# SUPER●®

SUPERSERVER 1016i-UF

USER'S MANUAL

1.0

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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 SuperServer 1016i-UF. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 1016i-UF is a high-end server based on the SC113TQ-330UBP 1U rackmount chassis and the Super X8SIU-F single processor serverboard.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X8SIU-F serverboard and the SC113TQ-330UBP chassis, which comprise the SuperServer 1016i-UF.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 1016i-UF into a rack and check out the server configuration prior to powering up the system. If your server 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 SuperServer 1016i-UF.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X8SIU-F 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 SC113TQ-330UBP server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply modules and cooling fans.

Chapter 7: BIOS

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

Appendix A: POST Error Beep Codes

Appendix B: System Specifications

Notes

Table of Contents

Chapter 1

Introduction

1-1   Overview

The SuperServer 1016i-UF is a high-end server comprised of two main subsystems: the SC113TQ-330UBP 1U server chassis and the X8SIU-F single processor motherboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the motherboard and chassis, various hardware components have been included with the 1016i-UF, as listed below:

● One slim DVD-ROM drive (DVM-PNSC-DVD-SBT)

● One mini SATA to USB adapter for slim DVD drive (CDM-USATA-G-O-P)

● Three sets of 4-cm counter-rotating fans (FAN-0086L4)

● One passive CPU heatsink (SNK-P0046P)

● Riser Cards: (see Section 5-6 for details)
  One RSC-R1UU-E8R+ for low-profile PCI-E card
  One RSC-R1UU-UE8 for UIO & PCI-E card

● SATA Accessories
  One SATA backplane (BPN-SAS-113TQ)
  Eight 2.5" hot-swap drive carriers (MCP-220-00047-0B)

● One rackmount kit (MCP-290-00043-0V)

● One CD containing drivers and utilities

● SuperServer 1016i-UF User's Manual

1-2   Motherboard Features

At the heart of the SuperServer 1016i-UF lies the X8SIU-F, a single processor motherboard based on Intel's 3420 chipset. Below are the main features of the X8SIU-F (see Figure 1-1 for a block diagram of the chipset).

Processors

The X8SIU-F supports single Intel® Xeon® 3400 and L3400 Series, Core™ i5 Dual Core, Core™ i3, Pentium® and Celeron® processors in an LGA1156 socket. Please refer to the motherboard description pages on our web site for a complete listing of supported processors.

Memory

The X8SIU-F has six DIMM sockets that can support supporting up to 16 GB of UDIMM or 32 GB of RDIMM DDR3-1333/1066/800 memory. Please refer to Chapter 5 for installing memory.

UIO

The X8SIU-F is a specially-designed motherboard that features Supermicro's UIO (Universal I/O) technology. UIO motherboards have a PCI-Express x8 connector that can support any one of several types of UIO card types to add SAS ports, additional LAN ports, etc. to the motherboard. This allows the user to tailor the motherboard to their own needs. Note: the 1016i-UF does not come with a UIO card installed.

Serial ATA

An on-chip SATA controller is integrated into the X8SIU-F to provide a six-port, 3 Gb/sec Serial ATA subsystem, which is RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units. Note: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the Serial ATA drives. Documentation on RAID setup guidelines can be found on our web site.

I/O Ports

The color-coded I/O ports include one COM port, a VGA (monitor) port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports. A dedicated IPMI LAN port is also included.

Graphics Controller

The X8SIU-F features an integrated ATI video controller based on the Matrox G200eW graphics chip, which has 16 MB of DDR2 memory.

Other Features

Other onboard features that promote system health include onboard voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

1-3   Server Chassis Features

The SC113TQ-330UBP chassis features eight 2.5" hard drive bays and a high-efficiency power supply. Details on the chassis and on service procedures can be found in Chapter 6. The following is a general outline of the main features of the chassis.

System Power

The SC113TQ-330UBP features a single 330W power supply module. The system must be shut down when replacing or removing this power supply module.

PCI Expansion Slots

A riser card (RSC-R1UU-E8R+, optional) on the right side of the chassis can support one PCI-E x8 low-profile add-on card (with a maximum length of 5.6"). The left side has a RSC-R1UU-UE8 riser card to support a UIO card and one PCI-E 2.0 x8 card. See our web site for details (http://www.supermicro.com/products/nfo/UIO.cfm) for details on UIO cards. See page 5-11 for installing add-on cards. (Right and left refer to the side when viewed from the front of the system.

Control Panel

The SC113 control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and a UID (Universal Information) LED. Also present are a main power button, a system reset button and a UID button.

Cooling System

The SC113 chassis' revolutionary cooling design has been optimized to provide sufficient cooling for dual CPU configurations. The chassis includes an air shroud and three 4-cm counter-rotating fans located in the middle of the chassis. There is a "Fan Speed Control Mode" in BIOS that allows chassis fan speed to be determined by system temperature.

**Figure 1-1. Intel 3420 Chipset:
System Block Diagram**

Note: This is a general block diagram. Please see Chapter 5 for details.

BLOCK DIAGRAM
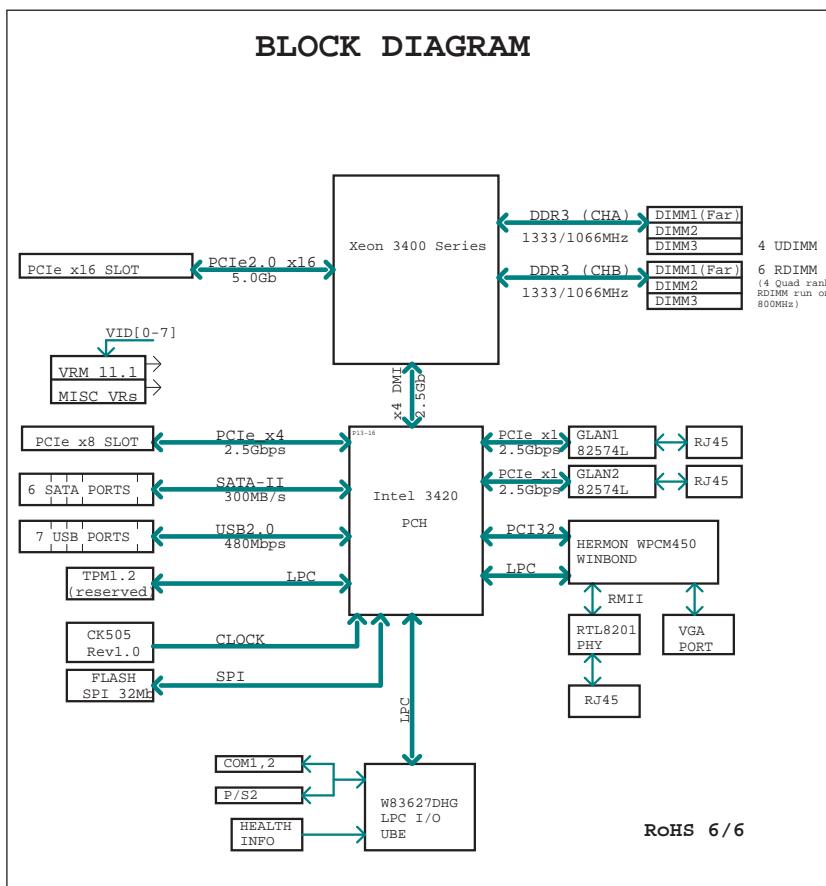
1-4   Contacting Supermicro

Headquarters

Address:	Super Micro Computer, Inc.
	980 Rock Ave.
	San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008
Email:	marketing@supermicro.com (General Information)
	support@supermicro.com (Technical Support)
Web Site:	www.supermicro.com

Europe

Address:	Super Micro Computer B.V.
	Het Sterrenbeeld 28, 5215 ML
	's-Hertogenbosch, The Netherlands
Tel:	+31 (0) 73-6400390
Fax:	+31 (0) 73-6416525
Email:	sales@supermicro.nl (General Information)
	support@supermicro.nl (Technical Support)
	rma@supermicro.nl (Customer Support)

Asia-Pacific

Address:	Super Micro Computer, Inc.
	4F, No. 232-1, Liancheng Rd.
	Chung-Ho 235, Taipei County
	Taiwan, R.O.C.
Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3991
Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
Tel:	886-2-8228-1366, ext.132 or 139

Chapter 2

Server Installation

2-1   Overview

This chapter provides a quick setup checklist to get your SuperServer 1016i-UF 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 server system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, 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 SuperServer 1016i-UF was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the server. 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. Read the Rack and Server Precautions in the next section.

2-3   Preparing for Setup

The box the SuperServer 1016i-UF was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.This product is for

installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

- This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

 Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.

- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.

- Always make sure the rack is stable before extending a component from the rack.

- You should extend only one component at a time - extending two or more si-multaneously may cause the rack to become unstable.

Server Precautions

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

- Determine the placement of each component in the rack *before* you install the rails.

- Install the heaviest server components on the bottom of the rack first, and then work up.

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

- Allow the hot plug drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4   Installing the System into a Rack

This section provides information on installing the SuperServer 1016i-UF into a rack. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. **Note:** This rail will fit a rack between 26" and 33.5" deep.

There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the 1016i-UF into a rack with the rack rails provided. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails

Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

Figure 2-1. Identifying the Sections of the Rack Rails

Outer Rails

Rail Extension
(Inner rail is pre-installed)
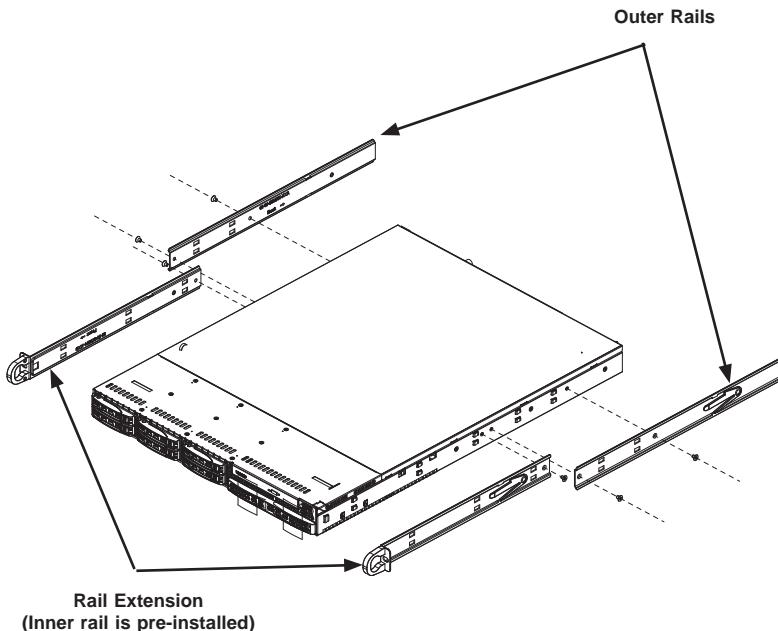
Inner Rails

The SC113 chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are pre-attached and do not interfere with normal use of the chassis if you decide not to use a server rack. Attach the inner rail extension to stabilize the chassis within the rack.

