SUPER●®

SuperWorkstation

7037A-IL

USER'S MANUAL

1.0

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperWorkstation 7037A-IL. Installation and maintenance should be performed by experienced technicians only.

The SuperWorkstation 7037A-IL is a high-end system based on the SC732D4F-500B tower/4U rackmount chassis and the X9DAL-i serverboard.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the system and describes the main features of the X9DAL-i serverboard and the SC732D4F-500B chassis.

Chapter 2: Installation

This chapter describes the steps necessary to setup the SuperWorkstation 7037A-IL into a rack and check out the server configuration prior to powering up the system. If your system was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperWorkstation 7037A-IL.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X9DAL-i serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC732D4F-500B chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SAS or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS Error Beep Codes

Appendix B: System Specifications

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Chapter 7 BIOS

Appendix A BIOS Error Beep Codes

Appendix B System Specifications

Chapter 1

Introduction

1-1 Overview

The 7037A-IL is a high-end workstation comprised of two main subsystems: the SC732D4F-500B tower/4U chassis and the X9DAL-i dual Intel® Xeon® processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperWorkstation 7037A-IL (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the SuperWorkstation 7037A-IL, as listed below:

- Two 9-cm PWM "SuperQuiet" chassis fans (FAN-0124L4)

- Optional:
  Two active CPU heatsinks (SNK-P0050AP4)

1-2   Serverboard Features

At the heart of the SuperWorkstation 7037A-IL lies the X9DAL-i, a dual processor serverboard based on the Intel® C602 chipset. Below are the main features of the X9DAL-i. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X9DAL-i supports single or dual Intel E5-2400 processors in LGA 1356 sockets (Socket B2). Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X9DAL-i has six DIMM slots that can support up to 192 GB of RDIMM/UDIMM/ LRDIMM ECC/non-ECC DDR3-1600/1333/1066/800 LRDIMMs (load-reduced DIMMs). See Chapter 5 for details.

SATA

A SATA controller is integrated into the chipset to provide a SATA subsystem that supports RAID 0, 1, 5 and 10 (RAID 5 is not supported with Linux OS). The X9DAL-i supports two SATA 3.0 and eight SATA 2.0 ports.

PCI Expansion Slots

The X9DAL-i has one PCI-E 3.0 x16, three PCI-E 3.0 x4, one PCI-E 3.0 x4 (in a x8 slot) and one PCI-32 slots.

Onboard Controllers/Ports

The rear I/O ports include one COM port, six USB 2.0 ports, a combination PS/2 mouse/keyboard port, two Gb Ethernet ports and six HDA (High Definition Audio) ports.

1-3   Chassis Features

The SC732D4F-500B is mid-tower chassis. The following is a general outline of the main features of the chassis.

System Power

The 7037A-IL features a single 500W power supply. This power supply unit has been designed to operate at a low noise level to make it ideal for use in a workstation environment.

SAS Subsystem

The SC732D4F-500B chassis was designed to support eight SATA hard drives.

Front Control Panel

The control panel on the SuperWorkstation 7037A-IL includes system monitoring LEDs, a main power button and a system reset button. In addition, two IEEE 1394a ports, two USB 2.0 ports, two USB 3.0 ports, one audio port and one microphone port are included on the control panel. See Chapter 3 for details.

Cooling System

The SC732D4F-500B chassis has an innovative "Super Quiet" cooling design that provides sufficient cooling at very low noise level - ideal for a workplace environment. The chassis includes one 12-cm rear exhaust fan and an optional 12-cm front cooling fan.

Figure 1-1. Intel C602 Chipset:
System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.
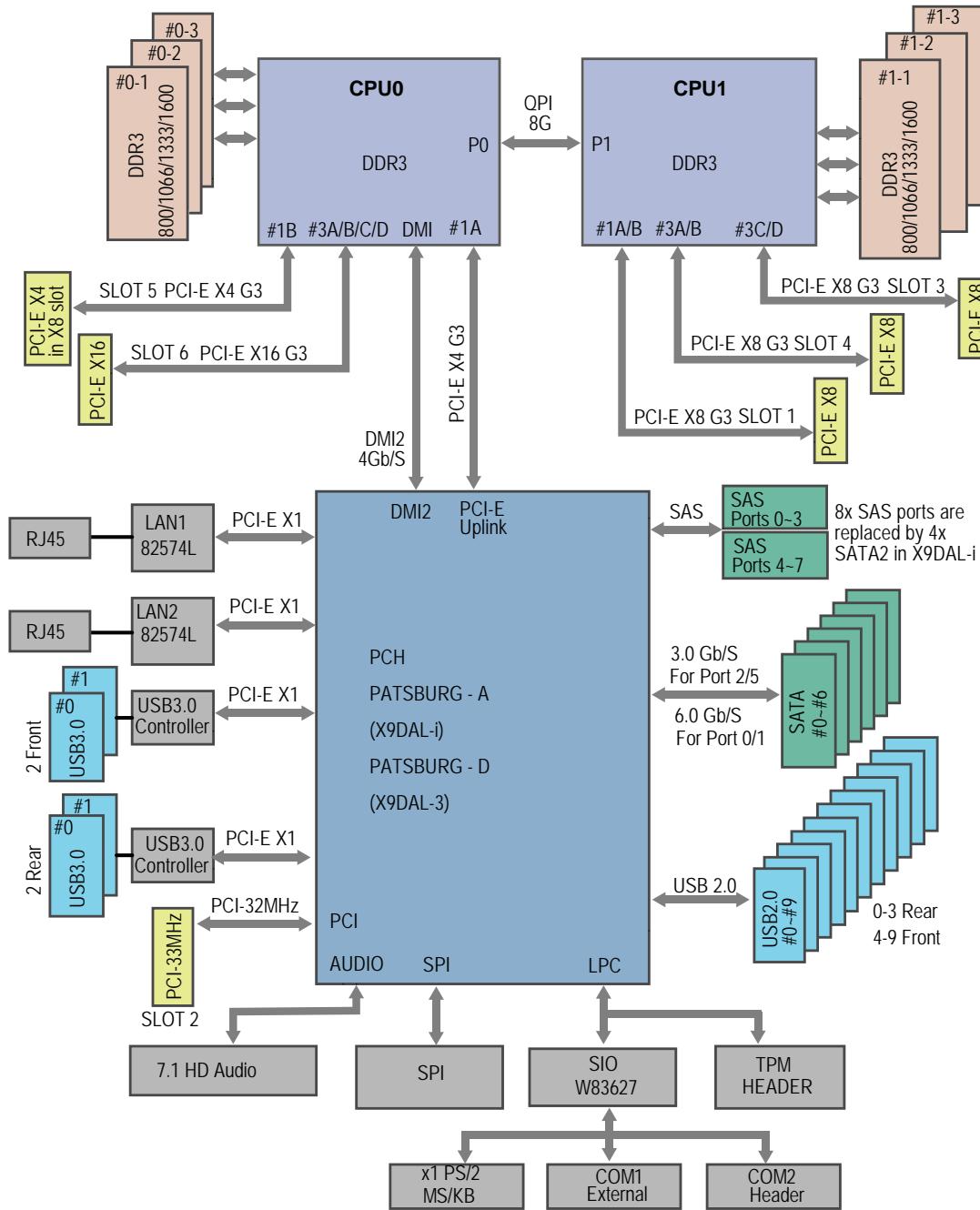
1-4   Contacting Supermicro

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Notes

Chapter 2

Installation

2-1   Overview

This chapter provides a quick setup checklist to get your SuperWorkstation 7037A-IL up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processor and memory preinstalled. If your system is not already fully integrated with a serverboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2   Unpacking the System

You should inspect the box the system was shipped in and note if it was damaged in any way. If the system itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the SuperWorkstation. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

!   **Warnings and Precautions!**   !

- Ensure that the caster wheels on the workstation are locked.

- Review the electrical and general safety precautions in Chapter 4.

- Use a regulating uninterruptible power supply (UPS) to protect the workstation from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the power supply units and hot-swap SATA drives to cool before touching them.

- To maintain proper cooling, always keep all chassis panels closed and all SATA carriers installed when not being serviced.

2-3   Accessing the Inside of the System

You may need to access the system periodically to perform maintenance or install components such as hard drives. The SC732 features two removable side covers, allowing easy access to the chassis interior.

Removing the Side Covers

1. Disconnect the chassis from any power souce.

2. Remove the two screws securing the left side cover to the chassis.

3. Slide the left cover toward the rear of the chassis.

4. Lift the left cover from the chassis.

5. Remove the three screws securing the right side cover to the chassis.

6. Slide the right cover toward the rear of the chassis

7. Lift the right cover from the chassis.

Figure 2-1. Removing the Chassis Side Covers
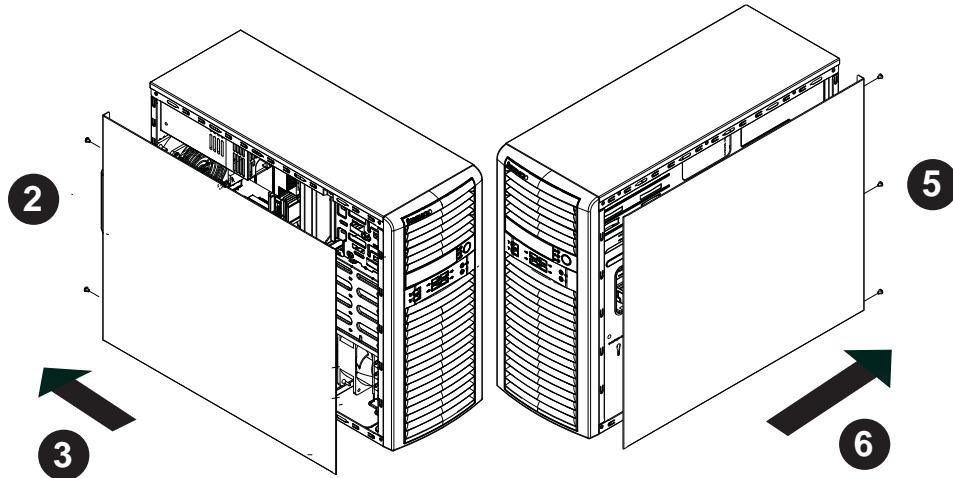
Chapter 3

System Interface

3-1   Overview

The control panel on the 7037A-IL has several LEDs and a power button. There are also two LEDs on each hard drive carrier. These LEDs keep you constantly informed of the overall status of the system and the activity and health of specific components.

3-2   Control Panel Button

A single push-button is located on the front of the chassis.

Power

This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3   Communications Panel Components

The SC732D4F features a front communication panel allowing easy access to the chassis communication ports. The chassis models are equipped as follows:

- Two USB 2.0 ports

- Two USB 3.0 ports

- One audio port

- One microphone port

See diagram on the following page.
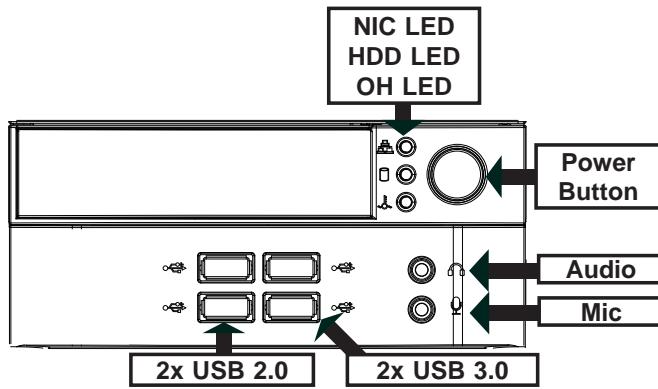
3-4   Control Panel LEDs

The control panel located on the front of the SC732 chassis has three LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

NIC

Indicates network activity on the LAN port(s) when flashing.

HDD

Indicates IDE channel activity on the SATA drive, and/or DVD-ROM drive activity when flashing.

Overheat/Fan Fail

When this LED flashes, it indicates a chassis fan failure. When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists.

3-4   Drive Carrier LEDs

Note: the LEDs of some drive carriers may not function depending on the number of drives that are supported by the serverboard and/or backplane.

- **Green:** When illuminated, the green LED on the front of the hard drive carrier indicates drive activity. A connection to the drive backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** The backplane activates the red LED to indicate a drive failure. If one of the hard drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed hard drives.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperWorkstation 7037A-IL from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the DVD-ROM and floppy drives. When disconnecting power, you should first power down the system with the operating system. The unit has more than one power supply cord. Disconnect both power supply cords before servicing to avoid electrical shock.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2   General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SuperWorkstation 7037A-IL clean and free of clutter.

- The 7037A-IL weighs approximately 39 lbs (17.7 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs. Don't use the handles (if installed) to lift the chassis; the handles should only be used to pull the server out of the rack.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3   ESD Precautions

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing the board from the antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

- Put the serverboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4   Operating Precautions

Care must be taken to assure that the chassis cover is in place when the system is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery

LITHIUM BATTERY

BATTERY HOLDER
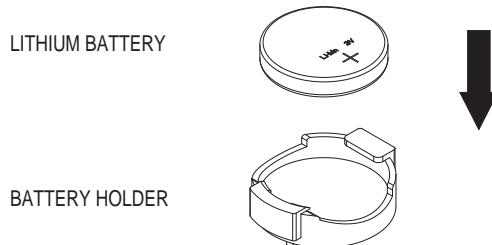
Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference.

5-1   Handling the Serverboard

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge.

- Touch a grounded metal object before removing any board from its antistatic bag.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

- When handling chips or modules, avoid touching their pins.

- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2   Connecting Cables

Now that the serverboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-9 for connector locations.)

- SATA drive data cables (I-SATA0 ~ I-SATA5)

- Control Panel cable (JF1)

- SGPIO cable (T-SGPIO1, T-SGPIO2)

Important! Make sure the the cables do not come into contact with the fans.

