Chapter 3

System Monitoring

3.1 Overview

This chapter instructs users on how to monitor their Suma RAID subsystem. LEDs, 3-Audible Alarms, 3-Firmware and Software can all be used to monitor the status of the Suma RAID subsystem.

3.2 System Monitoring

The system can be monitored in four different ways:

- ***Firmware***: - using the front panel LCD screen or the PC Hyper-Terminal program. – See ***Section 3.3***.

- ***LEDs***: - the drive trays, 3-LCD panel, 3-controller modules, 3-cooling FAN modules and PSUs all have status indicating LEDs. These LEDs are used to inform the end user about different system information. - See ***Section 3.4***.

- ***Software***:- using a GUI called RAIDWatch. - See ***Section 3.5***

- ***Notification Processing Center (NPC):-*** The NPC is a powerful module that can, 3-itself, 3-be installed redundantly on different hosts. It is used for event notification over Email, 3-fax, 3-LAN broadcast, 3-SNMP traps, 3-etc. – See ***Section 3.6***.

- ***Audible Alarm***: - an audible alarm will be triggered when certain system thresholds are violated. The alarm notifies, 3-alerts or warns users about different events. - See ***Section 3.7***.

3.3 Firmware

The firmware is pre-installed on the controller boards. It is used to both configure the subsystem and access system information. Both the front panel LCD screen and a PC terminal can access it. Using the Firmware to configure and monitor the system has been fully described in the ***"Generic Operation Manual***" that came with your system. Please refer to this manual for further information.

3.4 System LEDs

3.4.1 Controller Module LEDs

Controller module LEDs are shown in ***Figure 3- 1*** and ***Figure 3- 2*** below. ***Figure 3- 1*** shows the LEDs for the controller module found in single controller subsystems and ***Figure 3- 2*** shows the LEDs that are found on the controller modules on the dual-redundant controller subsystems. Definitions for the different controller LEDs are given below.

NOTE:
*In **Figure 3- 1** and **Figure 3- 2** the LEDs can be found on the left of the controller module marked **A, 3-B** and/or **C**. Other LEDs can be found towards the center of the controller module and these are marked numerically from **1** to **6**.*

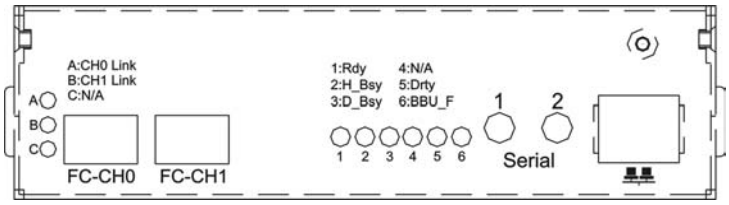

Figure 3- 1: Single Controller Module LED Definitions

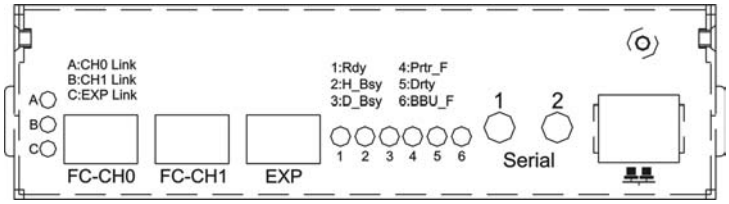

Figure 3- 2: Dual-Redundant Controller Module LED Definitions

- **1. CONTROLLER READY** – *Green*

ON	Indicates controller is active and operating properly.
FLASHING	Controller Initialization is taking place.
OFF	Controller is not ready for operation.

- **2. FC HOST PORTS ACTIVE** – *Green*

FLASHING	Activity on the FC Host Ports.
OFF	No activity on the FC Host Ports.

- **3. SATA DEVICE PORTS** – *Green*

FLASHING	Activity on the SATA Drive Ports.
OFF	No activity on the SATA Drive Ports.

- **4. PARTNER FAILED** – *Amber*

  Note:- *This LED is only available on the Redundant Controller Subsystems.*

ON	This indicates that the partner controller has failed.
OFF	This indicates that the partner controller is operating properly.

- **5. CACHE DIRTY** – *Amber*

ON	The cache memory is dirty and is being held up via the BBU.