Installing the Inner Rails (Figure 2-2)

1. Place the inner rack extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the pre-attached inner rail.

2. Slide the extension toward the front of the chassis.

3. Secure the chassis with two screws as illustrated.

4. Repeat steps 1-3 for the other inner rail extension.

Figure 2-2. Installing Chassis Rails
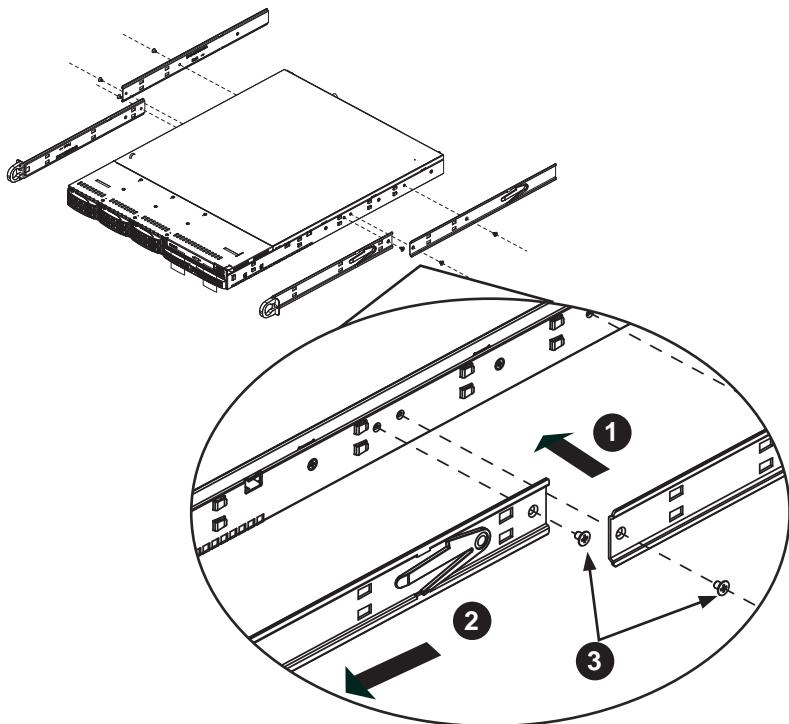
Outer Rails

Installing the Outer Rails to the Rack (Figures 2-3 and 2-4)

1. Attach the short bracket to the outside of the long bracket. You must align the pins with the slides. Also, both bracket ends must face the same direction.

2. Adjust both the short and long brackets to the proper distance so that the rail fits snugly into the rack.

3. Secure the long bracket to the front side of the outer rail with two M5 screws and the short bracket to the rear side of the outer rail with three M5 screws.

4. Repeat steps 1-4 for the left outer rail.

Figure 2-3. Assembling the Outer Rails

Secure to the Front of the Rack

Attach Outer Racks Together

Secure to the Rear of the Rack
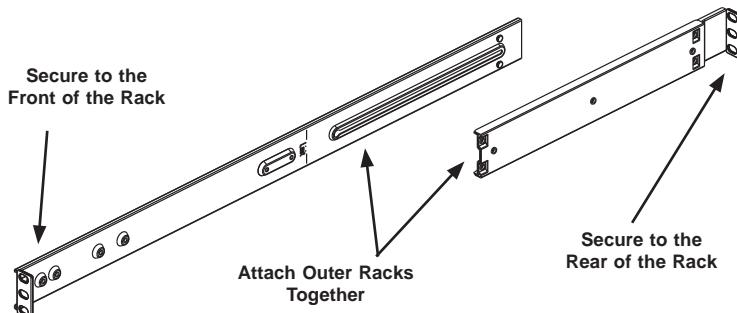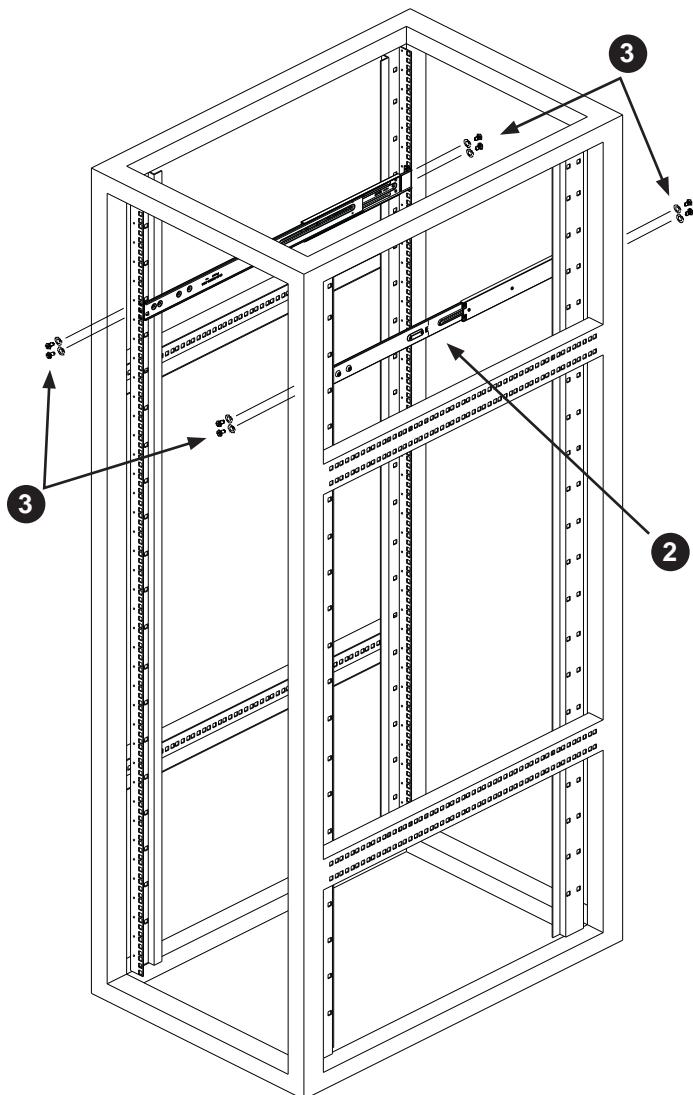
Figure 2-4. Installing the Outer Rails to the Rack

Installing the Chassis into a Rack (Figure 2-5)

1. Confirm that chassis includes the inner rails and rail extensions . Also, confirm that the outer rails are installed on the rack.

2. Line chassis rails with the front of the rack rails.

3. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the server has been pushed completely into the rack, you should hear the locking tabs "click".

4. (Optional) Insert and tightening the thumbscrews that hold the front of the server to the rack.

Figure 2-5. Installing the Server into a Rack
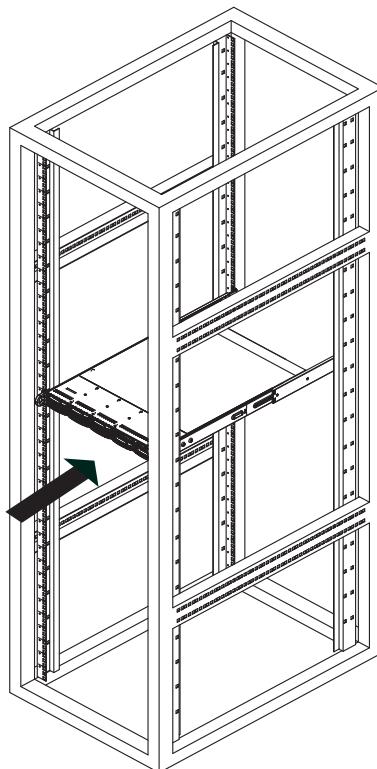
Installing the Server into a Telco Rack

To install the SuperServer 1016i-UF into a Telco type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far follow the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

Figure 2-6. Installing the Server into a Telco Rack
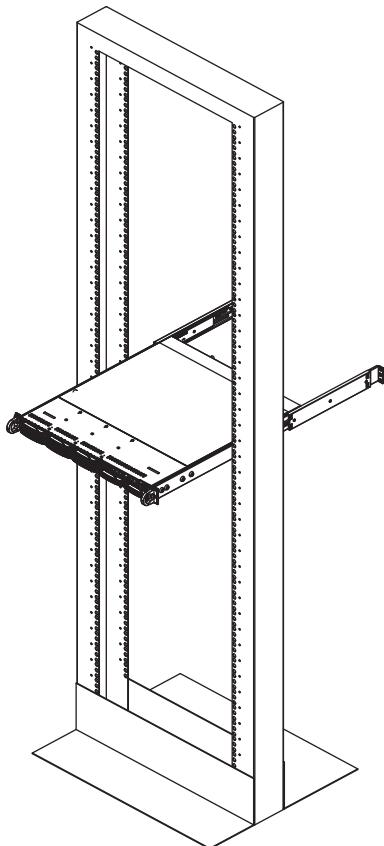
2-5   Checking the Serverboard Setup

After you install the 1016i-UF in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

Removing the Chassis Cover (Figure 2-5)

1. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").

2. Remove the screws securing the top cover to the chssis.

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

4. Lift the cover off the chassis.

Checking the Components

1. You should have one or two processors already installed into the serverboard. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

Figure 2-5: Removing the Chassis Cover
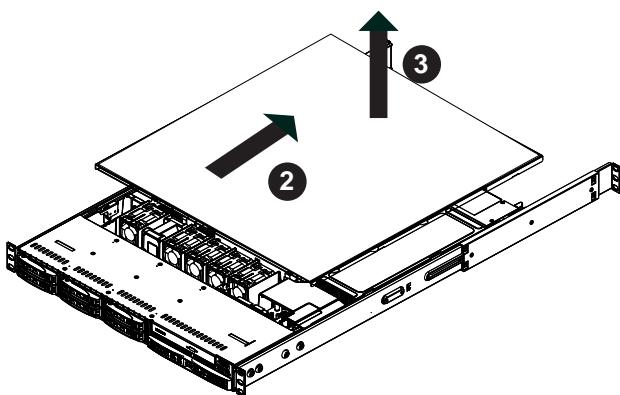
2. Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

3. If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections. Also, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the serverboard area of the chassis.

2-6   Checking the Drive Bay Setup

Next, you should check to make sure the hard drives have been properly installed and all connections have been made.

Checking the Drives

1. For servicing the hard drives, you will need to remove the top chassis cover.

2. If you need to remove or install hard drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by three sets of counter-rotating fans (two fans placed back-to-back in each set). The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

Providing Power

1. The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

2. Turn on the power switch on the back of the power supply, then depress the power button on the front chassis control panel.

Notes

Chapter 3

System Interface

3-1   Overview

There are several LEDs on the control panel to keep you constantly informed of the overall status of the system as well as the three buttons described below.

3-2   Control Panel Buttons

There are three buttons located on the front of the chassis: a reset button, a power on/off button and a UID button.

RESET

Reset

Use the reset button to reboot the system.

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.

UID

Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function. See the table in Figure 3-1 for descriptions of UID LED states.

3-3   Control Panel LEDs

The control panel located on the front of the SC113T chassis has five 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.

U

Universal Information LED

When this LED blinks red quickly, it indicates a fan failure and when blinking red slowly a power failure. This LED will be blue when used for UID (Unit Identifier). 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. See the table below for descriptions of the LED states.

Figure 3-1. Universal Information LED States

Universal Information LED States	
State	Indication
Fast Blinking Red (1x/sec)	Fan Fail
Solid Red	CPU Overheat
Slow Blinking Red (1x/4 sec)	Power Fail
Solid Blue	Local UID Button Depressed
Blinking Blue	IPMI-Activated UID

Note: deactivating the UID LED must be performed in the same way it was activated. (If the UID LED was activated via IPMI, you can only turn the LED off via IPMI and not with the UID button.)
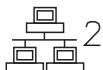
NIC2

Indicates network activity on LAN2 when flashing.

