SUPER●®

SUPERSERVER 6014H-8
SUPERSERVER 6014H-82
SUPERSERVER 6014H-X8

USER'S MANUAL

1.0a

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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 6014H-8/6014H-82/6014H-X8. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 6014H-8/6014H-82/6014H-X8 is a high-end, dual processor server based on the SC813S-500 1U rackmount server chassis and the X6DHR-8G/X6DHR-8G2/X6DHR-X8G serverboard, which supports single or dual Xeon™ processors at a Front Side (system) Bus speed of 800 MHz and up to 16 GB of DDR2-400 (for the X6DHR-8G2) or 16/32 GB of DDR333/266 (for the X6DHR-8G/X6DHR-X8G) SDRAM.

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 SUPER X6DHR-8G/X6DHR-8G2/X6DHR-X8G serverboard and the SC813S-500 chassis, which make up the SuperServer 6014H-8/6014H-82/6014H-X8.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6014H-8/6014H-82/6014H-X8 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 6014H-8/6014H-82/6014H-X8.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X6DHR-8G/X6DHR-8G2/ X6DHR-X8G serverboard, including the locations and functions of connectors, 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 1U SC813S-500 rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SCSI or peripheral drives and when replacing the system power supply unit and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS POST Messages

Appendix B: BIOS POST Codes

Appendix C: Software Installation

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Chapter 1

Introduction

1-1   Overview

The Supermicro SuperServer 6014H-8/6014H-82/6014H-X8 is a high-end dual processor, 1U rackmount server that features some of the most advanced technology currently available. The 6014H-8/6014H-82/6014H-X8 is comprised of two main subsystems: the SC813S-500 1U rackmount chassis and the X6DHR-8G/X6DHR-8G2/X6DHR-X8G dual processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the 6014H-8/6014H-82/6014H-X8.

In addition to the serverboard and chassis, various hardware components may have been included with your SuperServer 6014H-8/6014H-82/6014H-X8, as listed below:

● Two (2) 10-cm system blower fans (FAN-0059)

● One (1) slim floppy drive [FPD-TEAC-S(B)]*

● One (1) slim CD-ROM drive [CDM-TEAC-24(B)]*

● One (1) front control panel cable (CBL-0049)

● One (1) round floppy cable (CBL-0040)

● Two (2) riser cards (CSE-RR1U-X and CSE-RR1U-XLP)

● SCSI Accessories
  One (1) SCA SAF-TE compliant SCSI backplane (CSE-SCA-813S)
  One (1) internal 68-pin Ultra320 SCSI cable (CBL-037-U320)
  Four (4) SCA 1-inch high SCSI drive trays [CSE-PT39(B)]*

● 1U Rackmount Kit with screws (CSE-PT51):
  Two (2) rack rail assemblies
  Six (6) brackets for mounting the rack rails to a rack/telco rack

- One (1) CD-ROM containing drivers and utilities

- SuperServer 6014H-8/6014H-82/6014H-X8 User's Manual

* "B" indicates black.

1-2   Serverboard Features

At the heart of the SuperServer 6014H-8/6014H-82/6014H-X8 lies the X6DHR-8G/X6DHR-8G2/X6DHR-X8G, a dual Intel Xeon™ processor serverboard designed to provide maximum

Processors

The X6DHR-8G/X6DHR-8G2/X6DHR-X8G supports single or dual Intel 604-pin Xeon EM64T processors at an 800 MHz FSB speed. Please refer to the support section of our web site for a complete listing of supported processors (http://www.supermicro.com/support/).

Memory

The X6DHR-8G2 has eight 240-pin DIMM slots that can support up to 16 GB of low-profile, registered ECC DDR2-400 SDRAM. The serverboard has has been designed to support 2 GB DIMM modules for each memory slot, but it has only been validated with 1 GB memory modules.

The X6DHR-8G/X6DHR-X8G has eight 184-pin DIMM slots that can support up to 16 GB of low-profile, registered ECC DDR333 SDRAM or 32GB of low-profile, registered ECC DDR266 SDRAM. The serverboard has has been designed to support 2 GB DIMM modules for each memory slot, but it has only been validated with 1 GB memory modules.

Onboard SCSI

Onboard SCSI is provided with an Adaptec AIC-7902 SCSI controller chip, which supports dual channel, Ultra320 SCSI at a burst throughput rate of 320 MB/sec. The X6DHR-8G/X6DHR-8G2/X6DHR-X8G provides two SCSI ports. A QLogic GEM318 controller is used for the SAF-TE compliant SCSI backpanel.

PCI Expansion Slots

The 6014H-8 has two Universal PCI-X 133 MHz/PCI-Express x8/x4 slots. Two riser cards included with the server support the use of one standard size and one low-profile PCI-X cards. (PCI-Express riser cards are optional.)

The 6014H-82 has two Universal PCI-X 133 MHz/PCI-Express x8/x4 slots. Two riser cards included with the server support the use of one standard size and one low-profile PCI-X cards. (PCI-Express riser cards are optional.)

The 6014H-X8 has two 133 MHz PCI-X slots. Two riser cards included with the server support the use of two PCI-X 133 MHz (or 100 or 66 MHz) cards.

ATI Graphics Controller

The X6DHR-8G/X6DHR-8G2/X6DHR-X8G features an integrated ATI video controller based on the Rage XL SVGA graphics chip. Rage XL fully supports sideband addressing and AGP texturing. This onboard graphics package can provide a bandwidth of up to 512 MB/sec over a 32-bit graphics memory bus.

Onboard Controllers/Ports

The X6DHR-8G/X6DHR-8G2/X6DHR-X8G includes one floppy drive controller and two onboard IDE controllers, which support up to four IDE hard drives or ATAPI devices. Backpanel I/O ports include one COM port, two USB ports, PS/2 mouse and keyboard ports, a VGA (monitor) port, an external SCSI port and two Gb LAN ports.

Other Features

Other onboard features are included to promote system health. These include various voltage monitors, two CPU temperature sensors, four fan speed sensors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

Figure 1-1. E7520 Chipset Block Diagram
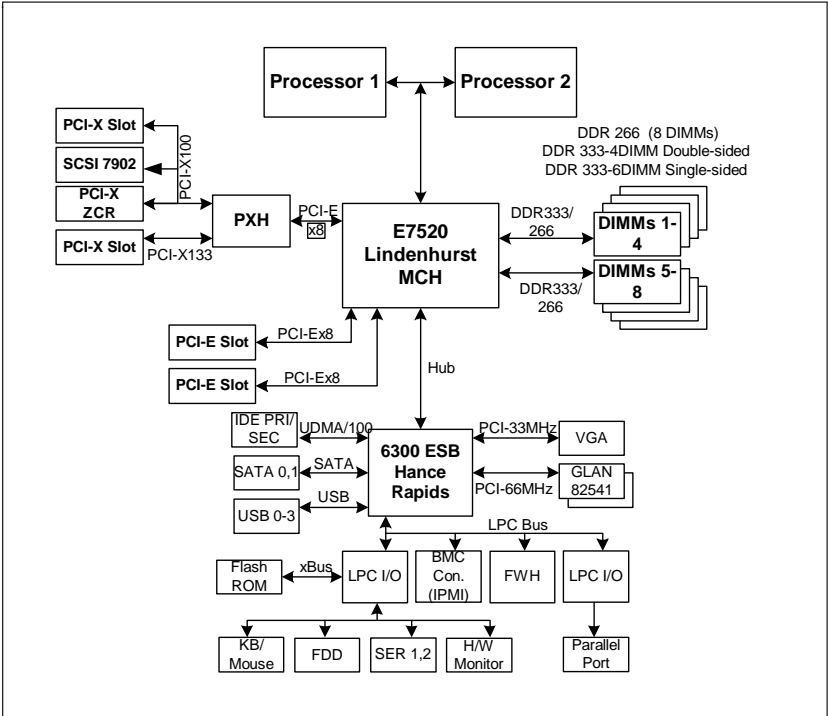
1-3   Server Chassis Features

The SC813S-500 is one of Supermicro's third-generation 1U chassis and features four hot-swap SCSI hard drive bays, a slim CD-ROM drive, a slim 3.5" floppy drive and a revolutionary cooling design that can keep today's most powerful processors running well below their temperature thresholds. The following is a general outline of the main features of the SC813S-500 chassis.

System Power

When configured as a SuperServer 6014H-8/6014H-82/6014H-X8, the SC813S chassis includes a 500W cold-swap power supply.

SCSI Subsystem

The SCSI subsystem supports four 80-pin SCA Ultra320 SCSI hard drives. (Any standard 1" drives are supported.   SCA = Single Connection Attachment.)   The SCSI drives are connected to an SCA backplane that provides power, bus termination and configuration settings.   The SCSI drives are also hot-swap units.   A Zero Channel RAID controller card can be used with the SCA backplane to provide data security.

Note: The operating system you use must have RAID support to enable the hot-swap capability of the SCSI drives.

Control Panel

The SC813S-500 control panel provides important system monitoring and control information.   LEDs indicate power on, network activity, hard disk drive activity and overheat/fan fail.   Also present are a main power button and a system reset button.

I/O Backplane

The SC813S-500 is a 1U rackmount chassis. Its I/O backplane provides one full-height full-length and one low-profile PCI expansion slots, one COM port (the other is internal), one VGA port, an external SCSI port, two USB ports, PS/2 mouse and keyboard ports and two Ethernet (LAN) ports.

Cooling System

The SC813S-500 chassis' revolutionary cooling design has been optimized to provide sufficient cooling for dual Xeon configurations. The SC813S-500 includes two heavy duty 10-cm blower fans located in the middle of the chassis. If either one of these fans breaks down, the overheat/fan fail LED on the chassis control panel will begin flashing.

All chassis and power supply fans operate continuously.

A setting in BIOS (see p. 7-17) is used to determine the fan speed. [The recommended setting for the 6014H-8/6014H-82/6014H-X8 is "3-pin (Server)".]

1-4   Contacting Supermicro

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Notes

Chapter 2

Server Installation

2-1   Overview

This chapter provides a quick setup checklist to get your SuperServer 6014H-8/6014H-82/6014H-X8 up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your 6014H-8/ 6014H-82/6014H-X8 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 6014H-8/6014H-82/6014H-X8 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 6014H-8/ 6014H-82/6014H-X8. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3   Preparing for Setup

The box the 6014H-8/6014H-82/6014H-X8 was shipped in may have included a rackmount kit consisting of 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).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

! **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 simultaneously 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 SCSI drives and power supply units 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 6014H-8/ 6014H-82/6014H-X8 into a rack unit with the rack rails provided. If the server has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies with the 6014H-8/ 6014H-82/6014H-X8. Each of these assemblies consists of two sections: an inner fixed chassis rail that secures to the chassis and an outer fixed rack rail that secures directly to the rack itself. Two pairs of short brackets to be used on the front side of the outer rails are also included.

Installing the Inner Rails

First, locate the right inner rail (the rail that will be used on the right side of the chassis when you face the front of the chassis). Align the four square holes on the right inner rail against the hooks on the right side of the chassis. Securely attach the rail to the chassis with two M4 flat head screws. Repeat these steps to install the left inner rail to the left side of the chassis.

Figure 2-1. System with Rack Rails Attached
(with optional front bezel shown)
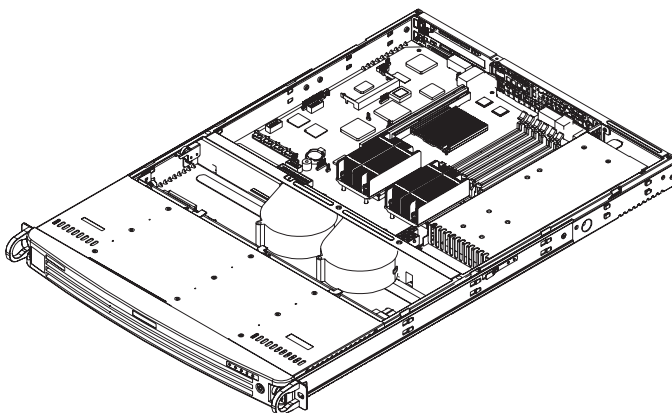
Installing the Outer Rails

Begin by measuring the distance from the front rail to the rear rail of the rack. Attach a short bracket to the front side of the right outer rail and a long bracket to the rear side of the right outer rail. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack. Secure the short bracket to the front side of the outer rail with two M4 screws and the long bracket to the rear side of the outer rail with three M4 screws. Repeat these steps for the left outer rail.

Locking Tabs

Both chassis rails have a locking tab, which serves two functions.   The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2.   Installing the Rack Rails
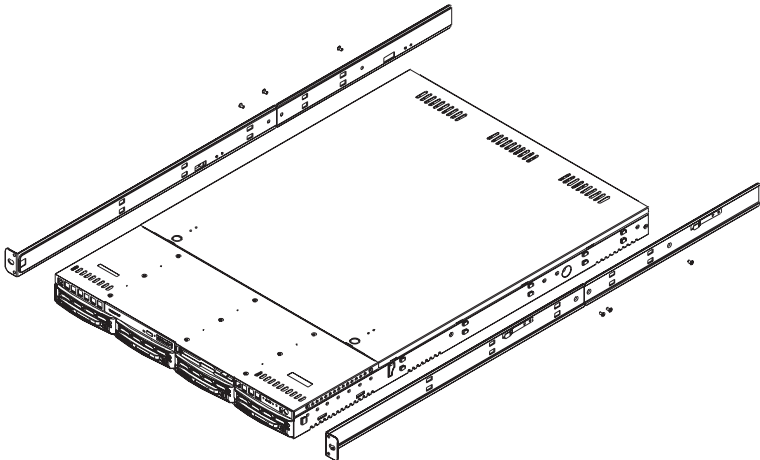
Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. 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). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

Figure 2-3. Installing the Server into a Rack (with optional front bezel shown)
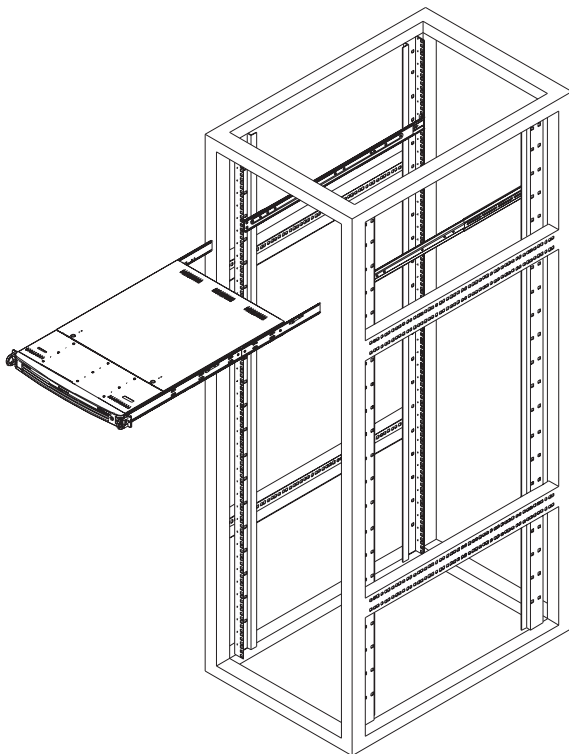
Installing the Server into a Telco Rack

If you are installing the SuperServer 6014H-8/6014H-82/6014H-X8 into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accommodate the width of the telco rack.