Connecting Power Cables

The X9DAL-i has a 24-pin primary power supply connector (J22) for connection to the ATX power supply. In addition, two 8-pin secondary power connectors (JPWR1 and JPWR2) must also be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

Figure 5-1. Control Panel Header Pins

	20	19	
Ground	○	○	NMI
X	○	○	X
Power LED	○	○	Vcc
HDD LED	○	○	Vcc
NIC1 LED	○	○	Vcc
NIC2 LED	○	○	Vcc
OH/Fan Fail LED	○	○	Vcc
PWR Fail LED	○	○	Vcc
Ground	○	○	Reset — Reset Button
Ground	○	○	PWR — Power Button
	2	1	
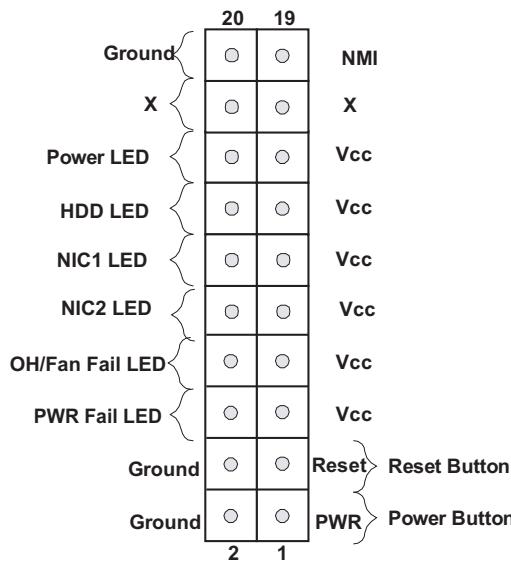
5-3   I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Ports
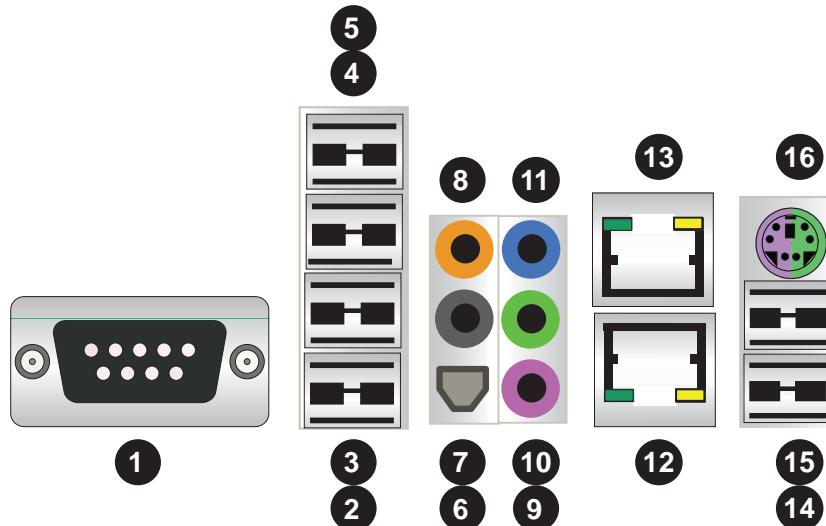
1. COM1 Port	9. MIC In
2. USB 2.0 Port 0	10. Line Out
3. USB 2.0 Port 1	11. Line In
4. USB 2.0 Port 2	12. Gb LAN 1 Port
5. USB 2.0 Port 3	13. CGb LAN 2 Port
6. SPDIF Out	14. USB 3.0 Port 0 (or USB keyboard/mouse)
7. Surround Out	15. USB 3.0 Port 1 (or USB keyboard/mouse)
8. CEN/LFE Out	16. PS/2 Keyboard or Mouse

5-4   Processor and Heatsink Installation

! When handling the processor package, avoid placing direct pressure on the label area of the fan.

Notes:

- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.

- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.

- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.

- Refer to the Supermicro web site for updates on CPU support.

Installing an LGA 1356 Processor

1. Press the socket clip to release the load plate covering the CPU socket from its locked position.

2. Gently lift the socket clip to open the load plate.

3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.

4. After removing the plastic cap, hold the CPU at the north and south center edges with your thumb and index finger,.
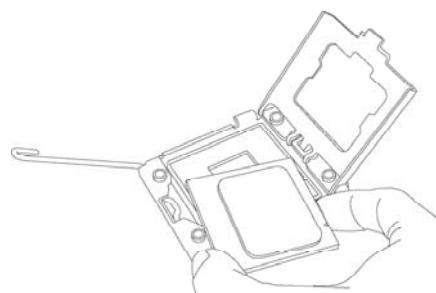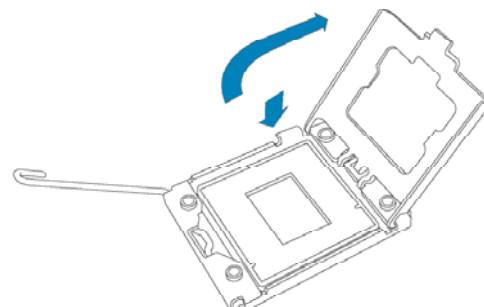
5. Align the CPU key, which is a semi-circle cutout, against the socket key, which is the notch below the gold color dot on the side of the socket.
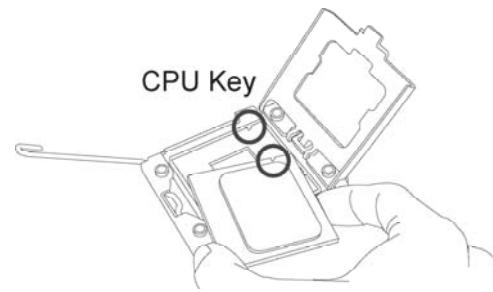
6. Align pin 1 of the CPU against pin 1 of the CPU socket.
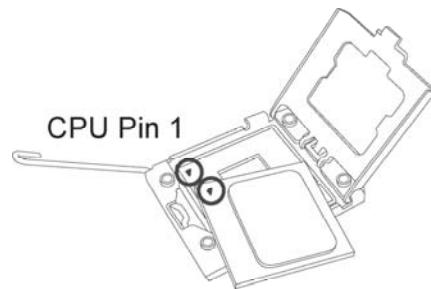
7. Once both CPU and the socket are aligned, carefully lower the CPU straight down into the socket. (To avoid damaging the CPU or the socket, do not rub the CPU against the surface of the socket or its pins.)

8. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

9. Once the CPU is securely seated on the socket, lower the CPU load plate to the socket.
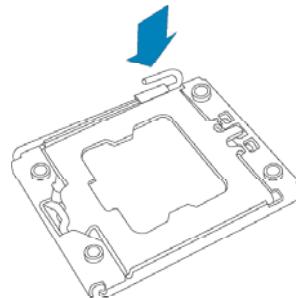
10. Use your thumb to gently push the socket clip down to the clip lock.

Warning: Please save the plastic cap. The serverboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed will cause damage to the socket pins.

Installation and Removal of the Heatsink

Installing the Heatsink

Heatsinks are optional on the 7037A-IL.

1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

3. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug (do not over-tighten the screws, which may damage the CPU.)

4. Finish the installation by fully tightening all four screws.
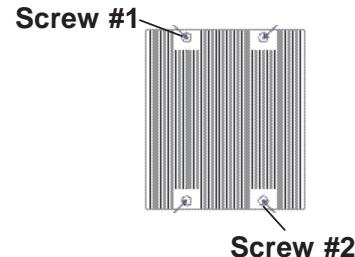
Screw #1

Screw #2

Uninstalling the Heatsink

!

Warning: We do not recommend removing the CPU or the heatsink. However, if you do need to uninstall the heatsink, please follow these instructions to avoid damaging the CPU or the CPU socket.

1. Unscrew and remove the heatsink screws in the sequence shown in the picture on the right.

2. Hold the heatsink as shown in the picture on the right and <u>gently</u> wriggle to loosen it from the CPU. (Do not use excessive force when doing this!)

3. Once the heatsink is loosened, remove it from the CPU socket.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease before you re-install the heatsink.

Screw #1   **Screw #3**
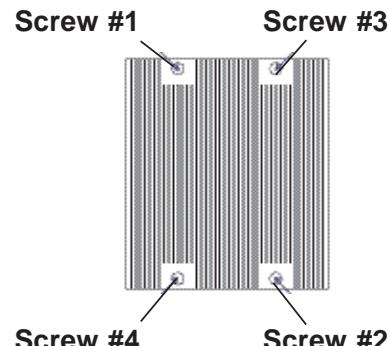
Screw #4   **Screw #2**

5-5   Installing Memory Modules

Note: Check the Supermicro web site for recommended memory modules.

CAUTION
Exercise extreme care when installing or removing DIMM
modules to prevent any possible damage.

Installing & Removing DIMMs

Press down the release tabs

1. Insert the desired number of DIMMs into the memory slots, starting with P1 DIMM1A. For best performance, please use the memory modules of the same type and speed in the same bank.See the DIMM Installation Chart on the following page.

2. Press down the release tabs on the ends of a memory slot. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.

Insert & press a DIMM into the slot

3. Using both thumbs, gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

4. Reverse the steps above to remove the DIMM modules from the serverboard.
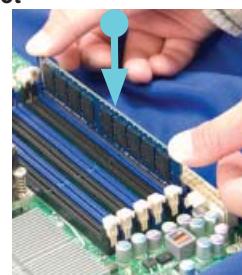
Figure 5-3. DIMM Installation

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove:
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.

Notch

Notch

Front View

Note: Notch should align with the receptive key point on the slot.

Release Tab

Release Tab

Top View of DDR3 Slot
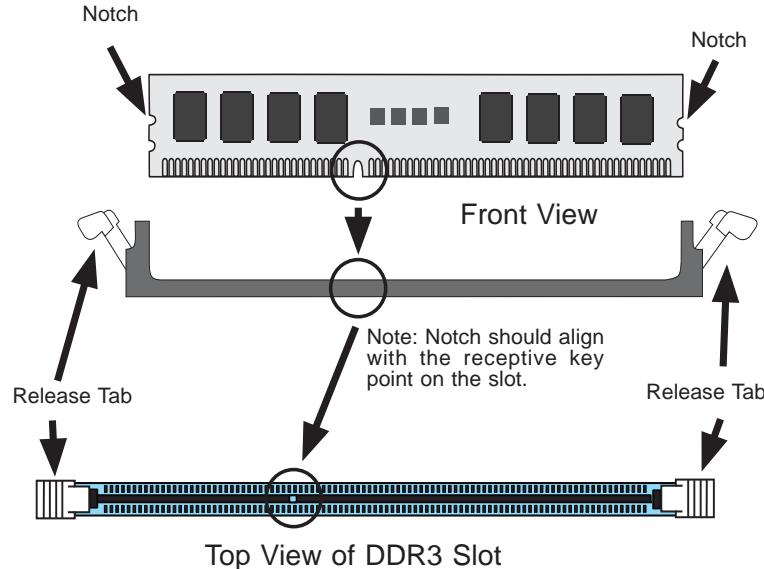
Memory Support

The X9DAL-i supports up to 192 GB Registered/Unbuffered/Load Reducing ECC/ Non-ECC DDR3-1600/1066/800 MHz memory in six DIMM slots. For the latest memory updates, please refer to our website.

For memory to work properly, follow the tables below for the correct order of populating the DIMM slots. See the serverboad layout page for slot numbering.

Processors and their Corresponding Memory Modules		
CPU#	**Corresponding DIMM Modules**	
CPU 1	P1-1A	P1-2A	P1-3A
CPU 2	P2-1A	P2-2A	P2-3A

Processor and Memory Module Population	
Number of CPUs+DIMMs	**CPU and Memory Population Configuration Table (For memory to work properly, please install DIMMs as shown below.)**
1 CPU & 2 DIMMs	CPU1 P1-1A/P1-3A
1 CPU & 3 DIMMs	CPU1 P1-1A/P1-3A, P1-2A
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-1A/P1-3A, P2-1A/P2-3A
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-1A/P1-3A/P1-2A, P2-1A/P2-3A//P2-2A

Processor Memory Support			
Ranks Per DIMM & Data Width (Note 1)	**Memory Capacity Per DIMM (Note 2)**		**Speed (MT/s) and Voltage Validated by Slot Per Channel (SPC) and DIMM Per Channel (DPC) (Notes 3, 4, 5, 6)**
			1 Slot Per Channel
			1DPC
			1.35V
QRx4 (DDP) (Note 7)	16GB	32GB	1066
QRx8 (P) (Note 8)	8GB	16GB	1066

Notes:
1. Physical Rank is used to calculate DIMM capacity.
2. Command Address Timing is 1N.
3. Only 2Gb/4Gb DRAMs are supported and validated.
4. The speeds listed are estimated only and will be verified through simulation.
5. Please refer to the ES-4600 Platform Design Guide for memory population rules.
6. For 3SPC/3DPC-Rank Multiplication (RM) is >=2.
7. DDP is for Dual Die Package DRAM stacking.
8. "P" Means "Planer Monolithic DRAM Die."

Note: All memory channels will run at the fastest common frequency.

5-6   Adding PCI Add-On Cards

The 7037A-IL can accommodate standard size add-on cards populated in all slots on the X9DAL-i serverboard.

Installing an Add-on Card

1. Begin by removing the PCI slot shield for the slot you wish to populate.

2. Fully seat the card into the card slot, pushing down with your thumbs evenly on both sides of the card.

3. Finish by using a screw to secure the top of the card shield to the chassis. The PCI slot shields protect the serverboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused slot.