- **6. BBU FAULT**– *Amber*

ON	The BBU cannot sustain the cache memory.
OFF	The BBU is able to sustain the cache memory.
SLOW FLASH	The BBU is charging

- **A. CH0 LINK –** Green

ON	Channel 0 link has been established
OFF	Channel 0 link has not been established or has been cut off.

- **B. CH1 LINK –** Green

ON	Channel 1 link has been established
OFF	Channel 1 link has not been established or has been cut off.

- **C. EXP LINK –** Green

Note:- *This LED is only available on the Redundant Controller Subsystems.*

ON	Expansion port link has been established
OFF	Expansion port link has not been established or has been cut off.

3.4.2 LCD Panel

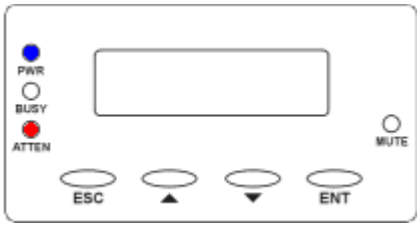

Figure 3- 3: LCD Panel

The LCD Panel shown in ***Figure 3- 3*** comes with three LEDs that are used to monitor the status of the system. The definitions of these LEDs are given below.

- **POWER** – *Blue*

ON	Power On
OFF	No Power

- **BUSY** – *White*

ON	Host/Drive Channel Busy
OFF	No activity

- **ATTENTION** – *Red*

ON	Turns on when there are any component failure/status events

	component failure/status events detected by the firmware.
OFF	No status events detected by the firmware

3.4.3 Drive Tray – Single Controller Model

- **DRIVE BUSY** – *Blue LED*

ON	Indicates read/write activity on the drive.
OFF	Drive Fault

- **POWER STATUS** – *Green/Red*

GREEN	There is power.
RED	No Power

3.4.4 Drive Tray – Redundant Controller Model

- **DRIVE BUSY** – *Blue/White LED*

BLUE	The primary controller is reading/writing to the drive.
WHITE	The secondary Controller is reading/writing to the drive.
OFF	Indicates there is no read/write activity on the drive.

- **POWER STATUS** – *Green/Red*

GREEN	There is power.
RED	No Power

3.4.5 PSU LEDs

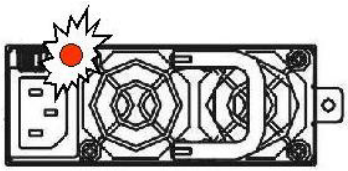

Figure 3- 4: PSU LED

Each PSU comes with a single LED at the back (see ***Figure 3- 4***). The LED is located just above the socket where the power cable connects. When the LED is **RED** it indicates that the PSU has failed. When the LED is **GREEN** it indicates that the PSU is functioning properly.

3.4.6 Cooling module LEDs

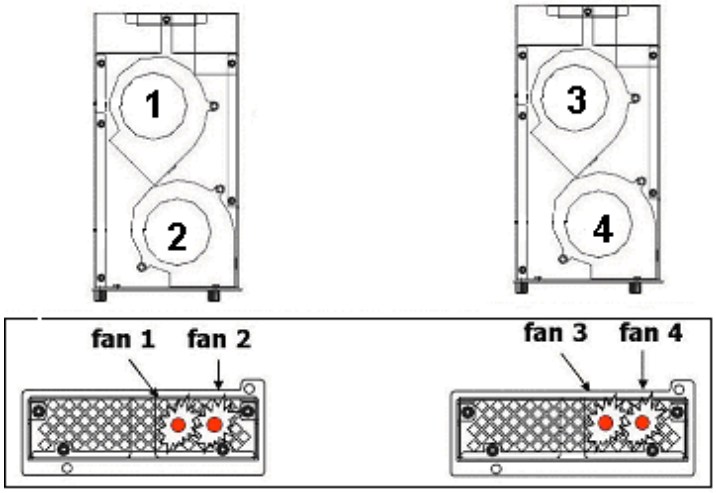

Figure 3- 5: Cooling FAN Module LEDs and cooling FAN locations

The cooling FAN modules each have two red LEDs on the back. Each LED corresponds to a single fan in the cooling FAN module (see ***Figure 3- 5***). When the LED is **ON** it indicates that the fan has failed. When the LED is **OFF** it indicates that the fan is functioning properly.

