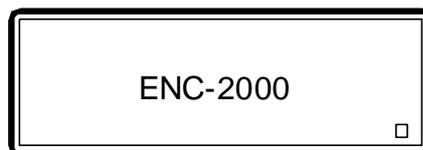
```
┌─────────────────────────┐
│                         │
│       ENC-2000           │
│                         │
│                      □   │
└─────────────────────────┘
```

" □ " moving up and down at the lower right corner of the screen indicates that the subsystem is functioning normally. If it is not moving, something must be wrong with the subsystem.

1. Press the "Health" button to enter HDD detection. The screen will apear as shown below after the hard drives have been detected.

```
HDD  S1 S2 S3 S4
      O  N  F  N
```

The characters on the second line of the screen denote the status of the hard drives installed in subsystem. The first character refers to the first drive, the second character refers to the second drive and so on.

   "N" : No hard drive is installed in the slot.
   "O" : The hard drive is on-line or operational.
   "F" : The hard drive is fail.

2. Press the "Health" button to enter other HDD detection.

```
HDD  S5 S6 S7 S8
      O  N  F  N
```

3. Press the "Health" button to enter power supply monitor .

```
POWR 1 2 3 4 5 6
        O F N N N N
```

4. Press the "Health" button to enter FAN monitor .

```
FAN1   3000  rpm
FAN2   3000  rpm
```

Note:
When Fan's rotation speed lower than 1200rpm, the "Alarm" LED will turn red and an alarm will sound.

5. Press the "Health" button to enter other FAN monitor .

```
FAN3   3000  rpm
FAN4   3000  rpm
```

6. Press the "Health" button to enter other FAN monitor .

```
FAN5   3000  rpm
FAN6   3000  rpm
```

7. Press the "Health" button to enter HDD temperature monitor .

```
┌─────────────────────────┐
│ ┌─────────────────────┐ │
│ │ ▫  S1   S2   S3   S4 │ │
│ │ C  40   42   39   38 │ │
│ └─────────────────────┘ │
└─────────────────────────┘
```

8. Press the "Health" button to enter other HDD temperature monitor .

```
┌─────────────────────────┐
│ ┌─────────────────────┐ │
│ │ ▫  S5   S6   S7   S8 │ │
│ │ C  27   22   19   23 │ │
│ └─────────────────────┘ │
└─────────────────────────┘
```

Note:
When an abnormal condition occurs (such as HDD temperature over 55°C / 131°F), the "Alarm" LED will turn red and an alarm will sound. You will also see an error message "Er" appear on the second line of the LCD screen. Press the "Alarm Reset" button to stop the alarm.

5.3 RAID Environment Controller's Error Message

1. The internal temperature of the subsystem has overheated.

```
┌─────────────────────────┐
│ ┌─────────────────────┐ │
│ │ >>  TEMP : 1  <<     │ │
│ │ !!!!   ALARM   !!!   │ │
│ └─────────────────────┘ │
└─────────────────────────┘
```

2.   The subsystem has detected power failure.

```
>> POWER : 1  <<
!!!!   ALARM   !!!
```

3.   The subsystem has detected FAN failure.

```
>>   FAN : 1   <<
!!!!   ALARM   !!!
```

Chapter 6

Configuring Faxes and Pagers

Before going on, make sure the modem is properly connected to the serial modem port at the rear of the subsystem.

6.1 Configuring the Fax

The subsystem supports two fax numbers. In case a hard drive fails to function, a message will be transmitted to the fax machine informing you that a problem has arised. You can set the number of times it will retry, in case the line is busy.

1. In the Main Menu, select RS232 Params.

Main Menu
3   RS232 Params

2.   In the RS232 Params menu, select MODEM Port.


```
3  RS232 Params
31 MODEM Port
```

3.   In the MODEM Port menu, select Baud Rate.

```
31 MODEM Port
311 Baud Rate
```

4.   In the Baud Rate menu, select the baud rate of your modem.

```
311 Baud Rate
19200
```

5.   Your will return to the MODEM Port menu. Select Stop Bit.

```
31 MODEM Port
312 Stop Bit
```

6.   In the Stop Bit menu, select the appropriate stop bit.

```
312 Stop Bit
1
```

7.   You will return to the MODEM Port menu. Select Data Bit.

```
31 MODEM Port
313 Data Bit
```

8.   In the Data Bit menu, select the appropriate data bit.

```
313 Data Bit
8
```

9.   You will return to the MODEM Port menu. Select Parity.

```
31 MODEM Port
314 Parity
```

10.   In the Parity menu, select ODD, EVEN or NONE.

```
314 Parity
NONE
```

6.2 Configuring the Pager

The subsystem supports two pager numbers. In case a hard drive fails to function, the pager will "beep" informing you that a problem has arised. You can set the number of times the pager will page you and the time interval between each page.

