SUPER●®

SUPERSERVER 8026B-6RF
SUPERSERVER 8026B-TRF
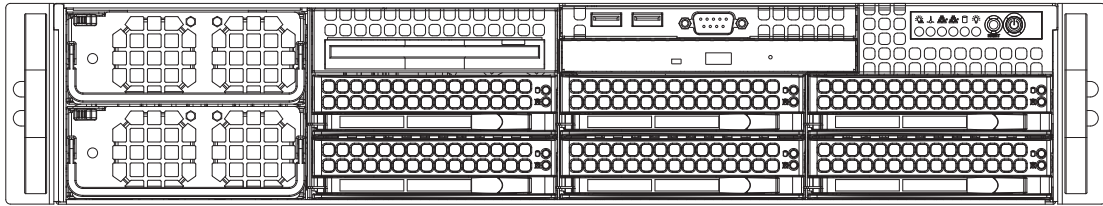
USER'S MANUAL

Revision 1.0

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 8025C-3R. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 8026B-6RF/8026B-TRF is a high-end quad processor server based on the SC828TQ-R1400LP 2U rackmount server chassis and the Super X8QB6-F/X8QBE-F serverboard. The X8QB6-F/X8QBE-F supports four Intel® Xeon processors. Please refer to our web site for an up-to-date list of supported processors.

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 X8QB6-F/X8QBE-F serverboard and the SC828TQ-R1400LP chassis.

Chapter 2: Server Installation

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

Chapter 3: System Interface

Refer to this chapter 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 8026B-6RF/8026B-TRF.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X8QB6-F/X8QBE-F 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 SC828TQ-R1400LP 2U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SAS or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS POST Codes

Appendix B: System Specifications

Notes

Table of Contents

Chapter 6 Advanced Chassis Setup

Chapter 7 BIOS

Appendix A POST Codes

Appendix B System Specifications

Chapter 1

Introduction

1-1   Overview

The SuperServer 8026B-6RF/8026B-TRF is a high-end server that is comprised of two main subsystems: the SC828TQ-R1400LP 2U server chassis and the X8QB6-F/ X8QBE-F quad processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the 8026B-6RF/8026B-TRF (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the 8026B-6RF/8026B-TRF, as listed below:

- Three 8-cm hot-swap chassis fans (FAN-0118L4)

- Four passive heatsinks (SNK-P0045P)

- One air shroud (MCP-310-82804-0B)

- One slim DVD-ROM drive (DVM-PNSC-824B)

- One rail set (CSE-PT55L)

- SAS/SATA Accessories
  One SAS backplane (BPN-SAS-828TQ)
  Six hot-swap hard drive carriers (MCP-220-00001-01)

- One SuperServer 8026B-6RF/8026B-TRF User's Manual

1-2   Serverboard Features

At the heart of the SuperServer 8026B-6RF/8026B-TRF lies the X8QB6-F/X8QBE-F, a quad processor serverboard based on the Intel 7500 + ICH10R chipset. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X8QB6-F/X8QBE-F supports four Intel Xeon 7500 Series processors in 1567-pin LGA sockets. Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X8QB6-F/X8QBE-F can support up to 512 GB of registered ECC DDR3-1333/1066/978/800 memory. (DDR-1333 memory will run at 1066 MHz.) Modules of the same size and speed should be used. See Chapter 5 Section 5 for details.

Serial Attached SCSI (X8QB6-F)

An onboard LSI 2108 Serial Attached SCSI (SAS) controller is integrated into the X8QB6-F (only), which supports eight 6 Gbps SAS hard drives. The SAS drives are connected to a backplane that provides power, bus termination and configuration settings and are hot-swappable units. **Note:** The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the SAS drives. RAID 0, 1, 5, 6, 10, 50 and 60 are supported.

Serial ATA

A SATA controller is integrated into the South Bridge (ICH10R) section of the chipset to provide a six-port 3 Gbps SATA subsystem, which is RAID 0, 1, 10 and 5 supported (RAID 5 supported by Windows only). The Serial ATA drives are hot-swappable units.

PCI Expansion Slots

The X8QB6-F/X8QBE-F can support one of the following configurations. Note that only low-profile cards are supported.

- two PCI-E 2.0 x16 slots

- one PCI-E 2.0 x16 and two PCI-E 2.0 x8 slots

- four PCI-E 2.0 x8 slots

I/O Ports

The I/O ports include one COM port (an additional COM header is located on the serverboard), a VGA (monitor) port, two USB 2.0 ports, two Gb Ethernet ports and a dedicated IPMI LAN port.

IPMI

IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for Supermicro server platforms. IPMI allows server administrators to view a server's hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive. Please refer to our web page on the X8QB6-F/X8QBE-F for more details.

Other Features

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

1-3 Server Chassis Features

The following is a general outline of the main features of the SC828TQ-R1400LP server chassis.

System Power

The SC828TQ-R1400LP features a redundant (two separate power modules) 1400W high-efficiency power supply with I^2C. This power redundancy feature allows you to replace a failed power supply without shutting down the system.

SAS Subsystem

The SC828TQ-R1400LP chassis was designed to support six hot-swappable SAS or SATA hard drives.

Front Control Panel

The control panel on the 8026B-6RF/8026B-TRF provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity, system overheat and power supply failure. A main power button and a system reset button are also included. In addition, two USB ports and a COM port have been incorporated into the front of the chassis for convenient access.

Cooling System

The SC828TQ-R1400LP chassis chassis has an innovative cooling design that includes six 4-cm counter-rotating fans located in the middle section of the chassis. The power supply module also includes a cooling fan. All chassis and power supply fans operate continuously. An air shroud channels the airflow from the system fans to efficiently cool the processors and memory.

**Figure 1-1. Intel 7500 Chipset:
System Block Diagram**

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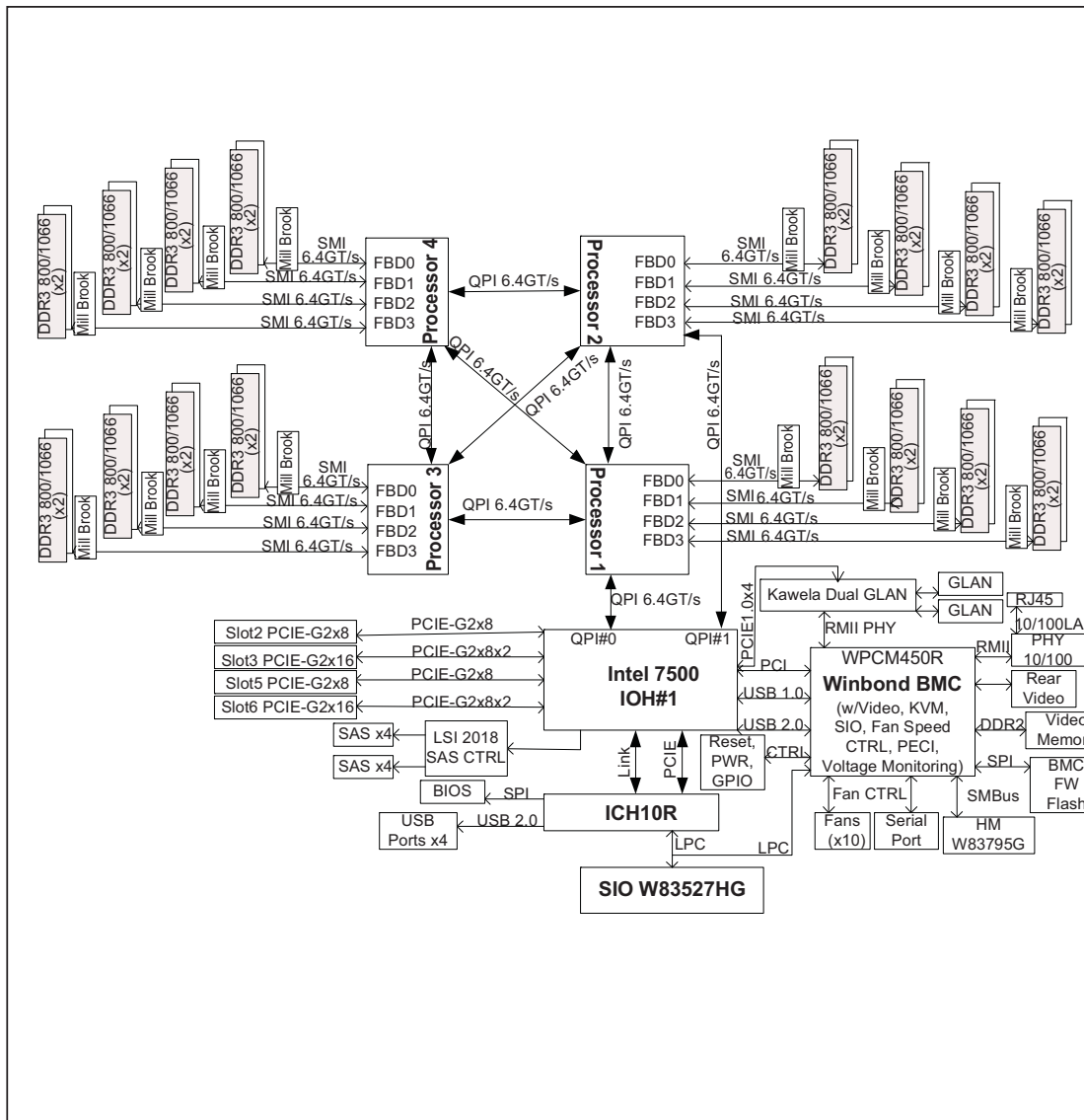
1-4   Contacting Supermicro

Headquarters

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

Europe

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

Asia-Pacific

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

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your 8026B-6RF/8026B-TRF up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the 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 8026B-6RF/8026B-TRF 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 8026B-6RF/8026B-TRF. 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 8026B-6RF/8026B-TRF was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

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

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

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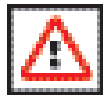
Warnings and Precautions!
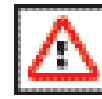
Rack Precautions

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

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

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

- You should extend only one component at a time - extending two or more 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 SAS/SATA drives and power supply modules to cool before touching them.

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

Rack Mounting Considerations

Ambient Operating Temperature

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

Reduced Airflow

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

Mechanical Loading

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

Circuit Overloading

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

Reliable Ground

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

2-4   Installing the System into a Rack

This section provides information on installing the 8026B-6RF/8026B-TRF into a rack unit with the rack rails provided. If the system 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 in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself. Two pairs of short brackets to be used on the front side of the outer rails are also included.

Installing the Inner Rails

Both the left and right side inner rails have been pre-attached to the chassis. Proceed to the next step.

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.

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 2-1.

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 2-1. Installing the Server into a Rack
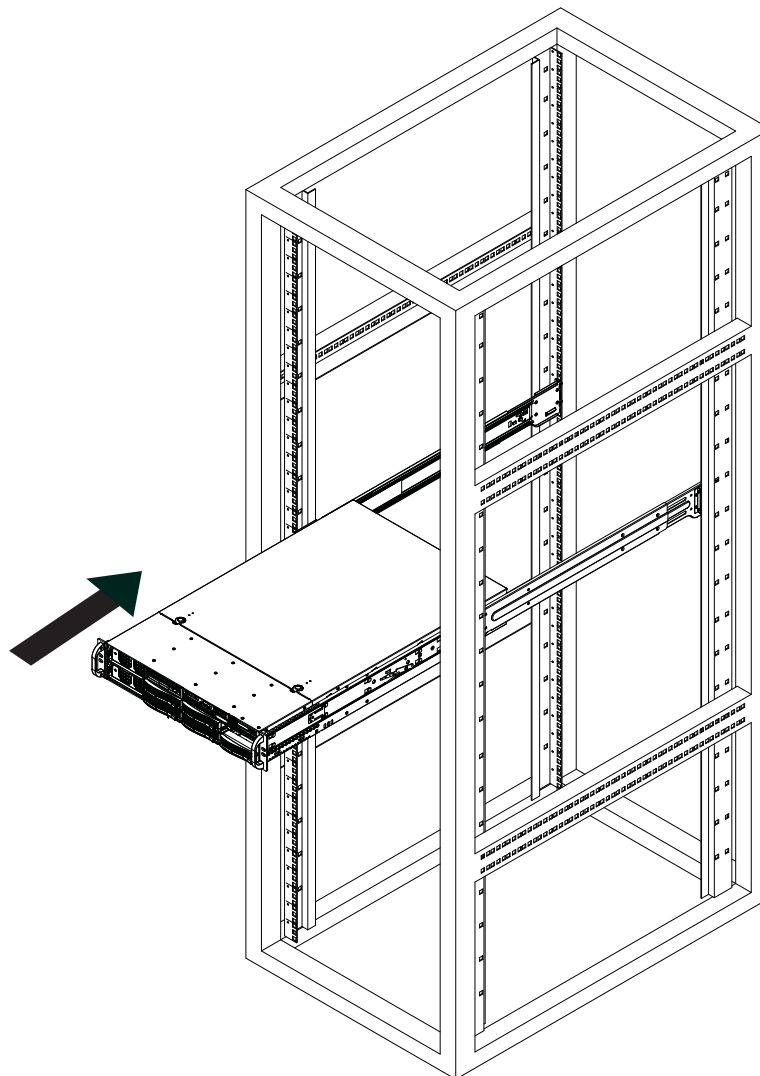
2-5   Checking the Serverboard Setup

After you install the 8026B-6RF/8026B-TRF in the rack, you will need to open the top cover to make sure the serverboard is properly installed and all the connections have been made.