Figure 2-4.   Installing the Server into a Telco Rack (with optional front bezel shown)
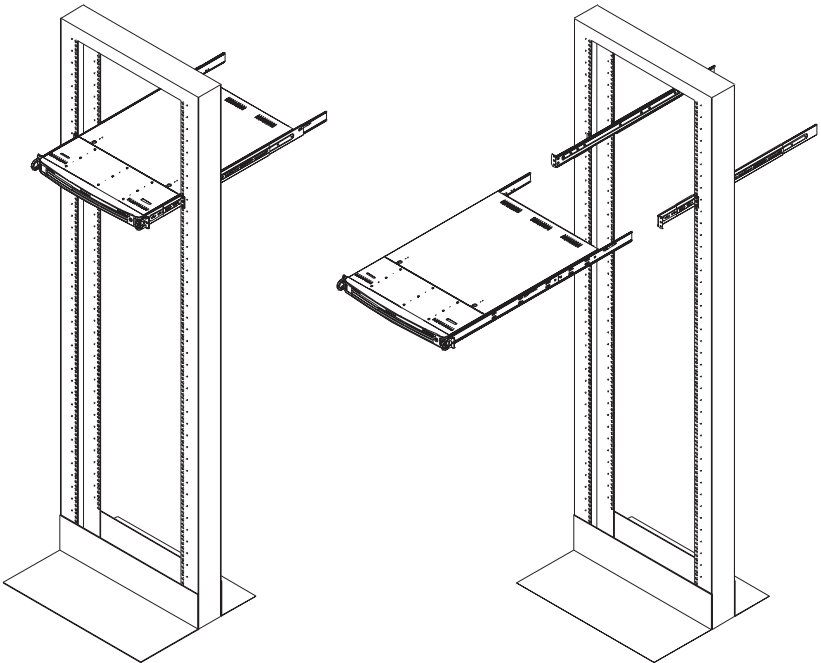
2-5   Checking the Serverboard Setup

After you install the 6014H-8/6014H-82/6014H-X8 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.

1. Accessing the inside of the System (see Figure 2-5)

First, release the retention screws that secure the system to the rack. Grasp the two handles on either side and pull the system straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover (1). Push the cover away from you (toward the rear of the chassis) until it stops (2). You can then lift the top cover from the chassis to gain full access to the inside of the server.

To remove the system from the rack completely, depress the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position. Another set of locking tabs will stop the chassis before it comes completely out of the rack.

2. Check the CPUs (processors)

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.

3. Verify the proper CPU clock ratio setting

If the CPU speed is not automatically detected you will need to set the correct speed with the BIOS Setup utility. See the CPU speed setting in BIOS (Chapter 7) for setting the proper CPU speed. (Most processor speeds are automatically detected so this step should be unnecessary.)

4. Check the system memory

Your 6014H-8/6014H-82/6014H-X8 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.

**Figure 2-5. Accessing the Inside of the System
(with optional front bezel shown)**
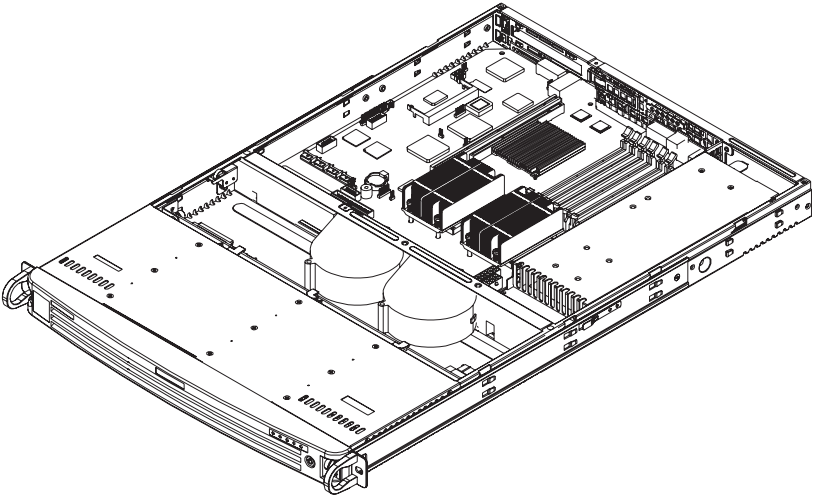
5. Installing add-on cards

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

6. Check all cable connections and airflow

Make sure all power and data cables are properly connected and not
blocking the chassis airflow. See Chapter 5 for details on cable connec-
tions. Also, check the air seals for damage. The air seals are located
under the blower fans and beneath the frame cross section that sepa-
rates 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 peripheral drives and the SCSI drives and SCSI backplane have been properly installed and all connections have been made.

1. Accessing the drive bays

All drives are accessable from the front of the server. For servicing the CD-ROM and floppy drives, you will need to remove the top chassis cover. The SCSI disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. CD-ROM and floppy disk drives

A slim CD-ROM and floppy drive should be preinstalled in your server. Refer to Chapter 6 if you need to reinstall a CD-ROM and/or floppy disk drive to the system.

3. Check the SCSI disk drives

Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SCSI drives, please refer to Chapter 6.

4. Check the airflow

Airflow is provided by two heavy duty 10-cm blower fans. The system component layout was carefully designed to direct sufficient cooling air-flow to the components that generate the most heat. 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.

5. Supplying power to the system

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).

Chapter 3

System Interface

3-1   Overview

There are several LEDs on the chassis control panel as to keep you con-
stantly informed of the overall status of the system as well as the activity
and health of specific components.   There are also two buttons on the
chassis control panel.   This chapter explains the meanings of the control
panel LED indicators and the appropriate response you may need to take
when one turns on.

3-2   Control Panel Buttons

There are two push-buttons located on the front of the chassis.   These are
(in order from left to right) a reset button and a power on/off button.

RESET

- **RESET:** The reset switch reboots the system.

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

3-3   Control Panel LEDs

The control panel located on the front of the SC813S-500 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.

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

● **NIC2:** Indicates network activity on GLAN2 when flashing .

● **NIC1:** Indicates network activity on GLAN1 when flashing.

● **HDD:** Indicates IDE channel activity. On the SuperServer 6014H-8/ 6014H-82/6014H-X8 this light indicates SCSI 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 SCSI Drive Carrier LEDs

Each SCSI drive carrier has two LEDs.

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

● **Red:** A SAF-TE compliant backplane (standard on the 6014H-8/6014H-82/6014H-X8) activates the red LED, which indicates a drive failure. If one of the SCSI drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SCSI drives.

Notes

Chapter 4

System Safety

4-1   Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 6014H-8/6014H-82/6014H-X8 from damage:

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

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

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the CD-ROM and floppy drives (not necessary for SCSI drives). When disconnecting power, you should first power down the system with the operating system and then unplug the power cords of all the power supply units in the system.

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

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

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

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

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

● CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-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.

4-2   General Safety Precautions

Follow these rules to ensure general safety:

● Keep the area around the SuperServer 6014H-8/6014H-82/6014H-X8 clean and free of clutter.

● The SuperServer 6014H-8/6014H-82/6014H-X8 weighs approximately 38 lbs (17.3 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 with the retention screws after ensuring that all connections have been made.

4-3   ESD Precautions

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

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

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

● Touch a grounded metal object before removing any board from its 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 6014H-8/6014H-82/6014H-X8 is operating to ensure proper cooling. Out of warranty damage to the 6014H-8/6014H-82/6014H-X8 system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery

LITHIUM BATTERY

LITHIUM BATTERY

OR

BATTERY HOLDER

BATTERY HOLDER
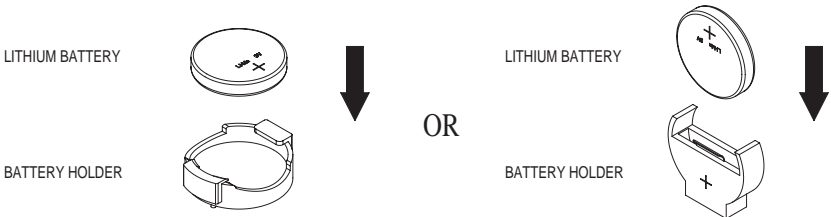
Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install processors and heatsinks to the X6DHR-8G/X6DHR-8G2/X6DHR-X8G serverboard, connect the data and power cables and install add-on cards. All serverboard 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 serverboard to protect and cool the system.

5-1   Handling the Serverboard

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 serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its anti-static 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 anti-static bags when not in use.

Unpacking

The serverboard 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

! When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the serverboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

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

CPU Installation

1. Lift the lever on the CPU socket: Lift the lever *completely* as shown on the picture on the right; otherwise, you will damage the CPU socket when power is applied. Install CPU1 first.

Socket lever

2. Insert the CPU in the socket, making sure that pin 1 of the CPU aligns with pin 1 of the socket (both corners are marked with a triangle). When using only one CPU, install it into CPU socket #1. (Socket #2 is automatically disabled if only one CPU is used.)

Pin 1

3. Press the lever down until you hear a *click*, which means the CPU is securely installed in the CPU socket. Repeat these steps if you wish to install a second processor into CPU socket#2.

Socket lever in the locking Position

Figure 5-1. 604-pin PGA Socket: Empty and with Processor Installed

Warning! Make sure you lift the lever <u>completely</u> when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.

Empty socket   With processor installed

Lever

Triangle (pin 1)   Triangle locating pin 1
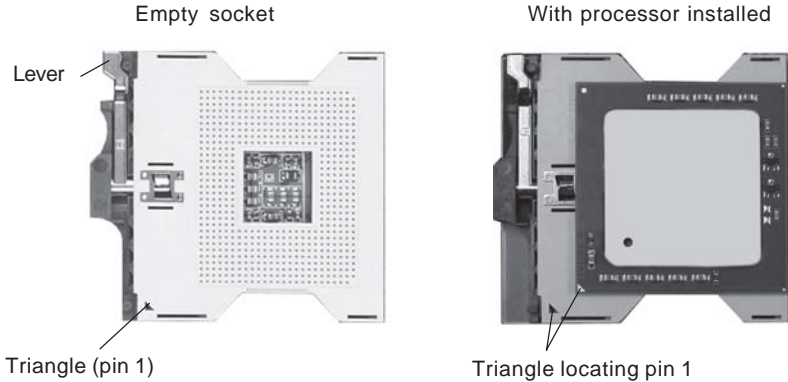
Heatsink Installation*

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

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

3. Screw in two diagonal screws (e.g. the #1 and the #2 screws) until just snug (do not fully tighten the screws to avoid possible damage to the CPU). Screw in the two remaining screws until snug (see Figure 5-2).

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

*The heatsink is an optional item that is sold separately (p/n SNK-P0009).
*Fan speed is controlled by a setting in BIOS (see page 7-17).

Figure 5-2. Installing the Heatsink

NO.1 SCREW   NO.3 SCREW

NO.4 SCREW   NO.2 SCREW

Do not reuse thermal grease!
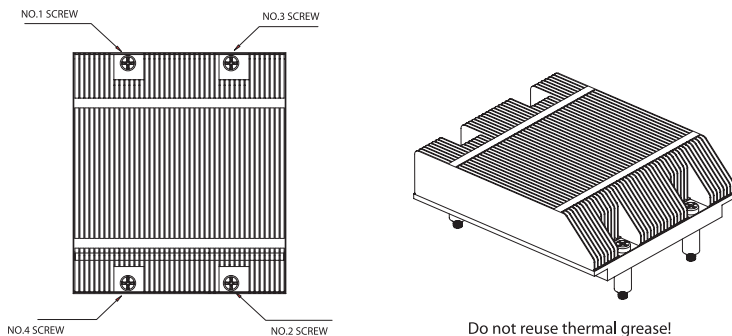
Removing the Heatsink/CPU

IMPORTANT: Removal of the heatsink or the CPU is not recommended. However, if you do need to remove the heatsink, please follow the instructions below to prevent damaging the CPU or the CPU socket.

1. Unscrew and remove the heatsink screws from the serverboard in the sequence as show in the picture above.

2. Hold the heatsink and gently wiggle it back and forth to loosen it from the CPU. (Do not use excessive force when loosening the heatsink!!)

3. Once the heatsink has been loosened from the CPU, remove the heatsink from the CPU socket.

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

5-3   Connecting Cables

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

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from block-ing the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the sys-tem, keep the airflow in mind when routing the cables. The following data cables (with their serverboard connector locations noted) should be connected. See the serverboard layout figure in this chapter for connector locations.

- CD-ROM drive cable (J6)

- SCSI drive cable (JA1)

- Control Panel cable (JF1, see next page)

- Floppy drive cable (J12)

- Front Side USB cable (JD2)

Connecting Power Cables

The X6DHR-8G/X6DHR-8G2/X6DHR-X8G has a 20-pin primary power supply connector at J1B1 designated "ATX Power" for connection to the ATX power supply. Connect the appropriate connector from the power supply to the J1B1 connector to supply power to the serverboard. The 12V 8-pin processor power connector at J1D1 and the 12V 4-pin power connector at J38 must also both be connected to your power supply. See the Connector Definitions section in this chapter for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-3 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 ribbon cable to simplify their connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects 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 5-3. JF1 Header Pins

	20	19	
Ground	○	○	NMI
X	○	○	X
Power LED	○	○	Vcc
HDD LED	○	○	Vcc
NIC1 LED	○	○	Vcc
NIC2 LED	○	○	Vcc
OH/Fan Fail LED	○	○	Vcc
Power Fail LED	○	○	Vcc
Ground	○	○	Reset — Reset Button
Ground	○	○	Pwr — Power Button
	2	1	
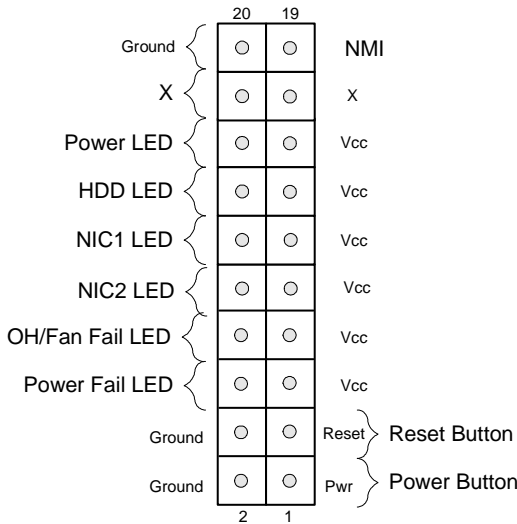
5-4   I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-4 below for the colors and locations of the various I/O ports.

Figure 5-4. I/O Ports

5-5   Installing Memory

Note: Check the Supermicro web site for recommended memory modules: http://www.supermicro.com/support/resources/

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

DIMM Installation (See Figures 5-5a and 5-5b)

1. Insert the desired number of DIMMs into the memory slots, starting with Bank #1A. The memory scheme is interleaved so <u>you must install two modules at a time</u>, beginning with DIMM #1A, then DIMM #1B, and so on.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

Memory Support

The X6DHR-8G2 has eight 240-pin DIMM slots that can support up to 16 GB of registered ECC DDR2-400 SDRAM. The serverboard has has been designed to support 2 GB DIMM modules for each memory slot, but it has only been validated with 1 GB memory modules.

The X6DHR-8G/X6DHR-X8G has eight 184-pin DIMM slots that can support up to 16 GB of low-profile, registered ECC DDR333 SDRAM or 32GB of low-profile, registered ECC DDR266 SDRAM. The serverboard has has been designed to support 2 GB DIMM modules for each memory slot, but it has only been validated with 1 GB memory modules. If registered ECC DDR333 (PC2700) memory is used, four double-banked DIMMs or six single-banked DIMMs are supported.

All three serverboards use an interleaved memory scheme, so memory modules must be installed two at a time (two DIMMs in the same bank). All memory modules should be the same size and speed.