1.   In the Main Menu, select System Params.


```
Main Menu
4   System Params
```

2.   In the System Params menu, select Pager Info.


```
4  System Params
42  Pager Info
```

3. In the Pager Info menu, select Paging.

```
42  Pager Info
421  Paging
```

4. In the Paging menu, select Enable.

```
421  Paging
ENABLE
```

5. You will return to the Pager Info menu. Select Pager1 No.

```
42  Pager Info
422  Pager1 No.
```

6. In the Pager1 No. menu, select Tel No.

```
422  Pager1 No.
4221 Tel No.
```

7. In the Tel No. menu, type-in the pager number. You can enter up to 16 characters.

```
4221  Tel No.
0
```

8. You will return to the Pager1 No. menu. Select pin No.

```
422  Pager1 No.
4222  Pin No.
```

9. In the Pin No. menu, type-in the pin number. You can enter up to 16 characters.

```
4222  Pin  No.
0
```

10. Press "Exit" to return to the Pager info menu. If you wish to enter another pager number, select Pager2 No.

```
42  Pager Info
423  Pager2 No.
```

11. In the Pager2 No. menu, select Tel No.

```
423   Pager2 No.
4231 Tel No.
```

12. In the Tel No. menu, type-in the pager number. You can enter up to 16 characters.

```
4231  Tel No.
0
```

13. You will return to the Pager2 No. menu. Select pin No.

```
423  Pager2 No.
4232  Pin No.
```

14. In the Pin No. menu, type-in the pin number. You can enter up to 16 characters.

```
4232  Pin No.
0
```

15. Press "Exit" to return to the Pager info menu. Select Code.

```
42  Pager Info
424  Code
```

16. The Code menu allows you to enter 2 messages. To enter the first message, select Part 1.

```
424  Code
4241  Part  1
```

17. In the Part 1 menu, type-in your message (code) by entering a maximum of 16 alphanumeric characters.

```
4241  Part  1
0
```

18. You will return to the Code menu. If you wish to enter a second message, select Part 2.

```
424  Code
4242  Part  2
```

19. In the Part 2 menu, type-in your message (code) by entering a maximum of 16 alphanumeric characters.

```
4242  Part  2
0
```

20. Press "Exit" to return to the Pager info menu. Select Repeat #.

```
42  Pager Info
425  Repeat #
```

21. The Repeat # menu, select the number of times you would like to "page" the number.

```
425  Repeat #
5
```

22. You will return to the Pager info menu. Select interval.

```
42  Pager Info
426  Interval
```

23. In the Interval menu, select the time interval (in minutes) between each page.

```
426  Interval
5
```

24. You will return to the Pager info menu. Select Page Now. This is to check whether your page number is correct and that your pager is working normally
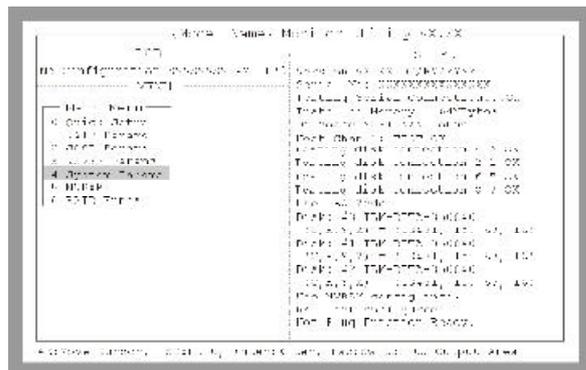
```
42  Pager Info
427  Page Now
```

6.3 Configuring Your FAX

Your subsystem supports two FAX numbers. In case a hard drive fails to function, a message will be transmitted to your FAX machine informing you that a problem has arised. You can set the number of times it will retry, in case the line is busy.

1. In the Main Menu, select System Params.

```
Main Menu
4  System Params
```

2.   In the System Params menu, select FAX info.

```
4  System Params
43  FAX  Info
```

3.   In the FAX Info menu, select FAX.

```
43  FAX  Info
431  FAX
```

4.   In the FAX menu, select Enable.

```
431  FAX
ENABLE
```

5.   You will return to the FAX Info menu. Select FAX1 No.

```
43  FAX  Info
433  FAX1  No.
```

6.   In the FAX1 No. menu, type-in the FAX number. You can enter up to 16 characters.

```
433  FAX1  No.
0
```

7.   You will return to the FAX Info menu. If you wish to enter another FAX number, select FAX2 No.

```
43  FAX  Info
434  FAX2 No.
```