5-7 Serverboard Details

Figure 5-4. X9DAL-i Layout
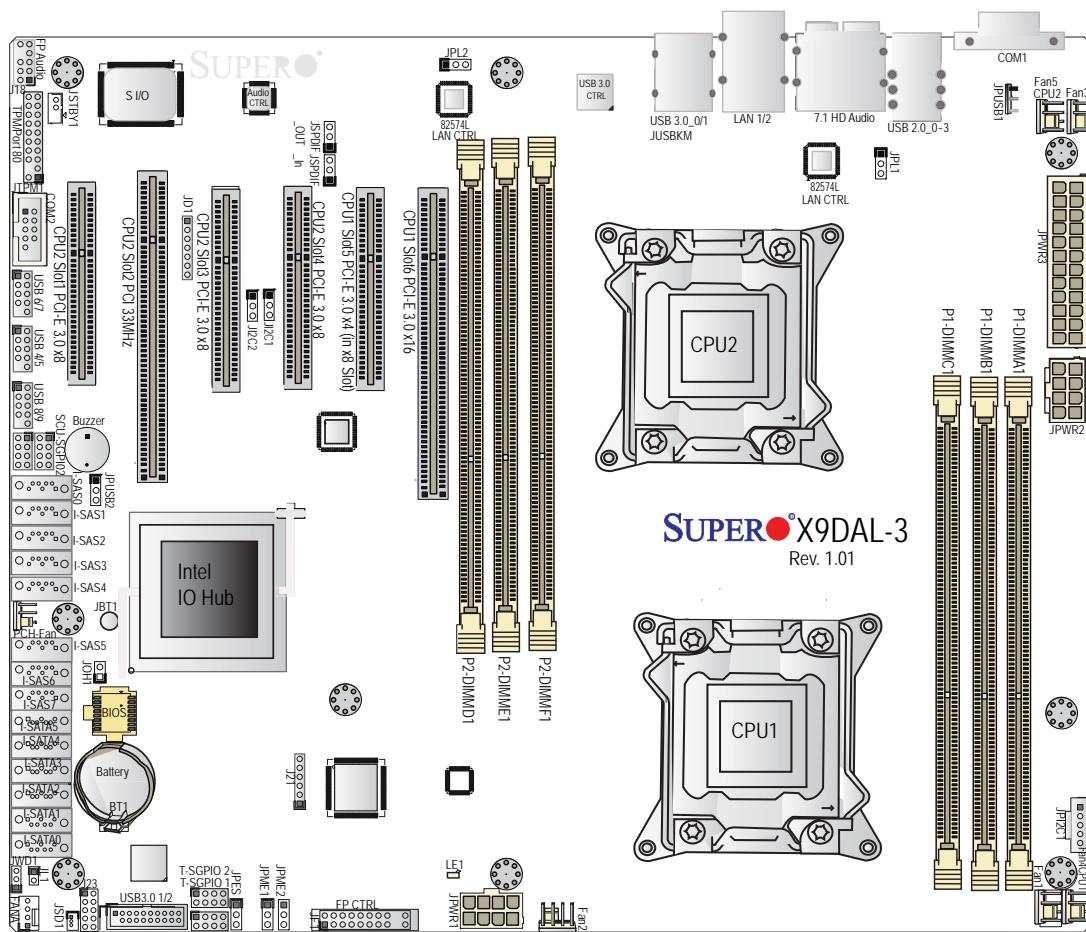
Notes:

- "■" indicates the location of "Pin 1".

- X9DAL-3 is shown: SAS components are not included on the X9DAL-i.

- Jumpers not indicated are for test purposes only.

X9DAL-i Quick Reference

LED	Description	State	Status
LE1	Standby PWR LED	Green: On	SB Power On

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Section 5-9
JI²C1/JI²C2	SMB to PCI-E/PCI Slots	Pins 1-2 (Enabled)
JPME2	Manufacture Mode	Pins 1-2 (Disabled)
JPES	Energy Saving Mode	Pins 1-2 (Enabled)
JPL1/JPL2	GLAN1/GLAN2 Enable/Disable	Pins 1-2 (Enabled)
JPME1	ME Recovery	Pins 1-2 (Disabled)
JPUSB1	Back Panel USB Standby Power	Pins 1-2 (Enabled)
JPUSB2	Front Panel USB Standby Power	Pins 1-2 (Enabled)
JWD1	Watch Dog	Pins 1-2 (Reset)

Connector	Description
7.1 HD Audio	8 Channel (7.1) High-Definition Audio Connections
COM1/COM2	Back Panel COM Port1/Front Accessible COM2 Header
FAN1~5, FANA	CPU/System Fan Headers (Fan4/5 = CPU1/2 Fan)
I-SATA 0-5	Intel SATA 3.0 Ports
I-SATA 6~9	Intel SATA 2.0 Ports 6~9
J18	Front Panel Audio Header
JD1	Speaker/Power LED Indicator
JF1	Front Panel Control Header
JPI²C1	Power Supply SMBbus I²C Header
JL1	Chassis Intrusion
JOH1	Overheat LED Header
JPWR1/JPWR2	12V 8-Pin Power Connectors
JPWR3	ATX 24-Pin Power Connector
JSD1	SATA DOM (Device On Module) Power Connector
JSPDIF In/Out	SPDIF (Sony/Philips Digital Interface) In/Out Headers
JSTBY1	Standby Header
JTPM1	TPM (Trusted Platform Module)/Port 80
LAN1/2	Gb Ethernet Ports 1/2
T-SGPIO 1/2	Serial Link (SATA) General Purpose IO Headers
USB 2.0 0/1/2/3	Back Panel USB 2.0 Ports 0/1/2/3
USB 2.0 4/5, 6/7, 8/9	Front Panel Accessible USB 2.0 Headers 4/5, 6/7, 8/9
USB 3.0 0/1	Back Panel USB 3.0 Ports 0/1
USB 3.0 2/3	Front Panel Accessible USB 3.0 Headers 2/3

5-8   Connector Definitions

Main ATX Power Connector Pin Definitions (JPW3)			
Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Main ATX Power Supply Connector

A 24-pin main power supply connector (JPRW3) and two 8-pin CPU power connectors (JPWR1/2) are located on the serverboard. These power connectors meet the SSI EPS 12V specification. These power connectors must be connected to your power supply. See the table on the right for pin definitions.

Warning: To prevent damage to the power supply or serverboard, please use a power supply that contains a 24-pin <u>and</u> two 8-pin power connectors. Be sure to connect these to the 24-pin and the two 8-pin power connectors on your serverboard to supply adequate power to your system. Failure to do so will void the manufacturer warranty on the power supply and serverboard.

Processor Power Connectors

JPWR1 and JPWR2 must also be connected to the power supply to provide power for the processors. See the table on the right for pin definitions.

Processor Power Connectors Pin Definitions (JPW1/JPW2)	
Pins	Definition
1 - 4	Ground
5 - 8	+12V

Required Connection

Power Button

The connection for the power button is on pins 1 and 2 of JF1. The chassis power button should be connected here. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	PW_ON
2	Ground

Reset Connector

The reset header is located on pins 3 and 4 of JF1. Attach the reset switch on the computer chassis to these pins. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Overheat/Fan Fail LED (OH)

Connect an LED to pins 7 and 8 of JF1 to provide advanced warning of chassis overheating or fan failure. Refer to the table on the right for pin definitions.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flash-ing	Fan Fail

NIC1 (GLAN) LED

The LED connections for the Gb LAN port are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
11	Vcc
12	Ground

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. This LED is used to display <u>all</u> IDE and SATA activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1 (use JLED for a 3-pin connector). This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	5V Stby
16	Control

Chassis Intrusion

The Chassis Intrusion header is designated JL1. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

Fan Headers

The X9DAL-i has seven fan headers (Fan 1-5 and Fan A), all of which are 4-pin fans. However, pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans. See the table on the right for pin definitions. The onboard fan speeds are controlled by Thermal Management (via Hardware Monitoring) under the Advanced Section in the BIOS. The default is disabled. When using Thermal Management setting, please use all 3-pin fans or all 4-pin fans.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

Internal Speaker

The Internal Speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions.

Internal Buzzer (SP1) Pin Definition		
Pin#		Definitions
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker
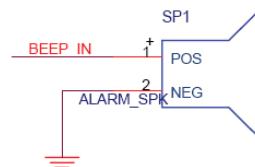
Power LED/Speaker

On JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are used with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

PWR LED Connector Pin Definitions	
Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	Cathode (-)

Speaker Connector Pin Settings	
Pin Setting	Definition
Pins 4-7	External Speaker
Pins 6-7	Internal Speaker

TPM Header/Port 80

A Trusted Platform Module/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. See the table on the right for pin definitions.

TPM/Port 80 Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4	14	SMB_DAT4
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)

Standby Power Header

The Standby Power header is located at JSTBY1 on the serverboard. Connect an appropriate cable here for standby support for your system.

Standby Power Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

Power SMB (I²C)

The Power System Management Bus (I²C) header (JPI²C1) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

PWR SMB Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

Overheat/Fan Fail LED

The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating and fan failure. This LED will blink when a fan failure occurs. Refer to the tables on right for pin definitions.

Overheat LED Pin Definitions	
Pin#	Definition
1	5vDC
2	OH Active

OH/Fan Fail LED Status	
State	Message
Solid	Overheat
Blinking	Fan Fail

SGPIO Headers

Two SGPIO (Serial General Purpose Input/Output) headers are designated T-SGPIO1 and SGPIO2. These headers are used to communicate with the system's enclosure management chip. See the table on the right for pin definitions.

SGPIO Header Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

SCU-SGPIO 1/2 Headers

Two additional SCU SGPIO headers are provided to support the onboard SATA 2 connections. See the table on the right for pin definitions.

SCU-SGPIO Header Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	Date In
3	Ground	4	Data Out
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

Serial Ports

One COM connection (COM1) is located on the rear I/O panel on the serverboard. COM2 is located next to PCI-E Slot 1 to provide front panel serial support. See the table on the right for pin definitions.

Serial COM Port Pin Definitions			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A

Ethernet Ports

Two Gigabit Ethernet ports (LAN1/2) are located on the I/O back panel. These ports accept RJ45 type cables.

LAN Ports Pin Definition			
Pin#	Definition	Pin#	Definition
9	P1V9	10	SGND
2	TD0+	12	Act LED
1	TD0-	11	P3V3SB
4	TD1+	14	Link 100 LED (Yellow, +3V3SB)
3	TD1-	A13	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
5	TD2-	16	Ground
8	TD3+	17	Ground
7	TD3-	18	Ground

NC = No Connection

SPDIF_In/SPDIF_Out Headers

The SPDIF In (JSPDIF_In) and SP-DIF Out (JSPDIF_Out) headers are located next to the LAN controller on the serverboard. Connect an appropriate cable on each header for audio support.

SPDIF_In Pin Definitions	
Pin#	Definition
1	S/PDIF_In
2	Ground

SPDIF_Out Pin Definitions	
Pin#	Definition
1	S/PDIF_Out
2	Ground

DOM Power Connector

A power connector for SATA DOM (Disk On Module) devices is located at JSD1. Connect an appropriate cable here to provide power support for your DOM devices.

DOM PWR Pin Definitions	
Pin#	Definition
1	+5V
2	Ground
3	Ground

Universal Serial Bus (USB)

Four Universal Serial Bus 2.0 ports (USB 2.0 0~3) are located on the I/O back panel. In addition, two USB 3.0 ports (USB 3.0 0/1) are also located on the rear I/O panel. Additionally, six USB 2.0 ports (USB 2.0 4/5, 6/7, 8/9), and two USB 3.0 ports (USB 3.0 2/3) are used to provide front chassis access. USB cables are not included. See the tables below for pin definitions.

Back Panel USB (2.0) #0~3 Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN1	6	USB_PN0
3	USB_PP1	7	USB_PP0
4	Ground	8	Ground

Front Panel USB (2.0) #4/5, 6/7, 8/9 Pin Definitions			
USB 5/7/9		USB 4/6/8	
Pin #	Definition	Pin #	Definition
1	+5V	2	+5V
3	USB_PN2	4	USB_PN3
5	USB_PP2	6	USB_PP3
7	Ground	8	Ground
9	Key	10	Ground

Back Panel USB (3.0) #0/1, Front Accessible USB (3.0) #2/3 Pin Definitions			
Pin#	Pin#	Signal Name	Description
1	10	VBUS	Power
2	11	D-	USB 2.0 Differential Pair
3	12	D+	
4	13	Ground	Ground of PWR Return
5	14	StdA_SSRX-	SuperSpeed Receiver
6	15	StdA_SSRX+	Differential Pair
7	16	GND_DRAIN	Ground for Signal Return
8	17	StdA_SSTX-	SuperSpeed Transmitter
9	18	StdA_SSTX+	Differential Pair

High Definition Audio (HD Audio)

This serverboard features a 7.1 Channel High Definition Audio (HDA) codec that provides ten DAC channels. The HD Audio connections simultaneously supports multiple-streaming 7.1 sound playback independent stereo output through the front panel stereo out for front, rear, center and subwoofer speakers. Use the Advanced software included in the CD-ROM to enable this function.

(BP) 7.1 HD Audio	
Conn#	Signal
1	SPDIF Out
2	Surround_Out
3	CEN/LFE_Out
4	Mic_In
5	Line_Out
6	Line_In

HD Audio
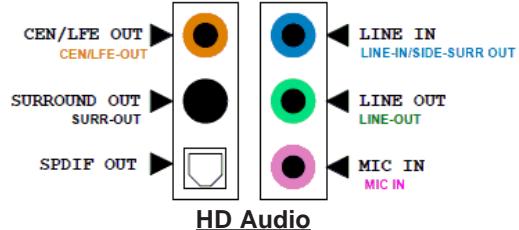
Front Accessible Audio Header

A 1o-pin Audio header (J18) is also located on the serverboard. This header allows you to use the onboard sound for audio playback. Connect an audio cable to the audio header to use this feature. See the tables at right for pin definitions for these headers.

10-Pin Audio Pin Definitions	
Pin#	Signal
1	Microphone_Left
2	Audio_Ground
3	Microphone_Right
4	Audio_Detect
5	Line_2_Right
6	Ground
7	Jack_Detect
8	Key
9	Line_2_Left
10	Ground

5-9   Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the con- nector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.
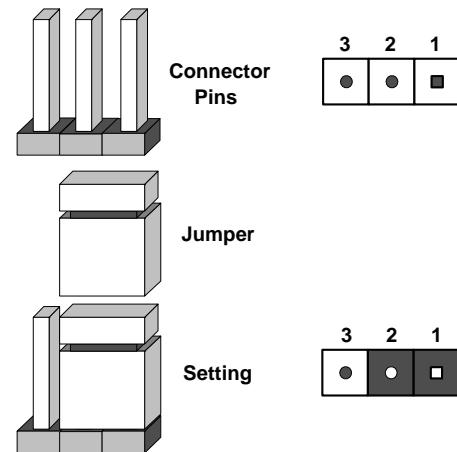
CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1. First power down the system and unplug the power cord(s).

2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.