Figure 5-5a. Side View of DIMM Installation into Slot
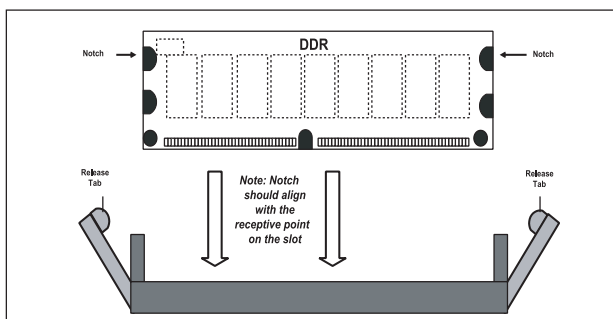
To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notch.
To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

Figure 5-5b. Top View of DIMM Slot
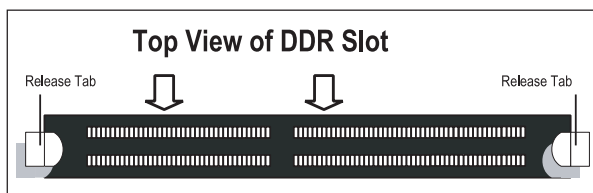
5-6   Adding PCI Cards

1. PCI slots

6014H-8: Included riser cards support the use of one standard PCI-X card of any speed and one low-profile PCI-X card of any speed. Alternatively, optional riser cards (sold separately) may be added to support the use of one x8 PCI-Express card and one x4 PCI-Express card (see below).

6014H-82: Included riser cards support the use of one standard PCI-X card (of 100 or 66 MHz) and one low-profile PCI-X card of any speed. Alternatively, optional riser cards (sold separately) may be added to support the use of two x8 PCI-Express cards.

The 6014H-X8 has two 133 MHz PCI-X slots. Two PCI-X cards of either speed (one standard size and one low-profile) may be installed for use with the included (standard) riser cards.

Riser Cards (Standard)	Slot	⇨	Add-on Card
CSE-RR1U-X	PCI-X (L)	⇨	PCI-X
CSE-RR1U-XLP	Univ. PCI (R)	⇨	PCI-X (low profile)

Riser Cards (Optional)	Slot	⇨	Add-on Card
CSE-RR1U-EL	Univ. PCI (L)	⇨	PCI-E
CSE-RR1U-ELP*	Univ. PCI (R)	⇨	Low-profile PCI-E

Note: (L) refers to left and (R) refers to right-side slots when viewed from the front of the chassis.

2. PCI card installation

Before installing a PCI add-on card, locate the PCI riser card mentioned in Step 1. Begin by swinging out the release tab for the PCI slot you wish to populate. Fully seat the PCI card into the riser card by pushing down with your thumbs evenly on both sides of the card. Finish by pushing the release tab back to its original (locked) position. Follow this procedure when adding a card to the other slot.

The PCI slot shields protect the serverboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused PCI slot.

*Use of the CSE-RR1U-ELP riser card requires a slight repositioning of the release tab mechanism on the low-profile slot: Remove the screw from the release tab mechanism and slide the mechanism to the left. Then secure it with the same screw but in the upper hole (see page 6-2 for diagram).

5-7 Serverboard Details

Figure 5-6. SUPER   X6DHR-8G2 Motherboard Layout*
(not drawn to scale)
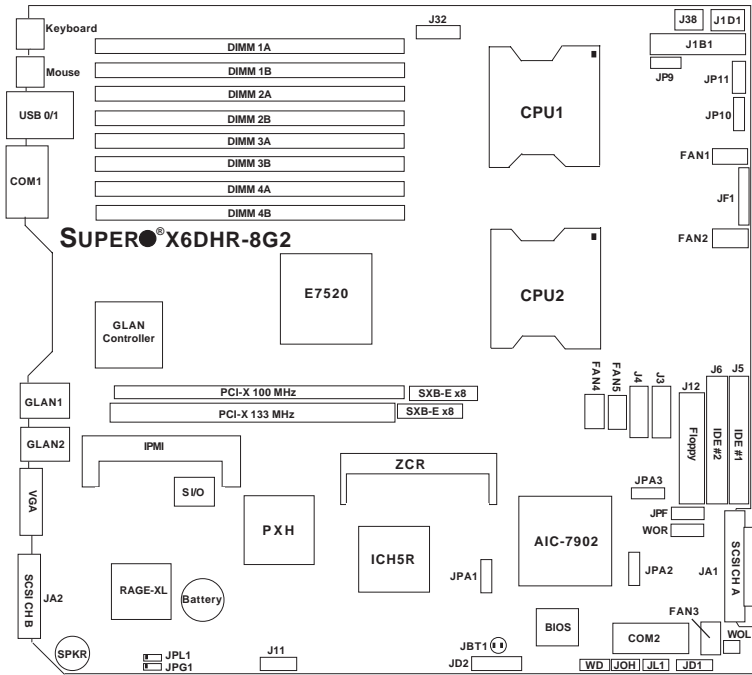
*Notes:

1. Jumpers not indicated are for manufacturer test purposes only - do not change these settings!

2. "■" indicates the location of pin 1.

X6DHR-8G2 Quick Reference

Jumper	**Description**	**Default Setting**
JP10	3rd PWR Supply Alarm En/Disable	Open (Disabled)
JP11	Alarm Reset	Closed (Enabled)
JPA1	SCSI Enable/Disable	Pins 1-2 (Enabled)
JPA2/JPA3	SCSI CH A/B Term. Enable/Disable	Open (Enabled)
JPF	PWR Force On	Open (Normal)
JBT1	CMOS Clear	See Section 5-9
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	GLAN Enable/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	**Description**
COM1/COM2	COM1/COM2 Serial Port Connector/Header
DIMM#1A-DIMM#4B	Memory (SDRAM) Slots
FAN#1-5	Onboard CPU Fan/Chassis Fan Headers
GLAN1/2	Gigabit Ethernet Ports
J3/J4	Serial ATA Connectors
J5/J6	IDE1/2 Hard Disk Drive Connectors
J9	IPMI 2.0 Connector
J11	System Management Bus Header
J12	Floppy Drive Connector
J32	SMB Power Connector
J38	4-Pin 12V Power Connector (required connection)
J1B1	Primary ATX 20-Pin Power Connector
J1D1	8-Pin 12V CPU Power Connector (required conn.)
JA1/JA2	SCSI Channel A/B Headers
JD1	PWR LED (pins 1-3) / Speaker (pins 4-7) Header
JD2	Front Panel USB2/3 Headers
JF1	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP9	Power Fail Detect Header
JP11	Alarm Rest Header (Default: On)
JWOL	Wake-on-LAN Header
JWOR	Wake-on-Ring Header
USB0/1	Universal Serial Bus Ports
VGA	Video (Monitor) Connector

Figure 5-7. SUPER X6DHR-8G/X6DHR-X8G Layout*
(not drawn to scale)
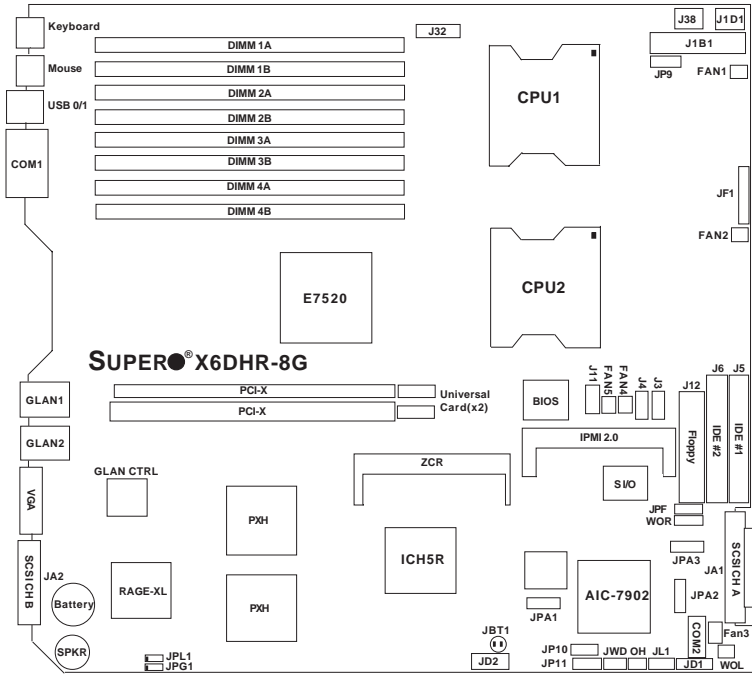
*Notes:

1. Jumpers not indicated are for manufacturer test purposes only - do not change these settings!

2. "■" indicates the location of pin 1.

3. The only difference between the X6DHR-8G and the X6DHR-X8G is that the X6DHR-X8G has no universal PCI card slot support.

X6DHR-8G/X6DHR-X8G Quick Reference

Jumper	**Description**	**Default Setting**
JBT1	CMOS Clear	See Section 5-9
JP10	3rd PWR Supply Alarm En/Disable	Open (Disabled)
JPA2/JPA3	SCSI CH A/B Term. Enable/Disable	Open (Enabled)
JPF	PWR Force On	Open (Normal)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	GLAN Enable/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	**Description**
COM1/COM2	COM1/COM2 Serial Port Connector/Header
DIMM#1A-DIMM#4B	Memory (SDRAM) Slots
FAN#1-5	Onboard CPU Fan/Chassis Fan Headers
GLAN1/2	Gigabit Ethernet Ports
J3/J4	SATA0/1 Connectors
J5/J6	IDE1/2 Hard Disk Drive Connectors
J9	IPMI 2.0 Connector
J11	System Management Bus Header
J12	Floppy Drive Connector
J32	SMB Power Connector
J38	4-Pin 12V Power Connector (required connection)
J1B1	Primary ATX 20-Pin Power Connector
J1D1	8-Pin 12V CPU Power Connector (required conn.)
JA1/JA2	SCSI Channel A/B Headers
JD1	PWR LED (pins 1-3) / Speaker (pins 4-7) Header
JD2	Front Panel USB Headers
JF1	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP9	Power Fail Detect Header
JP11	Alarm Rest Header (Default: On)
JWOL	Wake-on-LAN Header
JWOR	Wake-on-Ring Header
USB0/1	Universal Serial Bus Ports
VGA	Video (Monitor) Port

5-8   Connector Definitions

ATX Power Connector

The X6DHR-8G/X6DHR-8G2/ X6DHR-X8G includes a 20-pin main power supply connector (J1B1) and a 4-pin 12V PWR connector (J38). Both connections are required. These power connectors meet the SSI EPS 12V specification. See the table on the right for pin definitions. For J38, please refer to the item listed below.

ATX 20-pin Power Connector Pin Definitions (J1B1)

Pin #	Definition	Pin #	Definition
11	+3.3V	1	+3.3V
12	-12V	2	+3.3V
13	COM	3	COM
14	PS_ON	4	+5V
15	COM	5	COM
16	COM	6	+5V
17	COM	7	COM
18	-5V	8	PW-OK
19	+5V	9	5VSB
20	+5V	10	+12V

+12V 4-pin Connector (J38)

Required Connection

Pins #	Definition
1 & 2	Ground
3 & 4	+12 V

Processor Power Connector

In addition to the Primary ATX power connector (above), the 12v 8-pin processor power connector at J1D1 must also be connected to your power supply. See the table on the right for pin definitions.

Required Connection

CPU 8-pin PWR Connector (J1D1)

Pins	Definition
1 thru 4	Ground
5 thru 8	+12v

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

Pin Number	Definition
19	Control
20	Ground

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.

PWR_LED Pin Definitions (JF1)

Pin Number	Definition
15	Vcc
16	Control

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach the hard drive LED cable to display hard drive activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)

Pin Number	Definition
13	Vcc
14	HD Active

NIC1/NIC2 LED

The NIC (Network Interface Controller) LED connection for GLAN1 is located on pins 11 and 12 of JF1 and the connection for GLAN2 is on pins 9 and 10. Attach NIC LED cables to display network activity. Refer to the table on the right for pin definitions.

NIC1/2 LED Pin Definitions (JF1)

Pin Number	Definition
9/11	Vcc
10/12	GND

Overheat/Fan Fail LED

Connect an LED to pins 7 and 8 of JF1 to provide warning of a processor overheating or fan failure. The LED will flash/stay on as long as the fan fail/overheat condition exists. Refer to the table on the right for pin definitions.

Overheat (OH) LED Pin Definitions (JF1)

Pin Number	Definition
7	Vcc
8	GND

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

Power Fail LED Pin Definitions (JF1)

Pin Number	Definition
5	Vcc
6	GND

Reset Button

The Reset Button connection is lo-
cated on pins 3 and 4 of JF1. Attach
it to the hardware reset switch on the
computer case. Refer to the table on
the right for pin definitions.

**Reset Pin
Definitions
(JF1)**

Pin Number	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is lo-
cated on pins 1 and 2 of JF1. Mo-
mentarily contacting both pins will
power on/off the system. To turn off
the power when set to suspend
mode, depress the button for at least
4 seconds. Refer to the table on the
right for pin definitions.

**Power Button
Connector
Pin Definitions
(JF1)**

Pin Number	Definition
1	PW_ON
2	Ground

Chassis Intrusion

A Chassis Intrusion header is lo-
cated at JL1. Attach the appropri-
ate cable to inform you of a chas-
sis intrusion.

**Chassis Intrusion
Pin Definitions (JL1)**

Pin Number	Definition
1	Intrusion Input
2	Ground

Universal Serial Bus
(USB0/1, JD2)

There are two Universal Serial
Bus ports (USB0/1) located on the
I/O backpanel and an additional
two (USB2/3) next to the CMOS
Clear pads (JBT1). USB2/3 can be
used to provide front side chassis
access (cables not included). See
the tables on the right for pin defi-
nitions.

**USB Pin Definitions
USB0/1 (Backpanel USB)**

Pin#	Definition
1	+5V
2	P0-
3	P0+
4	Ground

USB2/3 (JD2)

Pin Number	Definition	Pin Number	Definition
1	+5V	2	+5V
3	PO-	4	PO-
5	PO+	6	PO+
7	Ground	8	Ground
		10	Ground

Fan Headers

There are five fan headers (FAN1-FAN5) on the serverboard. See the table on the right for pin definitions.

Note: These fan headers are 4-pin fans. Pins#1-#3 of the fan headers are backward compatible with traditional 3-pin fans. Fan speed is controlled by Thermal Management via a BIOS setting. The default setting is disabled. When using a Thermal Management setting, please use all 3-pin fans or all 4-pin fans on the serverboard. Do not use 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	PWR_Control

Caution: These fan headers use DC power.

Serial Ports

The COM1 serial port is located on the backplane and the COM2 header is located on the corner of the board near the FAN3 header. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	DCD	6	CTS
2	DSR	7	DTR
3	Serial In	8	RI
4	RTS	9	Ground
5	Serial Out	10	NC

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located on the backplane. See the table at right for pin definitions. (See Figure 5-3 for the location of each port.)

PS/2 Keyboard and Mouse Port Pin Definitions

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Power LED/Speaker

On the JD1 header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions.

Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)

Pin Number	Function	Definition
4	+	Red wire, Speaker data
5	Key	No connection
6		Key
7		Speaker data

Wake-On-Ring

The Wake-On-Ring header (designated JWOR) allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-on-Ring Pin Definitions (JWOR)

Pin Number	Definition
1	Ground
2	Wake-up

Wake-On-LAN

The Wake-On-LAN header is located at JWOL. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this function. (You must also have a LAN card with a Wake-On-LAN connector and cable.)

Wake-On-LAN Pin Definitions (JWOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Power Fail Detect

Connect a cable from your power supply to the Power Fail header (JP9) to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin to indicate on the control panel that a power supply has failed. See the table on the right for pin definitions.

Power Fail
Pin Definitions (JP9)

Pin Number	Definition
1	P/S 1 Fail Signal
2	P/S 2 Fail Signal
3	P/S 3 Fail Signal
4	Reset (from MB)

Note: This feature is only available when using redundant Supermicro power supplies.