NIC1

Indicates network activity on LAN1 when flashing.

HDD

Indicates DVD-ROM/hard drive activity when flashing.

Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4   Hard Drive Carrier LEDs

Each hard drive carrier has two LEDs.

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

* **Red:** The red LED indicates two states. When blinking, it indicates the drive is rebuilding. When solid, it indicates a drive failure. If a drive fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed drives.

Chapter 4

System Safety

4-1   Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 1016i-UF 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 install-ing main system components, such as the serverboard, memory modules and floppy drive. The 1026T-URF has more than one power supply. 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 neces-sary.

* 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 static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

* The power supply power cords 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 polarites (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 system clean and free of clutter.

- The 1016i-UF weighs approximately 37 lbs (16.8 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.

- 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 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 1016i-UF 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
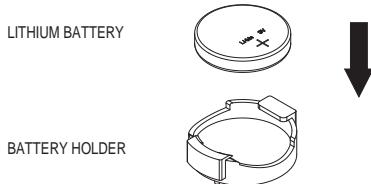
Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Motherboard Setup

This chapter covers the steps required to install processors and heatsinks to the X8SIU-F motherboard, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the motherboard to protect and cool the system sufficiently.

5-1   Handling the Motherboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the motherboard can cause it to bend if handled improperly, which may result in damage. To prevent the motherboard 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 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 motherboard, add-on cards and peripherals back into their antistatic bags when not in use.

Unpacking

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

5-2   Processor and Heatsink Installation

Notes:

- Always connect the power cord last and always remove it before adding, re-moving 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 the LGA1156 Processor

1. Press the load lever to release the load plate, which covers the CPU socket, from its locked position.
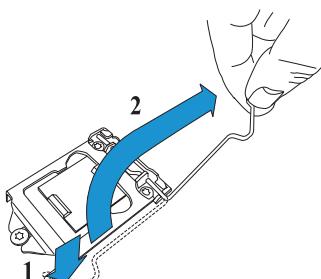
2. Gently lift the load lever to open the load plate. Remove the plate cap.
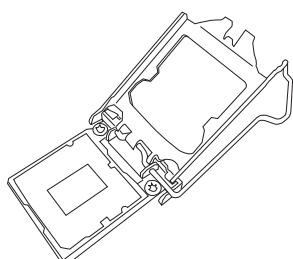
3. Use your thumb and your index finger to hold the CPU at the top center edge and the bottom center edge of the CPU.
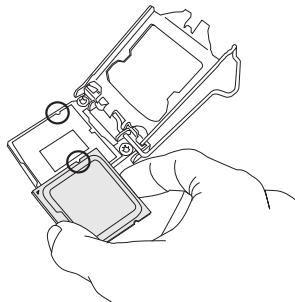
4. Align the CPU key that is the semi-circle cutouts against the socket keys. Once aligned, carefully lower the CPU straight down to the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically.

    Do not rub the CPU against the surface or against any pins of the socket to avoid damage to the CPU or the socket.)

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

Pin 1
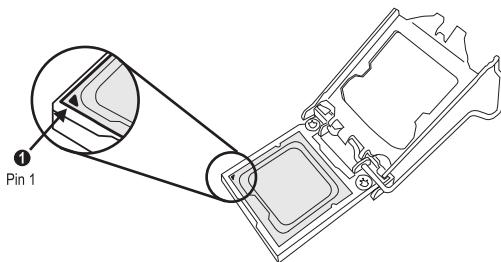
5. Use your thumb to gently push the load lever down to the lever lock.

    Save the plastic PnP cap. The motherboard must be shipped with the PnP cap properly installed to protect the CPU socket pins. Shipment without the PnP cap properly installed will cause damage to the socket pins.

CPU properly installed

Load lever locked into place.
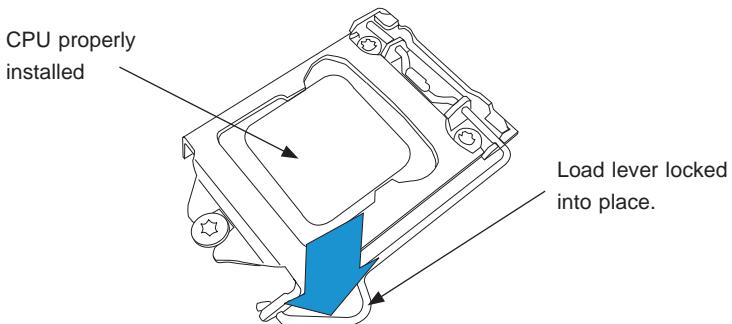
⚠ **Warning:** The CPU will only seat inside the socket in one direction. Make sure it is properly inserted before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is aligned properly.

Installing a Passive CPU Heatsink

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 motherboard and the heatsink bracket underneath.

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

4. Finish the installation by fully tightening all four screws.

Removing the Heatsink

⚠ **Warning:** We do not recommend removing the CPU or the heatsink. However, if you do need to remove the heatsink, please follow the instructions below to prevent damage to the CPU or other components.

1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the illustration below.

2. Gently wriggle the heatsink to loosen it from the CPU (do not use excessive force).

Figure 5-3. Installing the Heatsink
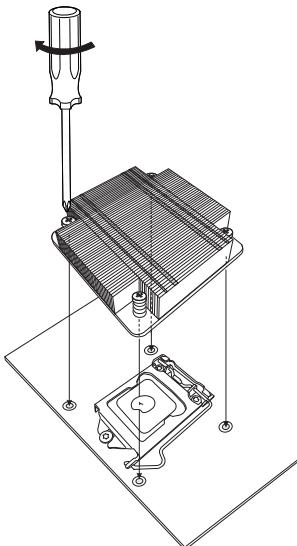
3. Once the CPU is loose, remove the it from the CPU socket.

4. Clean the surface of the CPU and the heatsink, removing the used thermal grease. Reapply the proper amount of thermal grease on the surface before re-installing the CPU and the heatsink.

Figure 5-4. Removing the Heatsink

Loosen screws in the sequence shown

Screw #4

Screw #1

Screw #2

Motherboard

Screw #3
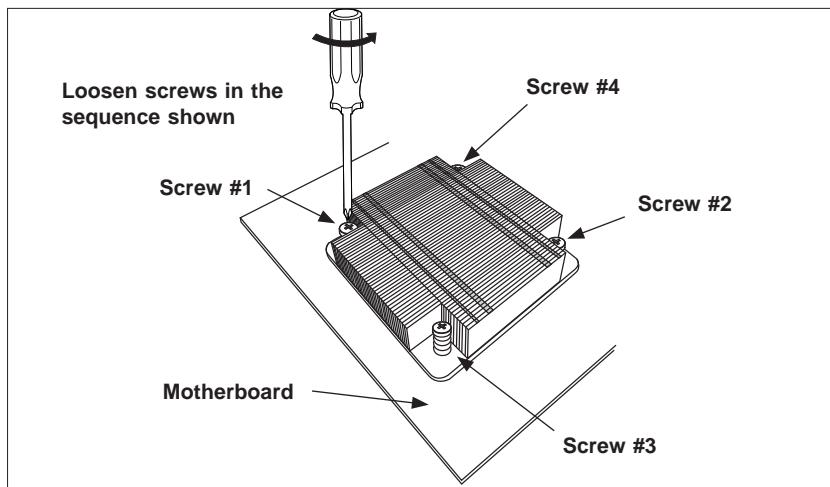
5-3   Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the motherboard. 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 in preconfigured systems 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 reroute them as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables.

The following data cables (with their motherboard connector locations noted) should be connected.

See the motherboard layout diagram in this chapter for connector locations.

- DVD-ROM Drive cable (SATA0)

- Control Panel cable (JF1, see next page)

- SATA cables (SATA1 ~ SATA5)

- SGPIO cable (T-SGPIO1 to SATA backplane)

Connecting Power Cables

The X8SIU-F has a 24-pin primary power supply connector designated "JPW1" for connection to the ATX power supply. Connect the appropriate connector from the power supply to JPW1 to supply power to the motherboard. See the Connector Definitions section in this chapter for power connector pin definitions.

In addition, your power supply must be connected to the 8-pin Processor Power connector at JPW2.

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. Please note that even and odd numbered pins are on opposite sides of each header.

All JF1 wires have been bundled into single keyed ribbon cable to simplify their connection. Connect one end of this cable to JF1 and the other end to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See the Connector Definitions section in this chapter for details and pin descriptions of JF1.

Figure 5-1. Front Control Panel Header Pins (JF1)

	16	15	
Power LED	○	○	LED_Anode+
HDD LED	○	○	LED_Anode+
NIC1 LED	○	○	LED_Anode+
NIC2 LED	○	○	LED_Anode+
OH/Fan Fail	○	○	UID LED
PWR Fail	○	○	LED_Anode+
Ground	○	○	Reset Button
Ground	○	□	Power Button
	2	1	

5-4   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. Rear Panel I/O Ports
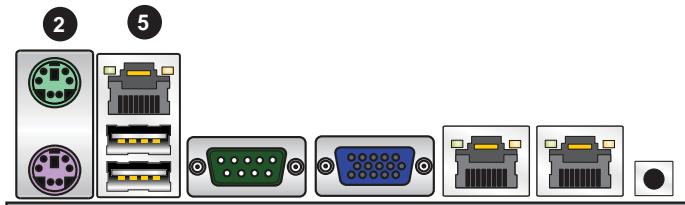
1. PS/2 Keyboard Port	6. Serial Port (COM 1)
2. PS/2 Mouse Port	7. VGA Port
3. USB0	8. LAN 1 Port
4. USB1	9. LAN 2 Port
5. IPMI Port	10. UID Switch

5-5   Installing Memory

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 DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with slots DIMM1A. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly. See Figure 5-5.

2. Gently press down on the DIMM module until it snaps into place in the slot. Repeat fstep 1 to install to DIMM1B if needed.

Memory Support

The X8SIU-F supports up to 16 GB of ECC DDR3-1333/1066/800 UDIMMs or up to 32 GB of ECC DDR3-1333/1066/800 RDIMMs in six DIMM slots. Populating these DIMM modules with a pair of memory modules of the same type and same size will result in interleaved memory, which will improve memory performance. Please refer to the table below.

Notes

1. Due to OS limitations, some operating systems may not show more than 4 GB of memory.

2. Both ECC and non-ECC memory can be installed.

Platform	DIMM Type	Intel® Xeon® Series Processors
X8SIU-F	Non-ECC UDIMM Only	Not Supported
	ECC UDIMM Only	Supported (see Table 1)
	RDIMM Only (with ECC)	Supported (see Table 2)
	Mixed ECC with non-ECC	Not Supported
	Mixed UDIMM/RDIMM	Not Supported

Table 1 - DDR3 ECC/Unbuffered (UDIMM) Memory Support		
ECC UDIMM	**1Gb (x8 DRAM)**	**2Gb (x8 DRAM)**
Single Rank	Up to 4GB (4 x 1GB DIMMs)*	Up to 8GB (4 x 2GB DIMMs)*
Dual Rank	Up to 8GB (4 x 2GB DIMMs)*	Up to 16GB (4 x 4GB DIMMs)*
Quad Rank	Not Supported	Not Supported

*For ECC UDIMMs, only Slot 1 and Slot 2 may be populated per channel.