3. Remove the screwdriver (or shorting device).

4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS.*

GLAN Enable/Disable

Change the setting of jumper JPL1 or JPL2 to enable or disable the LAN1 and LAN2 Ethernet ports, respectively. See the table on the right for jumper settings. The default setting is enabled.

GLAN Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (default)
2-3	Disabled

Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Watch Dog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset (default)
Pins 2-3	NMI
Open	Disabled

I²C Bus to PCI-Exp. Slots

Jumpers JI²C1 and JI²C2 allow you to connect the System Management Bus (I²C) to PCI/PCI-Express slots. These two jumpers are to be set at the same time. The default setting is Open to disable the connections. See the table on the right for jumper settings.

I²C for PCI-E slots Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled (Default)

Manufacture (ME) Mode

Jumper JPME2 allows the user to flash the system firmware from a host server to modify system settings. Close this jumper to bypass SPI flash security to use the manufacture mode. See the table on the right for jumper settings.

ME Mode Select Jumper Settings	
Jumper Setting	Definition
On	Manufacture Mode
Off	Normal (Default)

ME Recovery

Close Jumper JPME1 to use ME Firmware Recovery mode, which will limit system activities to support essential functions only. There will be no power use restrictions. In single operational mode, online upgrade will be available via the Recovery mode. See the table on the right for jumper settings.

ME Recovery Jumper Settings	
Jumper Setting	Definition
On	ME Recovery
Off	Normal (Default)

USB Wake-Up

Closing pins 1/2 of JPUSB1 will allow you to "wake-up" the system by pressing a key on a USB keyboard or by clicking a USB mouse connected to the backpanel of your system. Close pins 1/2 of JPUSB2 to "Wake-up" your system via a device connected to USB 4/5. The JPUSB jumpers are used together with the USB Wake-Up function in BIOS. Enable the jumpers on the serverboard and the BIOS setting in BIOS to allow the system to "wake-up via a USB Device." See the table on the right for jumper settings and jumper connections.

Note: JPUSB1 is for Back Panel USB 2.0 ports:0~3. JPUSB2 is for Front Panel USB 2.0 ports 4/5.

JPUSB1 (Back Panel USB Wake-up)	
Pin#	Definition
1-2	Enabled (Default)
2-3	Disabled

JPUSB2 (Front Panel USB Wake-up)	
Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

5-10 Onboard Indicators

LAN1/2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each port, one LED indicates activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

LAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	No Connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

Onboard Power LED

An Onboard Power LED is located at LE1 on the serverboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the table at right for more information.

Onboard PWR LED Indicator (LE1) LED Definitions	
LED Color	Status
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 (STR) State

5-11 SATA Ports

SATA Ports

Two SATA 3.0 ports (I-SATA0/1) and eight SATA 2.0 ports (I-SATA2~5, 6~9) are located on the serverboard. See the table on the right for pin definitions.

SATA Port Pin Definitions			
Pin#	Definition	Pin #	Definition
1	Ground	2	TXP
3	TXN	4	Ground
5	RXN	6	RXP
7	Ground		

5-12 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your serverboard.

Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

SuperDoctor III

The SuperDoctor® III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The SuperDoctor III program included on the CD-ROM that came with your serverboard allows you to monitor the environment and operations of your system. SuperDoctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the SuperDoctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within SuperDoctor, as the SuperDoctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor.

Supero Doctor III Interface Display Screen (Health Information)

Supero Doctor III Interface Display Screen (Remote Control)
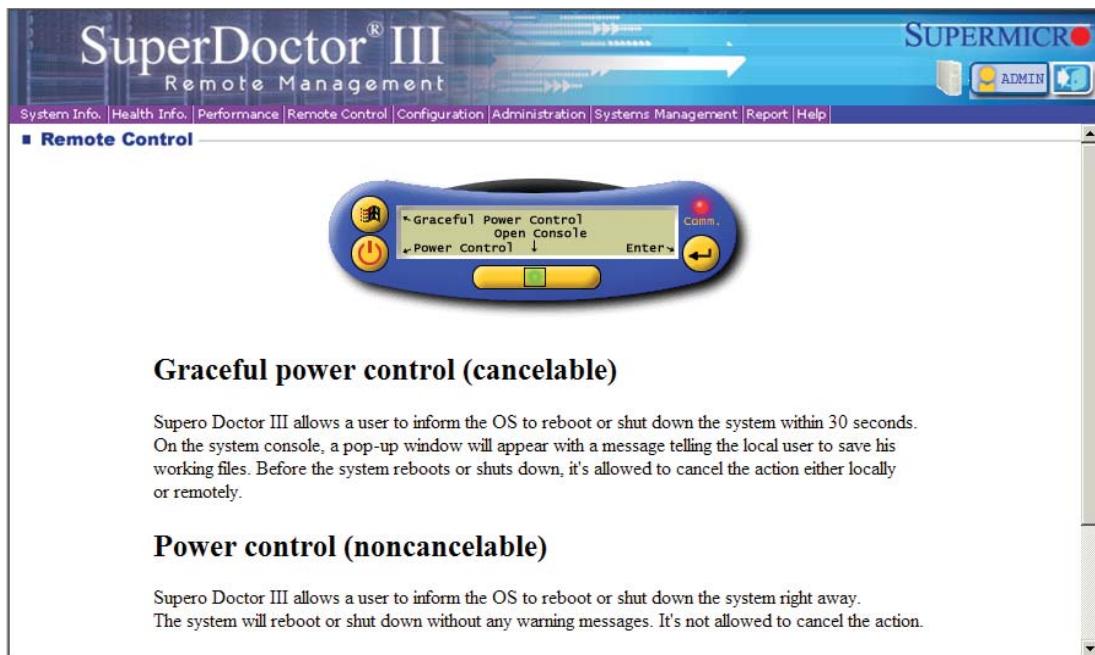
Note: The SuperDoctor III program and User's Manual can be downloaded from the Supermicro web site at http://www.supermicro.com/products/accessories/software/ SuperDoctorIII.cfm.

For Linux, we recommend using SuperDoctor II.

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform simple maintenance on the SC732D4F-500B chassis. Following the component installation steps in the order given will eliminate most common problems. If some steps are unnecessary, skip ahead to the step that follows.

Tools Required: The only tool you will need is a Philips screwdriver.

6-1   Static-Sensitive Devices

Static electrical discharge can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.

- Touch a grounded metal object before removing any board from its antistatic bag.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

- When handling chips or modules, avoid touching their pins.

- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging. When unpacking the board, make sure the person handling it is static protected.

6-2   Accessing the Inside of the System
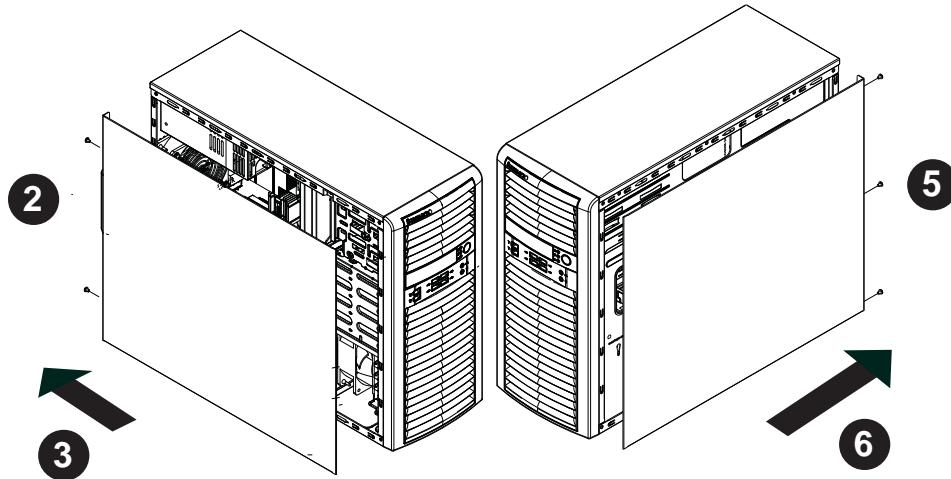
Figure 6-1. Removing the Chassis Side Covers

The SC732 features two removable side covers, allowing easy access to the chassis interior.

Removing the Side Covers

1.   Disconnect the chassis from any power souce.

2.   Remove the two screws securing the left side cover to the chassis.

3.   Slide the left cover toward the rear of the chassis.

4.   Lift the left cover from the chassis.

5.   Remove the three screws securing the right side cover to the chassis.

6.   Slide the right cover toward the rear of the chassis

7.   Lift the right cover from the chassis.

Warning: Except for short periods of time, do NOT operate the system without the cover in place. The chassis cover must be in place to allow for proper airflow and to prevent overheating.

6-3   Rotating the Hard Drive Cage
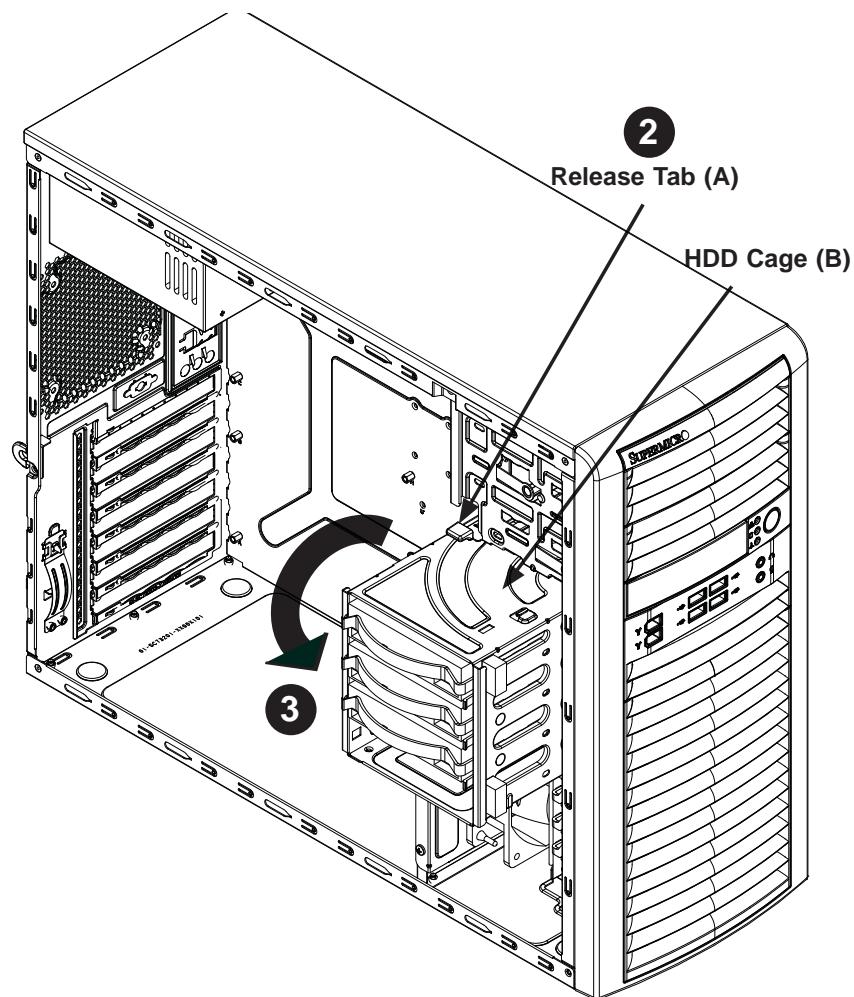
Figure 6-2. Rotating the Hard Drive Cage

In order to access and install components in the chassis interior, it is necessary to rotate the hard drive cage (B). This will provide sufficient room to install and configure the chassis components.

Rotating the Hard Drive Cage

1. Disconnect the chassis from any power source.

2. Lift the release tab (A).

3. Rotate the hard disk drive cage (B) outward.

6-4 Removing and Installing 3.5" Hard Drives
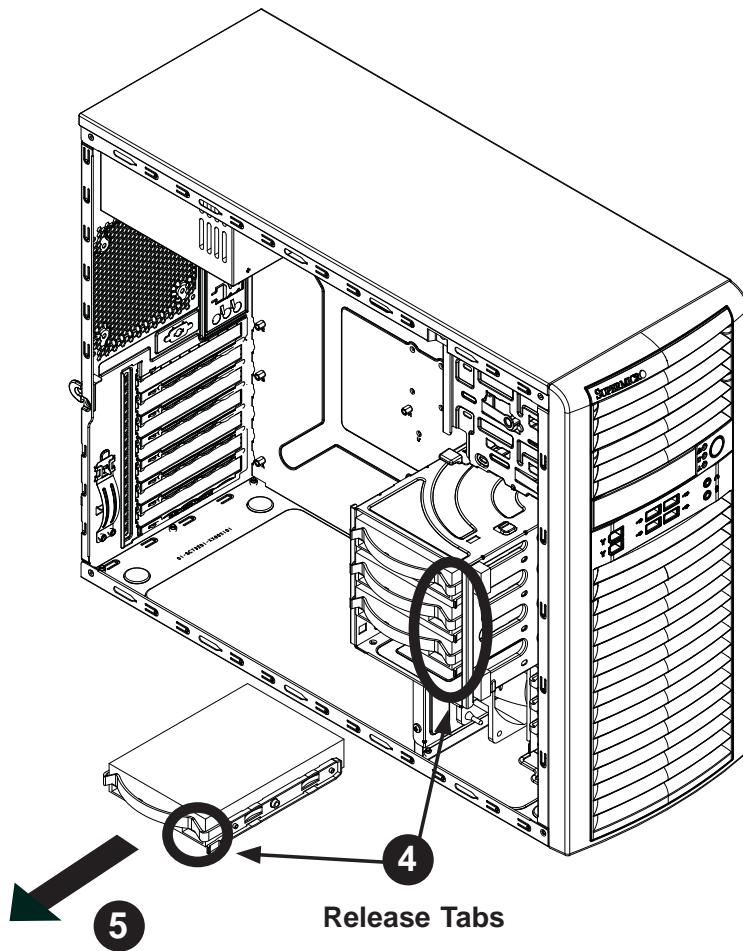
Figure 6-3. Removing a Hard Drive Carrier from the Hard Drive Cage

The SC732 chassis must be powered-down before hard drives can be removed from the hard drive carriers.