SMB (I^2C) Connector

An I^2C connector at J11 (located near the battery on the X6DHR-8G2 and near the IPMI header on the X6DHR-8G/X6DHR-X8G) monitors the status of the PWR supply, the fans and the system temperature.

SMB PWR
Pin Definitions (J27)

Pin #	Definition
1	Clock
2	SMB Data
3	N/A
4	N/A
5	N/A

Overheat LED (JOH1)

Connect an LED to the JOH1 header to provide warning of chassis overheating. See the table on the right for pin definitions.

Overheat LED
Pin Definitions (JOH1)

Pin Number	Definition
1	+5V
2	OH Active

GLAN1/2 (Ethernet Ports)

Two gigabit Ethernet ports (designated GLAN1 and GLAN2) are located on the I/O backplane. These ports accept RJ45 type cables.

5-9   Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.
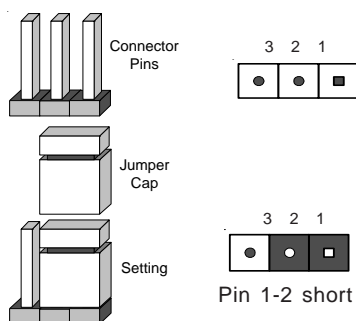
Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

Connector
Pins

3 2 1

Jumper
Cap

3 2 1

Setting

Pin 1-2 short

CMOS Clear

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

To clear CMOS,
1) First power down the system and unplug the power cord(s).
2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3) Remove the screwdriver (or shorting device).
4) Reconnect the power cord(s) and power on the system.

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

3rd Power Supply Alarm Enable/Disable

The system can notify you in the event of a power supply failure. This feature assumes that three power supply units are installed in the chassis with one acting as a backup. If you only have one or two power supply units installed, you should disable this (the default setting) with JP10 to prevent false alarms. See the table on right for pin definitions.

Power Supply Alarm Enable/Disable Jumper Settings (JP10)

Jumper Position	Definition
Open	Disabled
Closed	Enabled

VGA Enable/Disable

JPG1 enables or disables the VGA Connector on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

VGA Enable/Disable Jumper Settings (JPG1)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

GLAN Enable/Disable

Change the setting of jumper JPL1 to enable or disable the onboard GLAN ports (GLAN1 and GLAN2) on the serverboard. See the table on the right for jumper settings. The default setting is enabled

GLAN Enable/Disable Jumper Settings (JPL1)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

JWD enables the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application is "hung up". Pins 1-2 will cause WD to reset the system if an application is hung up. Pins 2-3 will generate a non-maskable interrupt signal for the application that is hung up. See the table on the right for jumper settings. Watch Dog can also be enabled via BIOS.

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

**Watch Dog
Jumper Settings (JWD)**

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3	WD to NMI
Open	Disabled

SCSI Termination Enable/ Disable

Jumpers JPA2 and JPA3 allow you to enable or disable termination for the SCSI connectors. Jumper JPA2 controls SCSI channel A and JPA3 is for channel B. The default setting is open to enable (terminate) both SCSI channels.

Note: In order for the SCSI drives to function properly, please do not change the default setting set by the manufacturer. See the table on the right for jumper settings.

**SCSI Channel Termination
Enable/Disable
Jumper Settings
(JPA2, JPA3)**

Jumper Position	Definition
Open	Enabled
Closed	Disabled

SCSI Controller Enable/ Disable

Jumper JPA1 allows you to enable or disable the SCSI headers. The default setting is pins 1-2 to enable all four headers. See the table on the right for jumper settings.

**SCSI Enable/Disable
Jumper Settings
(JPA1)**

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Power Force On

Jumper JPF allows you to force the system into a permanent power on state. Power will remain on (regardless of the power button being activated) until this jumper is reset to "open". The default setting is open. See the table on the right for jumper settings.

**Power Force On
Jumper Settings
(JPF)**

Jumper Position	Definition
Open	Normal
Closed	Power Force On

5-10 Onboard Indicators

GLAN LEDs

Each Ethernet port has two LEDs. The yellow LED indicates activity while the other LED may be green, orange or off to indicate the speed of the connection. See the table on the right for the functions associated with this second LED.

**Gb LAN Right LED
Indicator**

LED Color	Definition
Off	No Connection
Green	100 MHz
Orange	1 GHz

5-11 Floppy, Hard and SCSI Disk Drive Connections

Note the following when connecting the floppy and hard disk drive cables:

• The floppy disk drive cable has seven twisted wires.

• A red mark on a wire typically designates the location of pin 1.

• A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Floppy Connector

The floppy connector is located on J12. See the table below for pin definitions.

Floppy Connector Pin Definitions (J12)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

IDE Connectors

There are no jumpers to configure the onboard IDE#1 and #2 connectors. See the table below for pin definitions.

IDE Connector Pin Definitions
(J5, J6)

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

Ultra320 SCSI Connectors

Refer to the table below for the pin definitions of the Ultra320 SCSI connectors located at JA1 and JA2.

Ultra320 SCSI Connectors (JA1, JA2)

Connector Contact Number	Signal Names	Connector Contact Number	Signal Names
1	+DB(12)	35	-DB(12)
2	+DB(13)	36	-DB(13)
3	+DB(14)	37	-DB(14)
4	+DB(15)	38	-DB(15)
5	+DB(P1)	39	-DB(P1)
6	+DB(0)	40	-DB(0)
7	+DB(1)	41	-DB(1)
8	+DB(2)	42	-DB(2)
9	+DB(3)	43	-DB(3)
10	+DB(4)	44	-DB(4)
11	+DB(5)	45	-DB(5)
12	+DB(6)	46	-DB(6)
13	+DB(7)	47	-DB(7)
14	+DB(P)	48	-DB(P)
15	GROUND	49	GROUND
16	DIFFSENS	50	GROUND
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	RESERVED	53	RESERVED
20	GROUND	54	GROUND
21	+ATN	55	-ATN
22	GROUND	56	GROUND
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB(8)	65	-DB(8)
32	+DB(9)	66	-DB(9)
33	+DB(10)	67	-DB(10)
34	+DB(11)	68	-DB(11)

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC813S-500 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

Electricstatic 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 anti-static 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 anti-static 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

Slim-Line CD-ROM Drive   Floppy Drive   System LEDs   Control Panel

SCSI Drives   System Reset   Main Power

USB0/1   COM1 Port   PCI Expansion Slots

Power Supply   Mouse/Keyboard   Ethernet Ports   VGA Port   External SCSI Port

Upper Screw

Lower Screw

Low-Profile Release Tab (see page 5-9)
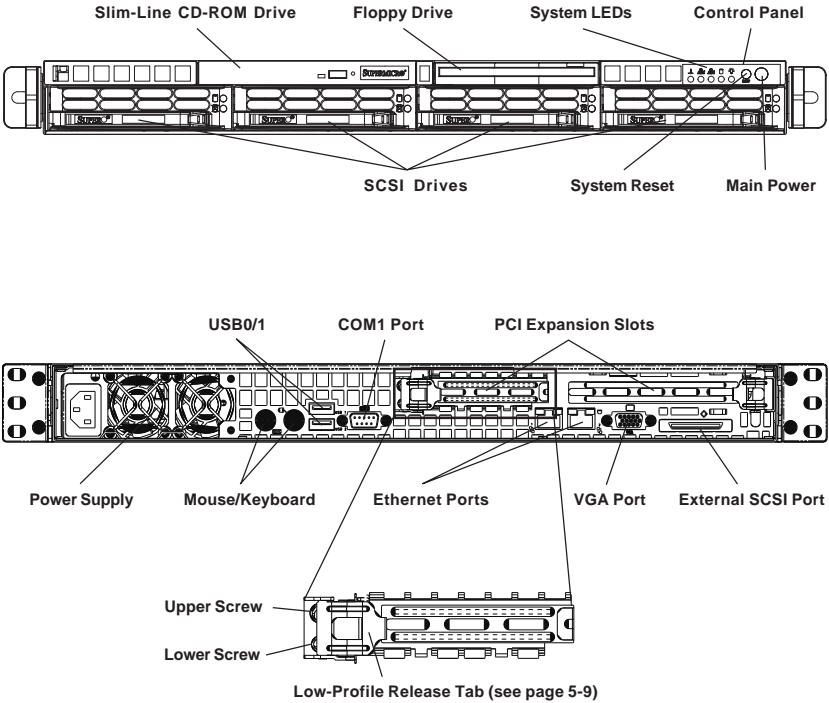
6-2   Control Panel

The control panel (located on the front of the chassis) must be connected to the JF2 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 JF2 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 JF2 can be found in "Chapter 5: Advanced Serverboard Setup."

6-3   System Fans

Two 10-cm blower fans provide all the cooling needed for the SuperServer 6014H-8/6014H-82/6014H-X8. 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.

The rpm of the blower fans can be adjusted with a setting in BIOS [see page 7-17 - recommended setting is "3-pin (Server)"].

System Fan Failure

If a fan fails, the ambient air temperature in the chassis will rise and activate the Overheat/Fan Fail LED on the control panel. Replace any failed fan immediately with the same type and model.   You must power down the system before replacing a cooling fan (removing the power cord is also recommended as a safety precaution).

Replacing System Cooling Fans

1.   Removing a fan
After first turning off the power to the system, remove the chassis cover and unplug the fan cable from the motherboard. Unscrew the failed blower fan from the chassis and pull it completely out from the serverboard.

2.   Installing a new fan
Replace the failed fan with an identical 10-cm, 12 volt fan (available from Supermicro: p/n FAN-0059). Install the new fan in its proper place in the chassis by positioning it on the two mounting posts. Secure the fan to the chassis with the screws you removed previously, then attach the fan wires to the same chassis fan header you removed it from. Make sure the air seal under the fan is properly installed and creating a good seal. Power up the system and check that the fan is working properly and that the Overheat/Fan Fail LED on the control panel has turned off. Finish by replacing the chassis cover.

Figure 6-2. System Cooling Fans (with optional front bezel shown)

10-cm Blower Fans
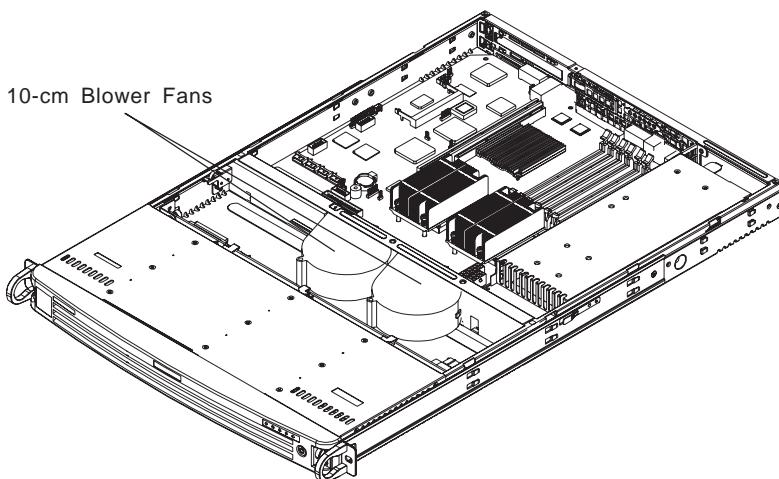
6-4 Drive Bay Installation/Removal

Removing the Front Bezel

If your system has a front bezel (optional, p/n CSE-PTFB-813) attached to the chassis, you must first remove it to gain access to the drive bays. To remove the bezel, first unlock the front of the chassis then press the release knob (see Figure 6-3). Carefully remove the bezel with both hands. A filter located within the bezel can be removed for replacement/cleaning. It is recommended that you keep a maintenance log of filter cleaning/replacement, since its condition will affect the airflow throughout the whole system.

Figure 6-3. Removing the Front Bezel

1. Unlock
2. Press release knob
3. Remove bezel assembly
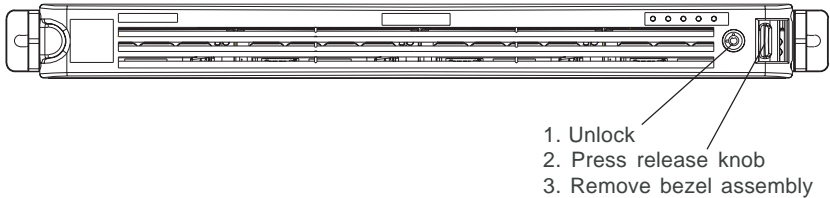
Accessing the Drive Bays

SCSI 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 SCSI drives. Proceed to the next step for instructions.

CD-ROM/Floppy Disk Drives: For installing/removing a CD-ROM or floppy disk drive, you will need to gain access to the inside of the 6014H-8/6014H-82/6014H-X8 by removing the top cover of the chassis. Proceed to the "CD-ROM and Floppy Drive Installation" section later in this chapter for instructions.

Note: Only a "slim" CD-ROM drive and a "slim" floppy drive will fit into the 6014H-8/6014H-82/6014H-X8.

Removing the Top Chassis Cover

First, release the retention screws that secure the server unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

SCSI Drive Installation

⚠ **!**   Use extreme caution when working around the SCSI backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the airflow.

1.   Removing a hot-plug SCSI drive carrier

The four SCSI drive carriers are all easily accessible at the front of the chassis. The SCSI drives are hot-pluggable, meaning they can be removed and installed without powering down the system. To remove a carrier, first push the release button located beside the drive LEDs. Swing the handle fully out and use it to pull the unit straight out from the chassis (see Figure 6-4).

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

2.   Mounting a SCSI drive in a drive carrier

The SCSI drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the SCSI drive bays. For this reason, even empty carriers without SCSI drives installed must remain in the chassis. To add a new SCSI drive, install the drive into the carrier with the printed circuit board facing down so that the mounting holes align with those in the carrier (3a). Secure the drive to the carrier with three screws on each side (3b), as shown in Figure 6-5.

⚠ **!**   <u>Important:</u> Regardless of how many SCSI hard drives are installed, all SCSI drive carriers must remain in the drive bays to promote proper airflow.

Figure 6-4. Removing a SCSI Drive Carrier
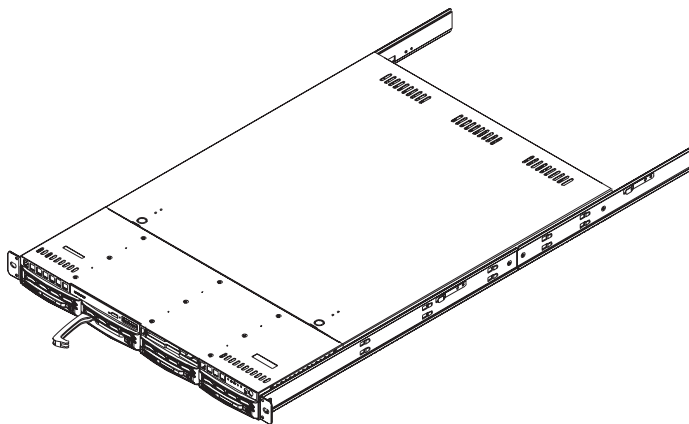

Figure 6-5. Mounting a SCSI Drive in a Carrier
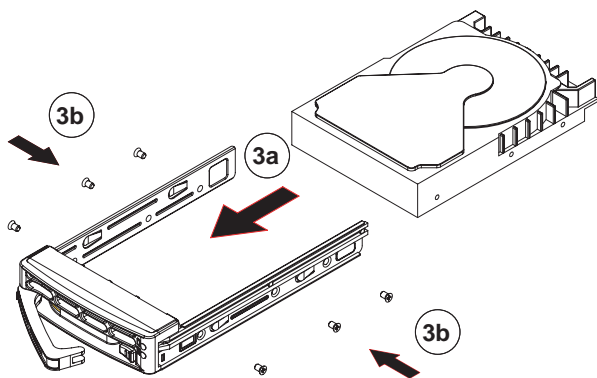
3. SCSI backplane

All four SCSI drives plug into a single SCSI backplane, which provides
Ultra320 single-channel operation for all SCSI drives. A ribbon cable from
JA1 on the serverboard should be connected to the IN connector on the
SCSI backplane. There is also a power connector on the backplane that
must be connected.