Accessing the Inside of the System

1. First, release the retention screws that secure the system to the rack.

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

3. Next, release the thumbscrew at the middle rear of the top cover. Then de-press the two buttons on the top of the chassis to release the top cover.

4. Push the cover away from you (toward the rear of the chassis) until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

5. 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.

Checking the Components and Setup

1. You may up to four processors already installed in the serverboard. Each processor needs its own heatsink. See Chapter 5 for instructions on proces-sor and heatsink installation.

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

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

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

2-6   Preparing to Power On

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

Checking the Drives

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

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

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

Checking the Airflow

1. Airflow is provided by six sets of 4-cm fans (each set of fans consists of two fans that are mounted back to back) and an air shroud. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

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

Providing Power

1. Plug the power cords from the power supplies unit into a high-quality power strip that offers protection from electrical noise and power surges.

2. It is recommended that you use an uninterruptible power supply (UPS).

3. Finally, depress the power on button on the front of the chassis.

Notes

Chapter 3

System Interface

3-1 Overview

There are several LEDs on the control panel as well as others on the SAS drive carriers to keep you constantly 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 and an on/off switch on the power supply. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis: a reset button and a power on/off button.

RESET
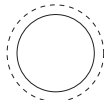
Reset

Use the reset button to reboot the system.
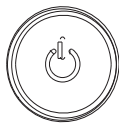
Power

The main power button is used to apply or remove power from the power supply to the server system. 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 SC828TQ-R1400LP 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.

Power Fail

Indicates a power supply module has failed. The second power supply module will take the load and keep the system running but the failed module will need to be replaced. Refer to Chapter 6 for details on replacing the power supply. This LED should be off when the system is operating normally

Overheat/Fan Fail

When this LED flashes it indicates a fan failure. When on continuously (on and not flashing) 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 overheat condition exists.

NIC2

Indicates network activity on LAN2 when flashing.

NIC1

Indicates network activity on LAN1 when flashing.

HDD

Indicates IDE channel activity. On the 8026B-6RF/8026B-TRF this light indicates SAS and/or DVD-ROM 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   Drive Carrier LEDs

Each drive carrier has two LEDs:

SAS Drives

- **Green:** When illuminated, the green LED on the drive carrier indicates the drive is powered on. If this LED is not lit, it means no power is being provided for the drive. Please refer to Chapter 6 for instructions on replacing failed drives.

- **Red:** A solid red LED indicates a drive failure. If one of the drives fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed drives. If this LED flashes ~ once per second (1 Hz) it indicates RAID rebuilding activity.

SATA Drives

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

- **Red:** The red LED to indicate a drive failure. If one of the drives fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed 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 8026B-6RF/8026B-TRF 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 floppy drive. When disconnecting power, you should first power down the system with the operating system first 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 static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

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

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

- 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.

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

4-2   General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SuperServer 8026B-6RF/8026B-TRF clean and free of clutter.

- The SuperServer 8026B-6RF/8026B-TRF weighs approximately 65.5 lbs. (29.8 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

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

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

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

- After accessing the inside of the system, close the system back up and secure it to the rack unit 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 <u>before</u> contact is made to protect your equipment from ESD:

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

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

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

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

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

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

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

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

4-4   Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 8026B-6RF/8026B-TRF is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery

LITHIUM BATTERY

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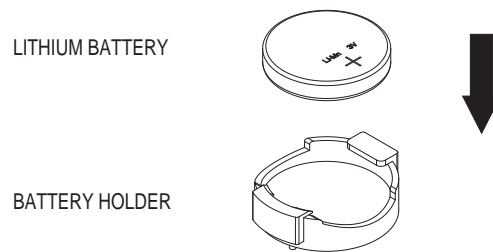
Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency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

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the X8QB6-F/X8QBE-F serverboard into the chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. <u>Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.</u>

5-1   Handling the Serverboard

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

Precautions

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

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

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

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

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

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

Unpacking

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

5-2   Serverboard Installation

This section explains the first step of physically mounting the X8QB6-F/X8QBE-F into the SC828TQ-R1400LP chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the serverboard, follow the procedure in reverse order.

Installing to the Chassis

1. Access the inside of the system by removing the screws from the back lip of the top cover of the chassis, then pull the cover off.

2. The X8QB6-F/X8QBE-F requires a chassis big enough to support a 16" x 16.79" serverboard, such as Supermicro's SC828TQ-R1400LP.

3. Make sure that the I/O ports on the serverboard align properly with their respective holes in the I/O shield at the back of the chassis.

4. Carefully mount the serverboard to the serverboard tray by aligning the board holes with the raised metal standoffs that are visible in the chassis.

5. Insert screws into all the mounting holes on your serverboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the serverboard ground to provide a continuous ground for the system.

6. Finish by replacing the top cover of the chassis.

5-3   Connecting Cables

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

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure of the pin 1 locations before connecting wires). The following data cables (with their locations noted) should be connected. (See the layout on page 5-11 for connector locations.)

- SAS drive data cables (SAS0 ~ SAS5, 8026B-6RF)

- SATA drive cables (I-SATA0~5, 8026B-TRF)

- Control Panel cable (JF1)

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

Connecting Power Cables

The X8QB6-F/X8QBE-F has a 24-pin primary power supply connector (JPW3) for connection to the ATX power supply. In addition, there are three 8-pin secondary power connectors (JPW1, JPW2, JPW4) that also must be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

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

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Section 5-9 for details and pin descriptions.

Figure 5-1. Control Panel Header Pins

	20	19	
Ground	○	○	NMI
X	○	○	X
FP PWRLED	○	○	3.3 V
HDD LED	○	○	ID_UID_SW/3/3V Stby
NIC1 Link LED	○	○	NIC1 Activity LED
NIC2 Link LED	○	○	NIC2 Activity LED
Blue+ (OH/Fan Fail/ PWR FaiL/UID LED)	○	○	Red+ (Blue LED Cathode)
Power Fail LED	○	○	3.3V
Ground	○	○	Reset — Reset Button
Ground	○	○	PWR — Power Button
	2	1	
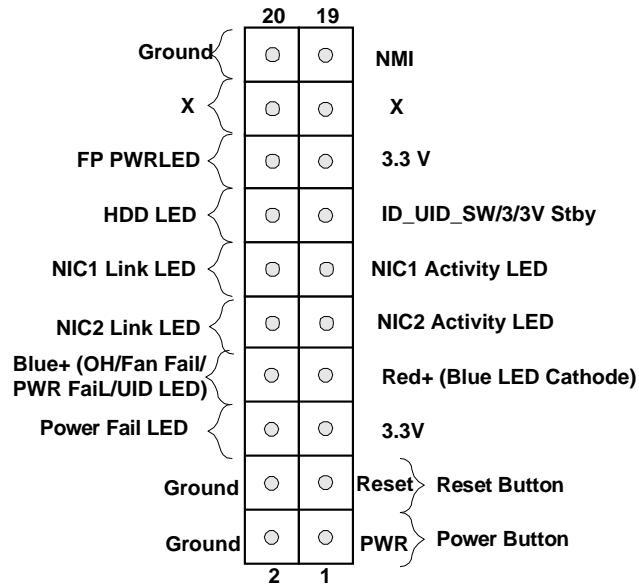
5-4 I/O Ports

The system provides the I/O ports shown below at the rear of the chassis. There are two additional USB ports located on the front of the chassis.

Figure 5-2. I/O Ports
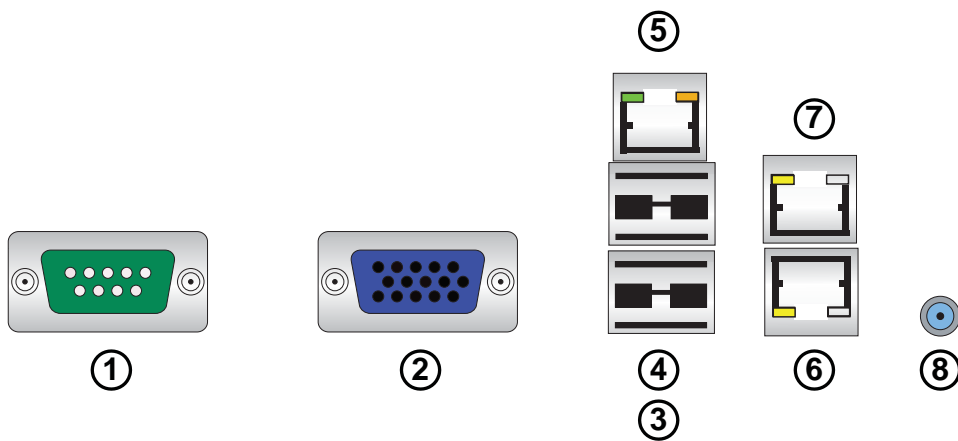
Rear I/O Ports	
1. COM1 Port	5. IPMI Dedicated LAN
2. VGA Port 1	6. LAN1 Port
3. USB0 Port	7. LAN2 Port
4. USB1 Port	8. UID Switch

5-5   Installing the Processor and Heatsink

! Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

Notes: Always connect the power cord last and remove it before adding, removing or changing any components. Make sure to install the processor into the CPU socket before you install the CPU heat sink. You will also need to first remove the air shroud (see Chapter 6). Be sure to replace the air shroud in its proper position after installing the processors and heat sinks.

Intel's boxed Xeon CPU package contains the CPU fan and heatsink assembly. If you buy the CPUs separately, use only Intel-certified heatsinks and fans.

Inspect the CPU socket and make sure that the CPU plastic cap is in place and none of the socket pins are bent. Otherwise, contact the retailer immediately.

For proper system setup, please follow the procedure below:

1. Press the socket clip to release the load plate, which covers the CPU socket, from its locking position.

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

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

4. Align the CPU key, which is a semi-circle cutout, with the socket key, which is the notch below the gold dot on the side of the socket.

CPU Key
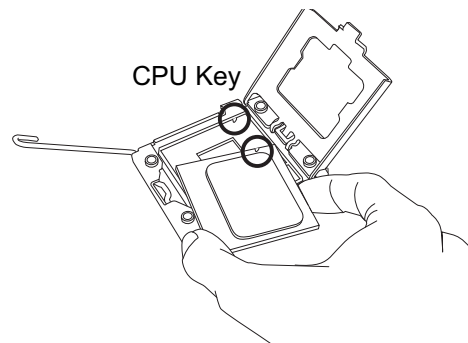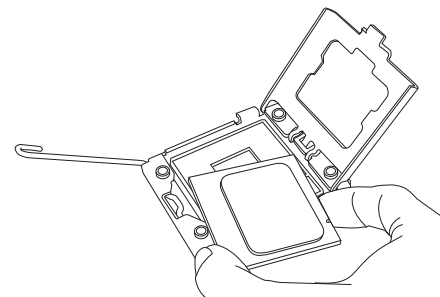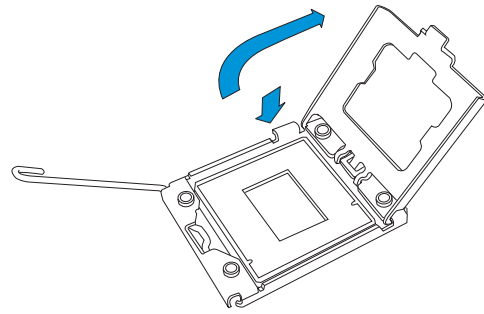
5. Align pin 1 on the CPU with pin 1 on the CPU socket.