Removing and Installing 3.5" Hard Drives

1. Disconnect the chassis from any power source.

2. Rotate the hard drive cage outward 90 degrees as described in section 6-3.

3. Disconnect all of the cables from the hard drive.

4. Press the release tab on the side of the hard drive carrier that is to be re-moved from the hard drive cage.

5. Gently slide the hard drive carrier out of the hard drive cage.
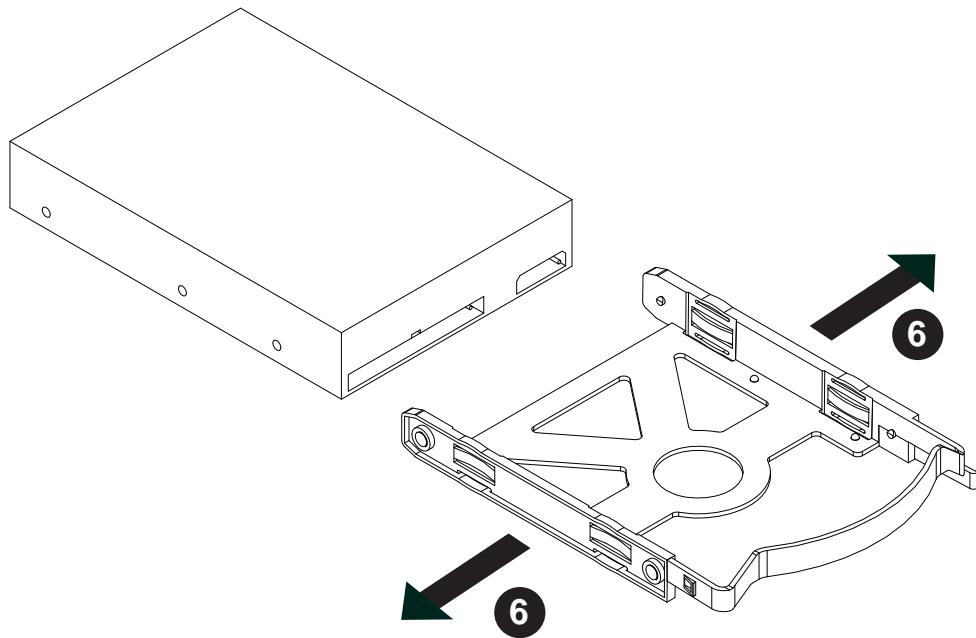
Figure 6-4. Removing a 3.5" Hard Drive from a Hard Drive Carrier

6. If a hard drive is already present, remove it by carefully pulling the sides of
    the hard drive carrier outward.

7. Remove the hard drive from the hard drive carrier.

> ⚠ ! Warning: Only enterprise level HDDs are recommended for use in this
> chassis.

8. Insert the new hard drive into the hard drive carrier.

9. Insert the hard drive carrier into the hard drive cage, sliding it towards the
    back of the the hard drive cage until it clicks into a locked position.

10. If desired, each hard drive carrier may be secured to the exterior of the hard
    drive cage using one optional screw.

11. Rotate the hard drive cage 90 degrees inward, returning it to the closed,
    operational position in the chassis.

12. Connect the related cables to the hard drives.
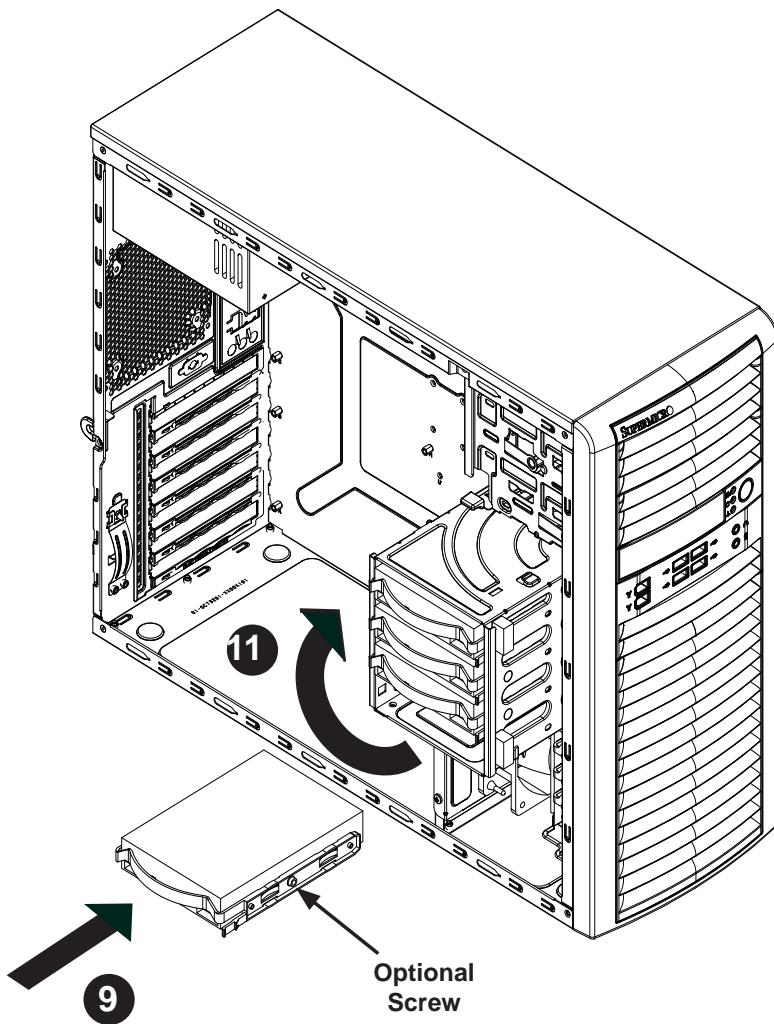
Figure 6-5. Installing a Hard Drive Carrier into the Hard Drive Cage

6-5   Removing and Installing 2.5" Hard Drives
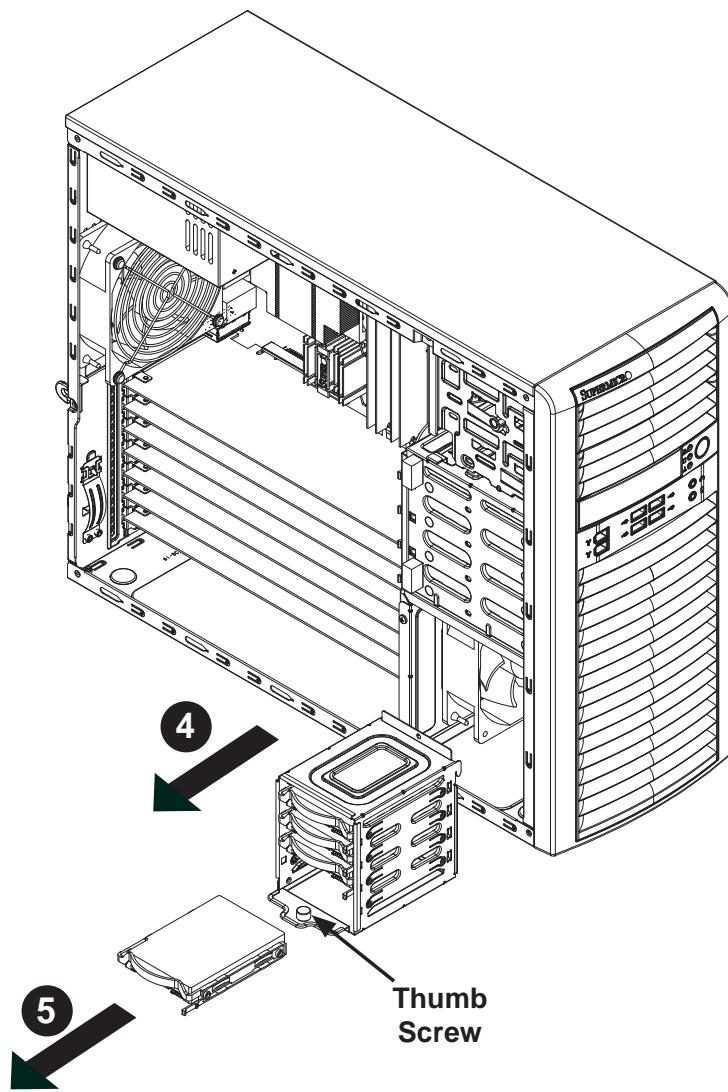
Figure 6-6. Removing a 2.5" Hard Drive

The SC732 chassis must be powered-down before hard drives can be removed from the hard drive carriers.

Removing and Installing 2.5" Hard Drives

1.   Disconnect the chassis from any power source.

2.   Loosen the thumb screw securing the 2.5" hard drive cage to the chassis.

3.   Disconnect all cables from the hard drive.

4.   Slide the 2.5" hard drive cage out of the chassis.
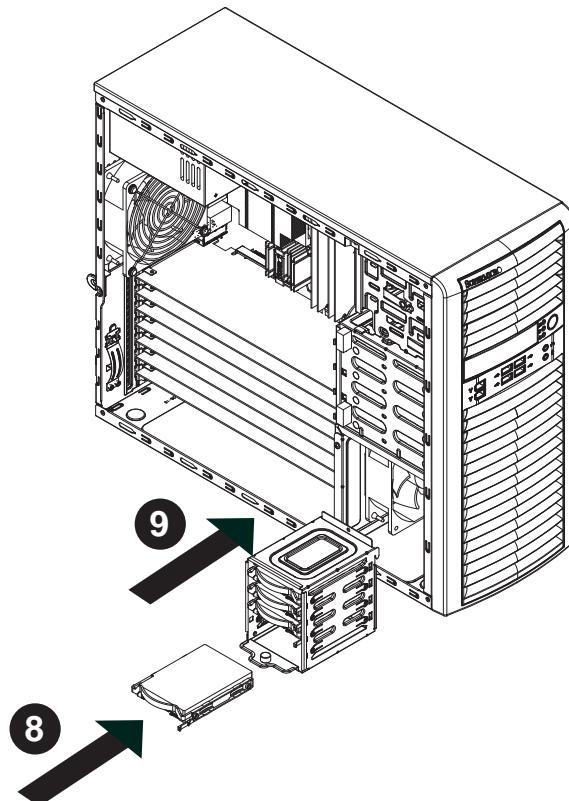
Figure 6-7. Installing 2.5" Hard Drives

5. If a hard drive is already present, remove it by carefully pulling the sides of the hard drive carrier outward.

6. Remove the hard drive from the hard drive carrier.

7. Insert the new hard drive into the hard drive carrier.

8. Insert the hard drive carrier into the hard drive cage, sliding it towards the back of the the hard drive cage until it clicks into a locked position.

9. Slide the 2.5" hard drive cage back into the chassis and tighten the thumb screw to secure the cage.

10. Connect the related cables to the hard drive

Warning: Only enterprise level HDDs are recommended for use in this chassis.

6-6   Installing a 3.5" Device

The SC732D chassis has one 3.5" device slot, which supports an optional device, such as an all-in-one card reader.

Installing a 3.5" Device

1. Remove the front bezel from the chassis by lifting it upwards from the bottom, and pulling off the front of the chassis.

2. Remove the cover plate from the 3.5" device slot on the front of the chassis.

3. Install the bracket rail (A) onto one side of the 3.5" device, by inserting the pins of the bracket into the mounting holes on the sides of the optical device.

4. Slide the 3.5" device into the chassis.

5. See Section 6-8: Installing the Front Bezel.

Figure 6-8. Installing a 3.5" Device
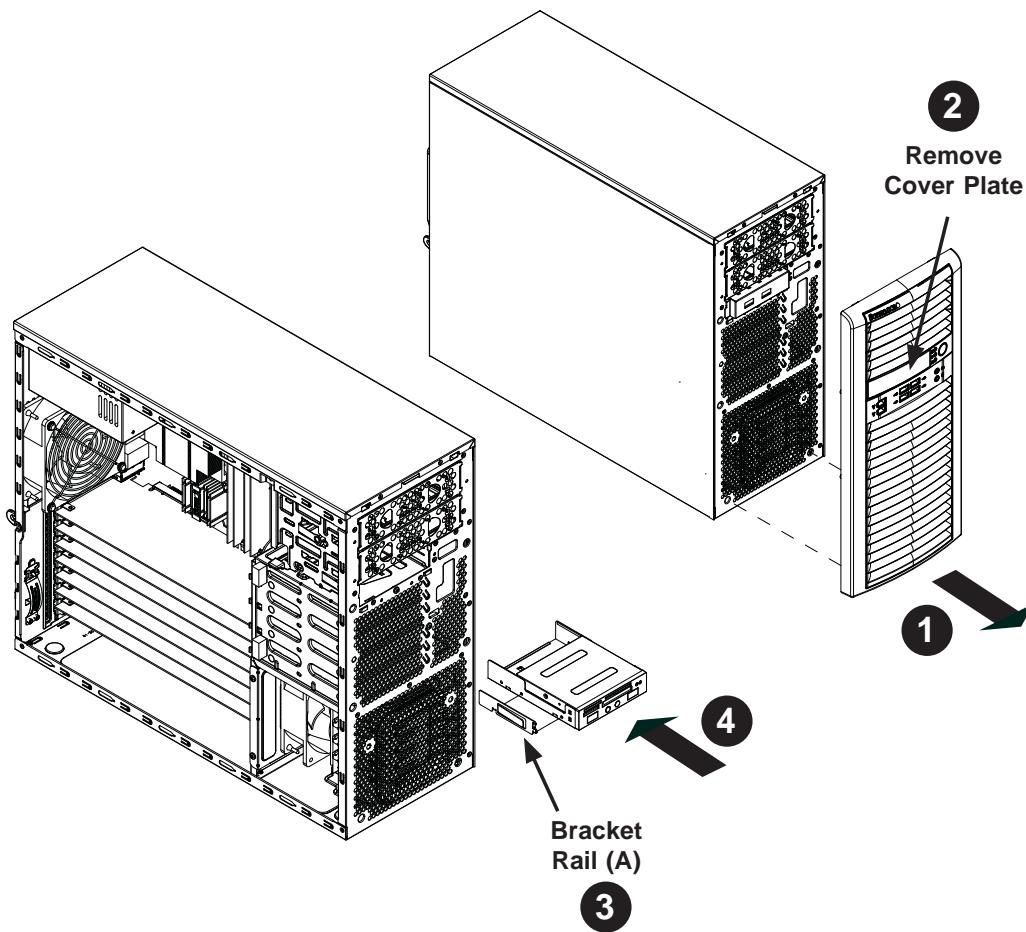
6-7   Installing System Fans
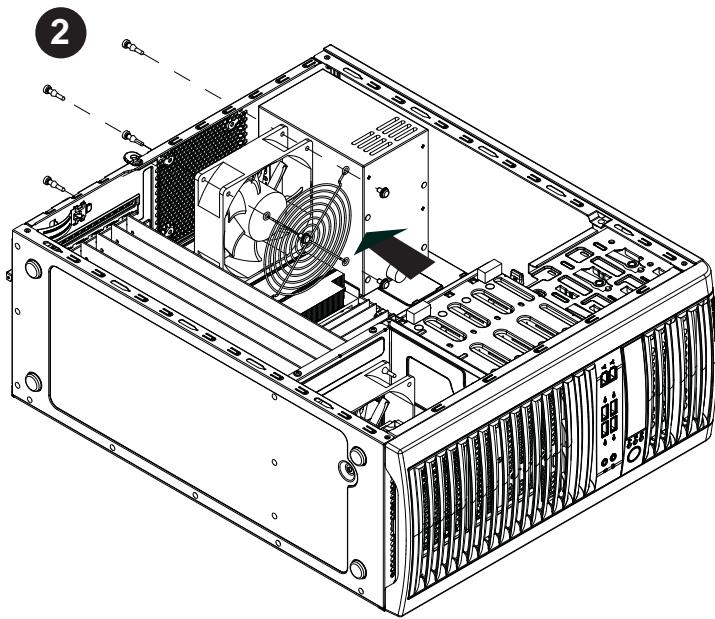
Figure 6-9. Installing the Rear Exhaust Fan