8. In the FAX2 No. menu, type-in the FAX number. You can enter up to 16 characters.

```
434  FAX2 No.
0
```

9. You will return to the FAX Info menu. Select Retry #.

```
43  FAX  Info
435  Retry  #
```

10. The Rerty # menu, select the number of times you would like to retry transmitting the fax.

```
435  Retry#
5
```

11. You will return to the FAX info menu. Select FAX Now. This is to check whether your FAX number is correct and that the FAX machine is working normally

```
43  FAX  Info
436  FAX Now
```

12. You will return to System Params menu. Select Company Info.

```
4  System Params
44  Company  Info
```

13. The Company Info menu allows you to enter 2 company information. To enter the first company information, select String 1.

```
44  Company Info
441  String  1
```

14. In the String 1 menu, enter the company information.

```
441  String  1
0
```

15. You will return to the Company Info menu. To enter the second company information, select String 2.

```
44  Company  Info
442  String 2
```

16. In the String 2 menu, enter the company information.

```
442  String  2
0
```

Chapter 7

Upgrading the Firmware

The subsystem allows you to upgrade the firmware.

To upgrade the firmware, please follow the steps below.

1. In the Main Menu, select RAID Funcs.

2.   In the RAID Funcs menu, select Update ROM.

3.   Press <Enter>. The following will appear.

4. Type <Y>. The following message will appear.

```
Before downloading the new firmware,
shutdown the host computer system.
Are you ready to download the new firmware?(Y/N) Y
Are you sure? (Y/N)
```

5. Double confirm to type <Y>. The following message will appear.

```
Before downloading the new firmware,
shutdown the host computer system.
Are you ready to download the new firmware?(Y/N) Y
Are you sure? (Y/N) Y
Begin firmware file transfer now.
To abort download restart the RAID system.
```

6. In the terminal program's menu bar, select Transfer menu.

7. The Transfer scroll-down menu will appear. Select Send Text File.

8. The Send Text File dialog box will appear. Select the drive and file where the new firmware is located and click Open.

9. After the file has been completely transmitted.

```
Before downloading the new firmware,
shutdown the host computer system.
Are you ready to download the new firmware?(Y/N) Y
Are you sure? (Y/N) Y
Begin firmware file transfer now.
To abort download restart the RAID system.
BB054P00
File transfer complete.
Checksum = 0x8E78 : OK.
New firmware transfer complete.
Enter 'Go' to update the firmware.
```

10. Type <Go>. This word is case senstive.


```
Before downloading the new firmware,
shutdown the host computer system.
Are you ready to download the new firmware?(Y/N) Y
Are you sure? (Y/N) Y
Begin firmware file transfer now.
To abort download restart the RAID system.
BB054P00
File transfer complete.
Checksum = 0x8E78 : OK.
New firmware transfer complete.
Enter 'Go' to update the firmware. Go
Enter 'Go' to reconfirm.
```

11. You will be asked to reconfirm. Type <Go> again.

12. The subsystem will restart.

Appendix A

Internal Structure of the RAID Environment Controller
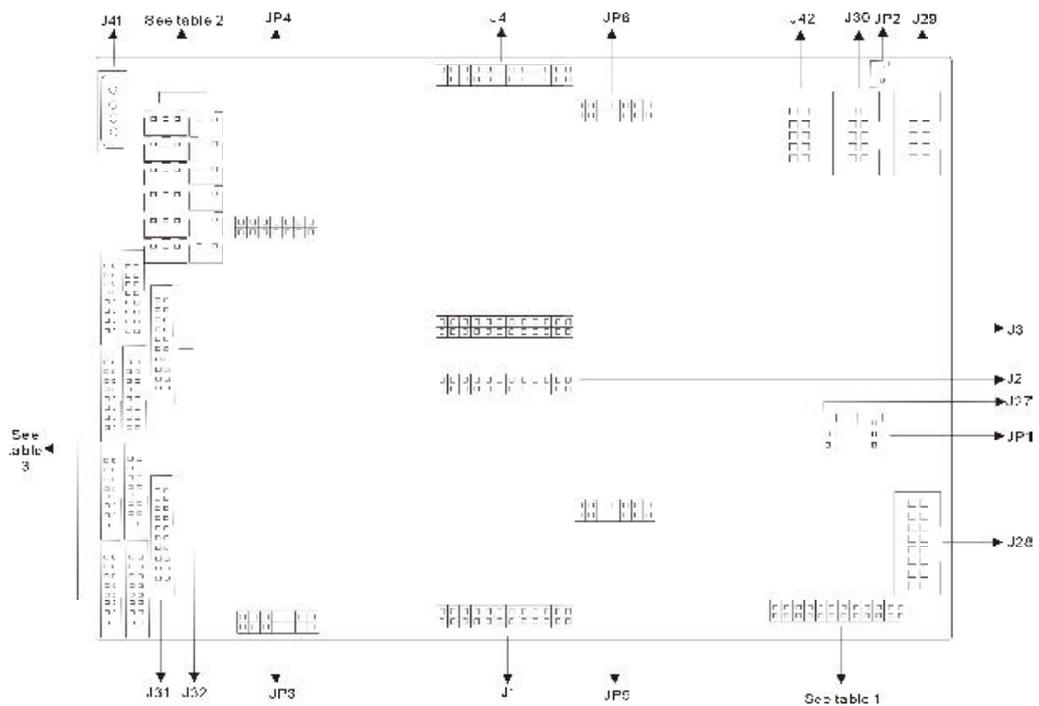
Connector	Description
J1, J2	SAF-TE GEM354 Interface Channel 1
J3, J4	SAF-TE GEM354 Interface Channel 2
JP3, JP4	SAF-TE GEM318 Interface Channel 1
JP5, JP6	SAF-TE GEM318 Interface Channel 2
J42	UPS Port.
J30	RS-232.
JP2	Connector for the power supply's alarm reset.
J29	Connector for the button switch on front panel.
J27	I2C Channel 1.
JP1	I2C Channel 2.
J28	Connector for the LCD display on the front panel.
J41	Power connector.
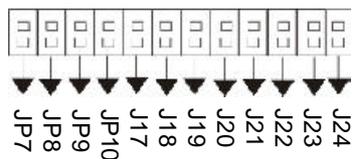
Pin Header	Description
JP7 - JP10	I2C enable from Daughter Board
J17 - J19	Number of Fan Install
J20 - J22	Number of Power Install
J23 - J24	Reserve