6. Once both the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. (To avoid damaging the CPU or the socket, do not rub the CPU against the surface of the socket or its pins.)

CPU Pin 1

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

8. Once the CPU is securely seated on the socket, lower the CPU load plate to the socket.

9. Use your thumb to gently push the socket clip down to the clip lock.

10. Repeat to install any addiitonal processors.

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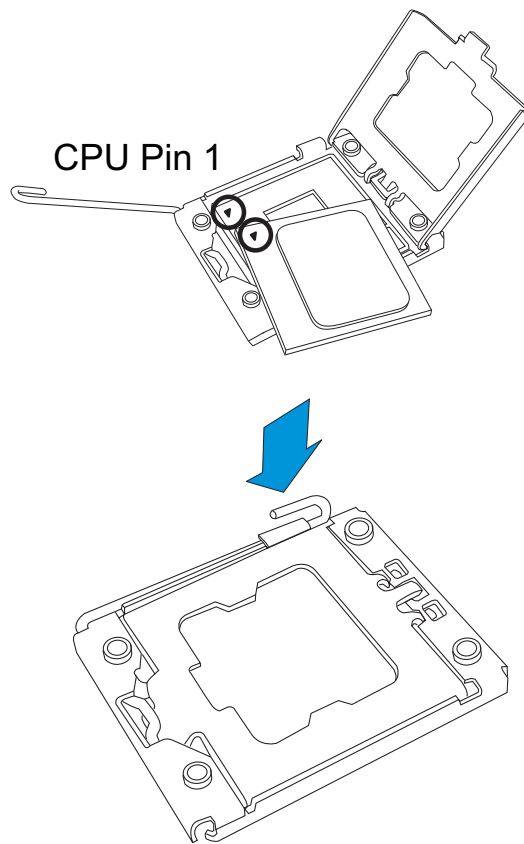
Warning: Please save the plastic cap. The serverboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed will cause damage to the socket pins.

Installing a Passive CPU Heatsink

1. Apply the proper amount of thermal grease (with thickness of up to 0.13 mm) to the heatsink.

2. Place the heatsink on top of the CPU so that the two retention screws on the heatsink are aligned with the standoff on the socket's backplate.

3. Secure the retention screws on each side with gentle and equal force. Gradually work one side then the other; do not secure one side down all the way first.
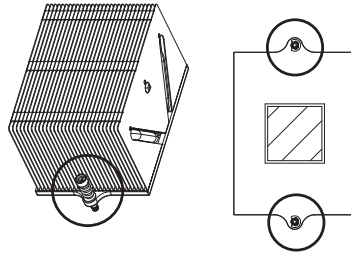
Warning: We do not recommend removing the CPU or the heat sink. However, if you do need to uninstall the heat sink, please follow these instructions to avoid damaging the CPU or the CPU socket.

Removing the Passive Heatsink

1. Power off the system and unplug the power cord from the power supply.

2. Release the heat sink screw gently and equally on both sides. Do not completely release one side before the loosening the other.

3. Hold the heatsink as shown in the picture below and gently wriggle the heatsink to loosen it from the CPU (do not use excessive force).

4. Once the heatsink is loose, remove the heatsink from the motherboard.
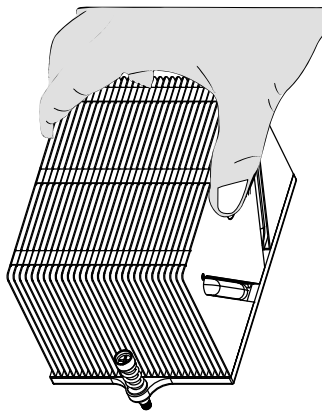
5. To reinstall the CPU and the heatsink, clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease to the CPU surface before reinstalling the heatsink on the motherboard.

5-6   Installing Memory

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

Memory Support

The X8QB6-F/X8QBE-F can support up to 512 GB of registered ECC DDR3-1333/1066/800 memory. (DDR-1333 memory will run at 1066 MHz.) Memory modules of the same size and speed should be used within the same bank. You will need to first power off the system and remove the air shroud (see Chapter 6). Be sure to replace the air shroud in its proper position after installing memory.

Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMM #1A. To enhance memory performance, install pairs of memory modules of the same type and speed, beginning with DIMM #1A and DIMM #2A, then DIMM #1B and DIMM #2B (see configuration table below).

2. Position the key on the bottom of the DIMM so that it aligns with the receptive point on the slot.

3. Use both thumbs together to press the notches on both ends of the module straight down into the slot until the module snaps into place.

4. Press the release tabs to the lock positions to secure the DIMM module into the slot.
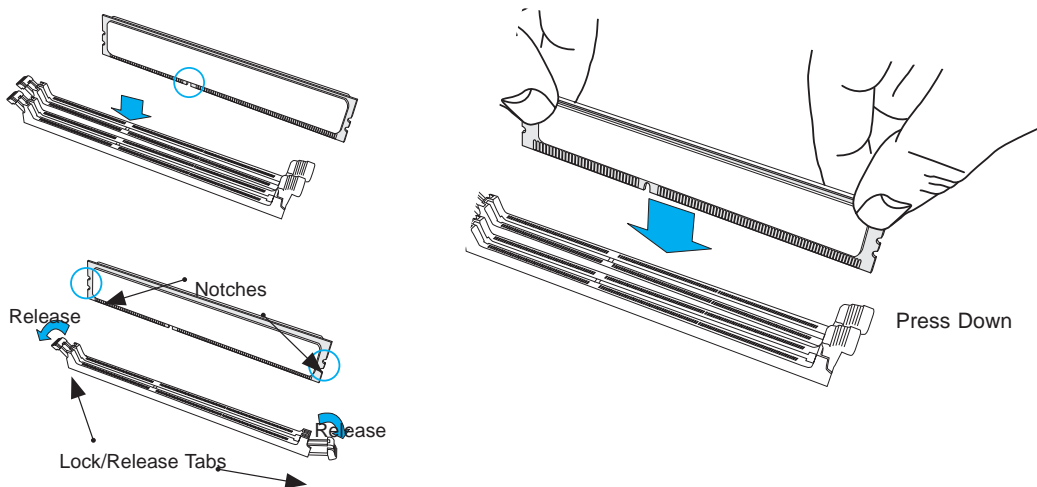
Configuring Memory

Follow the tables below for correct memory configuration.

Processors and their Corresponding Memory Modules								
CPU#	Corresponding DIMM Slots							
CPU 1	P1-1A	P1-2A	P1-3A	P1-4A	P1-5A	P1-6A	P1-7A	P1-8A
CPU2	P2-1A	P2-2A	P2-3A	P2-4A	P2-5A	P2-6A	P2-7A	P2-8A
CPU3	P3-1A	P3-2A	P3-3A	P3-4A	P3-5A	P3-6A	P3-7A	P3-8A
CPU4	P4-1A	P4-2A	P4-3A	P4-4A	P4-5A	P4-6A	P4-7A	P4-8A

Processor and Memory Module Population	
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table (For memory to work properly, please install DIMMs in pairs)
1 CPU & 2 DIMMs	CPU1 P1-1A/P1-3A
1 CPU & 4 DIMMs	CPU1 P1-1A/P1-3A, P1-5A/P1-7A
1 CPU & 5~8 DIMMs	CPU1 P1-1A/P1-3A, P1-5A/P1-7A + Any memory pairs in P1-2A/-4A/-6A/-8A DIMM slots
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-1A/P1-3A, P2-1A/P2-3A
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A/P2-5A/P2-7A
2 CPUs & 10~16 DIMMs	CPU1/CPU2 P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A/P2-5A/P2-7A + Any memory pairs in P1, P2 DIMM slots
3 CPUs & 6 DIMMs	CPU1/CPU2 + CPU3 or CPU4 P1-1A/P1-3A, P2-1A/P2-3A + P3-1A/P3-3A (if CPU 3 is installed) P1-1A/P1-3A, P2-1A/P2-3A + P4-1A/P4-3A (if CPU 4 is installed)
3 CPUs & 8 DIMMs	CPU1/CPU2 + CPU3 or CPU4 P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A + P3-1A/P3-3A (if CPU 3 is installed) P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A + P4-1A/P4-3A (if CPU 4 is installed)
3 CPUs & 10 DIMMs	CPU1/CPU2 + CPU3 or CPU4 P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A/P2-5A/P2-7A + P3-1A/P3-3A (if CPU 3 is installed) P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A/P2-5A/P2-7A + P4-1A/P4-3A (if CPU 4 is installed)
4 CPUs & 12 DIMMs	CPU1/CPU2 + CPU3 or CPU4 P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A/P2-5A/P2-7A + P3-1A/P3-3A/ P3-5A/P3-7A (if CPU 3 is installed) P1-1A/P1-3A/P1-5A/P1-7A, P2-1A/P2-3A/P2-5A/P2-7A + P4-1A/P4-3A/ P4-5A/P43-7A (if CPU 4 is installed)

5-7 Installing PCI Add-On Cards

The 8026B-6RF/8026B-TRF can accommodate low-profile (only) add-on cards installed into all the PCI slots included on the X8QB6-F/X8QBE-F.

You will need to first power off the system before installing add-on cards.

Installing an Add-on Card

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

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

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

5-8   Serverboard Details

Figure 5-5. X8QB6-F/X8QBE-F Layout
(not drawn to scale)
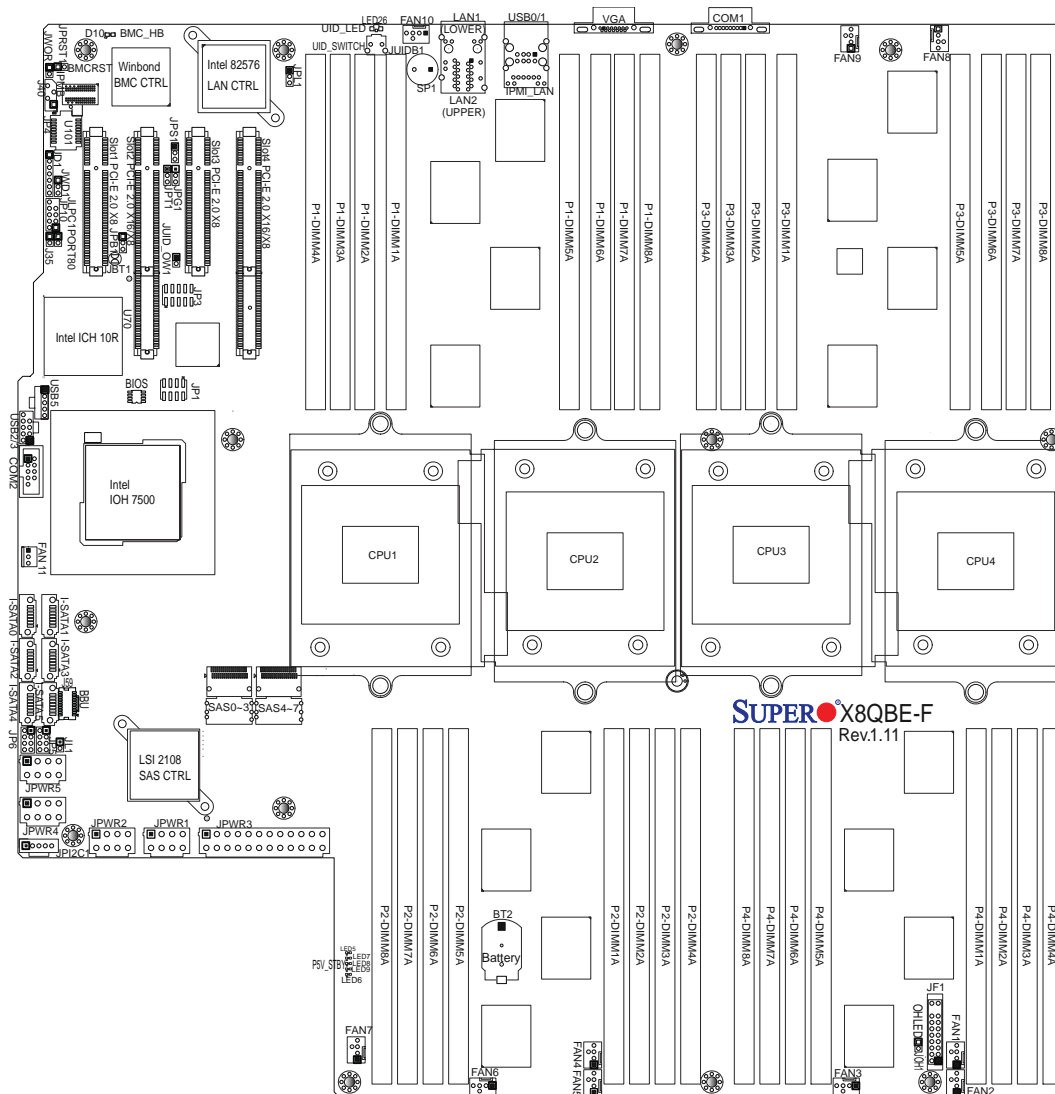
X8QB6-F/X8QBE-F Quick Reference