CD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the CD-ROM and floppy drive bays. The 6014H-8/6014H-82/6014H-X8 accomodates only slim CD-ROM and floppy drives. Side mounting brackets are needed to mount a slim CD-ROM drive in the 6014H-8/6014H-82/6014H-X8 server.

You must power down the system before installing or removing a floppy or CD-ROM drive. First, release the retention screws that secure the server unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

With the chassis cover removed, unplug the power and data cables from the drive you want to remove. Then locate the locking tab at the rear of the drive. It will be on the left side of the drive when viewed from the front of the chassis. Pull the tab away from the drive and push the drive unit out the front of the chassis. Add a new drive by following this procedure in reverse order. You may hear a faint *click* of the locking tab when the drive is fully inserted. Remember to reconnect the data and power cables to the drive before replacing the chassis cover and restoring power to the system. Please be aware of the following:

- The floppy disk drive cable has seven twisted wires.
- A color mark on a cable typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

6-5 Power Supply

The SuperServer 6014H-8/6014H-82/6014H-X8 has a single 500 watt power supply, which is auto-switching capable. This enables it to automatically sense and operate with either a 100v or 240v input voltage.

Power Supply Failure

If the power supply unit fails, the system will shut down and you will need to replace the unit. Replacement units can be ordered directly from Supermicro (see contact information in the Preface). As there is only one power supply unit in the 6014H-8/6014H-82/6014H-X8, power must be completely removed from the server before removing and replacing the power supply unit for whatever reason.

Removing/Replacing the Power Supply

1. Removing the power supply:
First turn the power switch on the control panel off, then unplug the power cord from the system. Remove the chassis cover by pressing the two release buttons on the top of the chassis (near the front) and push the chassis top rearward about one inch. To remove the failed power unit, push the beige colored release tab to the right and then carefully lift the unit up about 1/2 inch only. If you lift too high, you may damage the power distribution board that the other end of the unit is connected to. Then, pull the power unit straight back to unplug it from the power distribution board.

2. Installing a new power supply:
Replace the failed unit with another unit of the same input voltage, output voltage and wattage. It is highly recommended to replace it with exactly the same model power supply (p/n: PWS-0048). Carefully insert the new unit into position to plug it into the power distribution board, making sure you are not holding it at too great an angle, which may damage the power distribution board. Push it completely into the power distribution board and seat it in the chassis. When correctly installed it should be laying flat - make sure the end of the power supply is not sitting on the stop in the chassis. Reconnect the power cord, replace the chassis top cover and reposition the unit back into the rack. Finish by depressing the power button on the chassis front control panel.

Notes

Chapter 7

BIOS

7-1   Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X6DHR-8G/ X6DHR-8G2/X6DHR-X8G. The Phoenix BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program. Due to periodic changes in the BIOS, some settings may have been added or deleted that might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site for any such changes.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the 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 screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured. 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: BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)   Options printed in **Bold** are the default settings.

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

Note: fan speed is controlled by the "Auto Fan Control" setting in BIOS. The recommended setting for the 6014H-8/6014H-82/6014H-X8 is "3-pin (Server)" If you load the BIOS default settings this setting may change. Therefore, when loading BIOS defaults you should reenter BIOS setup and change this setting back to "**3-pin (Server)**", then save and exit (see page 7-17).

7-2   Running Setup

*Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

When you first power on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

 1.   By pressing <Delete> immediately after turning the system on, or
 2.   When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

7-3   Main BIOS Setup

All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶ icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu

```
         PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
   Main   Advanced   Security   Boot   Exit

                                                        Item Specific Help
      System Time:                  [18:18:42]
      System Date:                  [03-16-2004]
                                                     <Tab>, <Shift-Tab>, or
      BIOS Date                                      <Enter> selects field.
      Legacy Diskette A:            [1.44/1.25 MB  3½"]

      Parallel ATA:                 [Both]
      Serial ATA:                   [Enabled]
      Native Mode Operation:        [Auto]

   ► IDE Channel 0 Master
   ► IDE Channel 0 Slave
   ► IDE Channel 1 Master
   ► IDE Channel 1 Slave
   ► IDE Channel 2 Master
   ► IDE Channel 3 Master

      System Memory:                [XXXX KB]
      Extended Memory:              [XXXX KB]



   F1  Help   ↑↓ Select Item   -/+   Change Values    F9  Setup Defaults
   Esc Exit   ↔  Select Menu   Enter Select ► Sub-Menu F10 Previous Values
```

Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields and enter the correct data. Press the <Enter> key to save the data.

BIOS Date

This feature allows BIOS to automatically display the BIOS date.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

Parallel ATA

This setting allows the user to enable or disable the funciton of Parallel ATA. The options are Disabled, Channel 0, Channel 1 and **Both.**

Serial ATA

This setting allows the user to enable or disable the funciton of Serial ATA. The options are Disabled and **Enabled.**

Serial ATA RAID Enable

Select Enable to enable Serial ATA RAID Functions. (For the Windows OS environment, use the RAID driver if this feature is set to "Enabled". (If "**Disabled**", use the "Non-RAID" driver.)

Native Mode Operation

This option allows the user to select the Native Mode for ATA. Some Operating Systems are not supported by the Native Mode. The options are: Serial ATA, Parallel ATA, **Auto** and Both.

▶**IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master**

These settings allow the user to set the parameters of IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

```
    PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
  Main

                                                         Item Specific Help
    Type:
    CHS Format
    Cylinders:                                   User = you enter
    Cylinders:                                   parameters of hard-disk
    Heads:                        [  1]          drive installed at this
    Heads:                                       connection.
    Sectors:                                     Auto = autotypes
    Sectors:                                     hard-disk drive
    Maximum Capacity:                            installed here.
    Maximum Capacity:                            1-39 = you select
    LBA Format                                   pre-determined  type of
    Total Sectors:                               hard-disk drive
    Maximum Capacity:                            installed here.
                                                 CD-ROM = a CD-ROM drive
    Multi-Sector Transfers:     [Disabled]       is installed here.
    LBA Mode Control:           [Disabled]       ATAPI Removable =
    32 Bit I/O:                 [Disabled]       removable disk drive is
    Transfer Mode:              [Standard]       installed here.
    Ultra DMA Mode:             [Disabled]



  F1  Help  ↑↓ Select Item   -/+   Change Values     F9  Setup Defaults
  Esc Exit  ↔ Select Menu   Enter Select ▶ Sub-Menu  F10 Previous Values
```

Type

Selects the type of IDE hard drive. The options are **Auto** (allows BIOS to automatically determine the hard drive's capacity, number of heads, Sectors, Maximum Capacity, LBA Format, ect.). Enter a number from 1-39 to select a predetermined type of hard drive, CD-ROM and ATAPI Removable. The option- "User" will allow the user to enter the parameters of the HDD installed at this connection. The option-"Auto" will allow BIOS to automatically configure the parameters of the HDD installed at the connection. Choose the option"1-39" to select a pre-determined HDD type. Select CD-ROM if a CD-ROM drive is installed. Select ATAPI if a removable disk drive is installed.

Multi-Sector Transfers

Select the number of transfer sectors. The options are Disabled, 2, 4, 6, 8 and **16 Sectors**.

LBA Mode Control

This item determines whether Phoenix BIOS will access the IDE Primary Master Device via LBA mode. The options are **Disabled** and Enabled.

32 Bit I/O

Selects 32 Bit I/O operation. The options are Enabled and **Disabled**.

Transfer Mode

Selects the transfer mode. The options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, **Fast PIO4**, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA Mode

Selects Ultra DMA Mode. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, Mode 5 and Mode 6.
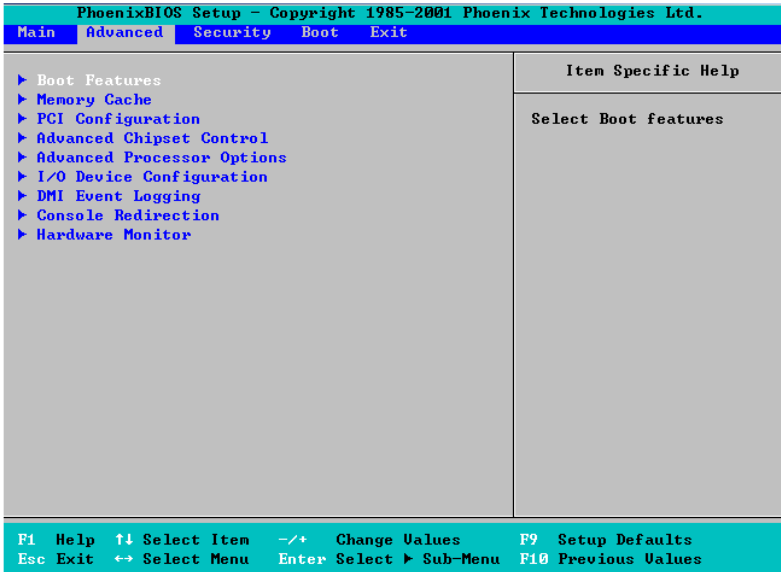
System Memory

This display informs you how much system memory is recognized as being present in the system.

Extended Memory

This display informs you how much extended memory is recognized as being present in the system.

7-4   Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys.   You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All Advanced BIOS Setup options are described in this section.

```
          PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
   Main   Advanced   Security   Boot   Exit

                                                        Item Specific Help
  ▶ Boot Features
  ▶ Memory Cache
  ▶ PCI Configuration                              Select Boot features
  ▶ Advanced Chipset Control
  ▶ Advanced Processor Options
  ▶ I/O Device Configuration
  ▶ DMI Event Logging
  ▶ Console Redirection
  ▶ Hardware Monitor




   F1   Help   ↑↓ Select Item    -/+   Change Values    F9   Setup Defaults
   Esc  Exit   ←→ Select Menu    Enter Select ▶ Sub-Menu  F10 Previous Values
```

▶Boot Features

Access the submenu to make changes to the following settings.

Quick Boot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

Quiet Boot

This setting allows you to **Enable** or Disable the diagnostic screen during boot-up.

ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and No.

Power Button Behavior

If set to Instant-Off, the system will power off immediately as soon as the user hits the power button. If set to 4-sec, the system will power off when the user presses the power button for 4 seconds or longer. The options are **instant-off** and 4-sec override.

Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Stay On, Power Off and **Last State**.

Watch Dog

Use this setting to Enable or **Disable** the Watch Dog feature.

Summary Screen

This setting allows you to **Enable** or Disable the summary screen.

▶**Memory Cache**

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select "**Write Protect**" to enable this function, and this area will be reserved for BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS write

(cache) its data into this reserved memory area. Select "**Write Protect**" to enable the function and this area will be reserved for BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations . Select "Uncached" to disable this funciton. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations . Select "Uncached" to disable this funciton. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations . Select "Uncached" to disable this funciton. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-

512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back**.

▶PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

Onboard GLAN (Gigabit- LAN) OPROM Configure

Enabling this option provides the capability to boot from GLAN. The options are **Disabled** and Enabled.

Onboard SCSI OPROM Configure

Enabling this option provides the capability to boot from SCSI HDD. The options are Disabled and **Enabled**.

Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data-(ESCD) area. The options are Yes and **No**.

Frequency for RAID-SLOT/SCSI

This option allows the user to change the bus frequency for the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

Frequency for G-LAN

This option allows the user to change the bus frequency of the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

Frequency for PCI-X #1/Frequency for PCI-X #2

This option allows the user to change the bus frequency of the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

▶**PCI-X 133MHz Slot #1/Slot#2, PCI-Expx8 Slot#3/PCI-Expx4 Slot#4**

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are Enabled and **Disabled**.

Latency Timer

This setting allows you to set the clock rate for Bus Master.A high-prioity, high-throughout device may benefit from a greater Clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h.   For Unix, Novell and other Operating Systems, please select the option:"other". If a drive fails after the installation of a new software , you might want to change this settiing and try again. Different OS requires different Bus Master clock rate**.**

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novellle NetWare and other operating systems).

▶**Advanced Chipset Control**

Access the submenu to make changes to the following settings.

Force Compliance Mode Entry

This feature allows you to enable the PCI-Express Compliance 1.0 Mode. The options are: **Disabled** or Enabled.

Memory RAS Feature Control

Select this option to enable the Memory RAS Feature Control The options are Miirroring, Sparing and **Standard**.

Clock Spectrum Feature

If "Enabled", BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and **Disabled**.

DRAM Data Integrity Mode

If enabled, this feature allows the data stored in the DRMA memory to be integrated for faster data processing. The options are 72-bit ECC, 144-bit ECC, **Auto**, Algorithms and Disabled.

ECC Error Type

This setting lets you select which type of interrupt to be activated as a result of an ECC error. The options are **None**, NMI (Non-Maskable Interrupt), SMI (System Management Interrupt) and SCI (System Control Interrupt.)

SERR Signal Condition

This setting specifies the conditions required to be qualified as an ECC error. The options are None, **Single Bit**, Multiple Bit and Both.

USB Function

This setting allows you to **Enable** or Disable all functions for the USB devices specified.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

▶**Advanced Processor Options**

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Hyper-threading

This setting allows you to **Enable** or Disable the function of hyper-threading.   Enabling hyper-threading results in increased CPU performance. (Applicable for the XP systems.)

Machine Checking

This setting allows you to Enable or **Disable** Machine Checking.

Adjacent Cache Line Prefetch

The CPU fetches the cache line for 64 bytes if Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

▶**I/O Device Configuration**

Access the submenu to make changes to the following settings.

KBC Clock Input

This setting allows you to select clock frequency for KBC. The options are 6MHz, 8MHz, **12MHz** and 16MHz.

On-board COM 1

This setting allows you to assign control of serial port A. The options are **Enabled** (user defined), Disabled and Auto (BIOS controlled).

Base I/O Address

Select the base I/O address for serial port A. The options are **3F8**, 2F8, 3E8 and 2E8.

Interrupt

Select the IRQ (interrupt request) for serial port A. The options are IRQ3 and **IRQ4**.

On-board COM 2

This setting allows you to assign control of serial port B. The options are **Enabled** (user defined), Disabled and Auto (BIOS controlled).

Mode

Specify the type of device that will be connected to serial port B. The options are **Normal**, IR (for an infrared device) and ASK-IR.

Base I/O Address

Select the base I/O address for serial port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

Select the IRQ (interrupt request) for serial port B. The options are **IRQ3** and IRQ4.

Parallel Port

This setting allows you to assign control of the parallel port. The options are Enabled (user defined), **Disabled** and Auto (BIOS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

Interrupt

Select the IRQ (interrupt request) for the parallel port. The options are IRQ5 and **IRQ7**.

Mode

Specify the parallel port mode. The options are Output Only, Bi-directional, EPP and **ECP**.

DMA Channel 1

Specify the DMA channel. The options are DMA1 and **DMA3**.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled and Auto (BIOS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **Primary** and Secondary.

▶DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display, not a setting, informing you of the event log validity.

Event Log Capacity

This is a display, not a setting, informing you of the event log capacity.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

▶Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

Specifies to redirect the console to On-board COM A or On-board COM B. This setting can also be **Disabled**.

BAUD Rate

Select the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K and 115.2K.

Console Type

Choose from the available options to select the console type for console redirection. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PCANSI**, VT100+, VT-UTF8.