Table 2 - DDR3 ECC Registered (RDIMM) Memory Support		
RDIMM	**1Gb (x8 DRAM)**	**2Gb (x8 DRAM)**
Single Rank	Up to 6GB (6 x 1GB DIMMs)	Up to 12GB (6 x 2GB DIMMs)
Dual Rank	Up to 12GB (6 x 2GB DIMMs)	Up to 24GB (6 x 4GB DIMMs)
Quad Rank	Up to 16GB (4 x 4GB DIMMs)**	Up to 32GB (4 x 8GB DIMMs)**

Note: All other memory sizes, types, die and density that are not listed in these tables are NOT supported. **For Quad Rank RDIMMs, only Slot 1 and Slot 2 are populated per channel.
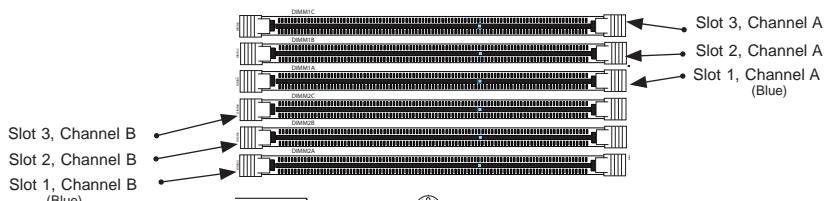
Figure A (rotated -90 degrees)

Memory Population Guidelines

Please follow the table below when populating the X8SIU-F.

DDR3 ECC UDIMM Memory				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type**	**POR Speeds**	**Ranks per DIMM (any combination)**
3	1	Unbuffered DDR3 ECC	1066, 1333	Single Rank, Dual Rank
3	2	Unbuffered DDR3 ECC	1066, 1333	Single Rank, Dual Rank
3	3	N/A	Not Supported	Single Rank, Dual Rank

Note: For ECC UDIMMs, only Slot 1 and/or Slot 2 may be populated per channel.

Figure 5-3. Installing DIMM into Slot

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
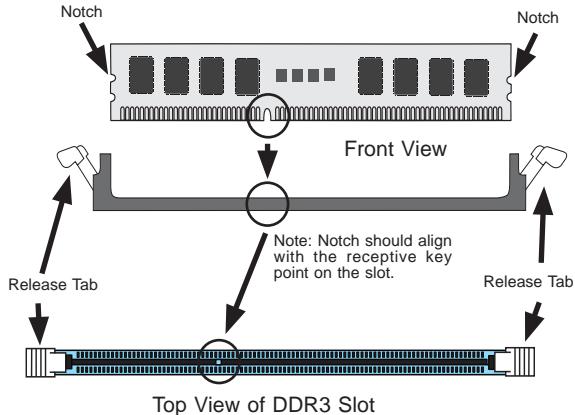
5-6   Adding PCI Cards

PCI Expansion Slots

Two riser cards are used to support add-on cards to the system. The SC113TQ-330UBP chassis can accommodate one standard size (full height full length) and one low profile PCI expansion card. When viewed from the chassis front, the standard size card installs to the left and the low-profile card installs to the right side.

PCI Card Installation

Before installing a PCI add-on card, make sure you install it into the correct riser card. Begin by releasing the locking tab that corresponds to the slot you wish to populate. Insert the expansion card into the correct riser card, pushing down with your thumbs evenly on both sides of the card.

PCI Slot/Card Configurations

Left Side Riser Card	*Expansion card supported*
RSC-R1UU-UE8 (pre-installed)	1x PCI-E 2.0 x8 and UIO card
Right Side Riser Card	*Expansion card supported*
RSC-R1UU-E8R+ (pre-installed)	1x PCI-E x8 low-profile card (maximum length of 5.6")

5-7 Motherboard Details

Figure 5-4. SUPER X8SIU-F Layout
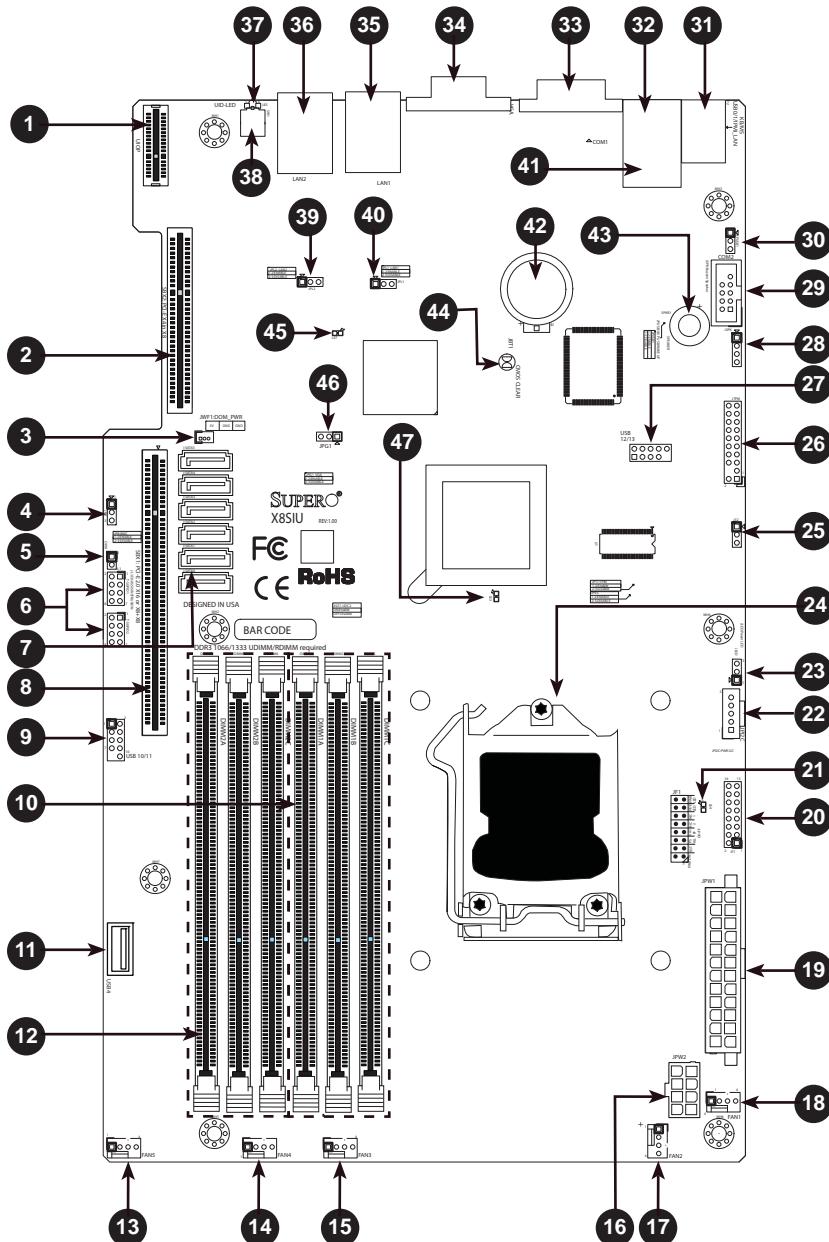
X8SIU-F Quick Reference		
Number	**Connector**	**Description**
1	UIOP	Universal I/O Power Connector
2	SBX2	SBX2 PCI-E Slot, x4 in x8 Slot
3	JWF1	Disk-On-Module (DOM) Power Header
5	JL1	Chassis Intrusion Header
6	T-SGPIO-1/2	Serial General Purpose I/O Headers (for SATA)
7	SATA 0~5	SATA Ports (0~5)
8	SBX1	SBX1 PCIE 2.0 Slot (x16 or x8 + x8, set by jumper 25)
9	USB10/11	Front Panel USB Header
10	DIMM Slots 1~3	DIMM Memory Slots (Bank 1)
11	USB4	Internal Type A USB Port (USB4)
12	DIMM Slots 4~6	DIMM Memory Slots (Bank 2)
13,14,15,17,18	Fan 5,4,3,2,1	Fan Connectors
16	JPW2	8-Pin Auxilliary Power
19	JPW1	24-pin Main ATX Power Connector
20	JF1	Front Panel Control Header
22	JPI2C	PWR supply (I2C) System Management Bus
23	JLED	Power LED Indicator Header
24	CPU	LGA 1156 CPU Socket
26	JTPM	TPM Header
27	USB12/13	Front Panel USB Header (USB12/13)
29	COM2	COM2 Header
31	KB/MS	Keyboard (Purple) and Mouse (Green) PS/2 Ports
32	IPMI_LAN (Top)	Back Panel IPMI LAN Port
33	COM1	Back Panel COM1 Port
34	VGA	Back Panel VGA Port
35	LAN1	Back Panel LAN1 Port
36	LAN2	Back Panel LAN2 Port
38	SW1	Unit ID (UID) Switch
41	USB0/1 (Bottom)	Back Panel USB Ports (USB0, USB1)
42	B1	Onboard Battery
43	SPKR1	Internal Speaker/Buzzer

Jumpers			
Number	**Jumper**	**Description**	**Default Setting**
4	JPB	BMC Jumper	Pins 1-2 (Enabled)
25	J32	SBX1 Slot Configuration Select	Pins 1-2 (PCIE x16) Pins 2-3 (PCIE x8 + x8)
28	JSPK	External Speaker Select	Pins 1-2 (External) Pins 3-4 (Onboard)
30	JPUSB1	USB Wake-up	Pins 1-2 (Enabled)
39	JPL2	LAN2 Enable	Pins 1-2 (Enabled)
40	JPL1	LAN1 Enable	Pins 1-2 (Enabled)
44	JBT1	CMOS Clear	See Chapter 3
46	JPG1	Onboard VGA Enable	Pins 1-2 (Enabled)

LEDs				
Number	**LED**	**Description**	**Color/State**	**Status**
21	LE4	Standby Power LED	Green: Solid On	Power On
37	LE5	Unit ID LED	Blue: Solid On	UID On
45	LE7	IPMI Heartbeat LED	Yellow: Blinking	IPMI Normal
47	LE3	Memory Status LED	Yellow: Blinking	Unsupported Memory

5-8   Connector Definitions

ATX Power Connector

A 24-pin main power connector is located at JPW1. This power connector meet the SSI EPS 12V specification. See the table on the right for pin definitions.

ATX Power 24-pin Connector Pin Definitions (JPW1)			
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

Processor Power Connector

In addition to the ATX main power, the 8-pin 12V power connector located at JPW2 is also required to provide power to the South Bridge, North Bridge and all VRMs. See the table on the right for pin definitions.

Processor Power Pin Definitions (JPW2)	
Pins	Definition
1 through 4	Ground
5 through 8	+12V

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	+5V
16	Ground

HDD LED

The HDD LED connections are located on pins 13 and 14 of JF1. Attach a cable here to indicate HDD activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	+5V
14	HD Active

NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for LAN Port 2 is on Pins 9 and 10. NIC1 LED and NIC2 LED are 2-pin NIC LED headers. Attach NIC LED cables to NIC1 LED and NIC2 LED to display network activities for LAN 1 and LAN2. Refer to the table on the right for pin definitions.

LAN1/LAN2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	LAN Act

Overheat (OH)/Fan Fail/Front UID LED

Connect an LED cable to the Front UID and OH/Fan Fail connections on pins 7 and 8 of JF1 to display UID (Unit ID) signals or to provide advanced warnings for chassis overheat/fan failure. Refer to the table on the right for pin definitions.