Installing the Rear Exhaust Fan

1. Disconnect all power to the chassis.

2. Insert the four rubber pins through mounting holes in the rear of the chassis and through the mounting holes in the rear fan.

3. Pull the rubber pins through the mounting holes of the fan to secure the fan to the chassis.

4. Connect the fan cable to the serverboard.
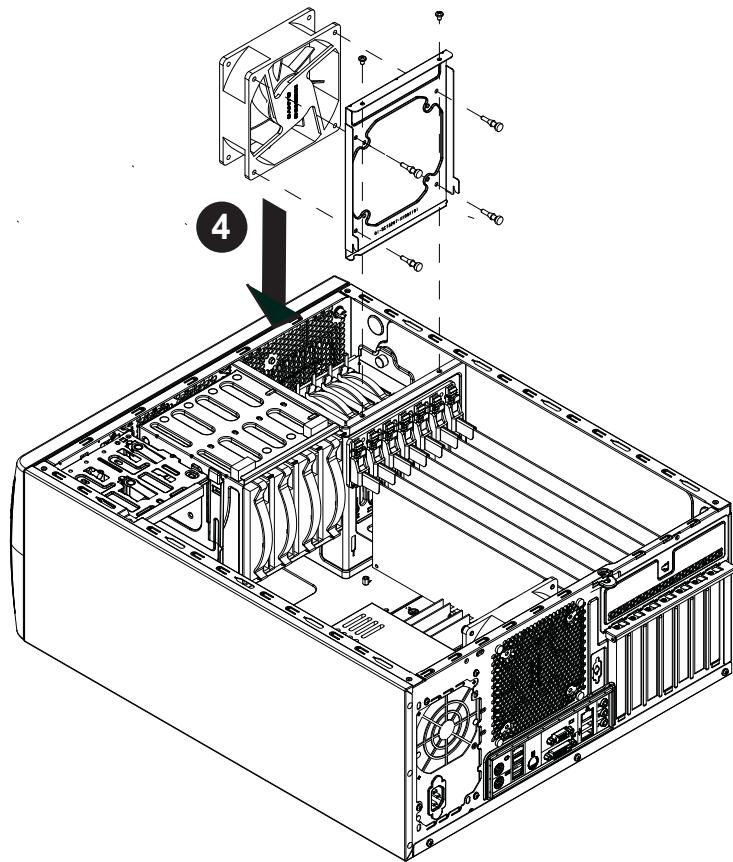
Figure 6-10. Installing the Front Cooling Fan (Optional)

Installing the Front Cooling Fan (Optional)

1. Disconnect all power to the chassis.

2. Insert the four rubber pins through the front fan bracket and into the mounting holes in the front fan.

3. Pull the rubber pins through the mounting holes of the system fan to secure the fan to the chassis.

4. Lower the fan into the chassis, aligning the holes at the top of the front fan bracket with the holes in the chassis.

5. Secure the fan to the chassis using the two screws provided.

6. Connect the fan cable to the serverboard.

6-8   Installing the Front Bezel

Front Bezel Installation

1. Insert the tabs on the front bezel into the mounting holse on the front of the chassis.

2. Ensure that the cover fits snugly.

This completes the installation of basic components in the SC732 chassis
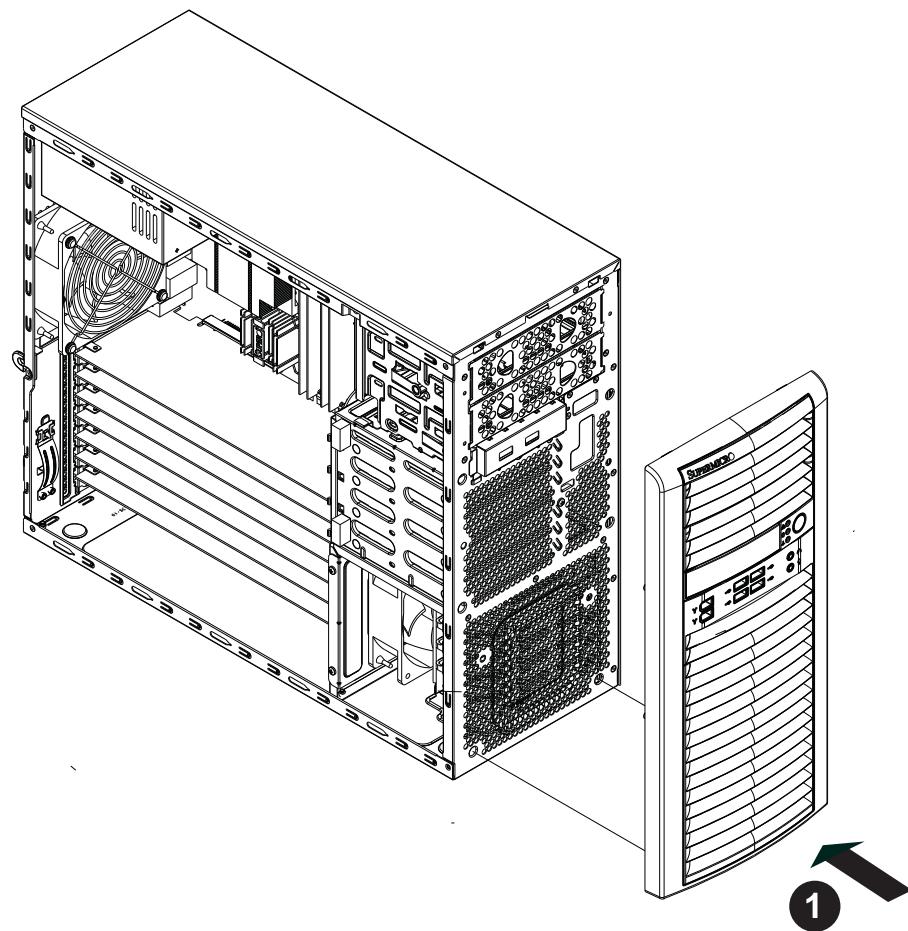
Figure 6-11. Installing the Front Bezel

6-9   Power Supply

The SC732 chassis includes a 500 Watt power supply. In the event that it becomes necessary to replace the power supply, follow the instructions below.
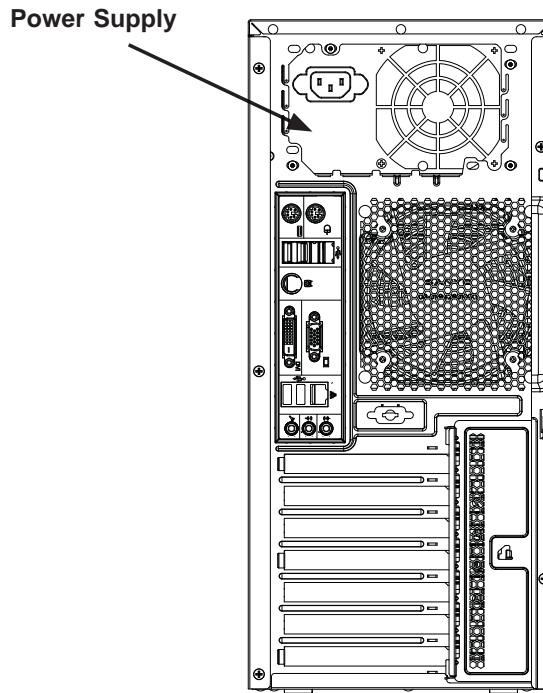
Power Supply

Figure 6-12. Removing the Power Supply

Changing the Power Supply

1. Disconnect the chassis from any power source.

2. Disconnect the serverboard cables.

3. Remove the screws securing the power supply to the chassis, which are located on the rear of the chassis. Set these screws aside for later use.

4. Gently lift the power supply out of the chassis.

5. Replace the failed power supply with an identical power supply model.

6. Secure the new power supply using the screws previously set aside.

7. Plug the AC power cord back into the module and power-up the system.

Notes

Chapter 7

BIOS

7-1   Introduction

This chapter describes the AMI BIOS Setup utility for the X9DAL-3/X9DAL-i. It also provides the instructions on how to navigate the AMI BIOS Setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

Starting BIOS Setup Utility

To enter the AMI BIOS Setup utility screens, press the <Del> key while the system is booting up.

> **Note**: In most cases, the <Del> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F3>, <F4>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for informational text. When an option is selected in the left frame, it is highlighted in white. Often informational text will accompany it.

> **Note**: The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational messages.

The AMI BIOS Setup utility uses a key-based navigation system called "hot keys." Most of the AMI BIOS setup utility "hot keys" can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

> **Note 1**: Options printed in **Bold** are default settings.

> **Note 2**: <F3> is used to load optimal default settings. <F4> is used to save the settings and exit the setup utility.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Delete> at the appropriate time during system boot.

📝 **Note**: For AMI UEFI BIOS Recovery, please refer to the UEFI BIOS Recovery User Guide posted @http://www.supermicro.com/support/manuals/.

Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

⚠️ **Warning!** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall the manufacturer be liable for direct, indirect, special, incidental, or consequential damage arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is being updated to avoid possible boot failure.

7-2   Main Setup

When you first enter the AMI BIOS Setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.

Main	Advanced	Event Logs	Boot	Security	Save & Exit	
						Set the Date. Use tab to switch between Data elements.
System Date		[Wed 05/07/2012]				
System Time		[14:55:30]				
X9DAL-3						
SMC Version		1.0				
SMC Build Date		05/03/2012				
Memory Information						
Total Memory		16384 MB (DDR3)				
						→← : Select Screen
						↑↓ : Select Item
						Enter: Select
						+/- : Change Opt.
						F1 : General Help
						F2 : Previous Values
						F3 : Optimized Defaults
						F4 : Save & Exit
						ESC :Exit

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The AMI BIOS main menu displays the following information:

System Date/System Time

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.).

X9DAL-3

SMC Version

This item displays the SMC version of the BIOS ROM used in this system.

SMC Build Date

This item displays the date that the BIOS Setup utility was built.

Memory Information

Total Memory

This displays the amount of memory that is available in the system.