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Section 5-9
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1	LAN1/LAN2 Enable	Pins 1-2 (Enabled)
JPS1 (X8QB6-F only)	SAS2 Enable	Pins 1-2 (Enabled)
JPT1	TPM Enable	Pins 1-2 (Enabled)
JWD1	Watch Dog	Pins 1-2 (Reset)

Connector	Description
COM1	COM1 Serial Connection
FAN 1~10	Fan Headers
IPMB	4-pin External BMC I^{2}C Header (for an IPMI Card)
I-SATA 0~5	Intel SB SATA Connectors 0~5
BBU	Connector for LSI SAS Battery Backup Unit (X8QB6-F only)
JD1	Speaker/Power LED Indicator
JF1	Front Panel Control Header
JL1	Chassis Intrusion Header
JLPC1	TPM/Port 80 Header
JOH1	Overheat/Fan Fail LED Header
JPI^{2}C	Power Supply SMBbus I^{2}C Header
JPW1~2, JPW4~5	12V 8-Pin Power Connectors
JPW3	ATX 24-Pin Power Connector
JUID_OW1	UID Override Header
LAN1/LAN2	Gb Ethernet Ports 1/2
(IPMI) LAN	IPMI_Dedicated LAN
SAS 0~3, 4~7	Serial Attached SCSI Connectors 0~3, 4~7
TPM/Port 80	Trusted Platform Module/Port 80 Header
T-SGPIO 1/2	Serial_Link General Purpose I/O Headers
USB 0/1/2/3/5	Back Panel (USB 0/1) and Front Access (USB2/3, 5)
UID Switch	Universal Identifier Switch

LED	Description
D10	BMC Heartbeat LED
LED8	Standby PWR LED
LED26	UID LED

5-9   Connector Definitions

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

Main ATX Power Supply Connector

The primary power supply connector (JPW3) meets the SSI EPS 12V specification. Refer to the table on the right for the pin definitions of the ATX 24-pin power connector. You must also connect the 8-pin (JPW1/ JPW2/JPW4/JPW5) processor power connectors to your power supply (see below).

Processor Power Connector

The power supply must be connected to any three of the JPW1, JPW2 and JPW4 and JPW5 power headers. See the table on the right for pin definitions.

+12V 8-pin Power Pin Definitions	
Pins	Definition
1 - 4	Ground
5 - 8	+12V

Required Connection

PW_ON Connector

The PW_ON connector is on pins 1 and 2 of JF1. This header should be connected to the chassis power button. See the table on the right for pin definitions.

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

Reset Connector

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

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

Power Fail LED

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

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	3.3V
6	PWR Supply Fail

Overheat (OH)/Fan Fail/PWR Fail/ UID LED

Connect an LED cable to pins 7 and 8 of JF1 to use the Overheat/Fan Fail/ Power Fail and UID LED connections. The red LED on pin 7 provides warnings of overheat, fan failure or power failure. Refer to the table on the right for pin definitions.

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

OH/Fan Fail LED Status (Red LED)	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

NIC2 (JLAN2) LED

The LED connections for JLAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)	
Pin#	Definition
9	Vcc
10	Ground

NIC1 (JLAN1) LED

The LED connections for JLAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

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

HDD LED

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

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

Power On LED

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

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

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#	Definition
19	Control
20	Ground

Fan Headers

There are 10 fan headers on the serverboard, all of which are 4-pin fans (pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans). See the table on the right for pin definitions. The onboard fan speeds are controlled by Thermal Management (via Hardware Monitoring) under the Advanced Section in the BIOS (with 4-pin fans only). The default is Full Speed.

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

Chassis Intrusion

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

Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground

TPM Header/Port 80

A Trusted Platform Module/Port 80 header is located at LPCI to provide TPM support and Port 80 connection performance and security enhancement. See the table on the right for pin definitions.

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

Overheat LED/Fan Fail

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

Overheat LED Pin Definitions	
Pin#	Definition
1	Vcc
2	OH/Fan Fail LED

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

T-SGPIO 1/2 Headers

Two SGPIO (Serial-Link General Purpose Input/Output) headers are included to support Serial_Link interfaces for onboard SATA connections. See the table on the right for pin definitions.

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

No Connection

Gb Ethernet Ports

Two gigabit Ethernet ports (LAN1 and LAN2) are located on the I/O backplane. A dedicated IPMI LAN is also included above the two USB ports. These ports accept RJ45 type cables.

Serial Ports

A serial port is included on the serverboard backpanel. See the table on the right for pin definitions.

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

Universal Serial Bus (USB)

Two Universal Serial Bus ports (USB 0/1) are located on the I/O backpanel. Additional onboard USB headers (USB 2/3, USB5) can provide front chassis access. See the tables on the right for pin definitions.

USB0/1 Pin Definitions	
Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	NA

USB2/3, USB5 Pin Definitions			
USB2 Pin #	Definition	USB3/5 Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	NC	5	Key

(NC= No connection)

Internal Speaker

The Internal Speaker (SP1) provides audible indications for various beep codes. See the table on the right for pin definitions.

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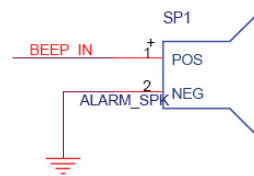
Power LED/Speaker

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

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

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

Unit Identifier Switch

A Unit Identifier (UID) switch LED Indi-
cators are included on the serverboard.
The UID switch is located next to the
LAN ports on the backplane. The UID
LED (LED26) is located next to the
UID switch. When you press the UID
switch, the UID LED indicators will turn
on. Press the UID switch again to turn
it off. These UID indicators provide
easy identification of a system unit that
may be in need of service.

Note: UID can also be triggered via
IPMI. For more information on IPMI,
please refer to the IPMI User's Guide
posted on our Website @http://www.
supermicro.com.

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

UID LED Status		
Color/State	OS	Status
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified

Power SMB (I²C) Connector

The Power System Management Bus
(I²C) connector (JPI²C) monitors power
supply, fan and system temperatures.
See the table on the right for pin
definitions.

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

IPMB

A System Management Bus header for
IPMI 2.0 is designated IPMB. Connect
the appropriate cable here to use the
IPMB I²C connection on your system.

IPMB Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

5-10 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 a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.
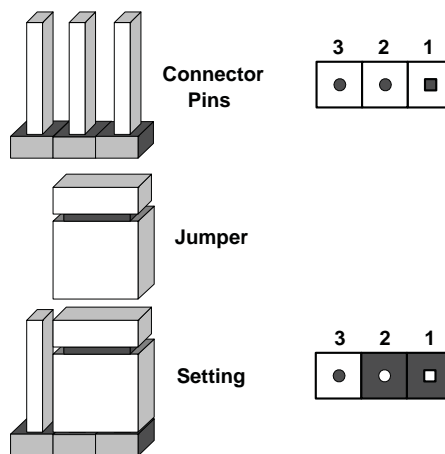
CMOS Clear

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

To clear CMOS,

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

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

3. Remove the screwdriver (or shorting device).

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

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

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the LAN1/LAN2 Ethernets port on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

VGA Enable/Disable

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

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

TPM Support Enable

JPT1 allows the user to enable TPM (Trusted Platform Modules) support to enhance data integrity and system security. See the table on the right for jumper settings. The default setting is enabled.

TPM Support Enable/Disbale Jumper Settings	
Jumper Setting	Definition
1-2	Enabled
2-3	Disabled

SAS2 Enable (X8QB6-F only)

Close pins 1-2 to enable SAS2 (Serial Attached SCSI) support for the X8QB6-F serverboard. See the table on the right for jumper settings. The default setting is enabled.

SAS2 Enable/Disable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (Default)
2-3	Disabled

Watch Dog Enable/Disable

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

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

5-11 Onboard Indicators

LAN1/2 LEDs

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

LAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	NC or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

IPMI Dedicated LAN LEDs

A dedicated IPMI LAN is also located on the I/O backplane of the serverboard. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table at right for more information.

IPMI LAN (F models only)

Link LED ——————— Activity LED
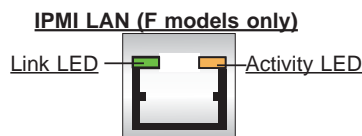
IPMI LAN Link LED (Left) & Activity LED (Right)		
	Color/State	Definition
Link (Left)	Green: Solid	100 Mb/s
Activity (Right)	Amber: Blinking	Active

Onboard Power LED

An Onboard Power LED is located at LED8 on the serverboard. When this LED is lit, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the table at right for more information.

Onboard PWR LED (LED8)	
LED Color	Definition
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 (STR) State

BMC Heartbeat LED

A BMC Heartbeat LED is located at D10 on the serverboard. When D10 is blinking, BMC functions normally. See the table at right for more information.

BMC Heartbeat LED Status	
Color/State	Definition
Green: Blinking	BMC: Normal

5-12 SAS and SATA Ports

SAS Ports

Eight SAS ports are supported on the serverboard. See the table on the right for pin definitions. Please note that SAS ports are included with the 8026B-6RF system only.

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

SATA Ports

There are no jumpers to configure the six onboard SATA ports. See the table on the right for pin definitions.

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

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform mainte-
nance on the SC828TQ-R1400LP 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 step that follows.

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

6-1   Static-Sensitive Devices

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

Precautions

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

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

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

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

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

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

Unpacking

When unpacking the system, make sure the person handling it is static protected.

Figure 6-1. Front and Rear Chassis Views

USB Ports, COM Port   DVD Drive (optional)   Control Panel

Power Supplies (2)   Slim Floppy Drive (optional)   SAS/SATA Drives (6)

USB Ports   Dedicated LAN Port   UID Button   7 Low-Profile PCI Slots

COM1 Port   VGA Port   Ethernet Ports
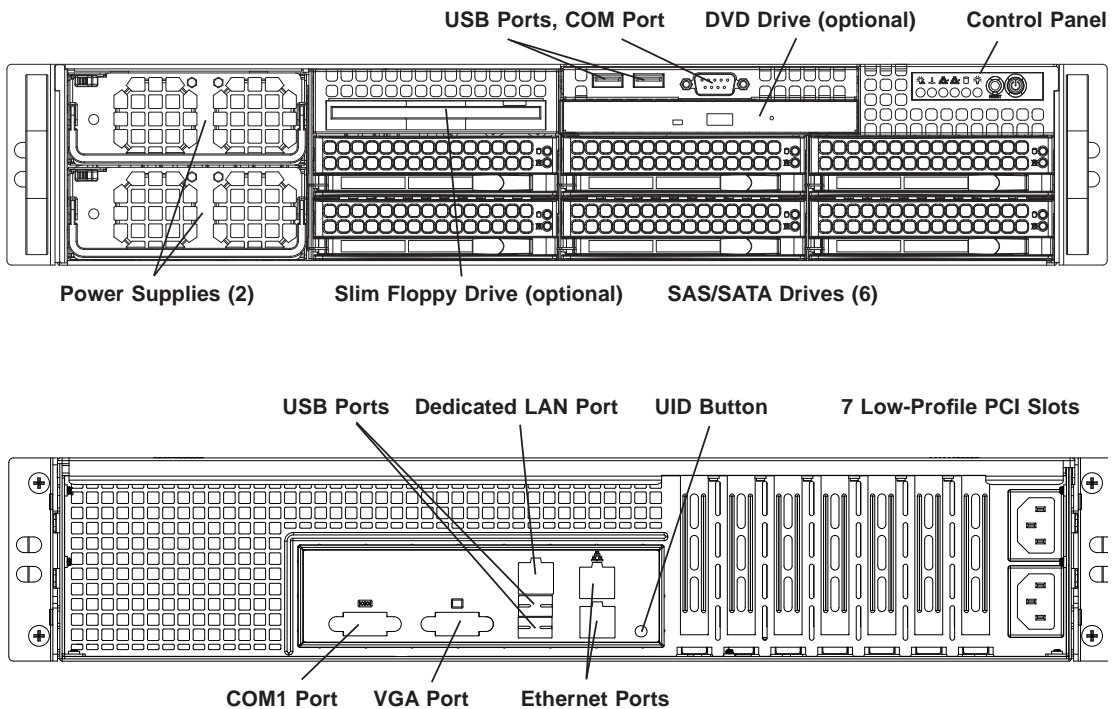
6-2   Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both JF1 and JP4. Pull all excess cabling out of the airflow path. The LEDs inform you of system status. See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

6-3   System Fans

Three 8-cm fans provide the cooling for the SuperServer 8026B-6RF/8026B-TRF. It is very important that the chassis top cover is properly installed in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the fans has failed.