Flow Control

Choose from the available options to select the flow control for console redirection. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

Select the console connection: either **Direct** or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the POST routine. The options are On and **Off**.
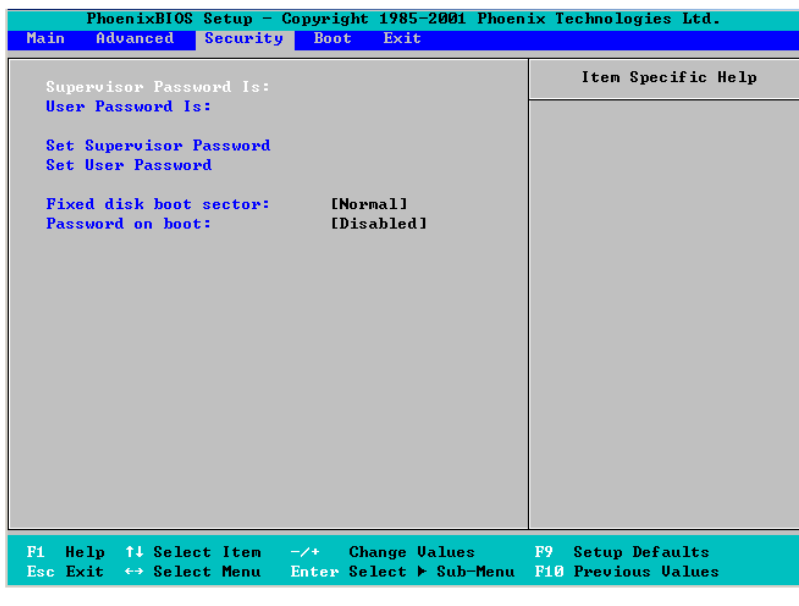
▶**Hardware Monitor**

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. If the option is set to "3-pin", the fan speed is controlled based upon the CPU die temperature. When the CPU die temperature is higher, the fan speed will be higher as well. If the option is set to "4-pin", the fan speed will be controlled by the Thermal Management Settings pre-configured by the user at this feature. Select "3-pin" if your chassis came with 3-pin fan headers. Select "4-pin" if your chassis came with 4-pin fan headers.   Select "Workstation" if your system is used as a Workstation. Select "Server" if your system is used as a Server. Select "Disable" to disable the fan speed control function to allow the onboard fans to run at the full speed (12V) at all time.   The options are **Disable,** 3-pin (Server), 3-pin (Workstation),   4-pin (Server) and 4-pin (Workstation).

The recommended setting for the 6014H-8/6014H-82/6014H-X8 is "3-pin (Server)". Note that loading the default values will change this setting. If you load BIOS defaults you should reenter BIOS setup and change this setting back to "3-pin (Server)".

7-5   Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys.   You should see the following display.   Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.

```
        PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
    Main   Advanced   Security   Boot   Exit

                                                      Item Specific Help
      Supervisor Password Is:
      User Password Is:

      Set Supervisor Password
      Set User Password

      Fixed disk boot sector:        [Normal]
      Password on boot:              [Disabled]

    F1  Help  ↑↓ Select Item   -/+   Change Values    F9   Setup Defaults
    Esc Exit  ↔  Select Menu   Enter Select ▶ Sub-Menu  F10 Previous Values
```

Supervisor Password Is:

This displays whether 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 Is:

This displays whether 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.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Fixed Disk Boot Sector

This setting may offer some protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. The other option is **Normal**.

Password on Boot

This setting allows you to require a password to be entered when the system boots up. The options are Enabled (password required) and **Disabled** (password not required).

7-6   Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or - will expand or collapse that entry. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

```
                        Phoenix BIOS Setup Utility

  Main         Advanced        Security        Boot        Exit

                                                   Item Specific Help
  +Removable Devices
  CD-ROM Drive
  +Hard Drive




  F1 Help      ↑↓  Select Item    -/+  Change Values    F9 Setup Defaults
  Esc Exit     ↔  Select Menu    Enter Select ▶Sub-Menu  F10 Save and Exit
```

+Removable Devices

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of devices in the Item Specific Help window.
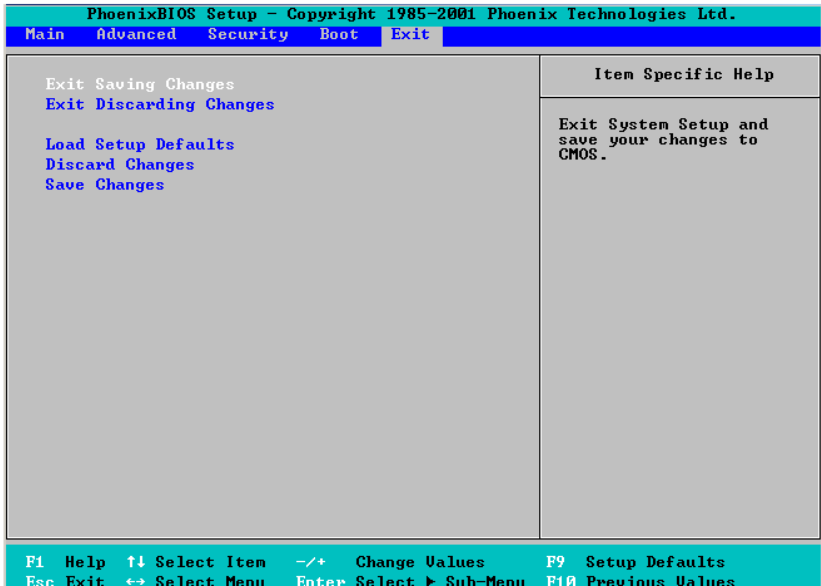
CD-ROM Drive

See details on how to change the order and specs of the CD-ROM drive in the Item Specific Help window.

+Hard Drive

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of hard drives in the Item Specific Help window.

7-7   Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.

```
     PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
  Main    Advanced    Security    Boot    Exit

                                                  Item Specific Help
     Exit Saving Changes
     Exit Discarding Changes                  Exit System Setup and
                                              save your changes to
     Load Setup Defaults                      CMOS.
     Discard Changes
     Save Changes




  F1   Help   ↑↓ Select Item   -/+   Change Values    F9   Setup Defaults
  Esc  Exit   ↔  Select Menu   Enter Select ▶ Sub-Menu F10  Previous Values
```

Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

Appendix A

BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Failure Fixed Disk
Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

Stuck key
Stuck key on keyboard.

Keyboard error
Keyboard not working.

Keyboard Controller Failed
Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch
Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP
Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn
Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

System RAM Failed at offset: nnnn
System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

Extended RAM Failed at offset: nnnn Extended memory not working or not configured properly at offset **nnnn.**

System battery is dead - Replace and run SETUP
The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used

System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error

The timer test failed. Requires repair of system board.

Real time clock error

Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings

BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used

Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS

Memory size found by POST differed from CMOS.

Diskette drive A error
Diskette drive B error

Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP

Type of floppy drive A: not correctly identified in Setup.

Incorrect Drive B type - run SETUP

Type of floppy drive B: not correctly identified in Setup.

System cache error - Cache disabled
RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:
CPU socket number for Multi-Processor error.

EISA CMOS not writeable
ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed
ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

Software NMI Failed
ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed
ServerBIOS2 test error: Fail-Safe Timer takes too long.

device Address Conflict
Address conflict for specified **device.**

Allocation Error for: device
Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive
CD ROM Drive identified.

Entering SETUP ...
Starting Setup program

Failing Bits: nnnn
The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n
Fixed disk **n** (0-3) identified.

Invalid System Configuration Data
Problem with NVRAM (CMOS) data.

I/O device IRQ conflict
I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:
PS/2 Mouse installed.

nnnn kB Extended RAM Passed
Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed
Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed
Where **nnnn** is the amount of shadow RAM in kilobytes successfully
tested.

nnnn kB System RAM Passed
Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

**One or more I2O Block Storage Devices were excluded from the Setup
Boot Menu**
There was not enough room in the IPL table to display all installed I2O block-
storage devices.

Operating system not found
Operating system cannot be located on either drive A: or drive C:. Enter Setup
and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn
Parity error found in the system bus. BIOS attempts to locate the address and
display it on the screen. If it cannot locate the address, it displays **????.** Parity is
a method for checking errors in binary data. A parity error indicates that some
data has been corrupted.

Parity Check 2 nnnn

Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.**

Press <F1> to resume, <F2> to Setup, <F3> for previous

Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup

Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:

PS/2 mouse identified.

Run the I2O Configuration Utility

One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed

System BIOS copied to shadow RAM.

UMB upper limit segment address: *nnnn*

Displays the address *nnnn* of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed

Video BIOS successfully copied to shadow RAM.

Notes

Appendix B

BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the PhoenixBIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

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

> 1 long and two short beeps - video configuration error
> 1 continuous long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen.
The following is a list of codes that may be written to port 80h.

POST Code	Description
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line *xxxx**
2Eh	1-3-4-3 RAM failure on data bits *xxxx** of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
47h	Initialize I20 support
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt "Press F2 to enter SETUP"
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs. One long, two short beeps on checksum failure

POST Code	Description
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase F2 prompt
AAh	Scan for F2 key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST.
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS
B9h	Prepare Boot
BAh	Initialize SMBIOS
BBh	Initialize PnP Option ROMs
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error handler
C5h	PnPnd dual CMOS (optional)
C6h	Initialize note dock (optional)
C7h	Initialize note dock late
C8h	Force check (optional)
C9h	Extended checksum (optional)
CAh	Redirect Int 15h to enable remote keyboard
CBh	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk
CCh	Redirect Int 10h to enable remote serial video

POST Code	Description
CDh	Re-map I/O and memory for PCMCIA
CEh	Initialize digitizer and display message
D2h	Unknown interrupt

The following are for boot block in Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

* If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (*xxxx*) indicating the address line or bits that failed. For example, "2C 0002" means address line 1 (bit one set) has failed. "2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

Notes

Appendix C

Software Installation

After all the hardware has been installed, you must first configure the Adaptec Embedded Serial ATA RAID Driver before you install the Windows operating system. The necessary drivers are all included on the Supermicro bootable CDs that came packaged with your motherboard. (For Adaptec's SCSI Host RAID Utility, please refer to the CDs that came with your motherboard.)

C-1   Adaptec Embedded SATA RAID Controller Driver

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. SATA is a serial link which supports transfer rates from 150 MBps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while SATA cables can extend up to one meter. Overall, SATA provides better functionality than PATA.

Configuring BIOS settings for the SATA RAID Functions

1. Press the **Del** key during system bootup to enter the BIOS Setup Utility.

Note: If it is the first time to power on the system, we recommend that you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Menu. Once in the "Exit" Menu, scroll down the menu to select the item "Load Optimized Default Settings" and press the **Enter** key. Select **OK** to confirm the selection. Press the **Enter** key to load the default settings to the BIOS.

3. Use the arrow keys to select the "Main" Menu in BIOS.

4. Scroll down to the item "SATA RAID Enable", select **Enabled** and press **Enter**.

5. Tap the **Esc** key and scroll down to "Exit". Select "Save and Exit" from the "Exit" menu. Press the **Enter** key to save the changes and exit the BIOS.

6. Once you've exited the BIOS Utility, the system will re-boot.

7. During system startup, press the **Ctrl** and the **A** keys simultaneously to run the Adaptec RAID Configuration Utility when prompted by the message: "Press <Ctrl><A> for Adaptec RAID Configuration Utility".

Adaptec Embedded SATA with HostRAID Controller Driver

Adaptec's Embedded Serial ATA RAID with HostRAID controller adds RAID functionality to the Serial ATA I/O controller by supporting RAID 0 (Striping) or RAID 1 (Mirroring) to enhance the industry's pioneer PCI-to-e host controller products. RAID striping (RAID 0) can greatly improve hard disk I/O performance because of its capability in striping data across multiple drives. RAID mirroring (RAID 1) allows the data to be simultaneously written to two drives, so critical data is always available even if one hard disk fails.

Due to this built-in functionality, your Supermicro motherboard is specially designed to keep pace with the increasing performance demands of today's computer systems by improving disk I/O throughput and providing data accessibility regardless of a single disk failure. By incorporating Adaptec Embedded Serial ATA into the motherboard design, Supermicro offers the user the benefits of SATA RAID without the high costs associated with RAID hardware.

Note: For Adaptec's RAID Driver Installation Instructions, please refer to the Adaptec RAID Controller User's Guide: "Emb_SA_RAID_UG.pdf", which is located in the CD that came with this motherboard. You can also download a copy of Adaptec's User's Guide from our website at www.supermicro.com.

Using the Adaptec RAID Configuration Utility (ARC)

The Adaptec RAID Configuration Utility is an embedded BIOS Utility, including:

*Array Configuration Utility: Use this utility when you want to create, configure and manage arrays.

*Disk Utilities: Use this option to format or verify disks.

To run the Adaptec RAID Configuration Utility, you will need to enable the RAID function in the system BIOS (refer to Chapter 7 for System BIOS Configurations), and then press the **Ctrl** and **A** keys simultaneously when prompted to do so during the system startup. (Refer to the previous page for detailed instructions.)

Note: To select an option, use the arrow keys to highlight the item and then press the **Enter** key to select it. To return to the previous menu, press the **ESC** key.

Using the Array Configuration Utility (ACU)

The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, add and delete spare drives, and initialize drives. During the system startup, press the **Ctrl** and **A** keys simultaneously, and the main menu will appear.
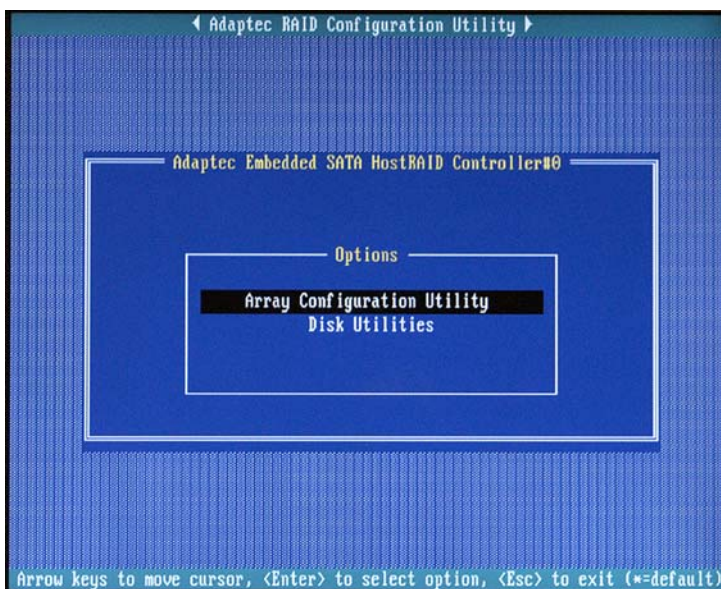
Managing Arrays

Select this option to view array properties and delete arrays. The following sections describe the operations Of "Managing Arrays".

To select this option, use the arrow keys and the **Enter** key to select **Managing Arrays** from the main menu (as shown below).
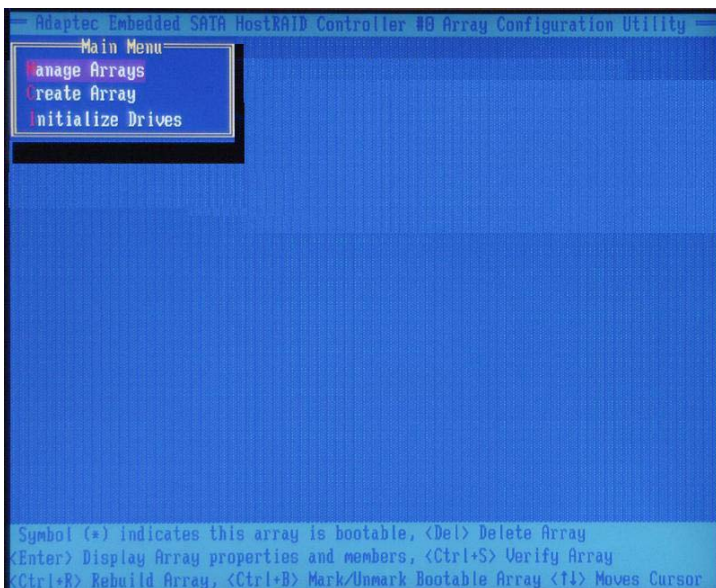
Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press **Ctrl+A**.