Table 1

J17-19: Number of Fan Install

	J17	J18	J19
Detect 1 Fan	Short	Open	Open
Detect 2 Fan	Open	Short	Open
Detect 3 Fan	Short	Short	Open
Detect 4 Fan	Open	Open	* Short
Detect 5 Fan	Short	Open	Short
Detect 6 Fan	Open	Short	Short

" * " : Default

J20-J22: Number of Power Supply Install

	J20	J21	J22
Detect 1 power	Short	Open	Open
Detect 2 power	Open	* Short	Open
Detect 3 power	Short	Short	Open
Detect 4 power	Open	Open	Short
Detect 5 power	Short	Open	Short
Detect 6 power	Open	Short	Short

" * " : Default

```
J5  ◄──  ┌ ┌ ┌ │ □ □  ──►  J11
J6  ◄──  │ ┌ ┌ │ □ □  ──►  J12
J7  ◄──  ┌ ┌ ┌ │ │ │  ──►  J13
J8  ◄──  □ □ □ │ □ □  ──►  J14
J9  ◄──  │ □ □ □ □ □  ──►  J15
J10 ◄──  │ □ □ □ □ □  ──►  J16
```
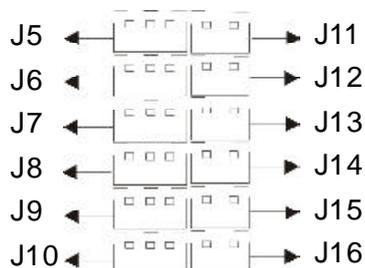
Connector	Description	Connector	Description
J5	Connector for Fan 1	J11	Connector for Power 1
J6	Connector for Fan 2	J12	Connector for Power 2
J7	Connector for Fan 3	J13	Connector for Power 3
J8	Connector for Fan 4	J14	Connector for Power 4
J9	Connector for Fan 5	J15	Connector for Power 5
J10	Connector for Fan 6	J16	Connector for Power 6

Table 2
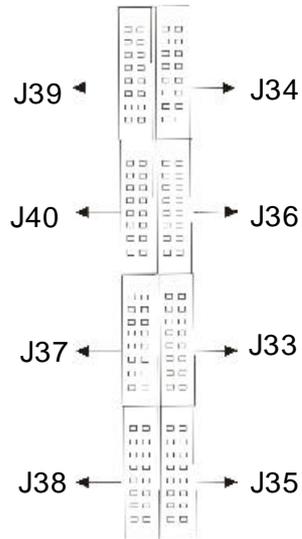
Connector	Description
J38	Fault bus channel 1 slot 1-4
J35	Fault bus channel 1 slot 5-8
J33	Fault bus channel 1 slot 9-12
J37	Fault bus channel 1 slot 4-6
J40	Fault bus channel 2 slot 1-4
J36	Fault bus channel 2 slot 5-8
J34	Fault bus channel 2 slot 9-12
J39	Fault bus channel 2 slot 4-6

Table 3