Replacing System Fans

Removing a Fan

1. Remove the chassis cover (see page 6-7 for procedure).

2. Press the tabs on the sides of the fan to unlock and remove the fan and its housing.

3. The fan's power connections will automatically detach. System power does not need to be shut down since the fans are hot-pluggable.

Installing a New Fan

1. Replace the failed fan with an identical 8-cm, 12 volt fan (available from Supermicro, p/n FAN-0118L4).

2. Position the new fan into the space vacated by the failed fan previously re-moved. A "click" can be heard when the fan is fully installed in place and the power connections are made.

3. If the system power is on, the hot-plug feature will cause the fan to start im-mediately upon being connected to its header on the serverboard.

4. Replace the chassis cover.

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

<u>SAS/SATA Drives</u>: You do not need to access the inside of the chassis or remove power to replace or swap hard drives. Proceed to the next step for instructions. **Note:** You must use standard 1" high, hard drives in the SuperServer 8026B-6RF/8026B-TRF.

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

Hard Drive Installation

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

Mounting a Hard Drive in a Drive Carrier

1. Install a drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.

2. Secure the drive to the carrier with six screws, as shown in Figure 6-2.

The hard drive carriers are located in the front of the chassis, making them easily accessible for installation and removal. These drives are hot-swappable, meaning that they can be installed and removed while the system is running.

Installing/Removing Hard Drives

1. To remove a hard drive, first push the release button located beside the drive's LEDs

2. Swing the handle fully out and use it to pull the drive carrier straight out (see Figure 6-3).

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

Figure 6-2. Mounting a Hard Drive in a Carrier
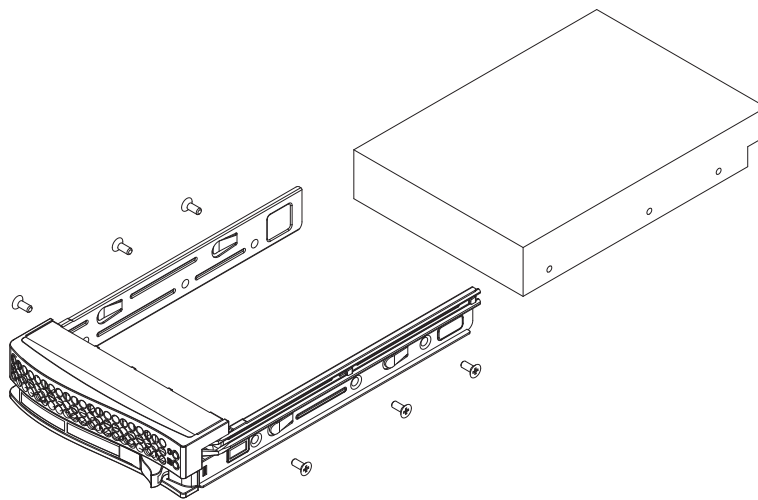
⚠ ! Use caution when working around the hard drive backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

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

Figure 6-3. Removing a Drive Carrier

Handle

Release button
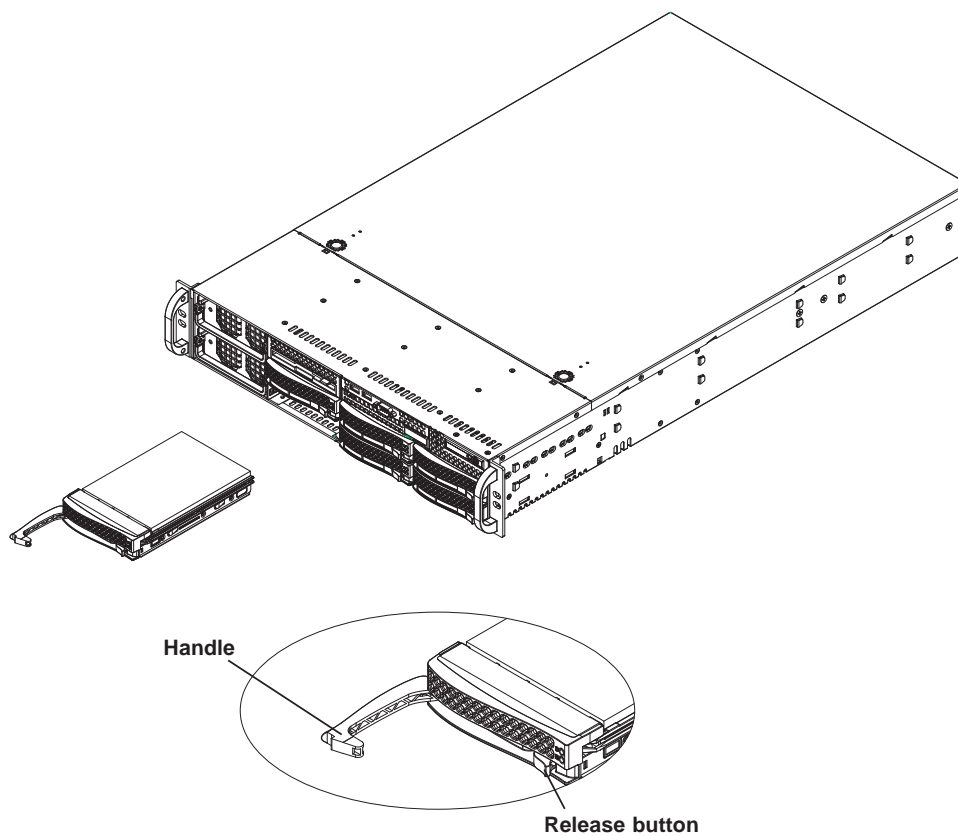
Important: Regardless of how many hard drives are installed, all drive carriers must remain in the drive bays to maintain proper airflow.

Hard Drive Backplane

The hard drives plug into a backplane that provides power, drive ID and bus termi-nation. A RAID controller can be used with the backplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the hard drives. The backplane is already preconfigured, so there are no jumpers or switches present on it.DVD-ROM Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD-ROM drive bay. The 8026B-6RF/8026B-TRF accomodates only slim type DVD-ROM drives. Side mounting brackets are typically needed to mount a slim DVD-ROM drive in the 8026B-6RF/8026B-TRF server. You must power down the system before installing or removing IDE components. See the Figures below for connector and component locations.

Figure 6-4. Backplane Connections
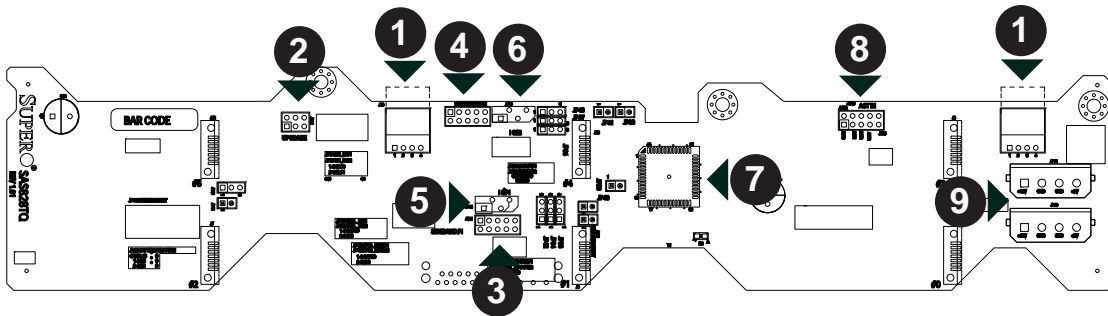
SAS Backplane Connections	
1. CD-ROM/Floppy Drive Power	9. 4-pin Power Connectors
2. Upgrade Connector	10. SAS Port #0
3. Sideband Connector #1	11. SAS Port #1
4. Sideband Connector #2	12. SAS Port #2
5. I2C Connector #1	13. SAS Port #3
6. I2C Connector #2	14. SAS Port #4
7. MG9072 Chip	15. SAS Port #5
8. ACT_IN	
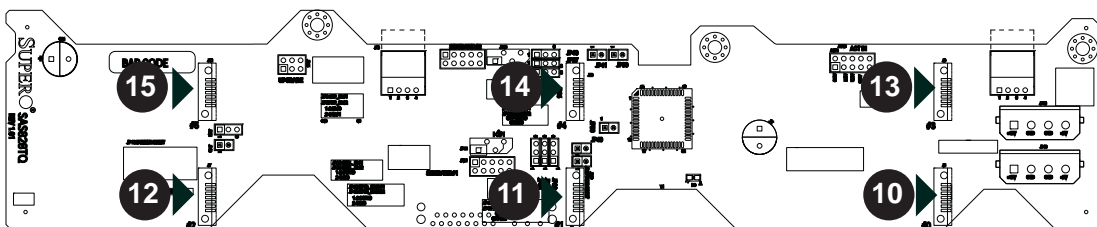
6-5 Power Supply

The SuperServer 8026B-6RF/8026B-TRF has a 1400 watt redundant power supply consisting of two power modules. Each power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V - 240V input voltage.

Power Supply Failure

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The PWR Fail LED will illuminate and remain on until the failed unit has been replaced. Replacement units can be ordered directly from Supermicro (see contact information in the Preface). The power supply units have a hot-swap capability, meaning you can replace the failed unit without powering down the system.

Removing/Replacing the Power Supply

You do not need to shut down the system to replace a power supply unit. The backup power supply module will keep the system up and running while you replace the failed hot-swap unit. Replace with the same model (see part number in the Appendix), which can be ordered directly from Supermicro.

Removing the Power Supply

1. First unplug the AC power cord at the front of the chassis that corresponds to the failed power supply module. (The top/bottom power socket corresponds to the top/bottom power module.)

2. Depress the locking tab on the power supply module.

3. Use the handle to pull the module straight out.

Installing a New Power Supply

1. Replace the failed hot-swap unit with another identical power supply unit.

2. Push the new power supply unit into the power bay until you hear a click.

3. Finish by plugging the AC power cord back into the socket.

Figure 6-5. Removing a Power Supply Module
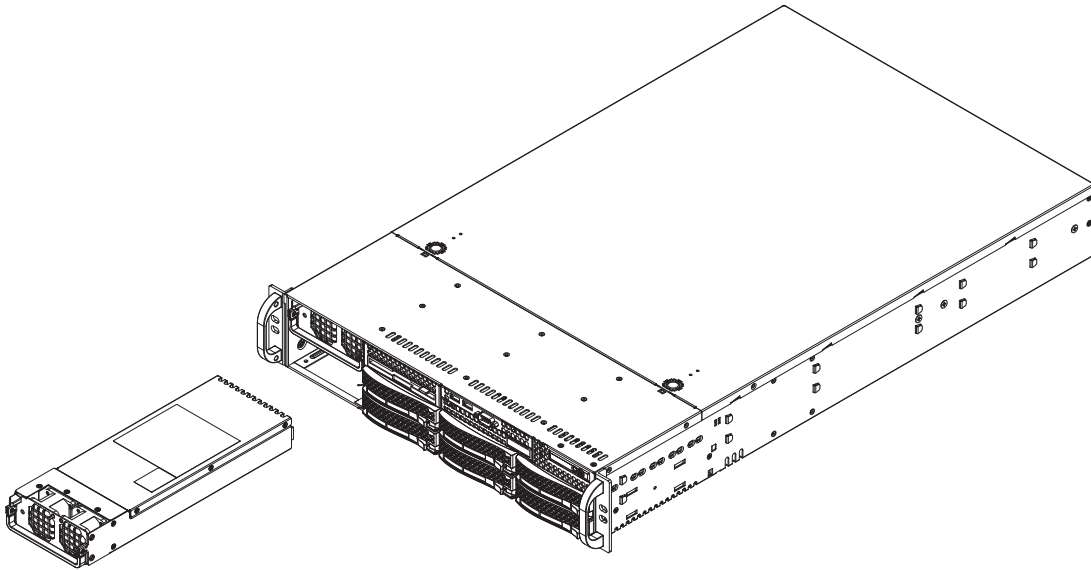
Notes

Chapter 7

BIOS

7-1   Introduction

This chapter describes the AMI BIOS Setup Utility for the X8QB6-F/X8QBE-F. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Starting BIOS Setup Utility

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

> **Note**: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys." Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

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

How To Change the Configuration Data

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

> **Note**: For AMI BIOS Recovery, please refer to the AMI BIOS Recovery Instructions posted on our website at http://www.supermicro.com/support/manuals/.