2. From the ARC menu, select **Array Configuration Utility (ACU)**.

3. From the ACU menu, select **Manage Arrays** (as shown on the previous screen.)

4. From the List of Arrays dialog box, select the array you want to view and press **Enter**.

The Array Properties dialog box appears, showing detailed

information on the array. The physical disks associated with the array are displayed here.

5. Press **Esc** to return to the previous menu.

Deleting Arrays

Warning: Back up the data on an array before you delete it to prevent the loss of data. Deleted arrays cannot be restored.

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC main menu, select **Array Configuration Utility (ACU)**.

3. From the ACU menu, select **Manage Arrays**.

4. Select the array you wish to delete and press **Delete**.

5. In the Array Properties dialog box, select **Delete** and press **Enter**. The following prompt is displayed:

   Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):

   RAID 1 only - the following prompt is also displayed:

   Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):

6. Press **Yes** to delete the array or partition or **No** to return to the previous menu.

7. Press **Esc** to return to the previous menu.

Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are un-initialized are shown in gray and cannot be used. See *Initializing Disk Drives*.

To create an array

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC menu, select **Array Configuration Utility Main Menu (ACU)** (as shown on the first screen on page B-4).

3. From the ACU menu select **Create Array**.

4. Select the disks for the new array and press **Insert** (as shown on the the screen below).

Note: To deselect any disk, highlight the disk and press **Delete**.
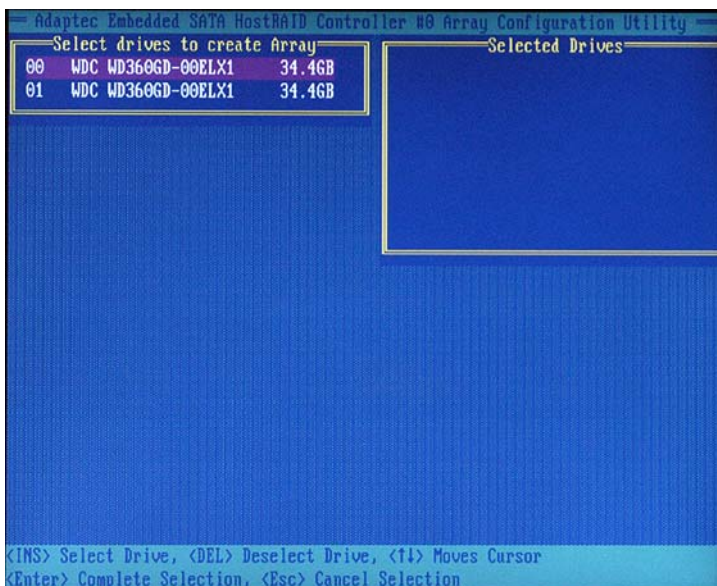
5. Press **Enter** when both disks for the new array are selected. The Array Properties menu displays (as the shown on the screen on the next page).
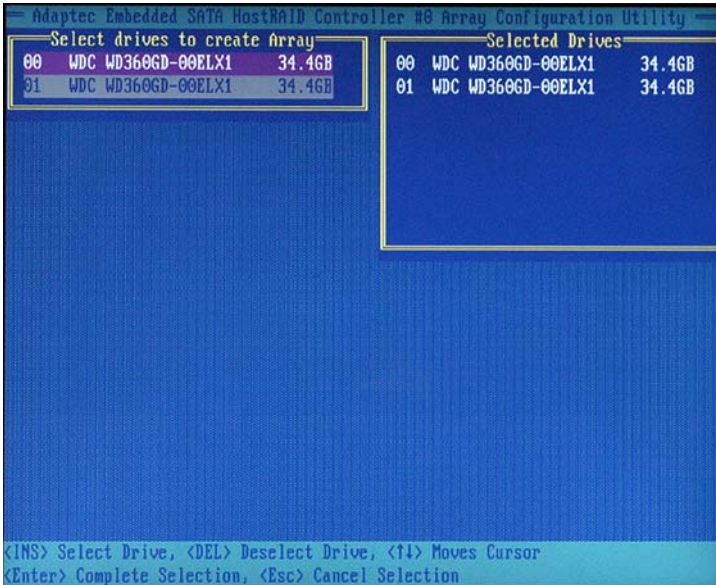
Assigning Array Properties

Once you've create a new array, you are ready to assign properties to the array.

Caution: Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. You will need to use the Adaptec Storage Manager - Browser Edition. (Refer to Adaptec's User's Guide in the enclosed CD.)

To assign properties to the new array

1. In the Array Properties menu (as shown on the following screen), select an array type and press **Enter**.

Note that only the available array types (RAID 0 and RAID 1) are displayed on the screen. (Using RAID 0 or RAID 1 requires two drives.)

2. Under the item "**Arrays Label**", type in a label and press **Enter**. The label cannot be more than 15 characters.

3. For RAID 0, select the desired stripe size. (Available stripe sizes are 16, 32, and 64 KB - default. It is recommended that you *do not* change the default setting.)

```
═ Adaptec Embedded SATA HostRAID Controller #0 Array Configuration Utility ═

                        ═Array Properties═
      Array Type        :    RAID 0(Stripe)
                             RAID 1(Mirror)
      Array Label       :

      Array Size        :    68.938 GB

      Stripe Size       :    64KB

      Create RAID via   :

                             [Done]




<↑↓> Moves Cursor, <Esc> Cancel Selection, <Enter> Accept Selection,<F1> Help
```
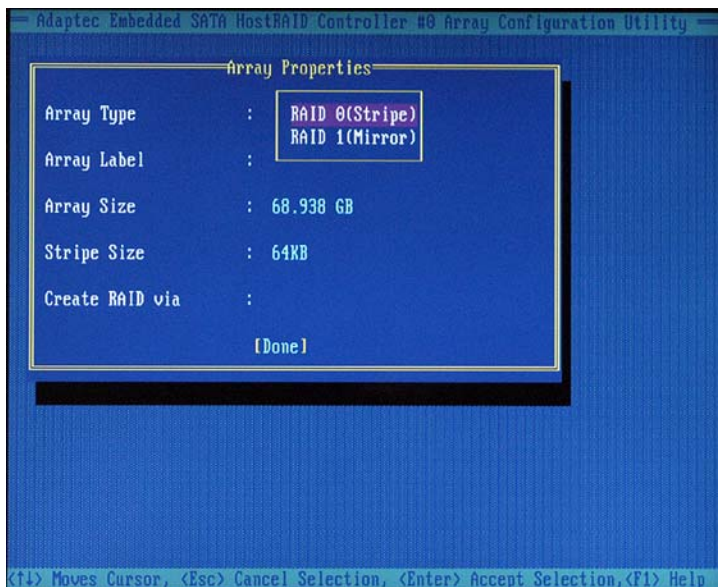
4. The item **"Create RAID via"** allows you to select between the differ-
ent methods of creating RAID 0 and RAID 1.

The following table gives examples of when each is appropriate.

Raid Level	Create Via	When Appropriate
RAID 0	No Init	Creating a RAID 0 on new drives
RAID 0	Migrate (*Note)	Creating a RAID 0 from one new drive and one drive with data you wish to preserve
RAID 1	Build1	Any time you wish to create a RAID 1, but especially if you have data on one drive that you wish to preserve
RAID 1	Clear	Creating a RAID 1 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1	Quick	Fastest way to create a RAID 1. Appropriate when using new drives
RAID 1	Init	

5. When finished, press **Done** (as shown on the following screen).

Note: If you select Migrate for RAID 0, or Build for RAID 1, you will be
asked to select the source drive. The contents of the source drive will be
preserved. However, the data on the new drive will be lost.
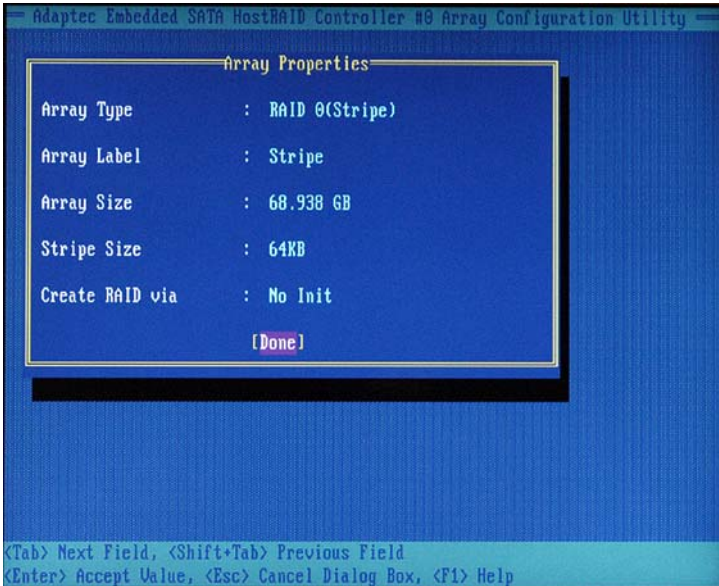
Notes

1. Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

2. If you stop the build or clear process on a RAID 1 from ACU, you can restart it by pressing **Ctrl+R**.

3. A RAID 1 created using the Quick Init option may return some data mis-compares if you later run a consistency check. This is normal and is not a cause for concern.

4. The ACU allows you to use drives of different sizes in a RAID. However, during a build operation, only the smaller drive can be selected as the source or first drive.

5. When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

6. Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

Warning: Do not interrupt the creation of RAID 0 using the Migrate option. If you do, you will not be able to restart or to recover the data that was on the source drive.

Adding a Bootable Array

1. From the Main menu, select **Manage Arrays.**

2. From the list of arrays, select the array you want to make bootable and press **Ctrl+B.**

3. Enter **Y** to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):"   A bootable array will then be created.   An asterisk will appear next to the bootable array.
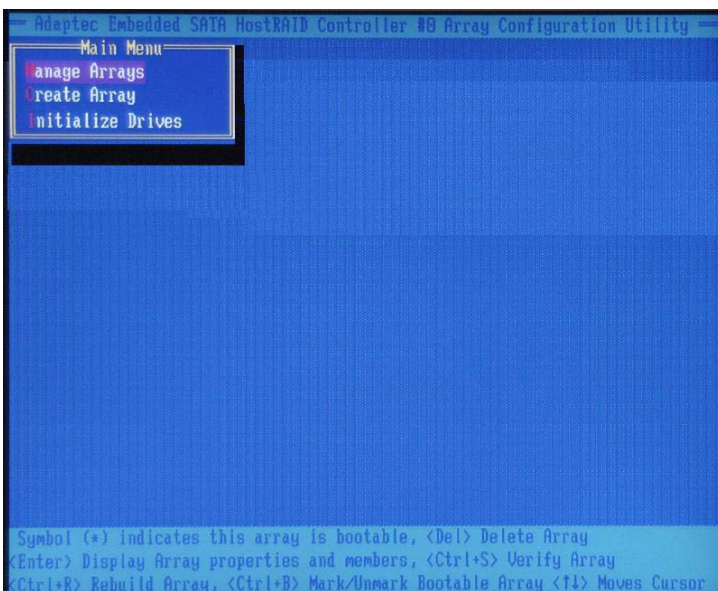
Deleting a Bootable Array

To delete a bootable array

1. From the Main menu, select **Manage Arrays.**

2. From the List of Arrays, select the bootable array (*) you want to delete and press **Ctrl+B**.   (A bootable array is an array marked with an asterisk.)

3. Enter **Y** to delete a bootable array when the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No):" The bootable array will then be deleted and the asterisk will disappear.

Note: do not use the delete key to delete a bootable array.

Adding/Deleting Hotspares

Note: In order to rebuild a RAID (RAID 0 or RAID 1), you need to add a new HDD as a hotspare.

1. Turn on your computer and press **Ctrl+A** as prompted to access the ARC Utility.

2. From the ARC menu, select **Array Configuration Utility** (ACU).

3. From the ACU menu, select **Add/Delete Hotspares**.

4. Use the up and down arrow keys to highlight and select the disk you want to designate as a hotspare, and press **Insert**, then press **Enter**.

5. Select **Yes** when the following prompt is displayed:

"Do you want to create spare?" (Yes/No?)

The spare you have selected will appear in the Select Drive Menu.

Initializing Disk Drives

If an installed disk does not appear in the disk selection list for creating a new array or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

Caution: Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again.

Do not initialize a disk that is part of a boot array. To determine which disks are associated with a particular array, please refer to *Viewing Array Properties.*

To initialize drives:

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC menu, select **Array Configuration Utility (ACU)** (as shown on the screen below).
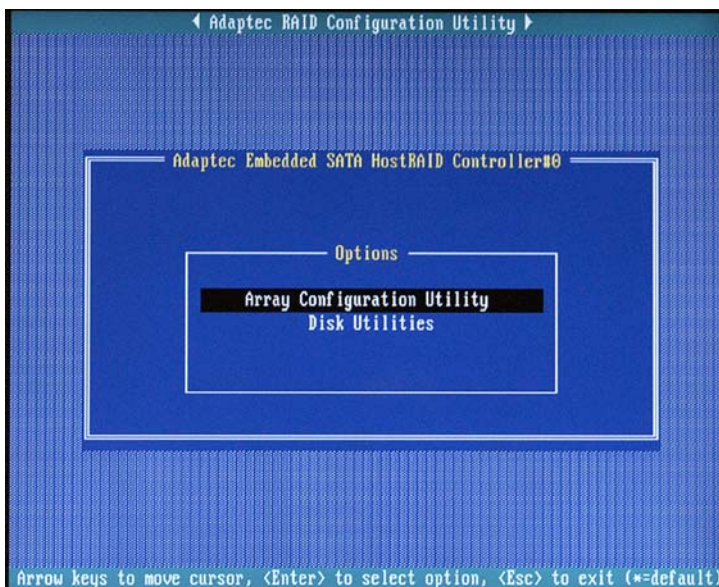
3. Select **Initialize Drives**.