7-3   Advanced Setup Configurations

Use the arrow keys to select Advanced Setup and press <Enter> to access the following submenu items.

```
  Main   Advanced   Event Logs   Boot   Security   Save & Exit

                                                    System Boot Feature Setting.
 ▶ Boot Feature
 ▶ CPU Configuration
 ▶ Chipset Configuration
 ▶ SATA Configuration
 ▶ SCU Configuration
 ▶ PCIe/PCI/PnP Configuration
 ▶ Super IO Configuration
 ▶ Serial Port Console Redirection
 ▶ Hardware Health Configuration
 ▶ ACPI Settings
 ▶ Trusted Computing
                                                    →←:     Select Screen
                                                    ↑↓ :    Select Item
                                                    Enter:  Select
                                                    +/- :   Change Opt.
                                                    F1 :    General Help
                                                    F2 :    Previous Values
                                                    F3 :    Optimized Defaults
                                                    F4 :    Save & Exit
                                                    ESC :Exit

            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

▶Boot Features

Quiet Boot

This feature allows the user to select bootup screen display between POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

Use this item to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

Use this feature to set the Power-on state for the Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

Select Enabled to force the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

Power Configuration

Watch Dog Function

If enabled, the Watch Dog timer will allow the system to automatically reboot when a non-recoverable error occurs that lasts for more than five minutes. The options are Enabled and **Disabled.**

Power Button Function

If this feature is set to Instant Off, the system will power off immediately as soon as the user presses the power button. If this feature is set to 4 Seconds Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant Off** and 4 Seconds Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Stay-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power On, Stay Off and **Last State**.

CPU Configuration

This submenu displays the information of the CPU as detected by the BIOS. It also allows the user to configure CPU settings.

▶Socket 0 CPU Information/Socket 1 CPU Information

This submenu displays the following information regarding the CPU installed in Socket 0 and (or) Socket 1 as detected by the BIOS.

- Type of CPU

- CPU Signature

- Microcode Patch

- CPU Stepping

- Maximum CPU Speed

- Minimum CPU Speed

- Processor Cores

- Intel HT (Hyper-Threading) Technology

- Intel VT-x Technology

- L1 Data Cache

- L1 Code Cache

- L2 Cache

- L3 Cache

CPU Speed

This item displays the speed of the CPU installed in Socket 0.

64-bit

This item indicates if the CPU installed in Socket 0 supports 64-bit technology.

Active Processor Cores

Set to Enabled to use a processor's second core and above. (Please refer to Intel's website for more information.) The options are **All,** 1, and 2.

Limit CPUID Maximum

This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled** (for the Windows OS).

Execute-Disable Bit Capability (Available if supported by the OS & the CPU)

Select Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web sites for more information.)

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU prefetches the cache line for 64 bytes if this feature is set to Disabled. The CPU prefetches both cache lines for 128 bytes as comprised if this feature is set to **Enabled**.

DCU Streamer Prefetcher (Available when supported by the CPU)

Select Enabled to support Data Cache Unit (DCU) prefetch to speed up data accessing and processing in the DCU to enhance CPU performance. The options are Disabled and **Enabled**.

DCU IP Prefetcher

Select Enabled for DCU (Data Cache Unit) IP Prefetcher support, which will prefetch IP addresses to improve network connectivity and system performance. The options are **Enabled** and Disabled.

Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to support Intel Virtualization Technology, which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled.

> **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's website for detailed information.)

Clock Spread Spectrum

Select Enable to enable Clock Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are Disabled and **Enabled**.

EuP

Select Enabled to support the Low-power Compliance Mode for Energy-using Products (EuP). The options are Enabled and **Disabled**.

▶CPU Power Management Configuration

This submenu allows the user to configure the following CPU Power Management settings.

Power Technology

Select Energy Efficiency to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving settings. The options are Disabled, **Energy Efficiency**, and Custom. If the option is set to Custom, the following items will display:

EIST

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disabled and **Enabled**.

C1E Support (Available when Power Technology is set to Custom)

Select Enabled to enable Enhanced C1 Power State to boost system performance. The options are **Enabled** and Disabled.

CPU C3 Report (Available when Power Technology is set to Custom)

Select Enabled to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are Enabled and **Disabled.**

CPU C6 Report (Available when Power Technology is set to Custom)

Select Enabled to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all cache is turned off. The options are **Enabled** and Disabled.

CPU C7 Report (Available when Power Technology is set to Custom)

Select Enabled to allow the BIOS to report the CPU C7 State (ACPI C3) to the operating system. CPU C7 State is a processor-specific low C-State. The options are **Enabled** and Disabled.

Package C State Limit

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are C0, C2, C6, and **No Limit**.

Energy Performance

Use this feature to select an appropriate fan setting to achieve maximum system performance (with maximum cooling) or maximum energy efficiency with maximum power saving). The fan speeds are controlled by the firmware management via IPMI 2.0. The options are Performance, **Balanced Performance**, Balanced Energy, and Energy Efficient.

Factory Long Duration Power Limit

This item displays the power limit (in watts) set by the manufacturer during which long duration power is maintained.

Long Duration Power Limit

This item displays the power limit (in watts) set by the user during which long duration power is maintained. The default setting is **0**

Factory Long Duration Maintained

This item displays the period of time (in seconds) set by the manufacturer during which long duration power is maintained.

Long Duration Maintained

This item displays the period of time (in seconds) during which long duration power is maintained. The default setting is **0**

Recommended Short Duration Power

This item displays the short duration power settings (in watts) recommended by the manufacturer.

Short Duration Power Limit

This item displays the time period during which short duration power (in watts) is maintained. The default setting is **0**

▶Chipset Configuration

▶North Bridge

This feature allows the user to configure the settings for the Intel North Bridge.

▶IOH Configuration

Intel® VT-d

Select Enabled to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enabled** and Disabled.

Intel® I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU over-head by leveraging CPU architectural improvements, freeing the system resource for other tasks. The options are Disabled and **Enabled**.

DCA Support

Select Enabled to use Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The options are **Enabled** and Disabled.

IOH 0, IOH 1 PCIe Port Bifurcation Control

This allows the user to configure the following IO PCIe Port Bifurcation Control settings for IOH 0 PCIe port and IOH 1 PCIe port, which determine how to distribute the available PCI-Express lanes to the PCI-Exp. Root Ports.

IOU1-PCIe Port

This feature allows the user to set the PCI-Exp bus speed between IOU1 and PCIe port. The options are x4x4 and x8. The default setting for IOH 0 is **x4x4**. The default setting for IOH 1 is **x8**.

Port 1A Link Speed

Select GEN1 to enable PCI-Exp Generation 1 support for Port 1A. Select GEN2 to enable PCI-Exp Generation 2 support for Port 1A. Select GEN3 to enable PCI-Exp Generation 3 support for Port 1A. The options are GEN1, GEN2, and **GEN3**.

Port 1B Link Speed

Select GEN1 to enable PCI-Exp Generation 1 support for Port 1B. Select GEN2 to enable PCI-Exp Generation 2 support for Port 1B. Select GEN3 to enable PCI-Exp Generation 3 support for Port 1B. The options are GEN1, GEN2, and **GEN3**.

IOU2-PCIe Port

If this feature allows the user to set the bus speed between the IOU2 and the PCI-Exp port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, and **x16**.

Port 2A Link Speed

Select GEN1 to enable PCI-Exp Generation 1 support for Port 2A. Select GEN2 to enable PCI-Exp Generation 2 support for Port 2A. Select GEN3 to enable PCI-Exp Generation 3 support for Port 2A. The options are GEN1, GEN2, and **GEN3**.

IOU3-PCIe Port

If this feature allows the user to set the bus speed between the IOU3 and the PCI-Exp port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16. The default for IOH 0 is **x16**. The default for IOH 1 is **x8x8**.

Port 3A Link Speed

Select GEN1 to enable PCI-Exp Generation 1 support for Port 3A. Select GEN2 to enable PCI-Exp Generation 2 support for Port 3A. Select GEN3 to enable PCI-Exp Generation 3 support for Port 3A. The options are GEN1, GEN2, and **GEN3**.

Port 3C Link Speed

Select GEN1 to enable PCI-Exp Generation 1 support for Port 3C. Select GEN2 to enable PCI-Exp Generation 2 support for Port 3C. Select GEN3 to enable PCI-Exp Generation 3 support for Port 3C. The options are GEN1, GEN2, and **GEN3**.

▶QPI Configuration

Current QPI Link Speed

This item displays the speed of the QPI Link.

Current QPI Link Frequency

This item displays the frequency of the QPI Link.

QPI (Quick Path Interconnect) Link Speed Mode

Use this feature to select data transfer speed for QPI Link connections. The options are **Fast** and Slow.

QPI Link Frequency Select

Use this feature to select the desired QPI frequency. The options are **Auto**, 6.4 GT/s, 7.2 GT/s, and 8.0 GT/s.

▶DIMM Configuration

Current Memory Mode

This item displays the current memory mode.

Current Memory Speed

This item displays the current memory speed.

Mirroring

This item displays if memory mirroring is supported by the serverboard. Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.

Sparing

This item displays if memory sparing can be supported by the serverboard. Memory sparing enhances system reliability, availability, and serviceability.

▶DIMM Information

The status of the memory modules will be displayed as detected by the BIOS.

Memory Mode

When Independent is selected, all DIMMs are available to the operating system. When Mirroring is selected, the serverboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the serverboard uses two areas of memory to run the same set of operations in parallel. The options are **Independent**, Mirroring, Lock step and Sparing.

DRAM RAPL BWLIMIT

This item sets the limits on the average power consumption and the bandwidth of a DRAM module in operation so that the OS can manage power consumption and energy budget of hardware more effectively within a certain window of time. The options are 0, **1**, 8, and 16

Perfmon and DFX Devices

A PerfMon device monitors the activities of a remote system such as disk usage, memory consumption, and CPU load which will allow an IT administrator to maximize the performance of each computer within the network. A DFX device, usually in the form of a USB adaptor, can be used to enhance audio performance. Select Unhide to display the Perfmon and DFX devices installed in the system. The options are **HIDE** and UNHIDE.

DRAM RAPL Mode

RAPL which stands for Running Average Power Limit is a feature that provides mechanisms to enforce power consumption limits on supported processors The options are DRAM RAPL MODE0 , **DRAM RAPL MODE1**, and Disabled.

MPST Support

Select Enabled to enable the Message Processing Subscriber Terminal which is used to process short messages. The options are **Disabled** and Enabled.

DDR Speed

Use this feature to force a DDR3 memory module to run at a frequency other than what the system is specified in the specification. The options are **Auto**, Force DDR3-800, Force DDR3-1066, Force DDR3-1333, Force DDR3-1600 and Force SPD.

Channel Interleaving

This feature selects from the different channel interleaving methods. The options are **Auto**, 1 Way, 2 Way, 3, Way, and 4 Way.

Rank Interleaving

This feature allows the user to select a rank memory interleaving method. The options are **Auto**, 1 Way, 2 Way, 4, Way, and 8 Way.

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enabled, the IO hub will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are **Enabled** and Disabled.

Demand Scrub

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are Enabled and **Disabled**.

Data Scrambling

Select Enabled to enable data scrubbing and ensure data security and integrity. The options are **Disabled** and Enabled.

DRAM RAPL (Running Average Power Limit)

This item allows the user to select the average power limit setting when a DRAM module is in operation. The options are Disabled, Mode 0, and **Mode 1**.

Device Tagging

Select Enabled to support device tagging. The options are **Disabled** and Enabled.

Thermal Throttling

Throttling improves reliability and reduces power consumption in the processor via automatic voltage control during processor idle states. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

OLTT (Open Loop Thermal Throttling) Peak BW (Bandwidth) %

This item sets a percentage of the peak bandwidth allowed for Open Loop Thermal Throttling. The range is between 25% and 100%. The default settling is **50** (%).

▶South Bridge Configuration

This feature allows the user to configure the settings for the Intel PCH chip.

PCH Information

This feature displays the following PCH information.

Name: This item displays the name of the PCH chip.

Stepping: This item displays the status of the PCH stepping.

USB Devices: This item displays the USB devices detected by the BIOS.

All USB Devices

This feature enables all USB ports/devices. The options are Disabled and **Enabled**. (If set to Enabled, EHCI Controller 1 and Controller 2 will appear.)

EHCI Controller 1/EHCI Controller 2 (Available when All USB Devices is set to Enabled)

Select Enabled to enable Enhanced Host Controller Interface (EHCI) Controller 1/ Controller 2. The options are Disabled and **Enabled**.

Legacy USB Support (Available when USB Functions is not Disabled)

Select Enabled to support legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available for EFI (Extensive Firmware Interface) applications only. The settings are Disabled, **Enabled** and Auto.

Port 60/64 Emulation

Select Enabled to enable I/O port 60h/64h emulation support for the legacy USB keyboard so that it can be fully supported by the operating systems that does not recognize a USB device. The options are Disabled and **Enabled**.

EHCI Hand-Off

This item is for operating systems that do not support Enhanced Host Controller Interface (EHCI) hand-off. When enabled, EHCI ownership change will be claimed by the EHCI driver. The options are **Disabled** and Enabled.

Audio Configuration

Azalia HD (High Definition) Audio

Select Enabled to enable support for Azalia High Definition Audio. The options are **Enabled** and Disabled.

Azalia Internal HDMI Codec

Select Enabled to enable support for Azalia High Definition Multi-Media Interface Decode. The options are Enabled and **Disabled**.

▶SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of IDE or SATA devices and displays the following items.

SATA Port0~SATA Port5: The AMI BIOS displays the status of each SATA port as detected by the BIOS.

SATA Mode

Use this feature to configure SATA mode for a selected SATA port. The options are Disabled, IDE Mode, **AHCI Mode** and RAID Mode. The following are displayed depending on your selection:

IDE Mode

The following items are displayed when IDE Mode is selected:

Serial-ATA (SATA) Controller 0~1

Use this feature to activate or deactivate the SATA controller, and set the compatibility mode. The options are Enhanced and Compatible**.** The default for SATA controller 0 is **Compatible**. The default for SATA controller 1 is **Enhanced**.

AHCI Mode

The following items are displayed when the AHCI Mode is selected.

Aggressive Link Power Management

When Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link in a low power mode during extended periods of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Enabled** and Disabled.

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for a particular port, which will allow the user to change a hardware component or device without shutting down the system. The options are Enabled and **Disabled**.

Staggered Spin Up

Select Enabled to enable Staggered Spin-up support to prevent excessive power consumption caused by multiple HDDs spinning-up simultaneously. The options are Enabled and **Disabled**.

RAID Mode

The following items are displayed when RAID Mode is selected:

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for the particular port. The options are Enabled and **Disabled**.

▶SCU Configuration

SCU Devices

Select Enabled to enable support for PCH SCU (System Configuration Utility) devices. The options are Disabled and **Enabled**.

OnChip SAS Oprom

Select Enabled to support the onboard SAS Option ROM to boot up the system via a storage device. The options are Disabled and **Enabled**.

▶PCIe/PCI/PnP Configuration

PCI ROM Priority

Use this feature to set the Option ROM priority to boot the system when there are multiple Option ROMs available in the system. The options are EFI Compatible ROM and **Legacy ROM**.

PCI Latency Timer

Use this feature to set the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

Above 4G Decoding (Available if the system supports 64-bit PCI decoding)

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Enabled and **Disabled**.

PERR# Generation

Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

Maximum Payload

Select Auto to allow the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum Read Request size for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

ASPM Support

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0s to force all PCI-E links to operate at L0s state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0s, and Auto.

⚠ **Warning**: Enabling ASPM support may cause some PCI-E devices to fail!

Slot 1~6 OPROM

Select Enabled to enable Option ROM support to boot the computer using a device installed on the slot specified above. The options are **Enabled** and Disabled.

Onboard LAN Option ROM Select

Select iSCSI to use the iSCSI Option ROM to boot the computer using a network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a network device. The options are iSCSI and **PXE**.

Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1 Option ROM~LAN4 Option ROM. This is to boot the computer using a network device. The default setting for LAN1 Option ROM is **Enabled**. The default setting for LAN2 Option ROM is **Disabled**.

Network Stack

Select Enabled enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Enabled and **Disabled**.

▶**Super IO Configuration**

Super IO Chip

Displays the Super IO chip type.

▶**Serial Port 0, Serial Port1 Configuration**

The submenus allow the user to configure the following settings for Serial Port 0 and Serial Port 1:

Serial Port

Select Enabled to enable a serial port specified by the user. The options are **Enabled** and Disabled.

Device Settings

This feature indicates whether or not a reset is required for a serial port specified.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The default setting is **Auto**.

P/S 2 Connector

This option enables the selection of keyboard or mouse for the PS/2 connector. The options are **Keyboard** or Mouse.

▶Serial Port Console Redirection

COM1, COM2

Console Redirection

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and **Disabled**.

▶Console Redirection Settings

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

Bits Per second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and **8 Bits**.

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled**.**

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Legacy OS Redirection

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are **80x24** and 80x25.

Putty Keypad

Use this feature to select function key and keypad setting on Putty. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The submenu allows the user to configure the following Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection (for EMS)

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and **Disabled**.

▶Console Redirection Settings

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Out-of-Band-Mgmt Port

Use this feature to select the port for out-of-band management. The options are **COM1** and COM2.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, VT100+, and **VT-UTF8**.

Bits Per Second

This item sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, and **115200** (bits per second).

Flow Control

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None,** Hardware RTS/CTS, and Software Xon/Xoff.

▶Hardware Health Configuration

This feature allows the user to monitor system health and review the status of each item as displayed.

Fan Speed Control Mode

This feature allows the user to set the fan speed mode. Select Optimal to reduce fan speed for optimal power saving. Select Full Speed for the fan to run at the full speed which will increase power consumption. The options are **Standard**, Full Speed and Optimal.

CPU Temperature Display Mode

This feature displays the CPU temperature detected by DTS (i.e., +34°C) or temperature status in text ("Low", "Medium" or "High"). The options are **Text Mode** or DTS.

CPU 1 Temperature/CPU 2 Temperature

The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low - This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The serverboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

Medium - The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition , but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The serverboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

High - The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm. The system may shut down if it continues for a long period to prevent damage to the CPU. If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

System Temperature, Patsburg Temperature, Peripheral Temperature

The temperature for the above items will be displayed as detected by the BIOS.

Fan Speed

This feature displays the fan speed readings for all fans detected by the BIOS.

Voltage Readings

The following voltage readings will be displayed.

VTT_P0, VTT_P1, 1.1V, 1.5V, 5VSB, 5V, 12V, CPU1 Vcore, CPU2 Vcore, VDIMM AB, VDIMM EF, 3.3V, 3.3VSB, and VBAT.

▶ACPI Setting

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

ACPI Sleep State

Use this feature to select the ACPI State when the system is in sleep mode. Select S1 (CPU_Stop_Clock) to erase all CPU caches and stop executing instructions. Power to the CPU(s) and RAM is maintained, but RAM is refreshed. Select Suspend Disabled to use power-reduced mode. Power will only be supplied to limited components (such as RAMs) to maintain the most critical functions of the system. The options are **S1 (CPU_Stop_Clock)**, Suspend Disabled, and S3 (Suspend to RAM).

Numa

This feature enables the Non-Uniform Memory Access ACPI support. The options are **Enabled** and Disabled.

High Precision Timer

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback, reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

▶Trusted Computing (Available if a TPM device is installed)

TPM Support

Select Enabled on this item and enable the TPM jumper on the serverboard to allow TPM support to improve data integrity and network security. The options are Enable and **Disable**.

Current Status Information: If a TPM device is detected, this item displays the information regarding the current TPM status.

TPM Enable Status

If a security device is detected by the BIOS, this item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

TPM Active Status

If a security device is detected by the BIOS, this item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

TPM Owner Status

If a security device is detected by the BIOS, this item displays the status of TPM Ownership.

7-4   Event Logs

Use this feature to configure Event Log settings.

| Main | Advanced | Event Logs | Boot | Security | Save & Exit |

▶ Change Smbios Event Log Settings

View Smbios Event Log
View System Event Log

Press <Enter> to change the Smbios Event Log Configuration.

→←:   Select Screen
↑↓ :   Select Item
Enter: Select
+/- :   Change Opt.
F1 :   General Help
F2 :   Previous Values
F3 :   Optimized Defaults
F4 :   Save & Exit
ESC :Exit

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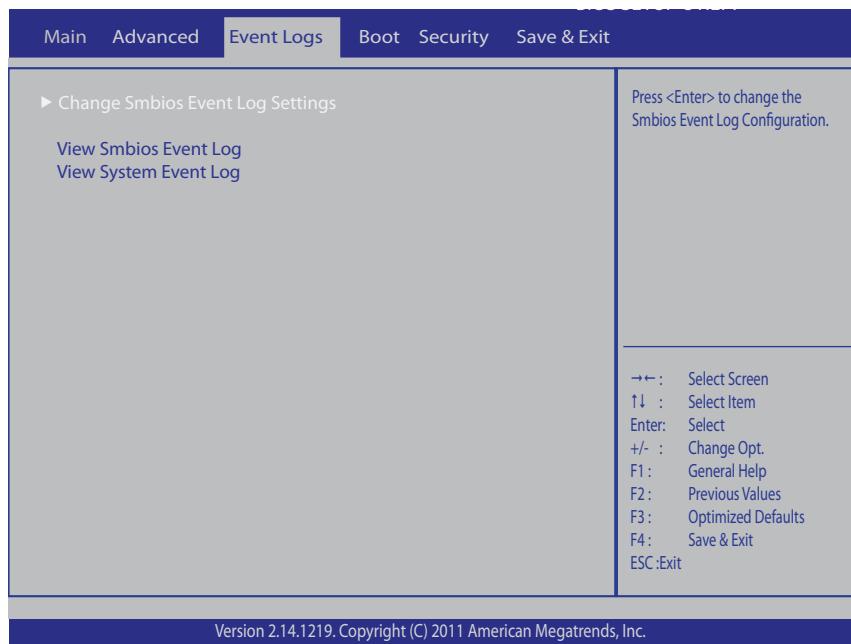
▶Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are **Enabled** and Disabled.

Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are **Enabled** and Disabled.

Memory Correctable Error Threshold

This feature allows the user to enter the threshold value for correctable memory errors. The default setting is **10**.

PCI Error Logging Support

Select Enabled to support error event logging for PCI slots. The options are Enabled and **Disabled**.

Erasing Settings

Erase Event Log

Select Enabled to erase the SMBIOS (System Management BIOS) Event Log, which is completed before a event logging is initialized upon system reboot. The options are **No**, Yes Next Reset, and Yes Every Reset.

When Log is Full

Select Erase Immediately to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

Select Enabled to log system boot events. The options are **Disabled** and Enabled.

MECI (Multiple Event Count Increment)

Enter the increment value for the multiple event counter. Enter a number from 1 to 255. The default setting is **1**.

METW (Multiple Event Count Time Window)

This item allows the user to decide how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number from 0 to 99. The default setting is **60**.

View Smbios Event Log

This feature displays the contents of the SmBIOS Event Log.

View System Event Log

This feature displays the contents of the System Event Log.

7-5   Boot

This submenu allows the user to configure the following boot settings for the system.

| Main | Advanced | Event Logs | **Boot** | Security | Save & Exit |

Sets the system boot order

Boot Option Priorities
Boot Option #1   [WDC WD150ZFYPS-02W3B0]
Boot Option #2   [UEFI: Built-in EFI...]

Hard Drive BBS Priorities

▶ Delete Boot Option

→← :   Select Screen
↑↓ :   Select Item
Enter: Select
+/- :   Change Opt.
F1 :   General Help
F2 :   Previous Values
F3 :   Optimized Defaults
F4 :   Save & Exit
ESC :Exit

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Boot Option Priorities

Boot Option #1, Boot Option #2, etc.

Use this feature to specify the sequence of boot device priority.

Hard Drive BBS Priorities

This option sets the order of the legacy and Hard Disks detected by the serverboard.

▶Delete Boot Option

This feature allows the user to delete a previously defined boot device from which the system boots during startup.

7-6   Security

This menu allows the user to configure the following security settings for the system.

Main	Advanced	Event Logs	Boot	Security	Save & Exit	

Password Description

If ONLY the administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password must be in the following range:

Minimum length   3
Maximum length   20

    Administrator Password
    User Password

Set Administrator Password

→← :   Select Screen
↑↓ :   Select Item
Enter: Select
+/- :   Change Opt.
F1 :   General Help
F2 :   Previous Values
F3 :   Optimized Defaults
F4 :   Save & Exit
ESC :Exit

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Administrator Password

Use this feature to set the Administrator Password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

User Password

Use this feature to set a User Password which is required to log into the system and to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

7-7   Save & Exit

This submenu allows the user to configure the Save and Exit settings for the system.

Main	Advanced	Event Logs	Boot	Security	Save & Exit