Starting the Setup Utility

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

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

7-2 Main Setup

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

```
                      BIOS SETUP UTILITY
 Main    Advanced    Boot    Security    Exit

 System Overview                                Use [ENTER], [TAB]
 ───────────────────────                        or [SHIFT-TAB] to
 System Time              [11:33:00]            select a field.
 System Date              [Mon 08/16/2010]
                                                Use [+] or [-] to
 Supermicro X8QB6/E                             configure system Time.
 BIOS Build Ver  :1.00
 BIOS Build Date :07/27/10

 Processor
 Intel(R) Xeon(R) CPU       X7542  @ 2.67GHz
 Speed         :2666MHz
 Physical Count :1                        ↔     Select Screen
 Logical Count  :6                        ↑↓    Select Item
                                          +-    Change Field
 System Memory                            Tab   Select Field
 Size     :8184MB                         F1    General Help
                                          F10   Save and Exit
                                          ESC   Exit

         v02.68 (C)Copyright 1985-2009, American Megatrends, Inc.
```

System Overview: The following BIOS information will be displayed:

System Time/System Date

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

Supermicro X8QB6/E

● **BIOS Version**: This item displays the BIOS vision used in your system.

● **BIOS Build Date**: This item displays the date when this BIOS was built.

Processor

The AMI BIOS will automatically display the status of the processor used in your system:

● **CPU Type**: This item displays the type of CPU used in the motherboard.

● **Speed**: This item displays the CPU speed as detected by the BIOS.

● **Physical Count**: This item displays the number of processors installed in your system as detected by the BIOS.

● **Logical Count**: This item displays the number of CPU Cores detected in your system by the BIOS.

System Memory

● **Size**: This displays the size of memory available in the system.

7-3 Advanced Setup Configurations

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

```
                        BIOS SETUP UTILITY
   Main    Advanced    Boot    Security    Exit

   Advanced Settings                          Select Boot Features
   ─────────────────

   ▶ Boot Features
   ▶ Processor & Clock options
   ▶ Advanced Chipset Control
   ▶ IDE/SATA Configuration
   ▶ PCI/PnP Configuration
   ▶ SuperIO Configuration
   ▶ USB Configuration
   ▶ ACPI Configuration
   ▶ Event Log Configuration
   ▶ Hardware Health Configuration
   ▶ IPMI Configuration                    ↔    Select Screen
   ▶ Remote Access Configuration           ↑↓   Select Item
   ▶ Trusted Computing                     Enter Go to Sub Screen
                                           F1   General Help
                                           F10  Save and Exit
                                           ESC  Exit


        v02.68 (C)Copyright 1985-2009, American Megatrends, Inc.
```

⚠ **Warning:** Be sure to select the correct setting for each item in this section. A wrong setting selected may cause the system to malfunction.

▶Boot Features

Quick Boot

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

Quiet Boot

Use this feature to modify the bootup screen display between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

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

Bootup Num-Lock

This feature is used to select the Power-on state for the Numlock key. The options are Off and **On**.

PS/2 Mouse Support

Select Enabled to enable PS/2 Mouse support. Select **Auto** to enable the onboard PS/2 mouse when a PS/2 mouse is detected. The options are Enable, Disabled, and **Auto**.

Wait For 'F1' If Error

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

Hit 'Del' Message Display

Select Enabled to display "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Interrupt 19 Capture

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

Watch Dog Function

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

▶Processor and Clock Options

This submenu displays the status of the processor used in the motherboard and allows the user to configure the Processor and Clock settings.

Spread Spectrum Mode

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

Ratio CMOS Setting (Available when CPU Ratio is set to manual)

This option allows the user to set the ratio between the CPU Core Clock and the FSB Frequency. (**Note**: if an invalid ratio is entered, the AMI BIOS will restore the setting to the previous state.) The default setting depends on the type of CPU installed on the motherboard. The default setting for this motherboard is [**20**].

Sever Class

Use this item to identify the server class for your system so that the prefectcher settings listed below can be correctly configured. The options are Enterprise, **HPC (High Performance Cluster)** and Custom (for customized servers).

Hardware Prefetcher (Available when supported by the CPU)

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

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

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

MPS and ACPI MADT Ordering

This feature allows the user to configure the MPS (Multi-Processor Specifications) and ACPI settings for your motherboard. Select Modern Ordering if XP or a newer version of Windows OS is used in the motherboard. Select Legacy Ordering if 2000 or an earlier version is used. The options are **Modern Ordering** and Legacy Ordering.

Max CPUID Value Limit

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

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

Select Enabled to enable Virtualization Technology support which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

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

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

CPU Multi-Core Enable/Disable (Available when supported by the CPU)

Select Enabled to enable multi-core CPU support to enhance CPU performance for the following CPU Cores. The options are Disabled and **Enabled.**

- **Core 0/Core 1/Core 2/Core 3/Core 4/Core 5/Core 6/Core 7**

A20M

When the A20M# pin is enabled, it will force address bit 20 to zero (to be masked) to emulate the address wraparound for the real-address mode at 1 MB. Set this item to Enabled for the legacy operating systems and applications that require A20M support to work properly. The options are Enabled and **Disabled**.

Intel® SpeedStep™ Technology

Intel EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust the processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Please refer to Intel's web site for detailed information. The options are Disable (Disable GV3) and **Enable (Enable GV3)**.

Intel® TurboMode Tech (Available when Intel EIST Technology is enabled)

Select Enabled to use the TurboMode Technique to boost system performance. The options are **Enabled** and Disabled.

Performance/Walt Select

Use this feature to balance the need between system performance and energy saving. The options are **Traditional** and Power Optimized (for energy saving).

Intel® C-STATE Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled**. If this feature is set to Enabled, the following items will display.

C-State Package Limit Setting

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

C1 Auto Demotion

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

C3 Auto Demotion

If this feature is set to Enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled.**

ACPI T State

When this feature is enabled, CPU Throttling state will be reported in the ACPI (Advanced Configuration and Power Interface) protocol. The options are **Enabled** and Disabled.

▶Advanced Chipset Control

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

▶CPU Bridge Configuration

▶QPI Configuration

QuickPath Interconnect (QPI) is the connection between the CPU and the motherboard's I/O hub. This section displays the following QPI items.

MMConfigBase

This item is used to select the space-based address for memory_mapped configuration. The options are **0x8000 0000**, 0x4000 0000, and 0xC000 0000.

MMIOH Size Per IOH

Use this feature to select the memory_mapped IOH size to be allocated to each IOH. The options are **2G**, 4G, 6G, and 8G.

Logical Interrupt Mode

This item is used to select the logical interrupt mode. The options are **Flat Mode** and Cluster Mode.

Cluster Mode Check Sampling

Select Enabled to check if the APICID in an IntPriUpd message is not zero. The options are **Enabled** and Disabled.

QPI Debug Message Output Level

This feature allows the user to decide the level of an QPI debug message to be sent to the user. The options are **Err/Warn/Info0/1**, Err/Warn/Info0, and Err/Warn.

CRC Mode

Use this feature to select the QPI CRC (Cyclic Redundancy Check) mode, which will determine how often the raw computer data stored in a network or a hard disk device is checked for CRC. The options are **8Bit CRC** and 16Bit Rolling CRC.

QPI (Quick Path Interconnect) Links Speed

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

QPI Frequency Select (Available if the item - QPI Link Speed is set to Fast)

This feature is used to set desired QPI frequency. The options are 4.800 GT, 5.866GT, 6.400 GT and **Auto**.

QPI Scrambling

Select Enabled to enable Bit-Shuffling support which will allow bits in the data flow to be shifted around for CRC checking during data transmission and receiving between the CPUs or between a CPU and an IO hub (IOH). The options are **Enabled** and Disabled.

▶**Integrated Memory Controller Configuration**

Interleave Type

Use this feature to select memory interleaving mode. Select Inter-Socket Block Interleaving to enable memory interleaving between blocks of memory modules installed in different DIMM slots. Select Intra-Socket Block Interleaving to enable memory interleaving between blocks of memory modules installed in the same DIMM slot. Select Automatic to allow BIOS to automatically select the memory interleaving mode for memory modules installed in the system. The options are No Interleaving, **Inter-Socket Block Interleaving**, Intra-Socket Block Interleaving, and Automatic.

Interleave Order

Use this feature to set the order of memory interleaving. The options are High Only, High Low, **Low High 0**, and Low High 1.

Mirroring

Mirroring support allows data stored in one location to be copied into another location for data redundancy and security. The options are listed below:

- **No Mirroring** (Mirroring Disabled),

- Intra-Socket Mirrored Nx1 to Nx3 (Memory Controller 1 to Memory Controller 3 of the same DIMM socket),

- Intra-Socket Mirrored Nx3 to Nx1 (Memory Controller 3 to Memory Controller 1 of the same DIMM socket),

- Inter-Socket Mirrored S0 (Socket 0) to S1 (Socket 1), and S2 (Socket 2) to S3 (Socket 3),

- Inter-Socket Mirrored S0 (Socket 0) to S2 (Socket 2) and S1 (Socket 1) to S3 (Socket 3),

- Inter-Socket Mirrored S0 (Socket 0) to S3 (Socket 3) and S1 (Socket 1) to S2 (Socket 2).

Spare Enable

Select Enabled to enable spare support for all sockets, creating a spare drive for each socket. The options are Enabled and **Disabled**.

Mapper Mode

Use this feature to set the memory_mapper mode. The memory_maper is used to translate local physical addresses presented by a media device into DRAM memory addresses (in terms of rank, bank, row and column). Select Open to maximize open_page hits. Select Close to minimize rank conflicts and to maximize command and simultaneous read/write bandwidth to boost performance. Select Adaptive to spread power dissipation over different DIMM modules to avoid memory overheating. The options are **Close**, Open and Adaptive.

Frequency Limit

This feature forces a DDR3 memory module to run at a frequency other than what the system has detected. The available options are **Auto**, 800 MHz, 978 MHz, 1067 MHz, and **Auto.**

Initialization Mode

Use this feature to select the memory initialization mode. The options are Serial and **Parallel**.

Hemisphere Mode

This feature is used to set the memory hemisphere mode. Select Enabled to prevent CPU's cache agent 1 from accessing cache agent 2 in an effort to reduce memory latency and maximize performance. This setting requires that both DIMM modules and DRAM sizes are configured in the same way. Select Disabled to allow a CPU's cache agent 1 to access cache agent 2. The options are Disabled and **Enabled**.

Page Policy

Use this feature to configure Page_Policy settings. A page is a set of memory blocks cached in a DRAM buffer that determines sub-commands needed for a memory module to access a particular page. Select Open to optimize memory

performance. Select Close to use memory safe mode. Select Adaptive to balance safety and performance. The options are Close, **Open** and Adaptive.

Scheduler Policy

Use this feature to configure Scheduler_Policy settings. The scheduler is used to translate memory read/write commands into memory sub-commands for easy execution. Select Static Trade Off to balance read/write priority. Select Static Read Priority to optimize read latency and bandwidth. Select Static Write Priority to optimize write bandwidth to expedite command writing and execution. Select Adaptive to minimize latency. The options are Static Trade Off, Static Read Priority, Static Write Priority, and **Adaptive**.

ECC Check Time Interval

This feature is used to set the time interval between each ECC Memory checking. If an ECC error occurs, an error message will also be sent via IPMI. The options are 100 Msec, 1 Sec, 10 Sec, 1 Min, **5 Minutes**, and 10 Minutes.