4. Use the up and down arrow keys to highlight the disk you wish to initialize and press **Insert** (as shown on the following screen).
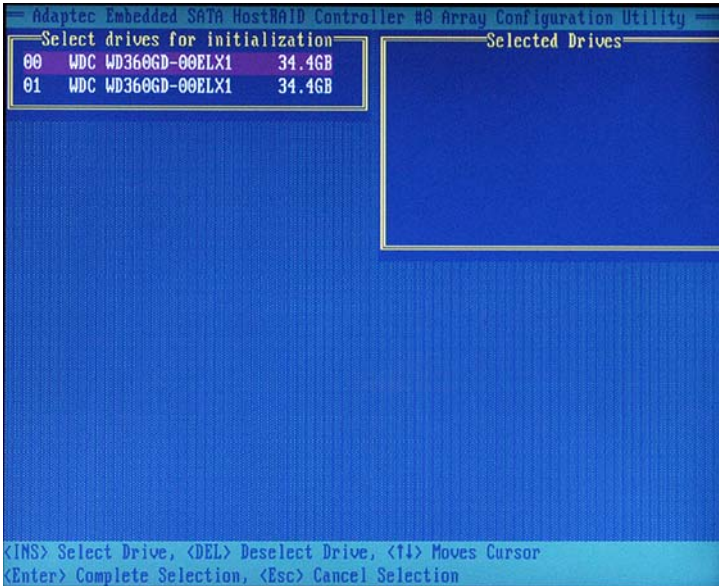
5. Repeat Step 4 so that both drives to be initialized are selected (as shown on the following screen).
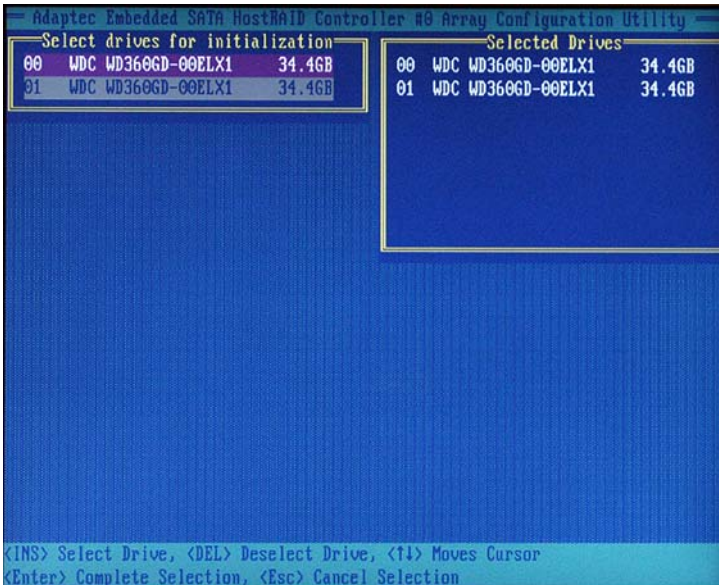
6. Press **Enter**.

7. Read the warning message as shown on the screen below.
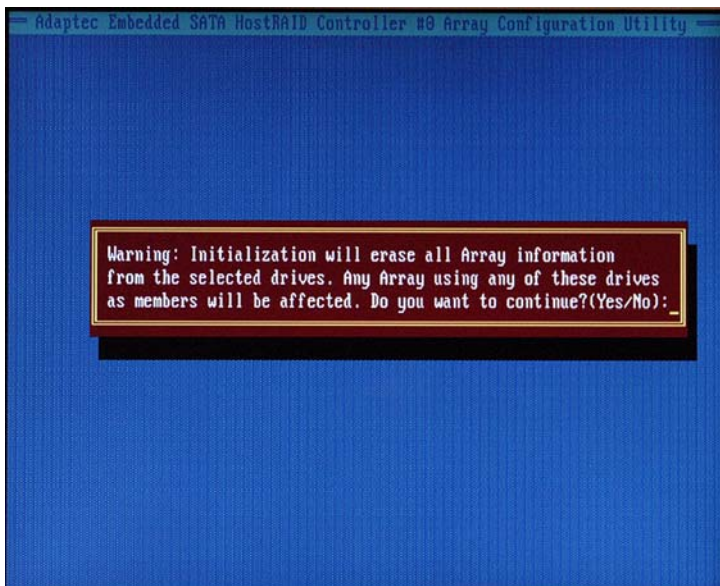
8. Make sure that you have selected the correct disk drives to initialize. If correct, type **Y** to continue.

Rebuilding Arrays

Note 1: Rebuilding applies to Fault Tolerant arrays (RAID 1) only.

If an array build process (or initialization) is interrupted or critical with one member missing, you must perform a rebuild to optimized its functionality. For a critical array rebuild operation, the optimal drive is the source drive.

Note 2: If no spare array exists and a hard disk drive fails, you need to create a spare before you can rebuild an array.

To Rebuild an array:

1. From the Main Menu, select **Manage Arrays**. From the list of arrays, select the array you want to rebuild.

2. Press **Ctrl+R** to rebuild.

Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC menu, select **Disk Utilities**.

3. Select the desired disk and press **Enter** (as shown below.)
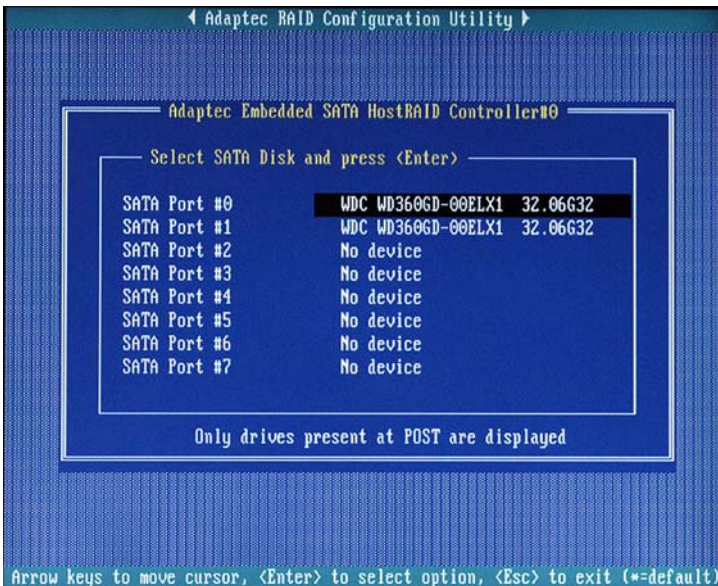
**You can choose from the following options**

1. Format Disk - Simulates a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

Caution: Formatting destroys all data on the drive. Be sure to back up your data before performing this operation.

2. Verify Disk Media - Scans the media of a disk drive for defects.

To Exit Adaptec RAID Configuration Utility

1. Once you have completed RAID array configurations, press **ESC** to exit. The following screen will appear.
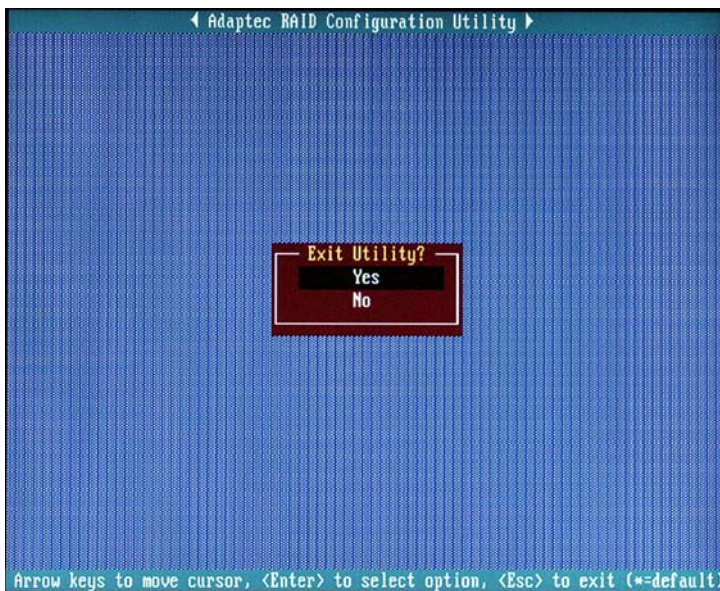
2. Press **Yes** to exit the Utility.

For more information regarding the Adaptec RAID Utility, please refer to Adaptec's User's Guide in the CD included in your shipping package. You can also download a copy of Adaptec User's Guide from our web site at: www. supermicro.com.

C-2   Installing Intel's ICH5R Driver by Adaptec and Windows OS

1. Insert Supermicro's bootable CD that came with the package into the CD Drive during the system reboot. The "Super Micro Driver Diskette Maker" screen will appear.

2. Choose "Intel ICH5R Driver by 3rd Party (Adaptec)" from the items listed and press **Enter**.

3. From the next screen displayed, choose the OS driver you want to install and press **Enter**.

4. Insert a formatted diskette into drive A: and press **Enter** as prompted.

5. Exit the program after the process is completed. Then, reboot the system.

6. Insert Microsoft Windows OS Setup CD in the CD Driver. The system will boot up from the CD.

7. Press the **F6** key when the message "Press F6 if you need to install a third party SCSI or RAID driver" is displayed.

8. When the Windows OS Setup screen appears, press **S** to specify additional device(s).

9. Insert the driver diskette labelled "Adaptec Embedded Serial ATA Raid Controller Driver" into your floppy drive and press the **Enter** key.

10. Choose **Adaptec Embedded Host Serial ATA Raid Controller** from the list indicated in the Windows OS Setup Screen and press the **Enter** key.

11. Press the **Enter** key to continue the installation process. (If you need to specify any additional devices to be installed, do so at this time.) Once all devices are specified, press the **Enter** key to continue with the installation.

12. From the Windows OS Setup screen, press the **Enter** key. The OS setup routine will automatically load all device files and continue the Windows OS installation.

13. After the Windows OS installation has completed, the system will automatically reboot.

C-3 Installing Other Software Programs and Drivers

Installing Other Drivers

After you've installed the Windows Operating System, a screen (as shown in Figure C-1) will appear. You are now ready to install additional software programs and drivers. To install these software programs and drivers, click the icons to the right of these items.

Figure C-1. Driver/Tool Installation Display Screen
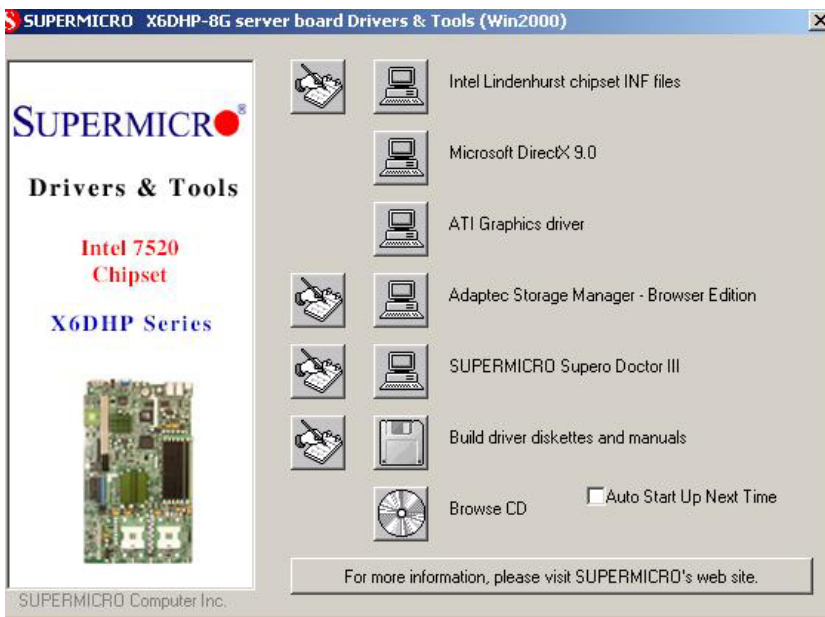
Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility, Intel LDCM and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Note: Please refer to the Adaptec User's Guide (included in the CD) for installing the Adaptec SATA RAID Controller Driver. You can also download a copy of the guide from our website.

Supero Doctor III

The Supero Doctor III program is a web-based management tool that offers both remote and local management tools. The local management application is called SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard 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 Figures C-2 and C-3 for examples of the Supero Doctor III interface.
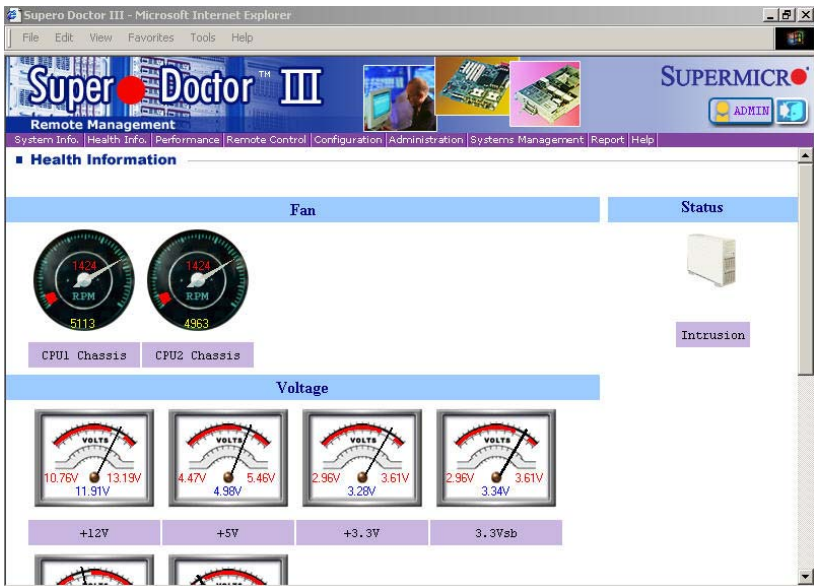
Figure C-2. Supero Doctor III: Health Information Display

Figure C-3. Supero Doctor III: Remote Control Display

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 the SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we recommend using Supero Doctor II.

Appendix D

System Specifications

Processors
Single or dual Intel® Xeon™ 604-pin processors at a front side (system) bus speed of 800 MHz

Note: Please refer to the support section of our web site for a complete listing of supported processors. (http://www.supermicro.com/support/)

Chipset
Intel E7520 chipset

BIOS
4 Mb Phoenix® Flash ROM

Memory Capacity
6014H-82 (X6DHR-8G2): Eight 240-pin DIMM sockets supporting up to 16 GB of low-profile, registered ECC DDR2-400 SDRAM

6014H-8/6014H-X8 (X6DHR-8G/X6DHR-X8G): Eight 184-pin DIMM sockets supporting up to 16 GB of low-profile, registered ECC DDR333 SDRAM or 32GB of low-profile, registered ECC DDR266 SDRAM

SCSI Controller
Adaptec AIC-7902 for dual channnel, Ultra320 onboard SCSI
Zero Channel RAID supported

SCSI Backplane
One (1) SCA813S 1U SCSI backplane with SAF-TE compliance

SCSI Drive Bays
Four (4) drive bays to house four (4) standard 1" 80-pin SCA SCSI drives

Peripheral Drive Bays
One (1) slim floppy drive
One (1) slim CD-ROM drive
Four (4) 3.5 x 1" drive carriers (for SCSI drives)

Expansion Slots (see section 5-6)
6014H-82 (X6DHR-8G2): two PCI-X cards of 133 or 100 MHz with standard riser cards or two x8 PCI-Express cards with optional riser cards

6014H-8 (X6DHR-8G): two 133 MHz PCI-X cards with standard riser cards or one x8 PCI-Express and one x4 PCI-Express card with optional riser cards

6014H-X8 (X6DHR-X8G): two PCI-X 133 MHz cards
Note: the 6014H-X8 does not support PCI-Express cards, only PCI-X riser cards may be used with this system.

Motherboard (6014H-8/6014H-82/6014H-X8)
Model: X6DHR-8G/X6DHR-8G2/X6DHR-X8G (Extended ATX form factor)
Dimensions: 12 x 13 in (305 x 330 mm)

Chassis
Model: SC813S-500 Form Factor: 1U rackmount
Dimensions: (WxHxD) 17.2 x 1.7 x 25.6 in. (437 x 44 x 650 mm)

Weight
Net (Bare Bone): 38 lbs. (17.3 kg.)

System Cooling
Two (2) 10-cm blower fans (fan speed controlled by BIOS setting, see page 7-17)

System Input Requirements
AC Input Voltage: 100-240V AC auto-range
Rated Input Current: 10A (115V) to 5A (230V)
Rated Input Frequency: 50 to 60 Hz

Power Supply
Rated Output Power: 500W PFC (Model# SP502-1S, Part# PWS-0048)
Rated Output Voltages: +3.3V (21A), +5V (30A), +12V$_{ALL}$ (39A), +5Vsb (2.0A)

BTU Rating
2750 BTUs/hr (for rated output power of 500W)

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

Regulatory Compliance
Electromagnetic Emissions:
FCC Class B, EN 55022 Class B, EN 61000-3-2 & EN 61000-3-3, CISPR 22 Class B

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), CE Marking (Europe)

Notes

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