3.5 RAIDWatch Manager

The RAIDWatch Manager enables users to manage and maintain the RAID Controllers using their web browsers. Ethernet ports at the back of each controller module enable users to use LAN cables to connect to the Suma subsystem.

Detailed installation instructions for the RAIDWatch Manager are given in ***Appendix B*** and in the ***RAIDWatch User's Manual***.

NOTE:
The RAIDWatch User Manual can be found on the CD that came with the system. To access the RAIDWatch User's Manual please refer to this file.

3.6 Notification Processing Center (NPC)

The NPC is a powerful module that runs as a background ***Disk and Executive Monitor*** (DAEMON) independent from RAIDWatch that can, 3-itself, 3-be installed redundantly on different hosts. It is used for event notification over Email, 3-fax, 3-LAN broadcast, 3-SNMP traps, 3-etc. It helps to prevent blind time and keeps a user constantly informed as to the status of the storage management subsystem. Installation instructions for the NPC are given in ***Appendix B*** and in the ***RAIDWatch User's Manual***.

3.7 Audible Alarm

Whenever any of the threshold values assigned to the different controllers are violated or when an active device in the Suma subsystem fails an audible alarm will be triggered. To determine what has triggered the alarm the user will have to read the error message on the LCD screen or on the PC terminal.

WARNING:
If an alarm is triggered it is necessary for the user to determine the problem. If the audible alarm is ignored or not taken seriously and the problem is not rectified, 3-permanent damage to the system can result.

3.7.1 Default Threshold Values

The following table, 3-***Table 3- 1***, 3-shows the default threshold values for the Suma subsystem. If any of these values are surpassed the alarm will sound:

	Upper Threshold	***Lower Threshold***
+3.3V	+3.6V	+2.9V
+5V	+5.5V	+4.5V
+12V	+13.2V	+10.8V
CPU Temperature	90ºC	0ºC
Board Temperature	90ºC	0ºC

Table 3- 1: Default Threshold Values

The thresholds in ***Table 3- 1*** are the default threshold values. The user can change these values. To see how to change these values please refer to the ***Generic Operation Manual*** that came with your system.

3.7.2 Failed Devices

If any of the following devices fail the audible alarm will be triggered.

- RAID Controller Modules
- Cooling Fan Modules
- PSU Modules

- BBU Modules
- Hard Drives

3.8 I^2C Monitoring

The PSU modules and the cooling FAN modules are monitored using I^2C. If either of these modules fail, 3-the failure will be detected and the user notified through the various methods described above.

audible alarm, 3-2, 3-10, 3-11
audible alarms, 3-1

controller head, 3-11
cooling FAN modules, 3-9

ethernet port, 3-9

firmware, 3-1, 3-2

Generic Operation Manual, 3-2, 3-11

GUI, 3-1

I^2C, 3-12

LCD panel, 3-1, 3-6
LED, 3-1

NPC, 3-1, 3-10

PSU, 3-8

RAIDWatch, 3-1, 3-9, 3-10
RAIDWatch User's Manual, 3-10

CHAPTER 3: SYSTEM MONITORING..... 3-1

3.1 OVERVIEW..... 3-1
3.2 SYSTEM MONITORING 3-1
3.3 FIRMWARE..... 3-2
3.4 SYSTEM LEDS..... 3-2
3.4.1 Controller Module on Single Controller..... 3-2
3.4.2 LCD Panel 3-6
3.4.3 Drive Tray – Single Controller Model..... 3-7
3.4.4 Drive Tray – Redundant Controller Model..... 3-7
3.4.5 PSU LEDs..... 3-8
3.4.6 Cooling module LEDs..... 3-9
3.5 RAIDWATCH MANAGER 3-9
3.6 NOTIFICATION PROCESSING CENTER (NPC)..... 3-10
3.7 AUDIBLE ALARM..... 3-10
3.7.1 Default Threshold Values 3-11
3.7.2 Failed Devices 3-11
3.8 I^2C MONITORING..... 3-12

Figure 3- 1: Controller Module LED Definitions 3
Figure 3- 2: LCD Panel 6
Figure 3- 3: PSU LED 8
Figure 3- 3: Cooling FAN Module LEDs and cooling FAN locations 9