▶North Bridge Configuration

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

Relaxed Ordering

Select Enabled to enable PCI Express Relaxed Ordering support which will allow certain transactions to violate the strict PCI-E ordering rules and be carried out first by passing other transactions that were issued earlier. The options are **Auto**, Disabled and Enabled.

Maximum Payload Size

This feature is used to set the maximum payload size for a PCI-Express device. Please refer to your add-on card user guide for the desired setting. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes, and Maximum supported.

Extended Tag Field

Select Enabled to use the 8-bit Tag field of a device as a requester. The options are **Auto**, Disabled and Enabled.

No Snoop

If this feature is set to Enabled, No_Snoop option for a PCI-Express device will be enabled. The options are **Auto**, Disabled and Enabled.

Maximum Read Request Size

This feature is used to set the maximum read request size for a PCI-Express device. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes, and Maximum supported.

Active State Power Management

Select Enabled to use the power management for signal transactions between the PCI Express L0 and L1 Links. Select Enabled to configure PCI-Exp. L0 and L1 Link power states. The options are **Disabled** and Enabled.

Extended Synch

Select Enabled to generate extended synchronization patterns. The options are **Auto**, Disabled and Enabled.

Intel VT-d

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

Thermal Sensor

Select Enabled to activate the thermal sensor. The options are **Disabled** and Enabled.

▶**South Bridge Configuration**

This feature allows the user to configure Intel ICH South Bridge settings.

USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports, 8 USB Ports, 10 USB Ports, and **12 USB Ports**. (If this item is set to Enabled, USB 2.0 Controller will be enabled.)

USB Port Configuration

This feature is used to configure USB port settings. The Options are: **6x6 USB Ports** and 8x4 USB Ports.

USB 2.0 Controller

Select Enabled to activate the USB 2.0 Controller. The options are **Enabled** and Disabled. (**Note**: If the item - USB Functions is enabled, USB 2.0 Controller will

always be enabled. When the item - USB Functions is set to Disabled, the user has the option to enable or disable USB 2.0 Controller.)

HDA Controller

Select Enabled to enable the High-Definition Audio Controller. The settings are **Enabled** and Disabled.

SMBUS Controller

Select Enabled to enable the System_Management Bus Controller. The settings are **Enabled** and Disabled.

SLP_S4# Min. Assertion Width

This feature allows the user to set the minimum SLP_S4# Assertion Width to ensure that the DRAMs have safe power cycles. The settings are **4 to 5 seconds,** 3 to 4 Seconds, 2 to 3 Seconds, and 1 to 2 Seconds.

Restore on AC Power Loss

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

SATA Master Break Event

If this feature is set to Enabled, activities on the SATA master drive will break from the C3/C6 state. The settings are Enabled and **Disabled**.

PCIE Ports Configuration

PCIE Port 0 ~ PCIE Port 4

This feature is used to configure PCI-E port settings. Select Auto to allow a specified PCIE port to be enabled if a PCIE device is detected. The settings are **Auto**, Enabled and Disabled.

PCIE High Priority Port

This feature allows the user to select the PCIE High Priority port. The settings are **Disabled**, Port 0, Port 1, Port 2, Port 3, Port 4, and Port 5.

PCIE Port 0 IOxAPIC Enable ~ PCIE Port 4 IOxAPIC Enable

Select Enable to enable IOxAPIC support for a PCIE port specified. The settings are Enabled and **Disabled**.

▶IDE/SATA Configuration

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

SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to the legacy_compatible mode. Selecting Enhanced sets SATA#1 to the native SATA mode. The options are Disabled, Compatible and **Enhanced**.

Configure SATA#1 as (Not available when SATA#1 Configuration is disabled)

Use this feature to select the drive type for SATA#1. The options are **IDE,** RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear. When the option-AHCI is selected, the item-ICH AHCI Codebase will be available.)

ICH RAID Code Base (Available when the option-RAID is selected.)

Select Intel to use Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to use Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are **Intel** and Adaptec.

ICH AHCI Codebase (Available when the option-AHCI is selected.)

Use this feature to select the AHCI Codebase for the ICH South Bridge. The options are BIOS Native Module and **Intel AHCI ROM**.

SATA#2 Configuration (Available when the option-IDE is selected.)

Select Enhanced to set SATA#2 to the native SATA mode. The options are Disabled and **Enhanced**.

Primary IDE Master/Slave, Secondary IDE Master/Slave, Third IDE Master, and Fourth IDE Master

These settings allow the user to set the parameters the slots indicated above. Press <Enter> to activate the following submenu screen for details. Set the correct configurations accordingly. The items included in the submenu are listed below.

Type

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

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must support a 48-bit LBA mode addressing. If not,

contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

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

PIO Mode

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

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

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

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

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

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

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

Select UDMA5 to allow the BIOS to use Ultra DMA mode 5. It has a data transfer rate of 133 MB/s.

Select UDMA6 to allow the BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133 MB/s. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

DMA Mode

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

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

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

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

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

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

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

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

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

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

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

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

Select UDMA5 to allow BIOS to use Ultra DMA mode 5. It has a data transfer rate of 100 MB/s.

Select UDMA6 to allow BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133 MB/s. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

S.M.A.R.T. For Hard disk drives

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

32Bit Data Transfer

Select Enabled to support 32-bit IDE data transfer. The options are **Enabled** and Disabled.

Hard Disk Write Protect

Select Enabled to support Hard Disk Write Protect to prevent data from being written to a hard drive. The options are Enabled or **Disabled**.

IDE Detect Timeout (sec)

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

▶PCI/PnP Configuration

Clear NVRAM

Select Yes to clear the Non-Volatile Random Access (Flash) Memory (NVRAM) during system boot. The options are **No** and Yes.

Plug & Play OS

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

PCI Latency Timer

This feature sets the PCI Latency Timer for each PCI device installed on a PCI bus. Select 64 to set the PCI Latency Timer to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

Palette Snooping

Select Enabled to allow BIOS to inform PCI-E devices that an ISA graphics device is installed in the system so that the ISA graphics card can function properly. The options are **Disabled** and Enabled.

SR-IOV Supported

Single Root I/O Virtualization is an industry-standard mechanism that allows devices to be shared simultaneously among several virtual machines. SR-IOV is capable of partitioning a PCI device into several virtual interfaces in order to share the resources of a PCI Express (PCIe) device under a virtual environment. The options are **Disabled** and Enabled.

Onboard VGA Device

Select Enabled to use VGA devices. The options are Disabled and **Enabled**.

Boot Graphic Adapter Priority

This feature selects the graphics adapter to be used as the primary boot device. The options are **Auto** and Onboard VGA Device.

Onboard SAS OPROM

Select Enabled to enable Onboard SAS Option ROM which will allow you to boot the computer using a SAS device. The options are **Enabled** and Disabled.

Onboard LAN Option ROM Select

Select iSCSI to use iSCSI Option ROMs to boot the computer. Select PXE to use PXE Option ROMs to boot the computer. The options are iSCSI and **PXE**.

LAN1 Option ROM/LAN2 Option ROM

Select Enabled to enable the onboard LAN1/LAN2 Option ROMs to boot the computer using a network interface. The options are Enabled and **Disabled.**

▶Super IO Device Configuration

Serial Port1 Address/IRQ, Serial Port2 Address/IRQ

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3 and 2F8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, 3F8/IRQ4, and 2E8/IRQ3.

▶USB Configuration

This feature allows the user to configure USB settings for the motherboard.

Legacy USB Support

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

Port60h/64h Emulation

Select Enabled to enable 60h/64h emulation so that a USB keyboard can be supported by an operating system that is not compatible with USB devices. The options are Enabled and **Disabled.**

USB 2.0 Controller Mode

This setting allows you to select USB 2.0 Controller mode. The options are **Hi-Speed (480 Mbps)** and Full Speed (12 Mbps).

BIOS EHCI Hand-Off

Select Enabled to support BIOS Enhanced Host Controller Interface to provide a workaround solution for an operating system that does not support EHCI Hand-Off technology. When enabled, the EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and **Enabled**.

Legacy USB1.1 HC Support

Select Enabled to enable Legacy USB 1.1 HC support. The settings are Disabled and **Enabled**.

Hot-Plug USB FDD Support

When this item is set to Enabled, a dummy Floppy Device Drive will be created as a Hot-Plug Floppy device in the system. When this item is set to **Auto**, a dummy floppy device will not be created if no USB FDD device is detected. The options are Disabled, Enabled and **Auto**.

▶ACPI Configuration

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

▶Advanced ACPI Configuration

This feature allows the user to configure the settings for the Advanced ACPI (Advanced Configuration and Power Interface) settings.

ACPI Version Features

Use this feature to select the ACPI version to be used in the system. The options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/.

ACPI APIC Support

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

AMI OEMB Table

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

Headless Mode (Available ACPI Aware O/S='Yes')

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

NUMA Support

Select Enabled to enable Non-Uniform Memory Access support to improve CPU performance for a system that has an OS with NUMA support. The options are **Enabled** and Disabled.

▶Chipset ACPI Configuration

This feature is used to configure Chipset ACPI (Advanced Configuration and Power Interface) settings.

Energy Lake Feature

Select Enabled to use Intel Energy Lake technology to enhance power efficiency. The options are **Disabled** and Enabled.

APIC ACPI SCI IRQ

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

USB Device Wakeup From S3/S4

Select Enable to wake up the system via a USB device when the system is in S3 or S4 State. The options are Enabled and **Disabled**.

High Precise Event Timer

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

▶General WHEA Configuration

WHEA Support

Select Enabled to support the Windows Hardware Error Architecture (WHEA) platform and provide a common infrastructure for the system to handle hardware errors within the Windows OS environment to reduce system crashes and to enhance system recovery and health monitoring. The options are **Enabled** and Disabled.

▶Event Log Configuration

View Event Log

Use this option to view the System Event Log.

Mark All Events as Read

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

Clear Event Log

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

▶Hardware Health Event Monitoring

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

CPU Overheat Alarm

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

> ⚠ **Warning!** 1.Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed. 2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

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

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

CPU 1 Temperature ~ CPU 4 Temperature/System Temperature 1 Reading~ System Temperature 4 Reading

This feature displays current temperature readings for the CPU and the System as specified above.

The following items will be displayed for your reference only:

CPU 1 Temperature ~ CPU 4 Temperature

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the motherboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25°C). The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

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

User intervention: No action required.

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

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

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

✎ **Notes**: 1. The system may shut down if it continues for a long period to prevent damage to the CPU.

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

System Temperature 1 Reading ~ System Temperature 4 Reading

The system temperature as specified above will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

Fan 1 Speed ~ Fan 11 Speed

This feature displays the fan speed readings from fan interfaces Fan 1 through Fan 10.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed/FS" to allow the onboard fans to run at full speed for maximum cooling. The FS setting is recommended for special system configuration or debugging. Select "Performance/PF" for better system cooling. The PF setting is recommended for high-power-consuming and high-density systems. Select "Balanced/BL" for the onboard fans to run at a speed that will balance the needs between system cooling and power saving. The BL setting is recommended for regular systems with normal hardware configurations. Select "Energy Saving/ES" for best power efficiency and maximum quietness. The Options are: Full Speed/FS, Performance/PF, **Balanced/BL**, and Energy Saving/ES.

Voltage Monitoring

CPU1 Vcore, CPU2 Vcore, CPU3 Vcore, CPU4 Vcore, +1.0V, +1.2V, +1.8V, +1.1V, +12V, 1.5V, 3.3V V, 3.3VSB, Battery Voltage, and IOPV12.

▶IPMI Configuration

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

Status of BMC

The Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This item displays the status of the current BMC controller.

IPMI Firmware Version

This item displays the current IPMI Firmware Version.

▶ View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. To view an event, select an Entry Number and press <Enter> to display the information as shown in the screen.

- Total Number of Entries

- SEL Record ID

- SEL Record Type

- Event Timestamp

- Generator ID

- Event Message Format Ver.

- Event Sensor Type

- Event Sensor Number

- Event Dir Type

- Event Data.

Clear BMC System Event Log

Clear BMC System Log now

Select OK and press <Enter> to clear the BMC system log immediately. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

⚠ **Caution**: Any cleared information is unrecoverable. Make absolutely sure that you will no longer need any data stored in the log before clearing the BMC Event Log.

▶Set LAN Configuration

This feature allows the user to configure the IPMI LAN adapter with a network address as shown in the following graphics.

Channel Number - This feature displays the channel number.

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

▶IP Address

Parameter Selector

This item displays the status of the IP Address Parameter Selector.