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

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Attach an LED cable here to indicate when there has been a power outage. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a the hardware Reset Button on the computer case. Refer to the table on the right for pin definitions.

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

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see BIOS Setup). To turn off the power in the suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	GND

Universal Serial Bus (USB)

Two Universal Serial Bus ports (USB 0/1) are located on the I/O back panel and an additional six USB ports in three headers, USB2/3, 10/11, 12/13 provide front/back chassis access. USB 4 is a Type A USB connector. (USB cables are not included). See the tables on the right for pin definitions.

Back Panel USB0/1 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/Back Panel USB2/3, 10/11, 12/13 Pin Definitions			
USB 2, 3		USB 10/11	
Pin #	Definition	Pin #	Definition
1	+5V	6	+5V
2	USB_PN2	7	USB_PN3
3	USB_PP2	8	USB_PP3
4	Ground	9	Ground
5	No Connection	10	Key

Serial Ports

The COM1 Port is located on the I/O back panel. COM2 is a header located on the the motherboard. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	CDC	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Fan Headers

The X8SIU-F has four fan headers (Fan1 ~ Fan4). These are all 4-pin fan headers, however pins 1-3 are backward compatible with traditional 3-pin fans. A fan speed control setting in the BIOS (Hardware Monitoring section) allows the BIOS to automatically set fan speeds based on the system temperature. The default setting is **Disabled,** which allows the on-board fans to run at full speed. Refer to the table on the right for pin definitions.

Note: Please use all 3-pin fans or all 4-pin fans on a motherboard. Please do not mix 3-pin fans and 4-pin fans on the same board.

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

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach the appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Unit ID Switch

There are three Unit Identification (UID) devices on the motherboard. The Control Panel UID LED is connected to pin 7 of JF1. When the user pushes the rear UID switch, the Control Panel UID LED and the back panel UID LED (LE5) will turn on. Push the rear UID switch again to turn off both Indicators. These UID Indicators provide easy identification of a system unit that may be in need of service.

UID Switch	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

External Speaker

On the JSPK header, pins 3~4 are used to activate the Internal Speaker/Buzzer. Close pins 3~4 with a jumper to use the internal Speaker/Buzzer. If you wish to use an external speaker, attach the external speaker's cable to pins 1~4. See the table on the right for pin definitions.

Speaker Connector Pin Definitions	
Pin Setting	Definition
Pins 3~4	Internal Speaker
Pins1~4	External Speaker

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse ports are located beside the USB ports. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Ports Pin Definitions	
Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Onboard Power LED

An onboard Power LED header is located at JLED. This Power LED header is connected to the Control Panel header (JF1) to indicate the status of system power. See the table on the right for pin definitions.

Onboard PWR LED Pin Definitions	
Pin#	Definition
1	VCC
2	No Connection
3	Connection to PWR LED in JF1

Power Supply I²C Connector

The Power Supply SMB (I²C) Connector is located at JPI**²C** on the motherboard. This connector monitors the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

PWR Supply I²C Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground

Trusted Platform Module Header

This header is used to connect a Trusted Platform Module (TPM), available separately from a third-party vendor. A TPM is a security device that allows encryption and authentication of hard drives, disallowing access if the TPM associated with it is not installed in the system. See the table on the right for pin definitions.

Trusted Platform Module Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME	4	No Pin
5	LRESET	6	VCC5
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	RSV0	14	RSV1
15	SB3V	16	SERIRQ
17	GND	18	CLKRUN
19	LPCPD	20	RSV2

Ethernet Ports

Two Ethernet ports (LAN1/LAN2) are located next to the VGA port on the I/O back panel. An IPMI Dedicated LAN port is also located above the USB0/1 ports on the X8SIU-F. This provides a dedicated network connection for IPMI 2.0 support. These ports accept RJ45 type connectors/cables.

LAN Ports Pin Definitions			
Pin#	Definition		
1	GND	10	TD0-
2	Vcc19-LAN	11	Link 1000 LED
3	TD3+	12	Link 100 LED
4	TD3-	13	3.3V
5	TD2+-	14	Act LED
6	TD2-	15	GND
7	TD1+-	16	GND
8	TD1-		
9	TD0+		

NC = No connection

Compact Flash/DOM PWR Connector

A Compact Flash/Disk On Module (DOM) Power Connector is located at JWF1. This connector is used to provide power to auxilliary flash memory media attached to a SATA port. See the table on the right for pin definitions.

Compact Flash Card PWR Connector	
Pin	Definition
1	Vcc
2	GND
3	GND

T-SGPIO 1/2 Headers

Two T-SGPIO (Serial-Link General Purpose Input/Output) headers are located near the SATA connectors on the motherboard. These headers are used to communicate with the enclosure management chip in the system. See the table on the right for pin definitions.

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

NC = No connection

Universal I/O Power Connector (UIOP)

The Universal I/O Power (UIOP) Connector is required for riser cards installed on the motherboard. Please connect the riser card to the UIOP connector to provide adequate power to the add-on cards installed on the motherboard so these cards function properly. See the table on the right for pin definitions.

Universal I/O Power Connector Pin Definitions			
Pin#	Definition	Pin #	Definition
B1	P5V	A1	P3V3
B2	P5V	A2	P3V3
B3	P5V	A3	P3V3
B4	P5V	A4	P3V3
B5	P5V	A5	P3V3
B6	P5V	A6	P3V3
B7	P5V	A7	P3V3
B8	P5V	A8	P3V3
B9	P5V	A9	P3V3
B10	P5V	A10	P3V3
B11	N12V	A11	P3V3
B12	P3V3 STBY	A12	P3V3
B13	P3V3 STBY	A13	P12V
B14	Ground	A14	P12V
B15	Ground	A15	P12V
B16	Ground	A16	P12V
B17	Ground	A17	P12V
B18	Ground	A18	Ground

5-9   Jumper Settings

Explanation of Jumpers

To modify the operation of the mother-board, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram at right for an example of jumping pins 1 and 2. Refer to the motherboard layout page for jumper locations.
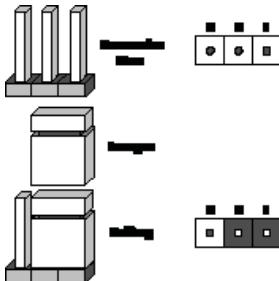
Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

JBT1 is used to clear CMOS and 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*.

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SBX1 Slot Configuration Select

SBX1 select (J32) allows you to select between a PCI-E x16 or a PCI-E x8+x8 configuration on the SBX1 slot.

SBX1 Slot Configuration Select Jumper Settings	
Both Jumpers	Definition
Pins 1-2	PCIE x16 (Default)
Pins 2-3	PCIE x8 + x8

LAN Port Enable/Disable

Use JPL1/JPL2 to enable or disable LAN Port 1 and LAN Port 2 on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

LAN Port Enable Jumper Settings	
Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

USB Wake-Up

Use the JPUSB1 jumper to "wake-up" your system by pressing a key on a USB keyboard or clicking the USB mouse. The JPUSB1 jumper is used together with the USB Wake-Up feature in the BIOS. Enable this jumper and the USB feature in the BIOS to wake-up your system via USB devices.

USB Wake-up Jumper Settings	
Pin#	Definition
1-2	Enabled (Default)
2-3	Disabled

BMC Jumper (JPB)

JPB is used to enable or disable the BMC (Baseboard Management Control) Chip and the onboard IPMI connection. This jumper is used together with the IPMI settings in the BIOS. The default position is on pins 1 and 2 to Enable BMC. See the table on the right for jumper settings.

BMC IPMI Enable/Disable Jumper Settings	
Settings	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

5-10 Onboard Indicators

LAN1/LAN2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each Gigabit LAN port, the yellow LED indicates activity when blinking 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.

LAN LED Connection Speed Indicator	
LED State	Definition
Off	No connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

IPMI Dedicated LAN

In addition to the LAN ports, a dedicated IPMI LAN port is also included on the X8SIU-F. The yellow LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the tables at right for more information.

IPMI LAN Link LED (Left) & Activity LED (Right)		
LED	Color	Definition
Link (left)	Green: Solid	100 Mbps
Activity (right)	Yellow: Blinking	Active

Onboard Standby Power LED

An Onboard Standby Power LED is located at LE4 on the motherboard. When LE4 is on, the AC power cable is connected. Make sure to disconnect the power cable before removing or installing any component.

Onboard Standby PWR LED LED	
LED State	Definition
Off	System Off
On	System on, or System off and PWR Cable Connected

IPMI Heartbeat LED

An IPMI Heartbeat LED is located at LE7. When LE7 blinks, the IPMI is functioning properly. Refer to the table on the right for details.

IPMI Heartbeat Indicator) LED	
LED	Definition
Link (left)	IPMI is ready for use

Unit ID LED

The rear UID LED is located at LE5 on the backplane. This LED is used in conjunction with the front UID LED and the rear UID switch to provide easy identification of a system that might be in need of service.

UID LED	
State	Definition
Blue: Steady	UID: On

Memory Status LED

A Memory Status LED is located at LE3. When LE3 blinks, it indicates that a memory error has been detected.

Memory Status Indicator LED	
State	Definition
Blinking	Unsupported memory is installed/Memory error
Steady	Memory OK

5-11 SATA Drive Connections

SATA Ports

Six Serial ATA (SATA) ports (I-SATA 0~5) are located on the motherboard. See the table on the right for pin definitions for the onboard SATA ports.

SATA Port Pin Definitions (SATA0 ~ SATA5)	
Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

5-12 Installing Drivers

After all the hardware and operating system have been installed, you need to install certain drivers. The necessary drivers are all included on the Supermicro CD that came packaged with your motherboard. After inserting this CD into your CD-ROM drive, the display shown in Figure 5-4 should appear. (If this display does not appear, click on the My Computer icon and then on the icon representing your CD-ROM drive. Finally, double click on the S "Setup" icon.)

Figure 5-4. Driver Installation Display Screen

Click the icons showing a hand writing on paper to view the readme files for each item. Click the tabs to the right of these *in order from top to bottom* to install each item one at a time. **After installing each item, you must reboot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility, which is optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Supero Doctor III

The Supero Doctor 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 Supero Doctor III program included on the CDROM that came with your serverboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

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

Note: When SuperDoctor III 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 Super Doctor, as the Super Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

Supero Doctor III Interface Display Screen (Health Information)
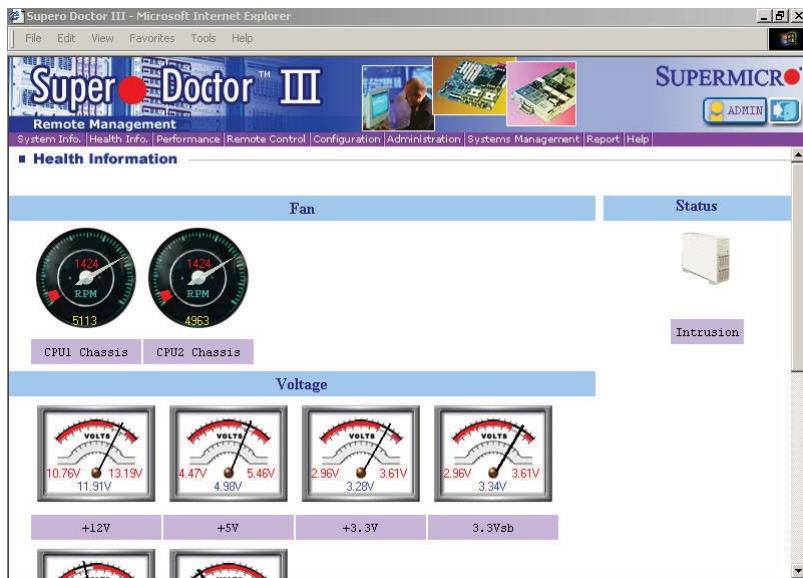
Supero Doctor III Interface Display Screen (Remote Control)

Note: SD III Software Revision 1.0 can be downloaded from our Web Site at: ftp:// ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/manuals/other/SDIII_User_Guide.pdf. For Linux, we will still recommend Supero Doctor II.