```
Discard Changes and Exit                            Exit system setup without
Save Changes and Reset                              saving the changes.

Save Options
Save Changes
Discard Changes

Restore Optimized Defaults
Save as User Defaults
Restore User Defaults

Boot Override                              →←  :    Select Screen
UEFI: Built-in EFI Shell                   ↑↓  :    Select Item
WDC WD1502FYPS-02W3B0                       Enter:    Select
                                            +/- :    Change Opt.
                                            F1 :     General Help
                                            F2 :     Previous Values
                                            F3 :     Optimized Defaults
                                            F4 :     Save & Exit
                                            ESC :Exit
```
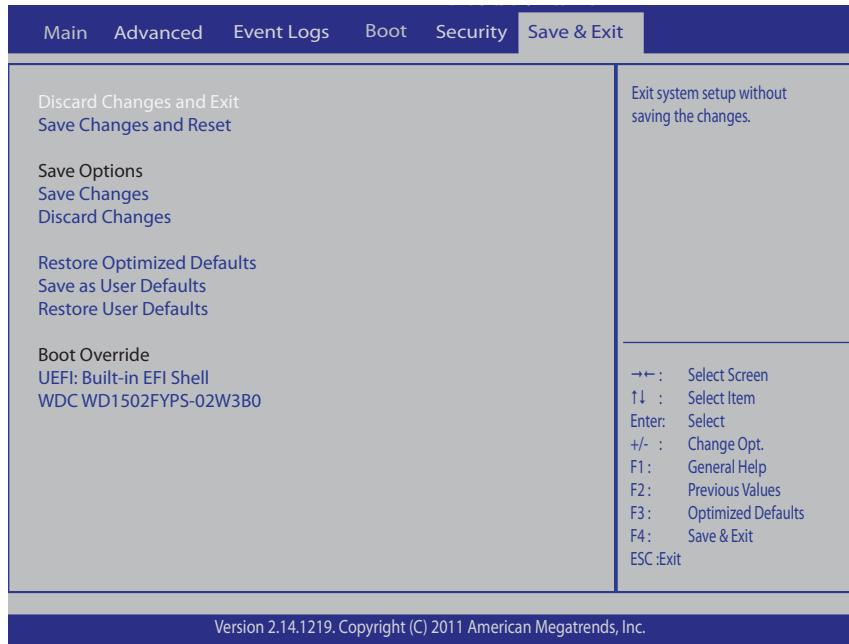
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Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes, or select No to quit the BIOS and save changes.

Save Changes and Reset

When you have completed the system configuration changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect. Select Save Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without sav-ing, select **Yes** to quit BIOS without saving the changes, or select No to quit the BIOS and save changes.

Save Options

Save Changes

Select this option and press <Enter> to save all changes you've done so far and return to the AMI BIOS utility Program. When the dialog box appears, asking you if you want to save configuration, select **Yes** to save the changes, or select No to return to the BIOS without making changes.

Discard Changes

Select this feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, select **Yes** to load the values previous saved, or select No to keep the changes you've made so far.

Restore Defaults

Select this feature and press <Enter> to load the optimized default settings that help optimize system performance. When the dialog box appears, asking you if you want to load optimized defaults, select **Yes** to load the optimized default settings, or select No to abandon optimized defaults.

Save as User Defaults

Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as user's defaults, select **Yes** to save the current values as user's default settings, or select No to keep the defaults previously saved as the user's defaults.

Restore User Defaults

Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, select **Yes** to restore the user's defaults previously saved in the system, or select No to abandon the user's defaults that were previously saved.

Boot Override

This feature allows the user to override the Boot Option Priorities setting in the Boot menu, and instead immediately boot the system with one of the listed devices. This is a one-time override.

Notes

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed at each system boot, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue to boot. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue with bootup procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

BIOS Error Beep Codes		
Beep Code/LED	**Error Message**	**Description**
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory

Notes

Appendix B

System Specifications

Processors

Two Intel E5-2400 processors in LGA 1356 sockets (Socket B2)

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Intel C602

BIOS

16 MB AMI SPI Flash EEPROM

Memory Capacity

Six DIMM sockets supporting up to 192 GB of RDIMM/UDIMM/LRDIMM ECC/non-ECC DDR3-1600/1333/1066/800 LRDIMMs (load-reduced DIMMs

Note: See the memory section in Chapter 5 for details.

SATA Controller

Intel on-chip controller for 10-port SATA 3.0/2.0 (RAID supported)

Drive Bays

Eight hot-swap drive bays to house eight SATA drives

Peripheral Drive Bays

Two 5.25" drive bays

Expansion Slots

Supports the use of six standard size PCI add-on cards: one PCI-E 3.0 x16, three PCI-E 3.0 x4, one PCI-E 3.0 x4 (in a x8 slot) and one PCI-32 slots.

Serverboard

X9DAL-i
Dimensions: 12" x 10" (305 x 254 mm)

Chassis

SC732D4F-500B Form Factor: mid tower
Dimensions (as tower): (WxHxD) 7.6 x 16.7 x 20.7 in. (193 x 424 x 526 mm)

Weight

39 lbs (17.7 kg.)

System Cooling

One 12-cm low-noise exhaust fan
One 12-cm low-noise cooling fan (optional)

System Input Requirements

AC Input Voltage: 100-240 VAC
Rated Input Current: 7A (115V) to 3.5A (240V)
Rated Input Frequency: 50/60 Hz

Power Supply

Rated Output Power: 500W (Part# PWS-502-PQ)
Rated Output Voltages: +3.3V (15A), +5V (20A), +12V (17A), -12V (0.5A), +5Vsb (3A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)
Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

Notes

(continued from front)

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