IP Address Source

This features allows the user to select how an IP address is assigned to a client computer or network device. Select DHCP (Dynamic Host Configuration Protocol) to allow a client (computer or device) obtains an IP address from a DHCP server that manages a pool of IP addresses and network information on a "request and grant" basis. Upon timeout (or lease expiration), the IP address assigned to the client can be reassigned to a new client. Select Static (Static Allocation) to allow the host server to allocate an IP address based on a table containing MAC Address/IP Address pairs that are manually entered (probably by a network administrator). Only clients with a MAC address listed in the MAC/ IP Address Table will be assigned an IP address. The IP Address allocated to the client is on a longer term basis than that assigned by the DHCP mentioned in the other option. The options are **DHCP** and Static.

IP Address

The BIOS will automatically enter the IP address for this machine; however it may be overwritten. The value of each three-digit number separated by dots should not exceed 255.

Current IP Address in BMC

The BIOS will automatically enter the current IP address in BMC for this machine; however it may be overwritten. The value of each three-digit number separated by dots should not exceed 255.

▶MAC Address Configuration

Parameter Selector

This item displays the status of the MAC Address Parameter Selector.

Current Mac Address in BMC

The BIOS will automatically enter the current Mac address in BMC for this machine; however it may be overwritten. Mac addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48. D0.D4.60).

▶**Subnet Mask Configuration**

Parameter Selector

This item displays the status of the Parameter Selector.

Subnet Mask

This item displays the current subnet mask setting for your IPMI connection. The value of each three-digit number separated by dots should not exceed 255.

Current Subnet Mask in BMC

The BIOS will automatically enter the current subnet mask in BMC for this machine; however it may be overwritten. The value of each three-digit number separated by dots should not exceed 255.

▶**Gateway Address**

Parameter Selector

This item displays the status of the Gateway Address Parameter Selector.

Gateway Address

The BIOS will automatically enter the Gateway address of this machine; however it may be overwritten. The value of each three-digit number separated by dots should not exceed 255.

Current IP Address in BMC

The BIOS will automatically enter the current IP address in BMC for this machine; however it may be overwritten. The value of each three-digit number separated by dots should not exceed 255.

▶**Remote Access Configuration**

Remote Access

This allows the user to enable the Remote Access feature. The options are Disabled and **Enabled**. If Remote Access is set to Enabled, the following items will display:

Serial Port Number

This feature allows the user decide which serial port to be used for Console Redirection. The options are COM 1 and **COM 2**.

Base Address, IRQ

This item displays the based address and IRQ of the serial port specified.

Serial Port Mode

Use this item to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

Flow Control

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

Redirection After BIOS POST

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

Terminal Type

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

VT-UTF8 Combo Key Support

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

Sredir Memory Display Delay

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

►Trusted Computing (Optional)

TCG/TPM Support

Select Yes on this item and enable the TPM jumper on the motherboard to enable TCG (TPM 1.1/1.2)/TPM support to improve data integrity and network security. The options are **No** and Yes. If this feature is set to Yes, the following items will display.

Indicate Physical (Available when TCG/TPM Support = 'Yes')

Select Yes for the BIOS to detect the presence of TPM devices at system boot. Select No to hide the presence of TPM devices at system boot. The options are Yes and **No**.

TPM Deactivated (Available when TCG/TPM Support = 'Yes')

Select Set to disable TPM support at bootup. Select Clear to activate the TPM devices to at bootup. Select Don't Change to keep the current TPM support status. The options are Set, Clear, and **Don't Change**.

TPM Owner (Available when TCG/TPM Support = 'Yes')

This feature allows the user to configure TPM Owner settings. The options are **Don't Change**, Enable Install, Disable Install, and Clear.

Execute TPM Command (Available when TCG/TPM Support = 'Yes')

Select Enabled to execute TPM commands you've selected. Select Don't Change to keep the current TPM commands without making any changes. Select Disabled to abandon the changes you have made on TPM commands. The options are Enabled, Disabled and **Don't Change**.

TPM Enable/Disable Status

This item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

TPM Owner Status

This item displays the status of TPM Ownership.

7-3   Boot Configuration

Use this feature to configure boot settings.

```
                              BIOS SETUP UTILITY
   Main    Advanced    Boot    Security    Exit

   Boot Settings                                   Specifies the
   ─────────────────────────────────              Boot Device
  ▶ Boot Device Priority                           Priority sequence.

   Retry Boot Device            [Disabled]



                                                 ↔     Select Screen
                                                 ↑↓    Select Item
                                                 Enter Go to Sub Screen
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit


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```

▶Boot Device Priority

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

- 1st Boot Device - [SATA: XXXXXXXXX]

▶Hard Disk Drive, CD/DVD-ROM Drive, Removable Drive

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all hard disk drives that have been detected (i.e., 1st Drive, 2nd Drive, 3rd Drive, etc).
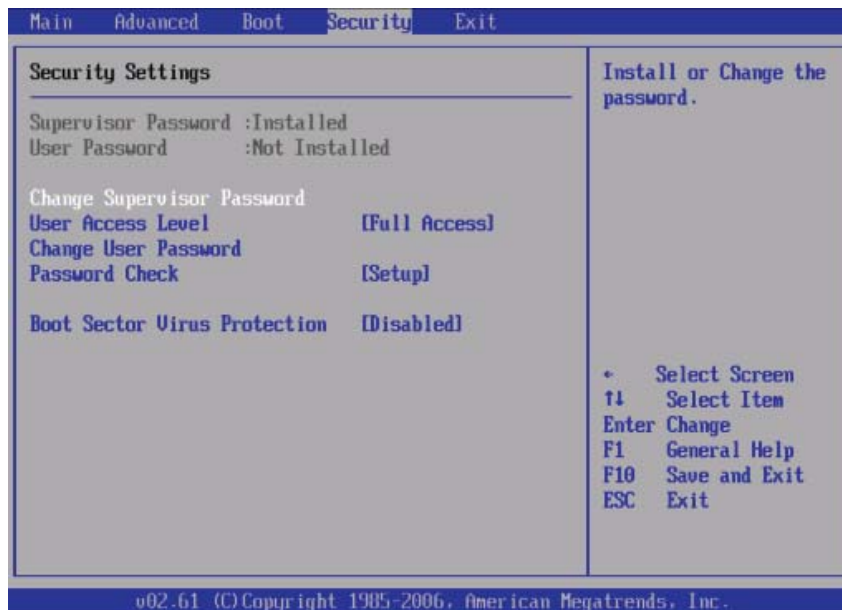
- 1st Drive - [SATA: XXXXXXXXX]

Retry Boot Devices

Select Enabled to enable Retry Boot Devices support to allow the system to attempt to boot from a specific boot device after a boot failure. The options are Enabled and **Disabled**.

7-4   Security Settings

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

```
Main    Advanced    Boot    Security    Exit

Security Settings                                    Install or Change the
                                                     password.
Supervisor Password :Installed
User Password       :Not Installed

Change Supervisor Password
User Access Level            [Full Access]
Change User Password
Password Check               [Setup]

Boot Sector Virus Protection  [Disabled]

                                                     ←    Select Screen
                                                     ↑↓   Select Item
                                                     Enter Change
                                                     F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit


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```

Supervisor Password

This item indicates if a Supervisor password has been entered for the system. "Not Installed" means a Supervisor password has not been used.

User Password

This item indicates if a user password has been entered for the system. "Not In-stalled" means that a user password has not been used.

Change Supervisor Password

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

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

Select **Full Access** to grant full User read and write access to the Setup Utility. Select View Only to allow the user to access to the Setup Utility without chang-ing the fields. Select Limited to allow the user to access and change limited fields such as Date and Time. Select No Access to prevent the user from accessing the Setup Utility.

Change User Password

Select this feature and press <Enter> to access the submenu and enter a new User Password.

Clear User Password (Available only when User Password has been set)

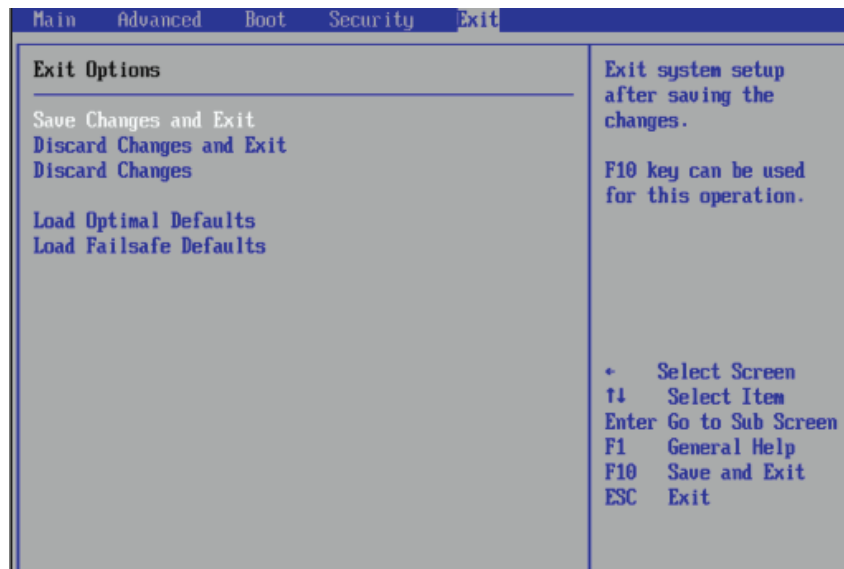This item allows you to clear a user password after it has been entered.

Password Check

Select Setup for the system to check for a password at Setup. Select Always for the system to check for a password at bootup. The options are **Setup** and Always.

Boot Sector Virus Protection

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

7-5   Exit Options

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

```
 Main    Advanced    Boot    Security    Exit

 Exit Options                                      Exit system setup
 ──────────────────────────────────               after saving the
 Save Changes and Exit                             changes.
 Discard Changes and Exit
 Discard Changes                                   F10 key can be used
                                                   for this operation.
 Load Optimal Defaults
 Load Failsafe Defaults




                                                   ←     Select Screen
                                                   ↑↓    Select Item
                                                   Enter Go to Sub Screen
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit
```

Save Changes and Exit

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

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

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

Load Optimal Defaults

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

Load Fail-Safe Defaults

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

Appendix A

POST Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

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

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

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

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

Notes

Appendix B

System Specifications

Processors

Four Intel® Xeon® 7500 Series processors inLGA-1567 sockets

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

Chipset

Intel 7500 + ICH10R

BIOS

32 Mb AMIBIOS® Flash ROM

Memory Capacity

Supports up to 512 GB of registered ECC DDR3-1333/1066/978/800 memory. (DDR-1333 memory will run at 1066 MHz.)

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

SAS Controller (8026B-6RF only)

Onboard LSI 2108 SAS controller supports eight 6 Gbps SAS hard drives (RAID 0, 1, 5, 6, 10, 50 and 60 are supported)

SATA Controller

SATA controller integrated into the South Bridge (ICH10R) section of the chipset provides a six-port 3 Gbps SATA subsystem, which is RAID 0, 1, 5 and 10 supported (RAID 5 supported by Windows only)

Drive Bays

Six hot-swap drive bays to house six standard SAS or SATA drives

Peripheral Drives/Bays

One (1) slim DVD-ROM drive

Expansion Slots

Supports the use of two PCI-E 2.0 x16 *or* one PCI-E 2.0 x16 and two PCI-E 2.0 x8 slots *or* four PCI-E 2.0 x8 add-on cards (all must be low-profile)

Chassis

SC828TQ-R1400LPLP (2U rackmount)

Dimensions (both): (WxHxD) 17.2 x 3.5 x 27.75 in. (473 x 89 x 705 mm)

Weight

Gross (Bare Bone): 65.5 lbs. (29.8 kg.)

System Cooling

Three 8-cm PWM (Pulse Width Modulated) fans

System Input Requirements

AC Input Voltage: 100 - 240V AC auto-range

Rated Input Current: 11.5 - 5.5A max

Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 1400W (Part# PWS-1K41P-1R) 80 Plus Gold Certified

Rated Output Voltages: +12V (91A @ 110V, 116A @ 180~240V), +5Vsb (4A @ 240V, 4A @ 100V)

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: 20% to 95% (non-condensing)

Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions:

FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity:

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

Safety:

EN 60950/IEC 60950-Compliant

UL Listed (USA)

CUL Listed (Canada)

TUV Certified (Germany)

CE Marking (Europe)

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

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