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform mainte-nance on the SC113 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) 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 ESD damage.

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.

Figure 6-1. Chassis: Front and Rear Views

DVD-ROM Drive   Control Panel

Hot-Swap Drive Bays (8)

Power Supply   Mouse/Kybrd Dedicated IPMI LAN   VGA Port   PCI Slots

USB Ports   COM Port   LAN Ports   UID Button
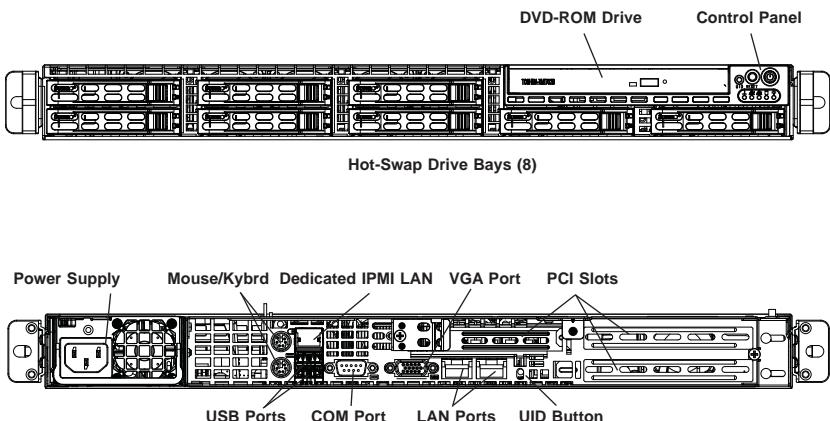
6-2   Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Installation."

6-3   System Cooling

Three 4-cm heavy-duty counter-rotating fans provide the cooling for the system. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. The SC113 chassis provides two additional open fan housings, where an additional system fan may be added for optimal cooling.

It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

Adding a System Fan

1. Turn off the power to the system and unplug the power cord.

2. Remove the chassis cover then remove the dummy fan from the fan tray.

3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

4. Connect the fan wires to the fan header on the serverboard.

5. Power up the system and check that the fan is working properly before replacing the chassis cover.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

The SC113 chassis includes three pre-installed fans. Three additional open slots are available so that more fans may be added.

Replacing a System Fan (Figure 6-2)

1. Open the chassis while the system is running to determine which fan has failed. Never run the server for an extended period of time with the chassis open.

2. Turn off the power to the system and unplug the power cord.

3. Remove the failed fan's wiring from the fan header on the serverboard.

4. Lift the failed fan from the chassis and pull it completely out.

5. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

6. Reconnect the fan wires to the same chassis fan header as the previous fan.

7. Power up the system and check that the fan is working properly before replacing the chassis cover.
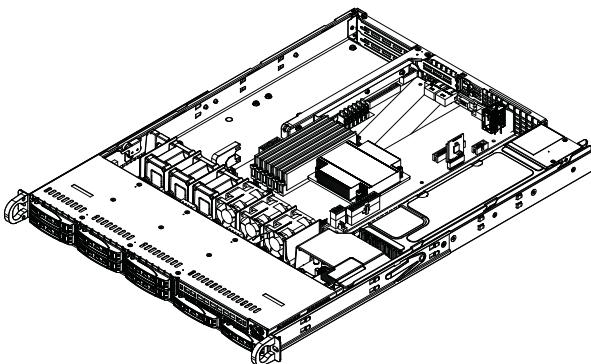
**Figure 6-2: System Fans
(shown with optional fan installed)**

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

Hard Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace hard drives. Proceed to the next section for instructions.

DVD-ROM Drive: For installing/removing a DVD-ROM drive, you will need to gain access to the inside of the system by removing the top cover of the chassis. Proceed to the "DVD-ROM Drive Installation" section later in this chapter for instructions.

Note: Only a "slim" DVD-ROM drive will fit into the 1016i-UF.

Hard Drive Installation

The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis.

Installing a Hard Drive into a Drive Carrier (Figure 6-3)

1. Insert a drive into the carrier with the PCB side facing down and the connec-
   tor end toward the rear of the carrier.

2. Align the drive in the carrier so that the screw holes of both line up. Note that there are holes in the carrier marked "SATA" to aid in correct installation.

3. Secure the drive to the carrier with four screws as illustrated below.

4. Insert the drive carrier into its bay, keeping the carrier oriented so that the hard drive is on the top of the carrier and the release button is on the right side. When the carrier reaches the rear of the bay, the release handle will retract.

5. Push the handle in until it clicks into its locked position

Removing a Hard Drive (Figure 6-4)

1. To remove a carrier, push the release button located beside the drive LEDs.

2. Swing the handle fully out and use it to pull the unit straight out (see Figure 6-4).

Note: Your operating system must have RAID support to enable the hot-plug capability of the hard drives.

⚠ Warning: Except for short periods of time (such as for swapping hard drives), do not operate the server with the hard drive carriers empty.

⚠ Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at http://www.supermicro.com/products/nfo/storage.cfm

**Figure 6-3: Installing a Hard Drive into a Carrier**
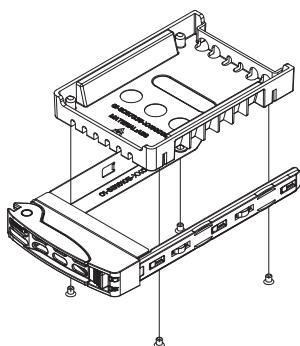
Figure 6-4. Removing a Hard Drive
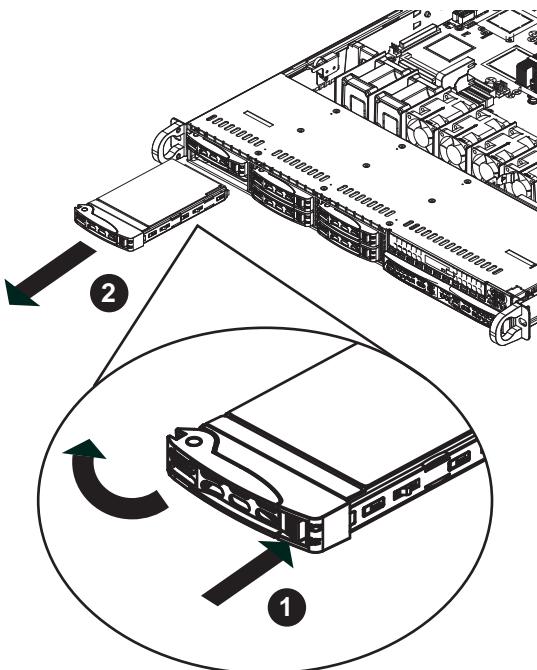
DVD Drive Installation

The SC113 chassis includes a pre-installed DVD-ROM.

Installing or Replacing a DVD-ROM Drive (Figure 6-5)

1. Power down the system and if necessary, remove the server from the rack and the front bezel from the chassis.

2. Remove the chassis cover.

3. Unplug the drives power and data cables from the serverboard and/or back-plane.

4. If you are adding a new drive: Remove the mini-bezel (grate) from the drive bay The bezel can be removed by pulling out the hard drive beneath the DVD-ROM, then pulling the mini-bezel forward.
   If you are replacing a drive: Locate the locking tab at the rear (left hand side when viewed from the front) of the DVD-ROM drive. Push the tab toward the drive and push the drive unit out the front of the chassis.

5. Insert the new drive unit in the slot until the tab locks in place.

6. Reconnect the data and power cables.

7. Replace the chassis cover (replace the server in the rack, if necessary) and power up the system.

Figure 6-5. Installing the DVD-ROM Drive
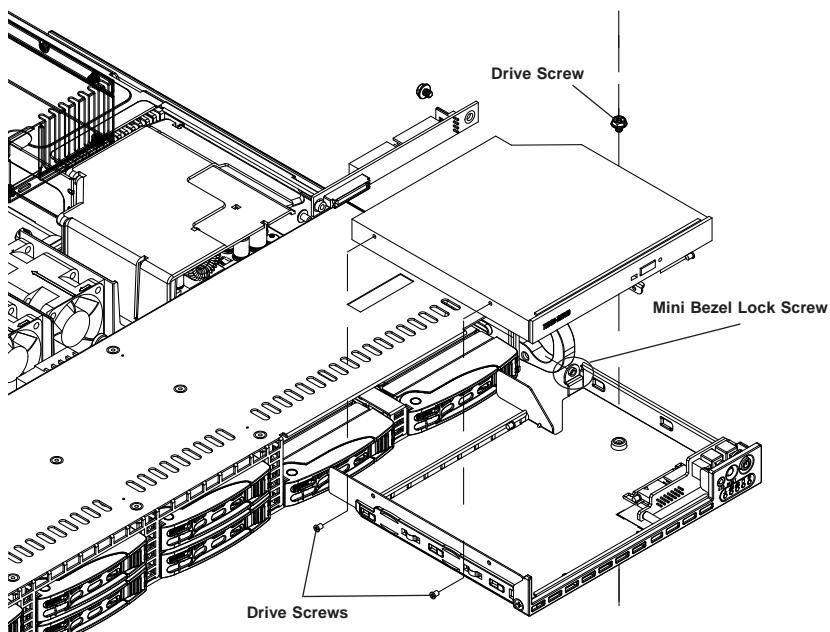
6-5   Power Supply

The SuperServer 1016i-UF has a single 330 watt power supply, which is auto-switching capable. This enables it to automatically sense and operate with a 100v - 240v input voltage.

If the power supply module fails, the system will shut down and you will need to replace the module. Replacements can be ordered directly from Supermicro (see contact information in the Preface). As there is only one power supply module in the 1016i-UF, power must be completely removed from the server before removing and replacing the power supply for whatever reason. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface).

Replacing the Power Supply (Figure 6-6)

1. First turn the power switch on the control panel off, then unplug the power cord from the system.

2. Push the release tab (on the back of the power supply) as illustrated.

3. Pull the power supply out using the handle provided.

4. Replace the failed power module with the same model.

5. Push the new power supply module into the power bay until you hear a click.

6. Reconnect the AC power cord and depress the power button on the control panel to restart the system.

Figure 6-6. Removing/Replacing the Power Supply
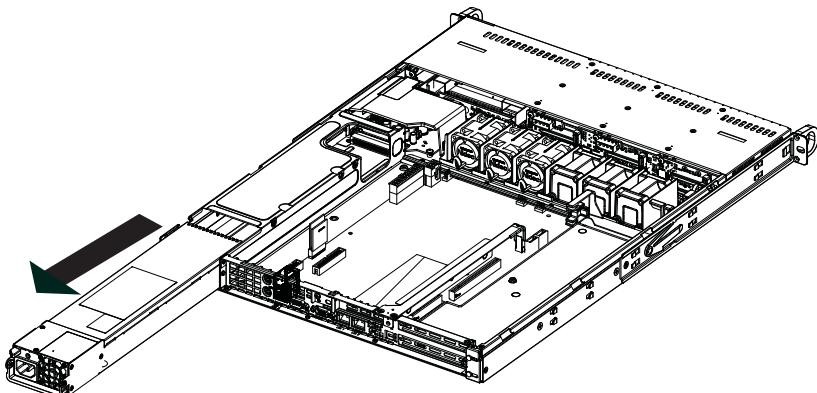
Chapter 7

BIOS

7-1   Introduction

This chapter describes the AMI BIOS Setup Utility for the X8SIU-F. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Note: For instructions on BIOS recovery, please refer to the instruction guide posted at http://www.supermicro.com/support/manuals/.

Starting BIOS Setup Utility

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

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, 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 a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text 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 the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

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

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 <Del> at the appropriate time during system boot.

How to Start 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 Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is 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.

```
                        BIOS SETUP UTILITY
 Main    Advanced    Security    Boot    Exit

                                                  Use [ENTER], [TAB]
 System Time                 [14:41:28]           or [SHIFT-TAB] to
 System Date                 [Wed 02/03/2010]     select a field.

 Supermicro X8SIT(-F)                             Use [+] or [-] to
 Version        :1.0                              configure system Time.
 Build Date     :01/28/10

 Processor
 Intel(R) Xeon(R) CPU       X3460 @ 2.80GHz
 Speed          :2800MHz
 Physical Count :1
 Logical Count  :8                                ↑↓↔:Move
                                                  Enter:Select
 System Memory                                    +/-/:Value
 Populated Size :16384MB                          F10:Save
                                                  ESC:Exit
                                                  F1:General Help
                                                  F8:Fail-Safe Defaults
                                                  F9:Optimized Defaults

        v02.67 (C)Copyright 1985-2009, American Megatrends, Inc.
```

System Overview: The following BIOS information will be displayed:

System Time/System Date

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. Press the <Tab> key or the arrow keys 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.)

Supermicro X8SIU-F

Version

Build Date

Processor

The AMI BIOS will automatically display the status of processor as shown below:

Type of Processor

Speed

Physical Count

Logical Count

System Memory

This displays the size of memory available in the system:

Populated Size

7-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and hit <Enter> to access the submenu items:
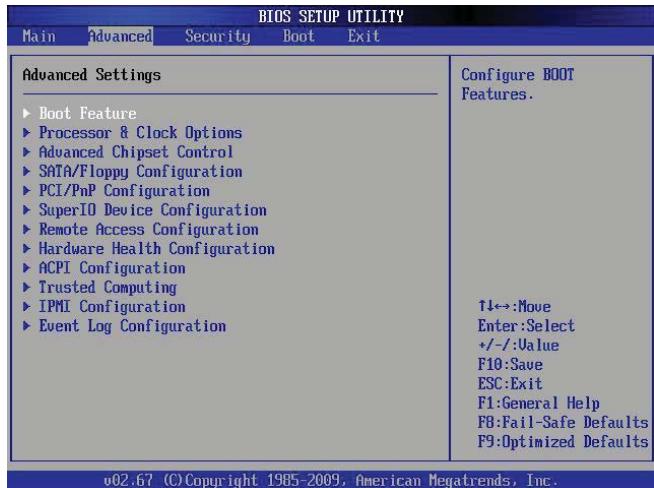
▶BOOT Feature

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or 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

This sets the display mode for Option ROM. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

This feature selects the Power-on state for Numlock key. The options are Off and **On**.

PS/2 Mouse Support

This feature enables support for the PS/2 mouse. The options are Disabled, Enabled and **Auto.**

Wait For 'F1' If Error

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

Hit 'Del' Message Display

This feature displays "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Power Button Mode

This setting allows you to decide if the power button will turn off the system instantly or wait for 4 seconds when it is pressed. 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 Power-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, Power-Off and **Last State**.

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 boot 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.

▶Processor & Clock Options

⚠ **Warning**: Take Caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency or incorrect DRAM timing may cause system to become unstable. When this occurs, revert to the default setting.

CPU Ratio

This feature allows the user to use the CPU clock multiplier to multiply CPU speed in order to enhance performance. Select Manual to Manually set the multiplier setting. Select Auto for the BIOS to automatically select the CPU multiplier setting for your system. The options are **Auto** and Manual.

Clock Spread Spectrum

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

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware pre fetcher will pre fetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

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

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

MPS and ACPI MADT Ordering

This feature allows the user to choose the method of ordering for the Multiple APIC Description Table (MADT). Select Modern Ordering if you have the Microsoft Windows XP or later version of the OS. Select Legacy Ordering if you use Microsoft Windows 2000 or earlier version of the OS. The options are **Modern Ordering** and Legacy Ordering.

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

Select Enabled to use the feature of Virtualization Technology to 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 web site for detailed information.

Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

Set to 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.)

Simultaneous Multi-Threading (Available when supported by the CPU)

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1, 2, 3 and 4.

Intel® EIST Technology

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**.

Intel® Turbo Boost Technology (Available if Intel® EIST technology is Enabled)

This feature allows processor cores to run faster than marked frequency in specific conditions. The options are Disabled and **Enabled.**

C1E Support

Select Enabled to use the "Enhanced Halt State" feature. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

Intel® C-STATE Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Default and **Enabled**.

C-State package limit setting

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

C1 Auto Demotion

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled.**

C3 Auto Demotion

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled.**

▶Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below.

Memory Remap Feature

This feature, when enabled, allows the remapping of everlapped PCI memory above the total physical memory. The settings are **Enabled** and Disabled.

Intel VT-d

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

Active State Power Management

Select Enabled to start Active-State Power Management for signal transactions between L0 and L1 Links on the PCI Express Bus. This maximizes power-saving and transaction speed. The options are Enabled and **Disabled**.

USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled and **Enabled**.

Legacy USB Support (available if USB Functions above is Enabled)

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard, and vise versa. The settings are Disabled, Enabled and **Auto**.

▶SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE Devices and displays the following items:

SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while se-lecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, Compatible, **Enhanced.**

Configure SATA as

This feature allows the user to select the drive type for SATA#1. The options are **IDE**, RAID and AHCI.

PCH RAID CodeBase (Available if RAID is selected above)

Select Intel to enable the Intel SATA Host RAID Utility. Select Adaptec to use the Adaptec Host RAID Utility. The options are **Intel** and Adaptec.

SATA#2 Configuration (Available when IDE is enabled under "Configure SATA#1 as" above)

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled and **Enhanced**

IDE Detect Timeout (sec)

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

SATA 0 ~ 5

These settings allow the user to set the parameters of the disc storage devices attached to the SATA ports. Press <Enter> to activate the following submenu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the submenu are:

Type

Select the type of device connected to the system. The options are Not Installed, **Auto**, CD/DVD and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4.

Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 to allow the AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MB/s.

Select 1 to allow the AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MB/s.

Select 2 to allow the AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MB/s.

Select 3 to allow the AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MB/s.

Select 4 to allow the AMI BIOS to use PIO mode 4. It has a data transfer bandwidth of 32-Bits. Select Enabled to enable 32-Bit data transfer.

DMA Mode

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE disk drive support cannot be determined.

Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MB/s.

Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MB/s.

Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MB/s.

Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MB/s.

Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MB/s.

Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2. It has a data transfer rate of 16.6 MB/s.

Select UDMA0 to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6 MBs. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2.

Select UDMA1 to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MB/s.

Select UDMA2 to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MB/s.

Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 44.4 MB/s.

Select UDMA4 to allow the BIOS to use Ultra DMA mode 4 . It has a data transfer rate of 66.6 MB/s.

The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

S.M.A.R.T.

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect hard disk drive support. Select Disabled to prevent the AMI BIOS from using the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32-Bit Data Transfer

Select Enable to enable the function of 32-bit IDE data transfer. The options are **Enabled** and Disabled.

▶PCI/PnP Configuration

This feature allows the user to set the PCI/PnP configurations for the following items:

Clear NVRAM

This feature clears the NVRAM during system boot. The options are **No** and Yes.

Plug & Play OS

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

PCI Latency Timer

This feature sets 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.

PCI IDE Bus Master

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are **Disabled** and Default.

ROM Scan Ordering

This item determines what kind of option ROM activates over another. The options are **Onboard First** and Add-on First.

SBX2 PCIe x4 OPROM

Use this feature to enable or disable PCI slot Option ROMs. The options are Disabled and **Enabled.**

SBX1 PCIe x16/x8 OPROM

Use this feature to enable or disable PCI slot Option ROMs. The options are Disabled and **Enabled.**

Onboard LAN1 Option ROM Select

This feature selects whether to load the iSCSI or PXE onboard LAN option ROM. The options are iSCSI and **PXE**.

Load Onboard LAN1 Option ROM
Load Onboard LAN2 Option ROM

This feature is to enable or disable the onboard LAN option ROMs. The options are **Disabled** and Enabled.

Boot Graphics Adapter Priority

Use this feature to select the graphics controller to be used as the primary boot device. The options are Other and **Onboard VGA**.

▶Super IO Device Configuration

Serial Port1 Address/ Serial Port2 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 3. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port 1 are Disabled, **3F8/IRQ4**, 2E8/IRQ3. The options for Serial Port 3 are Disabled, **2F8/IRQ3**, and 2E8/IRQ3.

▶Remote Access Configuration

Remote Access

This allows the user to enable the Remote Access feature. The options are **Disabled** and Enabled.

If Remote Access is set to Enabled, the following items will display:

Serial Port Number

This feature allows the user to decide which serial port to be used for Console Redirection. The options are COM 1 and **COM 3**.

> **Note:** Serial Over LAN (SOL) will be enabled when COM 3 is selected.

Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and Boot Loader. The options are Disabled, Boot Loader, and **Always**.

Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are **ANSI**, VT100, and VT-UTF8.

VT-UTF8 Combo Key Support

This is a terminal keyboard definition that provides a way to send commands from a remote console. Available options are **Enabled** and Disabled.

Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay,** Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

▶Hardware Health Configuration

This feature allows the user to monitor Hardware Health of the system and review the status of each item when displayed.

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

> ⚠️ **Warning:** Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5°C above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

System Temperature

This feature displays the absolute system temperature (i.e., 34°C).

CPU 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 motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

User intervention: No action required.

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 motherboard 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.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

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 Default Alarm – the Overheat LED and system buzzer will activate if the High condition continues for some time after it is reached. The CPU fan will run at full speed to bring the CPU temperature down. If the CPU temperature still increases

even with the CPU fan running at full speed, the system buzzer will activate and the Overheat LED will turn on.

The Early Alarm – the Overheat LED and system buzzer will be activated exactly when the High level is reached. The CPU fan will run at full speed to bring the CPU temperature down.

Note: In both the alarms above, please take immediate action as shown below. See CPU Overheat Alarm to modify the above alarm settings.

User intervention: 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. Note: the system may shut down if it continues for a long period to prevent damage to the CPU.

> **Notes:** The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is that each CPU is embedded by a unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline by which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send its 'Temperature Tolerance' to the motherboard resulting in better CPU thermal management.
>
> Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., $25^{o}C$).

The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

Fan1 ~ Fan5 Reading

This feature displays the fan speed readings from fan interfaces Fan1 through Fan4.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select Full Speed to allow the onboard fans to run at full speed (of 100% Pulse Width Modulation Duty Cycle) for maximum cooling. The Full Speed setting is recommended for special system configuration or debugging. Select Performance for the onboard fans to run at 70% of the Initial PWM Cycle for better

system cooling. The Performance setting is recommended for high-power-consuming and high-density systems. Select Balanced for the onboard fans to run at 50% of the Initial PWM Cycle in order to balance the needs between system cooling and power saving. The Balanced setting is recommended for regular systems with normal hardware configurations. Select Energy Saving for the onboard fans to run at 30% of the Initial PWM Cycle for best power efficiency and maximum quietness. The Options are: Full Speed (@100% of PWM Cycle), Performance (@70% of PWM Cycle), **Balanced** (@50% of PWM Cycle), and Energy Saving (@30% of PWM Cycle).

CPU Vcore, AVCC, 3.3Vcc, 12V, V_DIMM, 5V, 5Vsb, 3.3Vsb, and Vbat

►ACPI Configuration

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

High Performance Event Timer

Select Enabled to activate the High Performance 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 and 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.

ACPI Aware O/S

Enable ACPI support if it is supported by the OS to control ACPI through the Operating System. Otherwise, disable this feature. The options are **Yes** and No.

ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are **Enabled** and Disabled.

APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

Headless Mode

This feature is used to enable the system to function without a keyboard, monitor or mouse attached The options are Enabled and **Disabled**.

ACPI Version Features

The options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/

▶IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole. For more information on the IPMI specifications, please visit Intel's website at www.intel.com.

IPMI Firmware Revision

This item displays the current IPMI firmware revision.

Status of BMC

Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This is an informational feature which returns the status code of the BMC micro controller.

View BMC System Event Log

This feature is used to view any BMC events. It shows the total number of entries and will allow the viewing of each event by scrolling down on an Entry Number and pressing Enter.

Clear BMC System Event Log

This feature is used to clear the System Event Log. Caution: Any cleared information is unrecoverable. Make absolutely sure you no longer need any data stored in the log before clearing the BMC Event Log.

Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address.

   Channel Number - Enter the channel number for the SET LAN Config command. This is initially set to **[1]**. Press <+> or <-> on your keyboard to change the Channel Number.

   Channel Number Status - This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

   IP Address Source - This feature selects whether the IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server (Dynamic Host and Configuration Protocol) or manually entered by the user (Static). If Static is selected, the IP Address, Subnet Mask and Gateway

Address must be manually entered below. If DHCP is selected, the next three items will be configured automatically and will be grayed out. The options are Static and **DHCP**.

IP Address - Enter the IP address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255.

Subnet Mask - Subnet masks tell the network which subnet the machine belongs to. The value of each three-digit number separated by dots should not exceed 255 (i.e., 255.255.255.0).

Gateway Address - Enter the IP address of the Gateway this machine will use (i.e., 192.168.10.1).

MAC Address - The BIOS will automatically enter the MAC address (also known as Hardware Address) of this machine, however it may be over-ridden. MAC addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.9E.73.CF)

BMC Watch Dog Timer Action

This feature allows the BMC to reset or power down the system if the operating system hangs or crashes. The options are **Disabled**, Reset System, Power Down, Power Cycle.

BMC WatchDog TimeOut [Min:Sec]

This option appears if BMC Watch Dog Timer Action (above) is enabled. This is a timed delay in minutes or seconds, before a system power down or reset after an operating system failure is detected. The options are **[5 Min]**, [1 Min], [30 Sec], and [10 Sec].

▶Event Log Configuration

View Event Log

Use this option to view the System Event Log.

Mark all events as read

This option marks all events as read. The options are OK and Cancel.

Clear event log

This option clears the Event Log memory of all messages. The options are OK and **Cancel.**

ECC Event Logging

Use this option to enable logging of events of the system's memory. The options are **Yes** and No.

PCIE Error Log

Use this option to enable logging of errors encountered in the system's PCIe bus. The options are Yes and **No.**

7-4   Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both pass-words, the Supervisor password must be set first.
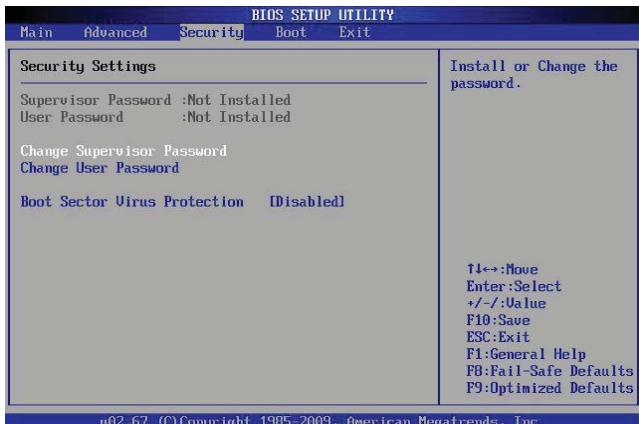
Supervisor Password

This item indicates if a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password:

This item indicates if a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Change Supervisor Password

Select this feature and press <Enter> to access the submenu, and then type in a new Supervisor Password.

User Access Level (Available when Supervisor Password is set as above)

Available options are **Full Access**: grants full User read and write access to the Setup Utility, View Only: allows access to the Setup Utility but the fields cannot be changed, Limited: allows only limited fields to be changed such as Date and Time, No Access: prevents User access to the Setup Utility.

Change User Password

Select this feature and press <Enter> to access the submenu , and then type in a new User Password.

**Clear User Password (Available only if User Password has been set)**

Password Check

Available options are **Setup** and Always.

Boot Sector Virus Protection

When Enabled, the AMI BOIS displays a warning when any program (or virus) is-
sues a Disk Format command or attempts to write to the boot sector of the hard
disk drive. The options are Enabled and **Disabled**.

7-5   Boot Settings
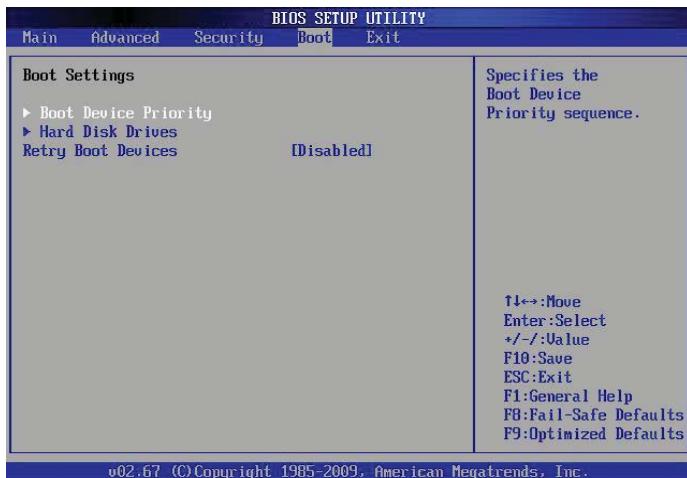
Use this feature to configure Boot Settings:

▶Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device.
The settings are 1st boot device, 2nd boot device, 3rd boot device, 4th boot device,
5th boot device and Disabled.

- 1st Boot Device - 1st Floppy Drive

- 2nd Boot Device - [USB: XXXXXXXXX]

- 3rd Boot Device - [SATA: XXXXXXXXX]

- 4th Boot Device - [Network: XXXXXXXXX]

- 5th Boot Device - [Network: XXXXXXXXX]

▶Hard Disk Drives

This feature allows the user to specify the sequence of priority from the available Hard Drives.

- 1st Drive [SATA: XXXXXXXXXX]

- 2nd Drive [SATA: XXXXXXXXXX]

▶Removable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

- 1st Drive

- 2nd Drive - [USB: XXXXXXXXX]

Retry Boot Devices

Select this option to retry booting from the configured boot devices if the systems fail to boot initially. The options are **Disabled** and Enabled.

7-6   Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.
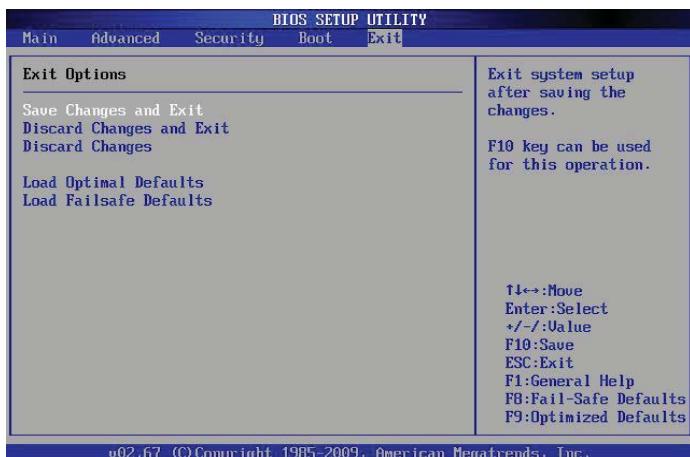
Save Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

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 from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

Notes

Appendix A

POST Error Beep Codes

This section lists POST (Power On Self Test) error beep codes for the AMI BIOS. POST error beep codes are divided into two categories: recoverable and terminal. This section lists Beep Codes for recoverable POST errors.

Recoverable POST Error Beep Codes

When a recoverable type of error occurs during POST, BIOS will display a POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and eight short beeps - video configuration error

1 repetitive long beep - no memory detected

1 continuous beep with the front panel Overheat LED on - system overheat

Notes

Appendix B

System Specifications

Processors
Single Intel® Xeon® 3400 and L3400 Series, Core™ i5 Dual Core, Core™ i3, Pentium® and Celeron® processors (LGA1156 socket)
Note: Please refer to our web site for a complete listing of supported processors.

Chipset
Intel 3420

BIOS
32 Mb SPI AMI® Flash

Memory Capacity
Six DIMM sockets supporting up to 16 GB of UDIMM or 32 GB of RDIMM DDR3-1333/1066/800 memory
See the memory section in Chapter 5 for details.

SATA Controller
Intel on-chip controller for six-port Serial ATA, RAID 0, 1 5 and 10 supported (RAID 5 not supported with Linux OS)

SATA Drive Bays
Eight hot-swap drive bays to house eight SATA drives

Peripheral Drive Bays
One (1) slim floppy drive (optional)
One (1) slim DVD-ROM drive

Expansion Slots (see Section 5-6 for details)
Left side: one PCI-E 2.0 x8 add-on card and one UIO card
Right side: one PCI-E 2.0 x8 low-profile (5.6" depth) add-on card

Serverboard
X8SIU-F (Proprietary form factor)
Dimensions: 8 x 13.05 in (203 x 331 mm)

Chassis

SC113TQ-330UBP Form Factor: 1U rackmount

Dimensions: (WxHxD) 17.2 x 1.7 x 23.5 in. (437 x 43 x 597 mm)

Weight

Gross (Bare Bone): 37 lbs. (16.8 kg.)

System Cooling

Three 4-cm heavy-duty counter-rotating PWM fans

System Input Requirements

AC Input Voltage: 100-240 VAC

Rated Input Current: 6.3A (115V) to 3.24A (230V)

Power Supply

Rated Output Power: 330W (Model# PWS-333-1H/20)

Rated Output Voltages (100-140VAC): +3.3V (15A), +12V (27A), -12V (0.5A), +5V (18A), +5Vsb (3A)

Rated Output Voltages (180-240VAC): +3.3V (15A), +12V (31A), -12V (0.5A), +5V (18A), +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 A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

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:

EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), 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